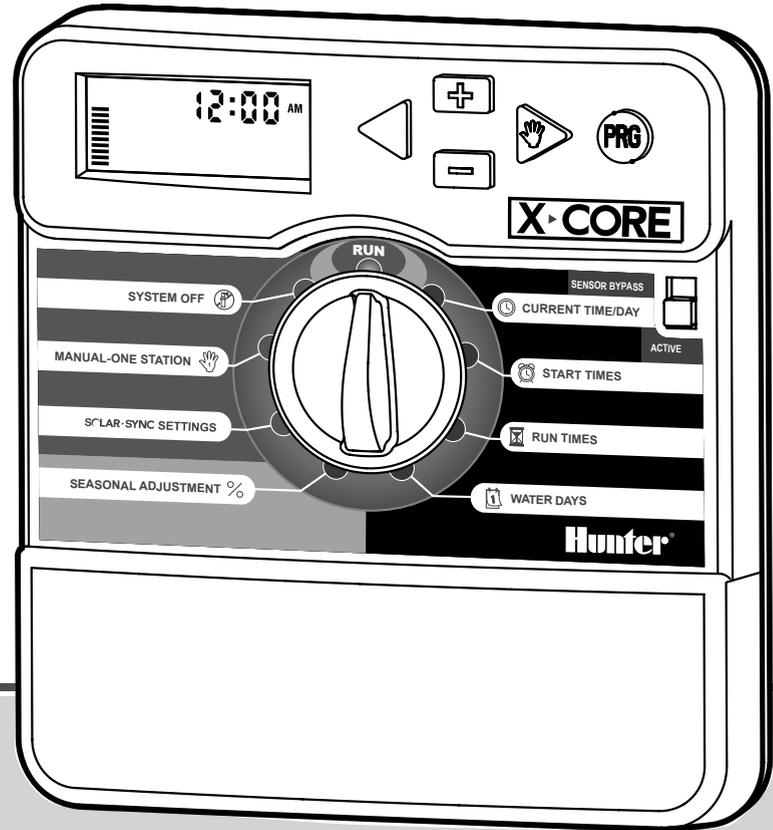


X-CORE

Residential Irrigation Controller



NEW

Owner's Manual and Programming Instructions
Compatible with Hunter Remotes and Solar Sync

Hunter[®]

12:00 AM



X-CORE

RUN

SYSTEM OFF

SENSOR BYPASS

CURRENT TIME/DAY

MANUAL-ONE STATION

ACTIVE

START TIMES

SOLAR-SYNC SETTINGS

RUN TIMES

SEASONAL ADJUSTMENT %

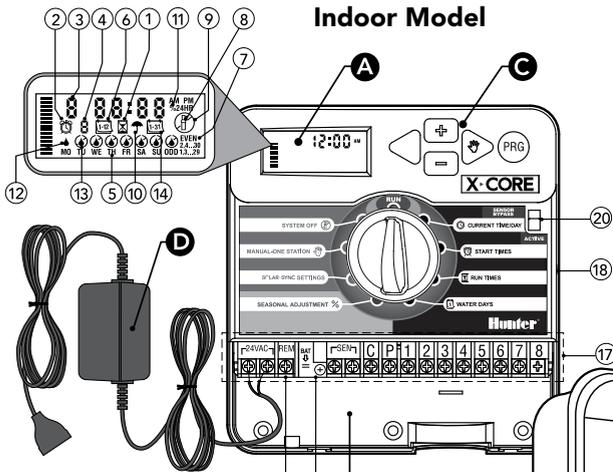
WATER DAYS

Hunter®

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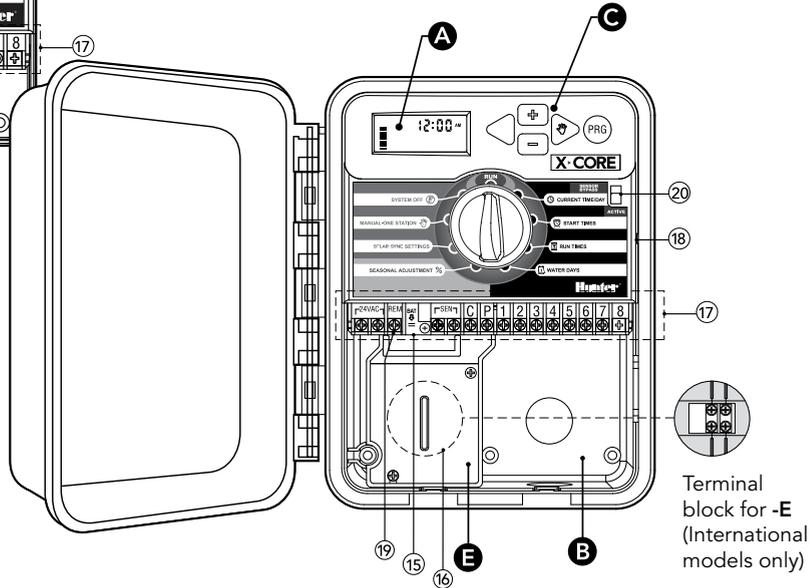
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X-CORE COMPONENTS



Note: Plug may look different from illustration

Outdoor Model (Internal Transformer Included)



Terminal block for -E (International models only)

X-CORE COMPONENTS

A LCD Display		
1	 Run Times	Allows user to set each valve station run time from 1 minute to 4 hours
2	 Start Times	Allows 1 to 4 start times to be set in each program
3	Station Number	Indicates currently selected station number
4	Program Designator	Identifies program (A, B, or C) in use
5	Day of the Week	Identifies day of the week
6	Interval Watering	Identifies month when programming current date
7	Odd/Even Watering	Identifies if Odd or Even watering has been selected
8	Flashing Sprinkler	Indicates that watering is taking place
9	 System Off	Allows user to discontinue all programs and watering. Also allows the user to set the programmable "rain off," which stops watering for a period from 1 to 7 days.
10	 Umbrella	Indicates that the rain sensor is active
11	% Seasonal Adjustment	Allows the user to make run time changes according to the seasons without reprogramming the controller. Bars on the left allow quick visual reference to the seasonal adjustment percentage. When using Solar Sync ET Sensor, will display seasonal adjust updated daily by sensor.
12	 Rain Drop	Indicates watering will occur on the selected day
13	 Crossed Rain Drop	Indicates the watering will NOT occur on the selected day
14	 Calendar	Indicates interval watering schedule has been programmed. Icon also appears when programming the current day

X-CORE COMPONENTS

B Wiring Compartment

15	Lithium Battery	The replaceable lithium battery (included) allows the controller to be programmed in the absence of AC power. In addition, the battery will provide power for backup timekeeping in the event of a power outage.	
16	Internal Junction Box	Junction box in outdoor models for making AC power connections	
17	Terminal Strip	Use to attach transformer, sensor, and valve wires from their source to the controller	
NEW	18	Reset Button	Use to reset the controller (located on side of controller)
NEW	19	REM	Allows for connection of Hunter SmartPort® and Hunter Remote Controls
20	Sensor Bypass Switch	Ignores “Clik” weather sensor input when in Bypass position	

C Control Buttons

	+ Button	Increases the selected item flashing in the display
	- Button	Decreases the selected item flashing in the display
	◀ Button	Returns selected flashing display to previous item
	▶ Button	Advances the selected flashing display to the next item
	PRG Button	Selects program A, B, or C for different watering zone requirements

X-CORE COMPONENTS

Dial Settings		
	Run	Normal dial position for all controller automatic and manual operation
	 Current Time/Day	Allows current day and clock time to be set
	 Start Times	Allows 1 to 4 start times to be set in each program
	 Run Times	Allows user to set each valve station run time from 1 minute to 4 hours
	 Water Days	Allows the user to select interval days to water
	% Seasonal Adjustment	Allows user to make run time changes according to the seasons without reprogramming the controller. Bars on the left allow quick visual reference to the seasonal adjustment percentage.
	 Manual-One Station	Allows user to activate a one-time watering of a single valve
	 System Off	Allows user to discontinue all programs and watering. Also allows the user to set the programmable "rain off," which stops watering for a period from 1 to 7 days
NEW	SOLAR·SYNC Settings	Allows user to program settings when using Solar Sync ET Sensor
D External Transformer (Indoor Model Only)		
		A plug in transformer is provided to supply AC power to the controller

MOUNTING THE CONTROLLER TO WALL



Note: The indoor version of the X-Core is not waterproof or weather resistant, and must be installed indoors or in a protected area.

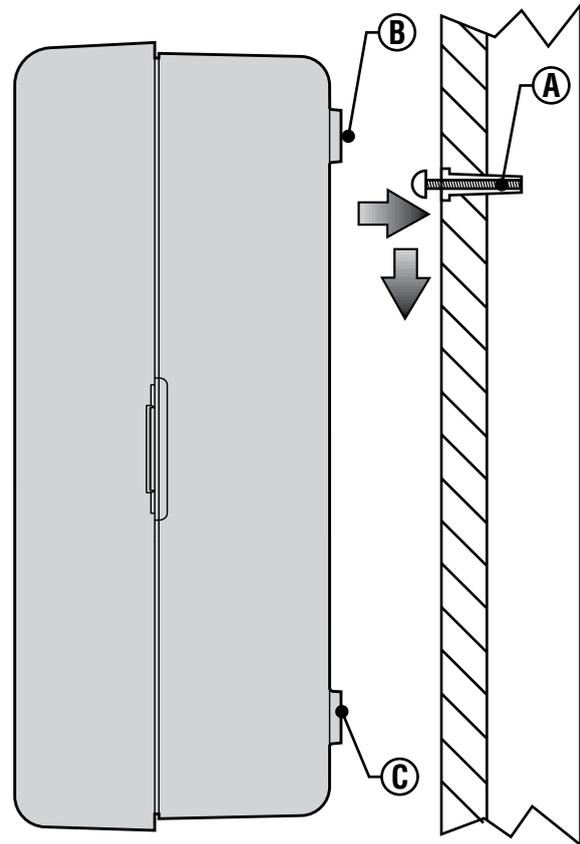
1. Secure one screw into the wall. Install screw anchors if attaching to drywall or masonry wall.
2. Slide the keyhole on top of the controller over the screw.
3. Secure the controller in place by installing screws in the holes below the terminal strip.



Do not plug transformer into power source until controller is mounted and all valve wiring has been connected.

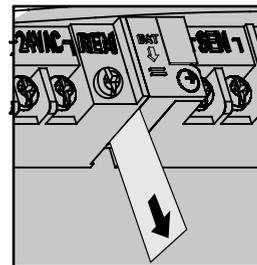


For XC - x01 - A: If the supply cord is damaged, it must be replaced by the manufacturer or service agent, or a similarly qualified person in order to avoid hazard.



ACTIVATING THE BATTERY

After installing your X-Core, make sure to remove the battery contact insulator to allow the X-Core to keep time in the event of a power outage.



CAUTION:
RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

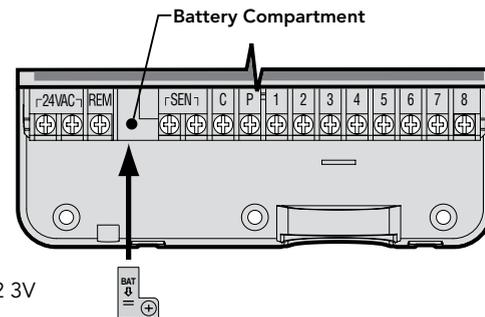
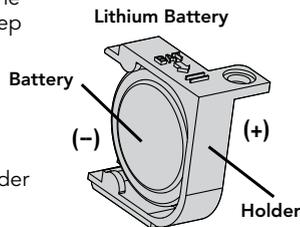
REPLACING THE BATTERY

A high-energy lithium battery is included with your X-Core controller. The battery allows the user to remotely program the controller without connecting AC power. It is also used to keep the current time and day during power outage conditions. To replace the battery:

1. Remove the screw from the battery holder.
2. Slide the battery holder down to access the battery.
3. Remove and replace the new battery into the battery holder and reinstall the battery holder.



NOTE: This positive(+) side of the battery should face the inside of the battery holder.



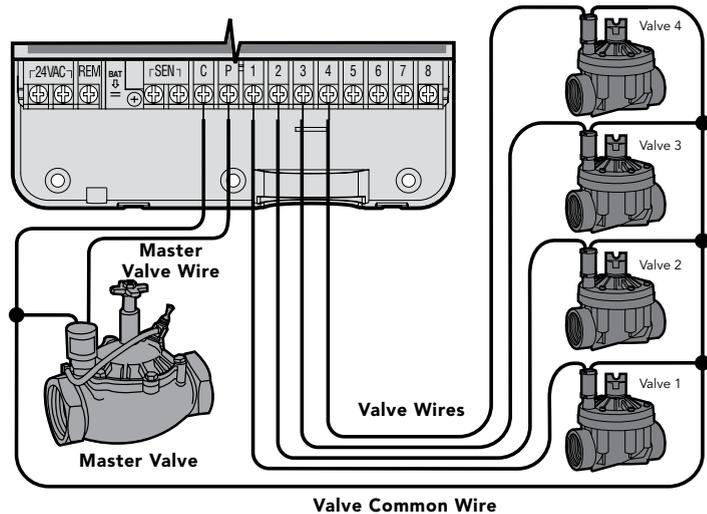
Battery type: CR2032 3V

CONNECTING A MASTER VALVE



NOTE: Complete this section only if you have a master valve installed in your irrigation system. A master valve is a “normally closed” valve installed at the supply point of the main line that opens only when the controller initiates a watering program.

1. At the Master Valve, attach the common wire to either solenoid wire of the valve. Attach a separate control wire to the remaining solenoid wire.
2. The common wire should be attached to the **C** terminal inside the controller. The other wire coming from the master valve should be attached to the **P** terminal inside the controller. Tighten each terminal screw.



CONNECTING A PUMP START RELAY

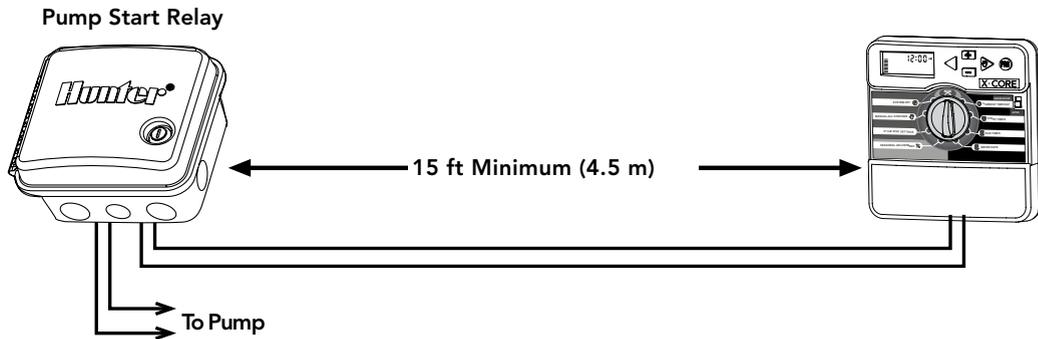


NOTE: Complete this section only if you have a pump start relay installed. A pump start relay is a device that uses a signal from the controller to actuate a separate electrical circuit to energize a pump to provide water to your system.

The controller should be mounted at least a 15 ft (4.5 m) away from both the pump start relay and pump to minimize any potential electrical interference.

1. Route a pair of wires from the pump relay into the controller.
2. Connect a common wire to the **C** (Common) terminal inside the controller and connect the remaining wire from the pump start relay to the **P** (Pump) terminal.

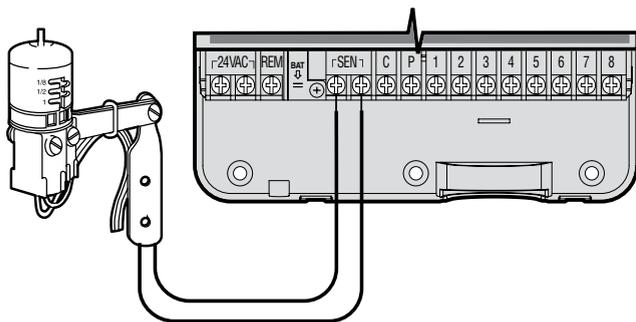
Relay holding current draw must not exceed 0.3 A. Do not connect the controller directly to the pump or damage to the controller will result.



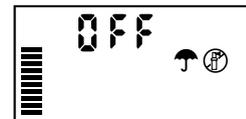
CONNECTING A HUNTER "CLIK" WEATHER SENSOR

A Hunter weather sensor or other micro-switch type weather sensors can be connected to the X-Core. The purpose of this sensor is to stop automatic watering when weather conditions dictate.

1. **Remove the metal jumper** plate that is attached across the two SEN terminals inside the controller.
2. Connect one wire to one SEN terminal and the other wire to the other SEN terminal.



When the weather sensor has deactivated automatic watering, the OFF, and ☂ icon will appear on the display.



Testing the Weather Sensor

The X-Core provides simplified testing of a rain sensor when the sensor is wired into the sensor circuit. You can manually test proper operation of the rain sensor by running a **MANUAL CYCLE** or by activating the system using the **One Touch MANUAL START** (see page 22). During the Manual cycle, pressing the test button on the Mini-Clik® will interrupt watering.

Manually Bypassing the Weather Sensor

If the rain sensor is interrupting irrigation, you can bypass it by using the bypass switch on the front of the controller. Slide the switch to the **SENSOR BYPASS** position to disable the rain sensor from the system to allow for controller operation. You can also bypass the weather sensor for manual operation by using the **MANUAL – ONE STATION** function.

The Bypass switch does not affect the Seasonal Adjust update when using Solar Sync sensor.



CONNECTING A HUNTER SOLAR SYNC ET SENSOR

The X-Core is compatible with the Solar Sync and Wireless Solar Sync systems. Solar Sync is a sensor system that will automatically adjust the X-Core controller's watering schedule (based on changes in local climate condition) by using the Seasonal Adjust function. The Solar Sync uses a solar and temperature sensor to determine evapotranspiration (ET), or the rate at which plants and turf use water, and also includes Hunter Rain Klik and Freeze Klik technology that will shut down irrigation when it rains and/or during freezing conditions.



NOTE: Solar Sync will apply a default seasonal adjust value of 100% until the first full day (24 hour period) of weather measurements have been received from the sensor.



NOTE: Enabling the Sensor Bypass switch has no effect on the seasonal adjust updates from the Solar Sync sensor. It will, however, bypass the Rain Klik and Freeze Klik functionality of the sensor.

Installing Solar Sync Sensor

Connect the Green and Black wire from the Solar Sync Sensor to the "SEN" wiring terminals on the X-Core controller, similar to picture on page 11. It does not matter which wire connects to which terminal. Turn the dial to the "Solar Sync Settings" position. The display will initially show dashed lines and then will show the default Region setting (3) on the left and the default Water Adjustment setting (5) on the right. Adjust the Region as needed



by using the ▲ and ▼ buttons (refer to page 13 for explanation of Solar Sync Region setting). Use the ► button to advance to the right to adjust the Water Adjust setting as needed (see page 14 for explanation of Water Adjust setting).

Installing the Wireless Solar Sync

Connect the Green and Black wire from the Wireless Solar Sync Receiver to the "SEN" wiring terminals on the X-Core controller. It does not matter which wire connects to which terminal. Turn the dial to the "Solar Sync Settings" position. The display will initially show dashed lines and then will show the default Region setting (3) on the left and the default Water Adjustment setting (5) on the right. Adjust the region as needed by using the ▲ and ▼ buttons (refer to page 13 for explanation of Solar Sync Region setting). Use the ► button to advance to the right to adjust the Water Adjust setting as needed (see page 14 for explanation of Water Adjust setting).



Solar Sync Settings

Once the Solar Sync sensor is connected to the X-Core controller, two numbers will appear in the display when the dial is turned to the Solar Sync Settings position. The number on the left of the screen is the Region setting, and the number on the right on the screen is the Water Adjustment setting (as shown above).

CONNECTING A HUNTER SOLAR SYNC ET SENSOR

Region

For accurate Solar Sync measurements, the controller needs to be programmed for the average peak season ET for your region. Use the table below to determine your region.

The table will assist you in identifying the type of region you live in. There are four basic ET regions, each with descriptions of the region, along with typical ET and temperature characteristics. It is recommended that, if possible, the region be chosen based upon average July ET or peak summer ET (inches/mm per day).

Use the following table for choosing your region (reference below). You can use methods **A**, **B** or **C** to help you choose which region is best for your area:

A: Based upon the ET of your region using the **average** July ET or peak summer ET (inches/mm per day). This is the preferred option when selecting your region.

B: Based upon the temperature for your region using the **average** July or the driest month high temperature (not the highest temperature for July).

C: Based upon the general description of your region.

IF ANY OF THE CHOICES IN THE ROWS APPLY TO YOUR SITUATION, THEN THAT IS YOUR REGION SETTING CHOICE.			
	A	B	C
Region 1	If the average July ET is < 0.17" (4.3 mm) per day	If the average temperature for July is 65°–75° (18°C – 24°C)	<ul style="list-style-type: none"> • U.S. Northern States • Coastal Regions
Region 2	If the average July ET is 0.18" – 0.23" (4.6 mm – 5.8 mm) per day	If the average temperature for July is 75°– 85° (24°C – 29°C)	<ul style="list-style-type: none"> • Mountains • U.S. Northern Inland States
Region 3	If the average July ET is 0.24" – 0.29" (6.1 mm – 7.4 mm) per day	If the average temperature for July is 85° – 95° (29°C – 35°C)	<ul style="list-style-type: none"> • U.S. Southern States • Inland/High Desert
Region 4	If the average July ET is > 0.30" (7.6 mm) per day	If the average temperature for July is 95° – 105° (35°C – 41°C)	<ul style="list-style-type: none"> • Deserts

* For Southern hemisphere locations, use the month of January.

CONNECTING A HUNTER SOLAR SYNC ET SENSOR

Water Adjustment \updownarrow

The Water Adjustment is a 1 to 10 scale that allows for easy adjustment of the Seasonal Adjust value from the Solar Sync ET Sensor. Upon installation of the Solar Sync ET Sensor, it is recommended that the Water Adjustment setting stay at the default value of 5. However, after installation, if you find that the seasonal adjust value is lower or higher than expected, the Water Adjustment value can be modified to modify the Seasonal Adjust output value. See Calibration/Setup on page 15 for explanation of how to use Water Adjustment scale to fine tune seasonal adjust output value.



NOTE: If an individual zone is “wetter” or “drier” than the rest of the system, simply increase or decrease the amount of run time on the controller.

Uninstalling a Solar Sync Sensor

If a Solar Sync sensor has been installed on the X-Core controller then the seasonal adjust value used by the controller will be calculated from the weather data supplied by the Solar Sync sensor. If it is decided that the Solar Sync sensor will no longer be used with the X-Core controller, it must be uninstalled. **If the Solar Sync sensor is not uninstalled, the controller will not allow the seasonal adjust value to be manually changed.** For example, if the seasonal adjust value shown on the controller was 50% when the Solar Sync sensor was removed, it will remain 50% until the Solar Sync sensor is uninstalled.

To uninstall the Solar Sync sensor, simply disconnect the green and black wires from the controller terminal and then turn the dial to the “Solar Sync Settings” position. The display should show dashes, indicating that the controller no longer recognizes the Solar Sync sensor for calculation of seasonal adjustment. Now the seasonal adjust value can be changed manually by turning the knob to the “Seasonal Adjust” position and using the \oplus or \ominus button to adjust the value.

CONNECTING A HUNTER SOLAR SYNC ET SENSOR

Calibration/Setup

After Solar Sync has been installed and programmed, it is recommended to allow the system to run for a few days at the initial setting. Because of the variety in site conditions (including sensor location, amount of direct sunlight available to the sensor, reflective heat from surrounding structures, etc), **the initial setting may require adjustment in order to arrive at the desired performance.** The calibration of the Solar Sync to a particular site can easily be accomplished by adjusting the Region and/or Water Adjustment settings. The instructions below outline this process:

1. Install Solar Sync sensor
2. Program Region and allow system to operate at initial setting for a minimum of 3 days (see page 13 for instructions on how to determine proper Region setting).
3. Observe the Seasonal Adjust on the controller. If the Seasonal Adjust amount appears to be lower or higher than expected for that time of year, the Solar Sync settings need to be adjusted.
 - a. **Seasonal Adjust too low:** Turn the dial to the Solar Sync settings position. Increase the value on the Water Adjustment scale (10 is max). Once the setting is changed, the controller will immediately be updated with the new Seasonal Adjust %. Increase the Water Adjustment setting until the desired Seasonal Adjust % is shown. **If you max out the Water Adjustment scale at 10 and still require more Seasonal Adjust, move down to the next lower Region (from Region 4 to 3, for example).**
 - b. **Seasonal Adjust too high:** Turn the dial to the Solar Sync settings position. Decrease the value on the Water Adjustment scale (default setting is 5). Once the setting is changed, the controller will immediately be updated with the new Seasonal Adjust %. Decrease the Water Adjustment setting until the desired Seasonal Adjust % is shown. **If you minimize the Water Adjustment scale down to 1 and still require a reduction in Seasonal Adjust, move up the next Region (from Region 2 to 3, for example).**

Station Run Times: It is important to understand that Solar Sync provides a global seasonal adjustment to the controller. This means that all station run times will be modified by the seasonal adjust percentage shown. When programming the controller, the run times should be entered that represent peak season watering schedules. If the Solar Sync is adjusting to the appropriate seasonal adjust value but the run time for a particular station appears to be too long/short, adjust the station run time in the controller program.

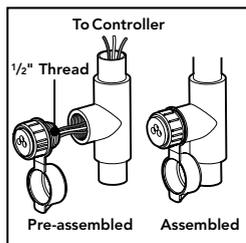
CONNECTING A HUNTER REMOTE

Connecting to a Hunter Remote (not included)

The X-Core Controller is compatible with Hunter Remote Controls (not included). The SmartPort® wiring harness (included with all Hunter Remotes) allows for fast and easy use of the Hunter controls. The Hunter remotes make it possible for you to operate the system without having to walk back and forth to the controller.

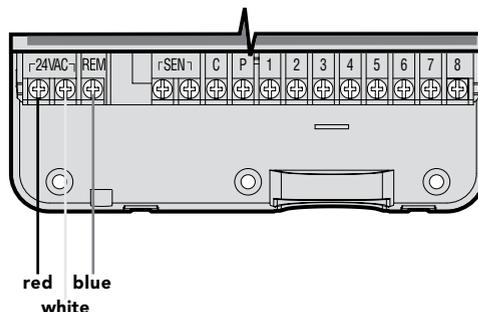
To install the SmartPort connector

1. Install a ½" female threaded "Tee" in the field wiring conduit approximately 12" below the X-Core.
2. Feed the red, white, and blue wires of the harness through the base of the "Tee" and into the wiring compartment as shown.
3. Screw the SmartPort harness housing into the "Tee" as shown.

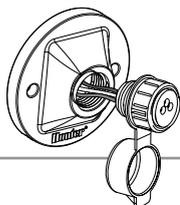


4. Attach the red, white, and blue SmartPort wires to the controller terminal as shown below:

- Red wire to left side "24VAC" terminal
- White wire to right side "24VAC" terminal
- Blue wire to "REM" terminal



NOTE: P/N 258200 can be used as an alternate method to mount the SmartPort connector.



POWER FAILURES

Due to the possibility of power failures, the controller has non-volatile memory. Programmed information will never be lost due to a power outage. The lithium battery will keep the correct time without AC power. Normal watering will resume when AC power is restored.

PROGRAMMING THE CONTROLLER

The X-Core display shows the time and day when the controller is idle. The display changes when the dial is rotated to indicate the specific programming information to enter. When programming, the flashing portion of the display can be changed by pressing the **+** or **-** buttons. To change something that is not flashing, press the **◀** or **▶** buttons until the desired field is flashing.

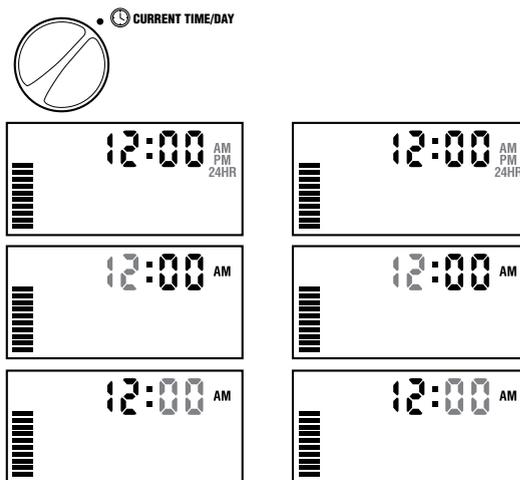
Three programs A, B, and C, each with the ability to have four daily start times, permit plants with different watering requirements to be separated on different day schedules.

Setting the Date and Time 🕒

1. Turn the dial to the **CURRENT TIME/DAY** position.
2. The current year will be flashing. Use the **+** or **-** buttons to change the year. After setting the year, press the **▶** button to proceed to setting the month.
3. The month and day will be in the display. The month will be flashing and the **1-12** icon will be displayed. Use the **+** or **-** buttons to change the month. Press the **▶** button to proceed to setting the day.
4. The day will be flashing and the **1-31** icon will be displayed. Use the **+** or **-** buttons to change the day. Press the **▶** button to proceed to setting the time.
5. The time will be displayed. Use the **+** and **-** buttons to select AM, PM, or 24 hour. Press the **▶** button to move to hours. Hours will be flashing. Use the **+** and **-** buttons to change the hour shown on the display. Press the **▶** button to move to minute. Minutes will be flashing. Use the **+** and **-** buttons to change the minutes shown on the display. The date, day, and time have now been set.



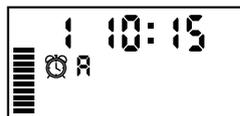
NOTE: A basic programming rule is that whatever symbol or character is flashing will be the item programmed. For instance, if the hour is flashing when setting the time, the hour can be changed or programmed. For illustration purposes in this manual, flashing characters are in GRAY type.



PROGRAMMING THE CONTROLLER

Setting the Program Start Time(s)

1. Turn the dial to the **START TIMES** position.
2. The factory preset is set on program A. If necessary, you can select program B, or C by pressing the **PRG** button.
3. Use the **+** or **-** button to change the start time. (The start times advance in 15 minute increments).
4. Press the **▶** button to add an additional start time, or **⏸** button for the next program.



NOTE: One start time will activate all stations sequentially in that program. This eliminates the need to enter each station's start time. Multiple start times in a program can be used for separate morning, afternoon, or evening watering cycles. Start times may be entered in any order. The X-Core will automatically sort them.



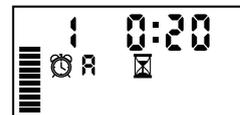
Eliminating a Program Start Time

With the dial set to **START TIMES** position, push the **+** or **-** button until you reach 12:00 AM (Midnight). From here push the **-** button once to reach the OFF position.



Setting Station Run Times

1. Turn the dial to **RUN TIMES** position.
2. The display will show the last program selected (A, B, or C), the station number selected,  icon, and the station will be flashing. You can switch to another program by pressing the **PRG** button.
3. Use the **+** or **-** button to change the station run time on the display. You can set the run times from 0 to 4 hours.
4. Press the **▶** button to advance to the next station.



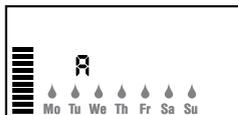
Setting Days To Water

1. Turn the dial to the **WATER DAYS** position.
2. The display will show the last program selected (A, B, or C). You can switch to another program by pressing the **PRG** button.
3. The controller will display the seven days of the week (MO, TU, WE, TH, FR, SA, SU). Each day will have a  icon or a  icon above the day. The  icon would represent an "On" water day, while a  icon would represent an "Off" watering day.



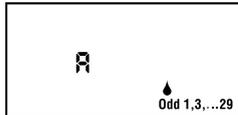
PROGRAMMING THE CONTROLLER

Selecting Specific Days of the Week to Water

1. With the  cursor on a specific day (the cursor will always start with MO), press the  button to activate a particular day of the week to water. Press the  button to cancel watering for that day. After pressing a button the cursor automatically advances to the next day.

2. Repeat step 1 until all desired days have been selected. The selected days will show a  to indicate their status is ON. The last  is the last day of watering for that program.

Selecting Odd or Even Days to Water

This feature uses numbered day(s) of the month for watering instead of specific days of the week (odd days: 1st, 3rd, 5th, etc.; even days: 2nd, 4th, 6th, etc.).

1. With the  cursor on SU press the  button once. The  icon and odd will be displayed.

2. If odd day watering is desired, turn the dial back to the run position.

3. If even day watering is desired, press the  button once. The  icon and **EVEN** will be displayed. You can move back and forth from **ODD** to **EVEN** by pressing the  and  buttons.

Selecting Interval Watering

With this option you can select interval watering from 1 to 31 days.

1. With the cursor on **EVEN**, press the  button once and the  icon will appear and a 1 flashing in the display. Interval watering schedule appears on the display.

2. Press the  or  button to select the number of days between watering days (from 1 to 31 days). This is called the interval.

The controller will water the selected program at the next start time and will then water at the interval programmed.



NOTE: The 31st of any month and February 29th are always "off" days if Odd watering is selected.

PROGRAMMING THE CONTROLLER

Setting Event Day(s) Off

The X-Core allows you to program a No Water Day(s). This feature is useful to inhibit watering on specific day(s). For example, if you always mow the lawn on Saturdays, you would designate Saturday as a **No Water Day** so that you are not mowing wet grass.

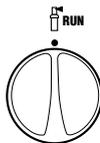
1. Turn the dial to the **WATER DAYS** position.
2. Enter an interval watering schedule as described on page 19.
3. Press the ► button to scroll to the **No Water Days** at the bottom of the display. **MO** will be flashing.
4. Use the ► button until the cursor is at the day of the week you wish to set as a No Water Day.
5. Press the ■ button to set this day as a no water day. The ☑ will illuminate over this day.
6. Repeat steps 4 and 5 until all desired event day(s) are off.



NOTE: You also have the option in the interval watering schedule to program Odd or Even days off.

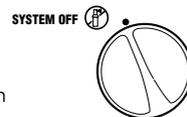
Automatic Watering

After programming the X-Core, set the dial to the **RUN** position to enable automatic execution of all selected watering programs and start times.



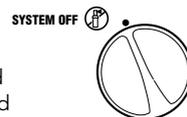
System Off

Valves currently watering will be shut off after the dial is turned to the **SYSTEM OFF** position for two seconds. All active programs are discontinued and watering is stopped. To return the controller to normal automatic operation, simply return the dial to the **RUN** position.

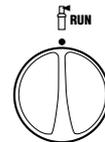
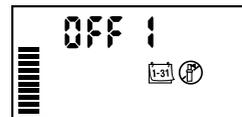


Programmable Rain Off

This feature permits the user to stop all programmed waterings for a designated period from 1 to 7 days. At the end of the programmed rain off period, the controller will resume normal automatic operation.



1. Turn the dial to the **SYSTEM OFF** position. Wait for **OFF** to be displayed.
2. Press the ■ button as many times as needed to set the number of days off (up to 7 days).
3. Turn the dial back to the **RUN** position at which **OFF**, a number, the  and  icons will be displayed.



The days off remaining will decrease at midnight each day. When it goes to zero, the display will show normal time of day and normal irrigation will resume at the next scheduled start time.

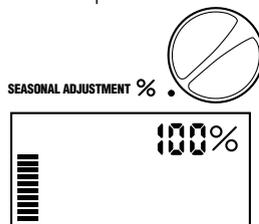


PROGRAMMING THE CONTROLLER

Seasonal Adjustment %

Seasonal Adjustment is used to make global run time changes without re-programming the entire controller. To use the Seasonal Adjustment feature:

1. Turn the dial to the **SEASONAL ADJUSTMENT** position.
2. The display will now show a flashing number followed by a %, as well as the bar graph which always remains on the display. Press the **+** or **-** button to adjust the percentage of the seasonal adjustment. Each bar on the graph represents 10%. This feature can adjust the controller from 10% to 150% of the original program.



To view the adjusted run times, simply turn the dial to the **RUN TIMES** position, the displayed run time will be updated accordingly as the seasonal adjustment is made.



NOTE: The controller should always be initially programmed in the 100% position.

When using a Hunter “Clik” weather sensor, the Seasonal Adjustment value can be adjusted as described.

When using the Solar Sync ET sensor, the Seasonal Adjustment value is automatically updated daily based on the Solar Sync sensor. The Solar Sync ET sensor measures weather patterns, determines the optimal Seasonal Adjustment value, and then updates the controller on a daily basis. This value can be overridden manually by pressing the **+** or **-** buttons to the desired Seasonal Adjustment value. **However, it is important to understand that the manually adjusted Seasonal Adjustment value will be replaced at midnight by the new updated value from the Solar Sync sensor.**

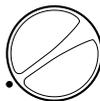
To revert to a manually adjusted mode, the Solar Sync sensor must be uninstalled. See page 14 for instructions on how to uninstall the Solar Sync sensor.

PROGRAMMING THE CONTROLLER

Manually Run a Single Station

1. Turn dial to **MANUAL – ONE STATION** position.
2. Station run time will flash in the display. Use the  button to move to the desired station. You may use the  or  button to select the amount of time for a station to water.
3. Turn the dial clockwise to the RUN position to run the station (only the designated station will water, then the controller will return to automatic mode with no change to the previously set program). Also see **One Touch Manual Start and Advance**.

MANUAL-ONE STATION 



One Touch Manual Start and Advance

You can also activate all stations to water without using the dial.

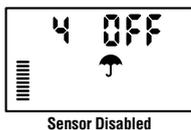
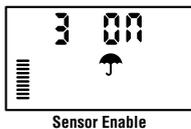
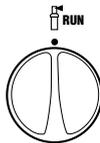
1. Hold down the  button for 2 seconds.
2. This feature automatically defaults to program A. You can select program B or C by pressing the  button.
3. The station number will be flashing. Press the  button to scroll through the stations and use the  or  button to adjust station run times. (If no buttons are pressed for a few seconds during step 2 or 3, the controller will automatically begin watering).
4. Press the  button scroll to the station you wish to begin with. After a 2 second pause, the program will begin. At any time during the manual cycle, you can use the  or  buttons to navigate from station to station manually.

ADVANCED FEATURES

Programmable Sensor Override

The X-Core allows the user to program the controller so that the sensor disables watering on only desired stations. For example, patio gardens that have pots under overhangs and roofs may not receive water when it rains and will continue to need to be watered during periods of rain. To program sensor override:

1. Turn the dial to the **RUN** position.
2. Press and hold the  button down while turning the dial to **START TIMES** position.
3. Release the  button. At this point, the display will show the station number, ON, and the  icon, will be flashing.
4. Press the  or  button to enable or disable the sensor for the station shown.
ON = Sensor enabled
(will suspend irrigation)
OFF = Sensor disabled (will allow watering)
5. Use the  or  buttons to scroll to the next station that you would like to program the sensor override.



NOTE: The controller default is for the sensor to disable watering on all zones when rain occurs.

When the X-Core receives an input from the sensor to disable watering, the display will indicate those stations that have been programmed to override the sensor. A station that is running in the sensor override mode will flash the  and  icons alternately.

Test Program of All Stations

The X-Core allows the user a simplified method for running a test program. This feature will operate each station in numerical sequence, from the lowest to the highest.

1. With the dial in the **RUN** position, press and hold the  button. The station number will be displayed and the time will be flashing.
2. Use the  or  buttons to set the run time from 1 to 15 minutes. The run time needs to be entered only once.
3. After a 2 second pause, the test program will start.

Hunter Quick Check™ Diagnostics

This feature allows you to quickly diagnose wiring problems with your controller. Instead of having to check each field wiring circuit for potential problems, you can use the Hunter Quick Check circuit test procedure. To initiate the Quick Check test procedure:

1. Press the , , , and  buttons simultaneously. In the standby mode, the LCD will display all segments.
2. Press the  button once to begin the Quick Check procedure. Within seconds, the system searches all stations for detecting any circuit problems. When a field wiring short is detected, an ERR symbol preceded by the station number will momentarily flash on the display. After the Quick Check completes running the circuit diagnostic procedure, the controller returns to the automatic watering mode.

ADVANCED FEATURES

Easy Retrieve™ Program Memory

The X-Core is capable of saving the preferred watering program into memory for retrieval at a later time. This feature allows for a quick way of resetting the controller to the original programmed watering schedule.

To save the program into the memory

1. With the dial in the **RUN** position, press and hold the **+** and **PRG** buttons for 5 seconds. The display will scroll three segments  from left to right across the display indicating the program is being saved into memory.
2. Release the **+** and **PRG** buttons.

To retrieve a program that was previously saved into memory.

1. With the dial in the **RUN** position, press and hold the **-** and **PRG** buttons for 5 seconds. The display will scroll three segments  from right to left across the display indicating the program is being saved into memory.
2. Release the **-** and **PRG** buttons.

Programmable Delay Between Stations

This feature allows the user to insert a delay between stations between when one station turns off and the next one turns on.

1. Start with the dial in the **RUN** position.
2. Press and hold the **-** button down while turning the dial to the **RUN TIMES** position.
3. Release the **-** button. At this point the display will show a delay time for all stations in seconds, which will be flashing.
4. Press the **+** or **-** buttons to increase or decrease the delay time between 0 and 4 hours.
5. Return the dial to the **RUN** position.

Clearing the Controller's Memory/Resetting the Controller

If you feel you have misprogrammed the controller, there is a process that will reset the memory to the factory defaults and erase all programs and data that have been entered into the controller.

1. Press and hold the **PRG** button.
2. While holding the **PRG** button press the RESET button for 3 seconds, then release the RESET button while continuing to hold the **PRG** button.
3. Continue holding **PRG** button until time is displayed (this takes about 8 seconds).

TROUBLESHOOTING GUIDE

Problem	Causes	Solutions
The controller is continuously watering	Too many start times have been programmed	Only one start time is necessary to activate a program (refer to Setting the Program Start Times on page 18)
There is no display	Check AC power wiring	Correct any errors
The display reads "No AC"	There is no AC power present (the controller is not receiving any power)	Check to see if the transformer is properly installed
Display reads "Off,   "	The rain sensor is interrupting irrigation or the sensor jumper has been removed	Slide the rain sensor bypass switch to the BYPASS position to bypass the rain sensor circuit, or reinstall the jumper
Rain sensor will not shut off the system	<ul style="list-style-type: none"> • Defective rain sensor • Jumper was not removed when sensor was installed • Stations have been programmed to override the sensor 	<ul style="list-style-type: none"> • Verify operation of rain sensor and proper wiring • Remove jumper from the sensor terminals • Reprogram the sensor override to enable the sensor (see page 11)
Frozen display, or showing incorrect information	Power surge	Reset the controller per page 24 "Clearing Controller Memory/Resetting the Controller"
Display shows "ERR" with a number (1 to 8)	Short in valve wiring circuit, or faulty solenoid on the station number indicated	Check wire circuit or solenoid for the valve number indicated. Repair short or replace solenoid. Press any button to clear the "ERR" from the display
Display shows "P ERR"	<ul style="list-style-type: none"> • Faulty pump relay or master valve wiring • Incompatible or defective relay or solenoid • Under sized wire to the pump relay or master valve 	<ul style="list-style-type: none"> • Check wiring to relay or master valve solenoid. Press any button to clear the "P ERR" from the display • Check electrical specification for the pump relay. Do not exceed controller's electrical rating. Replace if defective • Replace wire with larger gauge wire

TROUBLESHOOTING GUIDE

Problem	Causes	Solutions
Display shows a station is running but the ☂ and ⚡ icons are flashing	The sensor is interrupting irrigation, however the station has been programmed to override the sensor	Check the sensor override status (see page 23)
Automatic irrigation does not start at the start time and controller is not in the System Off mode	<ul style="list-style-type: none"> • AM/PM of time of day not set correctly • AM/PM of start time not set correctly • Start Time is disabled (set for Off) • Controller is not receiving AC power 	<ul style="list-style-type: none"> • Correct AM/PM of time of day • Correct AM/PM of start time • See Setting Program Start Times (see page 18) • Check AC power connections
The display shows dashes when the dial is in the Solar Sync Settings position	<ul style="list-style-type: none"> • The Solar Sync sensor is not connected to the controller • The Solar Sync sensor wires may have a break in them or a bad connection 	Connect the Solar Sync to the “SEN” positions on the wiring terminal. The display will then show the Region and Water Adjustment setting.
Run times for a particular station are too short/too long when using a Solar Sync sensor	Program Run Time too long/short	Solar Sync provides a global seasonal adjustment to the controller. If a particular station has run times too long or too short, make the appropriate adjustment to the program in the controller. Make sure to change seasonal adjust back to 100% before making changes to program run times. Do this by turning the dial to the Seasonal Adjust position and increasing/decreasing the value to 100%.
Seasonal Adjust seems low	<ul style="list-style-type: none"> • Region too high • Water Adjustment too low • Location of Sensor does not allow for full sun 	Increase the value on the Water Adjustment scale (the default setting is 5). If you max out on the Water Adjustment scale at 10 and still require more seasonal adjustment, move down one Region (from 4 to 3, for example) and start at Water Adjustment setting 5. Solar Sync will immediately update the Seasonal Adjust on the controller. If it is still too high, repeat the adjustment until the desired seasonal adjust is showing on the controller.

TROUBLESHOOTING GUIDE

Problem	Causes	Solutions
Seasonal Adjust seems high	<ul style="list-style-type: none"> • Region too low • Water Adjustment setting too high 	Decrease the value of the Water Adjustment setting. If you minimize the Water Adjustment scale at 1 and still require reduced seasonal adjustment, move up one Region (from 2 to 3, for example) and start at Water Adjustment setting 5. Solar Sync will immediately update the Seasonal Adjust on the Controller. If it is still too high, repeat the adjustment until the desired seasonal adjust is showing on the controller.
Solar Sync still sending Seasonal Adjust when Controller Bypass switch is in the "Bypass" position	Solar Sync's automated Seasonal Adjustment cannot be de-activated by the Bypass switch. The Bypass switch only controls the Rain/Freeze shutoff function of the Solar Sync.	
After removing the Solar Sync sensor from the controller, the seasonal adjust value cannot be changed manually	The Solar Sync sensor needs to be uninstalled if permanently removing it from the controller	After removing the Solar Sync sensor from the controller, turn the knob to Solar Sync Settings. The screen should show dashed lines. The sensor is now uninstalled (see page 14).
Display shows "no SS"	<ul style="list-style-type: none"> • Solar Sync sensor has been disconnected from controller but not uninstalled • Wiring connection from Solar Sync connection is faulty 	<ul style="list-style-type: none"> • Check Solar Sync sensor wiring connection to controller • Uninstall Solar Sync sensor if intent is to permanently remove sensor from controller (see page 14)

SPECIFICATIONS

Operating Specifications

- Station Run Times: 0 to 4 hours in 1-minute increments
- 3 Independent Watering Programs
- Start Times: 4 per day per program for up to 12 daily starts
- Watering Schedule: 365-day calendar, interval watering, odd/even watering
- AM/PM, 24-hour clock
- Simple manual operation
- Sensor override by station
- Programmable rain delay (1 to 7 days)
- Manual Seasonal Adjustment (10% to 150%)
- Automatic Seasonal Adjustment using Solar Sync sensor
- Sensor bypass switch
- X-Core-x00i for indoor use. X-Core-x00 for outdoor use
- Sea level to 6500 ft (2000 m) at -13° F to 140° F (-25° C to 60° C)

Dimensions

Indoor Cabinet

- Height: 6.5" (16.5 cm)
- Width: 5.75" (14.6 cm)
- Depth: 2" (5 cm)

Outdoor Cabinet

- Height: 8.625" (22 cm)
- Width: 7" (17.8 cm)
- Depth: 3.75" (9.5 cm)

Electrical Specifications

- Transformer input 120VAC \pm 10% 60 Hz (230VAC \pm 10% 50/60 Hz International Models)
- Transformer Output: 24VAC 1.0 amp
- Station Output: 0.56 amps per station
- Maximum Output: 0.90 amps (includes master valve)
- Battery: 3 V Lithium (included) used for remote programming and backup timekeeping. Use CR2032 3-volt.
- Electronic short circuit protection
- Non-volatile memory for program data
- UL Listed
- Model X-Core-x00 has an IP2X Rating
- Clean only with a cloth dampened with mild soap and water

Explanation of Symbols

~ = AC

 = Consult Documentation

 = Hazardous Voltages Present

 = Ground

CERTIFICATE OF CONFORMITY TO EUROPEAN DIRECTIVES

Hunter Industries declares that the irrigation controller Model X-Core complies with the standards of the European Directives of "electromagnetic compatibility" 87/336/EEC and "low voltage" 73/23/EEC.


Project Engineer

This product should not be used for anything other than what is described in this document. This product should only be serviced by trained and authorized personnel.

FCC part 15:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Hunter®

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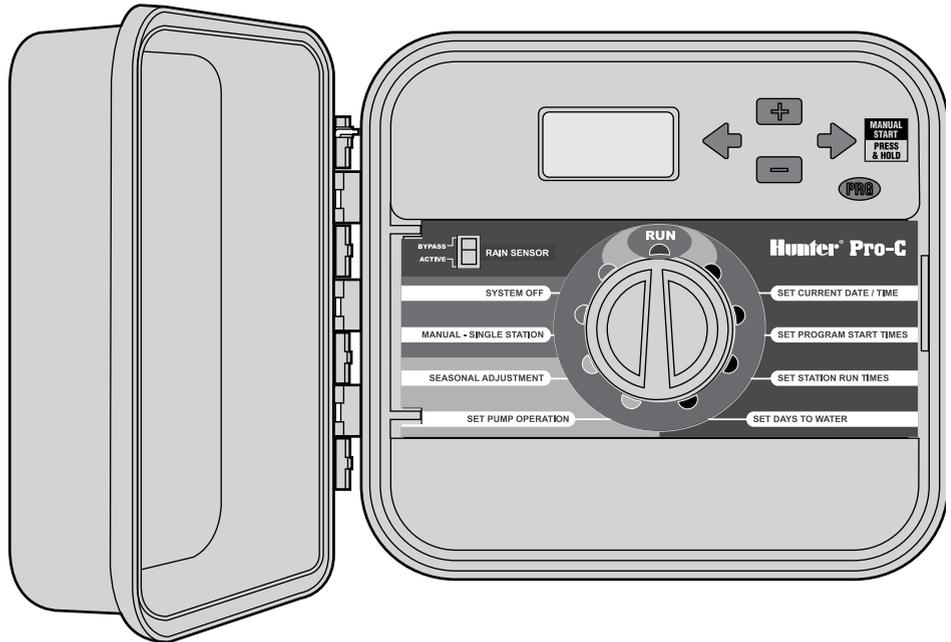
Pro-C

Residential and Light Commercial Irrigation Controllers

PCC Series Controller
6, 9, 12 & 15 Station
Indoor/Outdoor Models

**Owner's Manual and
Installation Instructions**

Please leave with property owner



Hunter[®]

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CONTROLLER PROGRAMMING AND OPERATION

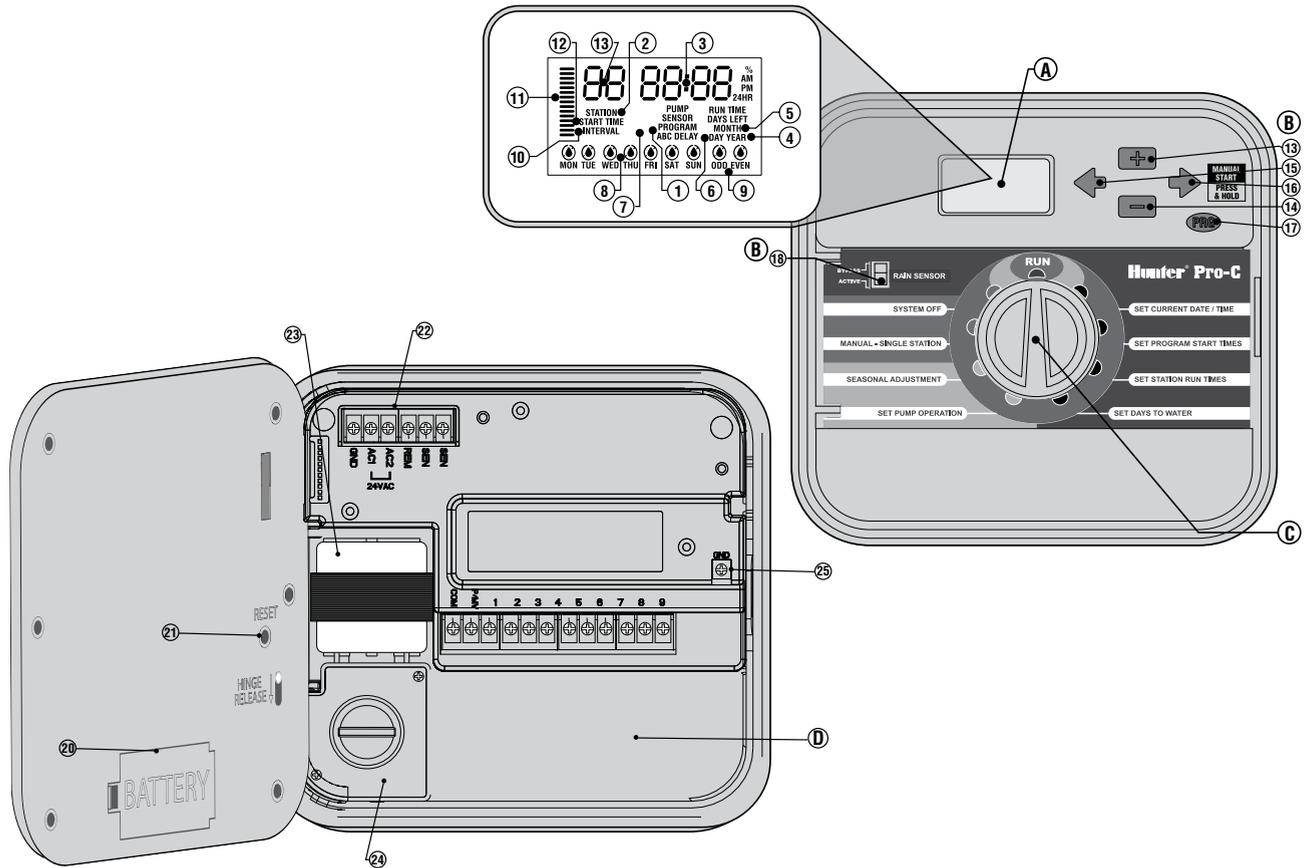
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PRO-C



A. – LCD Display

1. **Program Selector** – Identifies the program in use A, B, or C.
2. **Station Number** – Identifies currently selected station number.
3. **Main Display** – Indicates various times, values, and programmed information.
4. **Year** – Identifies current calendar year.
5. **Month** – Identifies current calendar month.
6. **Day** – Identifies current calendar day.
7. **Running** – Sprinkler icon indicates when watering is occurring.
8. **Days of the week** – Identifies days of the week to water or not water.
9. **Odd/Even Watering** – Identifies if odd or even watering is selected.
10. **Interval** – Identifies if interval watering has been selected.
11. **Seasonal Adjust** – Displays in increments of 5%, the percentage of seasonal adjust that has been selected.
12. **Start Time** – Identifies selected program start time.

B. – Control Buttons and Switches

13. **+ Button** – Increases the selected flashing display.
14. **- Button** – Decreases the selected flashing display.
15. **◀ Button** – Returns selected flashing display to the previous item.
16. **▶ Button** – Advances the selected flashing display to the next item. Also to start a manual cycle.
17. **PRG Button** – Selects programs A, B, and C. Also to start a test program.
18. **Rain Sensor Bypass Switch** – Use to bypass weather sensor, if one is installed.

C. – Control Dial

- Run** – Normal dial position for automatic operation.
- Set Current Date/Time** – Set current date time.
- Set Program Start Times** – Set 1 to 4 start times in each program.
- Set Station Run Times** – Set each station run time.
- Set Days to Water** – Select individual days to water, odd, even, or interval watering schedule.
- Set Pump Operation** – Turn pump or master valve on or off for each station.
- Manual – Single Station** – Activates a one time watering of a single station.
- Seasonal Adjustment** – Make global run time changes without reprogramming the controller (from 5% to 300%).
- System Off** – Used to discontinue all programs and stop all watering until the dial is returned to the **RUN** position, or to set the programmable rain off feature.

D. – Wiring Compartment

20. **9-Volt Battery** – An alkaline battery (not included) allows you to program the controller without AC power.
21. **Reset Button** – This button will reset the controller. All programmed data will remain intact.
22. **Power Area** – Used to attach transformer, sensor wires, and other systems to the controller.
23. **Transformer** – A transformer is installed (Outdoor models only, indoor models are supplied with a plug-in transformer.)
24. **Junction Box** – This box provides an area for connecting primary AC power. (Outdoor models only.)
25. **Ground Lug.**

MOUNTING THE CONTROLLER TO A WALL.....

All necessary hardware is included for most installations.



NOTE: The indoor Pro-C is not weather or water resistant, and must be installed indoors or in a protected area. This device is not intended for use by young children. Never let children play with this device.

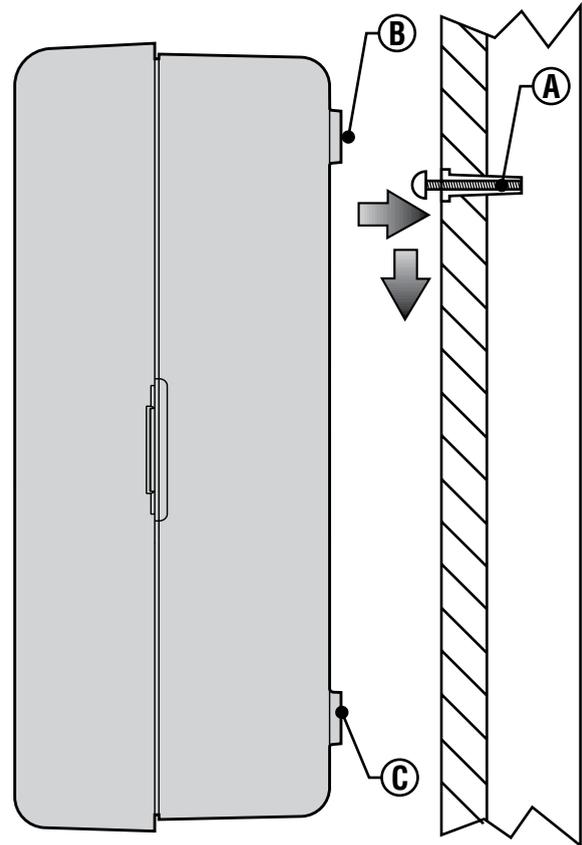
1. Select a location close to an electrical outlet or power supply that is not controlled by a light switch.
2. Remove the front panel from the Pro-C by first removing the ribbon connector and then pulling down the hinge release. Removing the front panel will ease installation of the controller cabinet.
3. Use the hole at the top of the controller as a reference and secure one 25mm screw (A) into the wall. **Note: Install screw anchors if attaching to drywall or masonry wall.**
4. Align controller with the screw and slide the keyhole (B) on top of the controller over the screw.
5. Secure controller in place by installing screws in the holes (C).



NOTE: Outdoor model is water and weather resistant. Connecting the outdoor Pro-C to the primary power should be done by a licensed electrician following all local codes. Improper installation could result in shock or fire hazard. This device is not intended for use by young children. Never let children play with this device.

For PC-301-A:

If the supply cord is damaged, it must be replaced by the manufacturer or service agent or a similarly qualified person in order to avoid hazard.

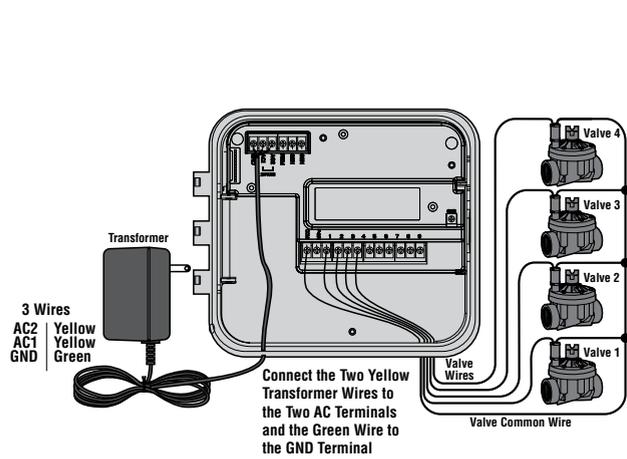


CONNECTING VALVES AND AC POWER

1. Route valve wires between control valve location and controller.
2. At valves, attach a common wire to either solenoid wire of all valves. This is most commonly a white colored wire. Attach a separate control wire to the remaining wire of each valve. All wire splice connections should be done using waterproof connectors.
3. Route valve wires through the conduit and attach conduit to one of the openings on the bottom of the cabinet.
4. Strip ½" (13 mm) of insulation from ends of all wires. Secure valve common wire to "COM" (Common) terminal. Attach all individual valve control wires to appropriate station terminals.

Indoor Cabinet

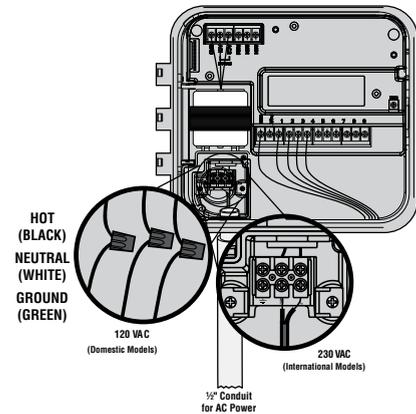
Route transformer cable through the hole on the bottom left side of the controller and connect one Yellow Wire to each of the screws marked **AC** and the Green Wire to **GND**.



NOTE: It is recommended that a licensed electrician perform the following power installation.

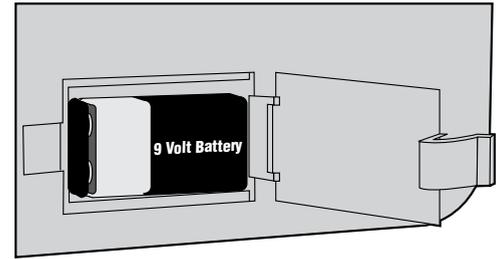
Outdoor Cabinet

Route **AC** power cable and conduit through the ½" (13 mm) conduit opening on the left side of the bottom of the cabinet. Connect the wires to the transformer wires located inside the junction box. International units are supplied with a built in terminal strip. Always use a UL listed conduit ½" (13 mm) male adapter when installing the **AC** wiring. Insert the adapter into the ½" hole at the bottom of the controller. Attach a nut to the adapter inside the enclosure.



CONNECTING THE BATTERY (optional)

Connect a 9-volt **alkaline** battery (not included) to the battery terminals and place in the battery compartment in the front panel. The battery allows the user to program the controller without AC power. **Watering will not occur without AC power.** Since this controller has non-volatile memory, the program clock and calendar will be retained during a power outage even if no battery is installed.

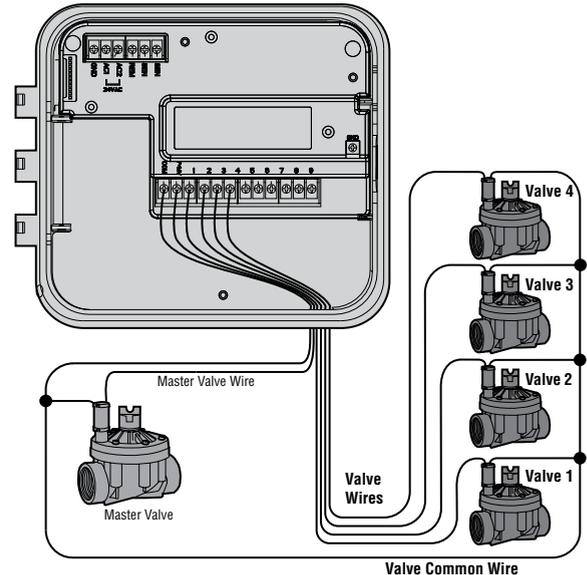


CONNECTING A MASTER VALVE.....



NOTE: Complete this section only if you have a master valve installed. A master valve is a normally closed valve installed at the supply point of the main line that opens only when the automatic system is activated.

1. At the Master Valve, attach the common wire to either solenoid wire of the valve. Attach a separate control wire to the remaining solenoid wire.
2. Route the wires into the controller.
3. Connect either wire from Master Valve to the **P/MV** terminal. Connect remaining wire to the "**COM**" (Common) terminal.



CONNECTING A PUMP START RELAY.....

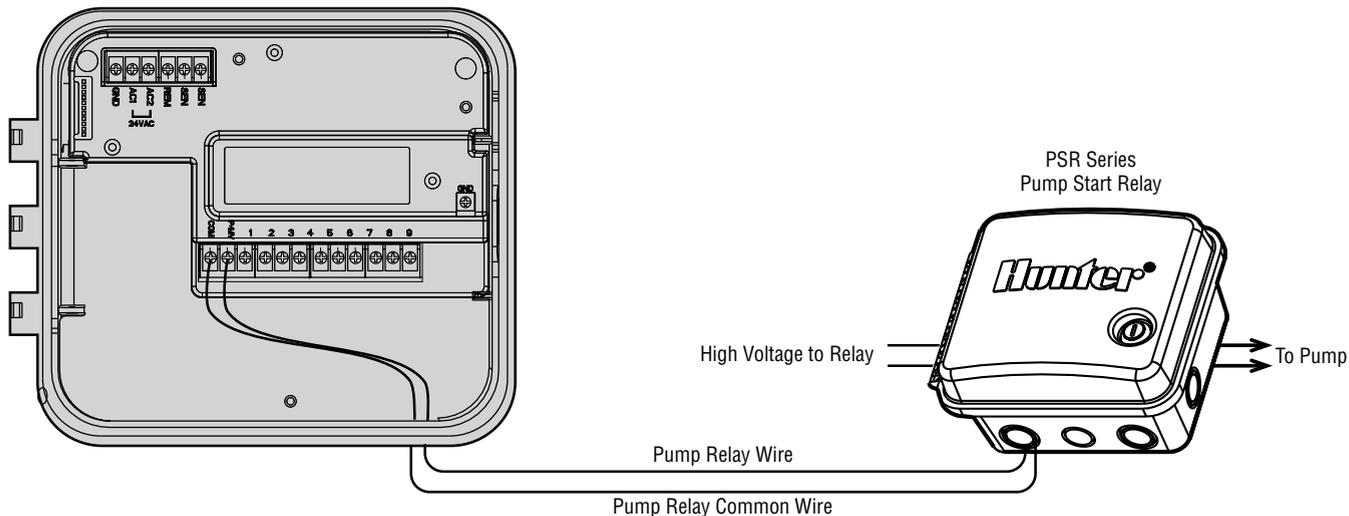


NOTE: Complete this section only if you have a pump and pump start relay installed. A pump start relay is an electronic device that uses a signal current from the irrigation controller to activate a pump to provide water to your system.

When a pump is to be operated by the controller, a pump start relay is typically used. Hunter offers a full range a pump start relays for most applications.

1. Route a wire pair from the pump relay into the controller housing.
2. Connect the pump common wire to the terminal slot “COM” (Common) and the remaining wire from the pump relay to the P/MV screw slot.

Relay holding current draw must not exceed .28 amps (24 VAC).
Do not connect the controller directly to the pump – damage to controller will result.



CONNECTING A WEATHER SENSOR (not included).....

A Hunter Mini-Clik® rain sensor or other type of micro-switch weather sensor may be connected to the Pro-C. The purpose of a rain sensor is to stop watering when precipitation is sufficient.

1. Route the wires from the rain sensor up through the same conduit used for valve wiring.
2. **Remove the metal jumper plate** from the two **SEN** terminals.
3. Connect one wire to the **SEN** terminal and one to the other **SEN** terminal.
4. When the weather sensor has deactivated automatic watering, OFF and sensor will appear on the display



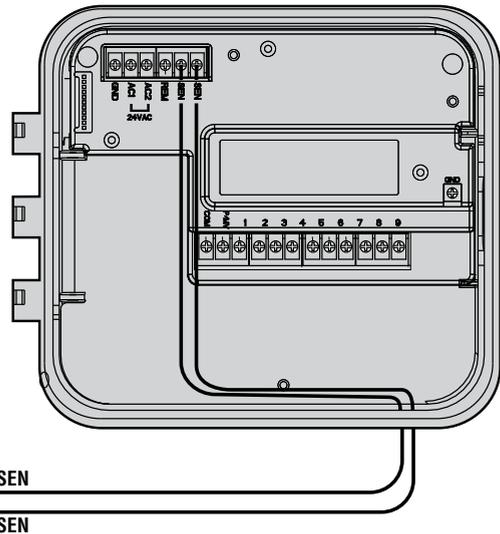
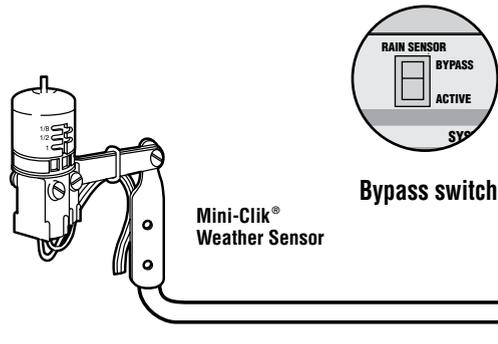
SENSOR BYPASS position to disable the rain sensor from the system to allow for the controller operation. You can also bypass the weather sensor for manual operation by using the **MANUAL - SINGLE STATION** function.



NOTE: If the rain sensor switch is left in the **ACTIVE** position and no sensor is connected and the jumper has been removed, the display will read **SEN OFF** and no irrigation will occur. To eliminate this problem when no sensor is connected, leave the switch in the **BYPASS** position or install a short jumper wire between the sensor terminals.

Manually Bypassing the Weather Sensor

If the rain sensor is interrupting irrigation you can bypass it by using the bypass switch on the front of the controller. Slide the switch to the



CONNECTING A WEATHER SENSOR (continued)

Testing the Weather Sensor

The Pro-C provides simplified testing of a rain sensor when the sensor is wired into the sensor circuit. You can manually test proper operation of the rain sensor by running a **MANUAL ALL STATIONS** cycle by activating the system using the **ONE TOUCH MANUAL START** (see page 19). During the Manual Cycle, pressing the test button on the Mini-Click will interrupt watering.



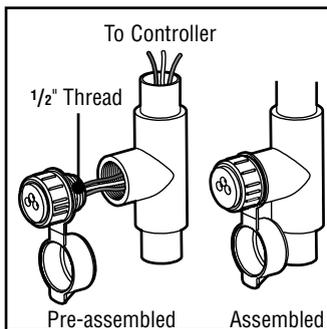
NOTE: A manual single station cycle will override the sensor to allow manual operation when the sensor is active.

CONNECTING AN SRR OR ICR REMOTE CONTROL (not included)

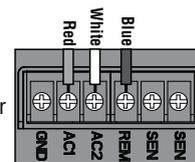
The Pro-C controller is shipped with a SmartPort® wiring harness, allowing for fast and easy use of the Hunter SRR, or Long Range ICR remote controls. The SRR and ICR make it possible for you to operate the system without having to walk back and forth to the controller.

To install the SmartPort connector

1. Install a 1/2" female threaded "Tee" in the field wiring conduit approximately 12" below the Pro-C.
2. Feed the red, white, and blue wires of the harness through the base of the "Tee" and into the wiring compartment as shown.



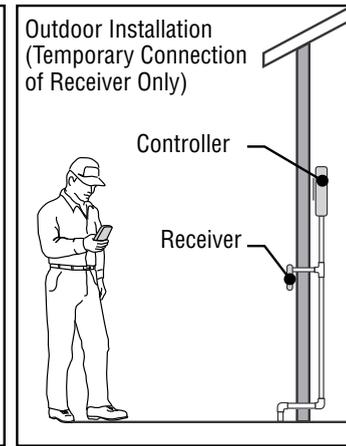
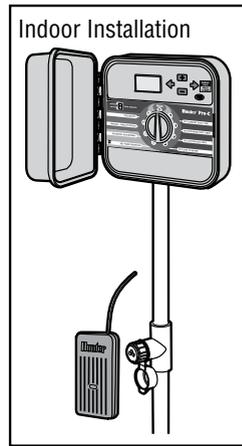
3. Screw the SmartPort harness housing into the "Tee" as shown.
4. Attach the red wire to the bottom most **AC1** screw slot, attach the white wire to the upper **AC2** screw slot and attach the blue wire to the screw slot marked **REM**.



The SmartPort is now ready for remote control use. Please refer to either the SRR or ICR owner's manual for further information or contact your local Hunter distributor for ordering information.

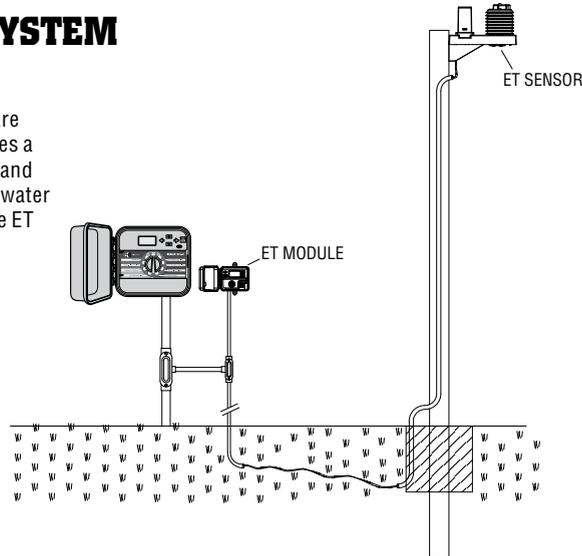


NOTE: Any extension of the wiring on the SmartPort® may result in an error message in the controller display and possible malfunction of the remote unit due to radio interference. In some situations, lengthening of the harness may work fine, in others it may not work at all (it is site specific). In either case, extending the wiring harness should be done using shielded cable to minimize the possible effects of electrical noise. For easiest installation, order a new Hunter SmartPort shielded cable wiring harness (part #SRR-SCWH) with a full 25 feet of shielded cable.



CONNECTING TO THE HUNTER ET SYSTEM

The Hunter ET System allows irrigation programs to be created automatically, based on local climate conditions. These programs are then loaded into the controller and run automatically. ET System uses a sensor to determine the local “evapotranspiration” (ET) rate of turf and plants. The result is a new, water-efficient irrigation program every water day, based on local weather conditions. For more information on the ET System, contact your local Hunter dealer.



CONNECTING TO THE HUNTER IRRIGATION MANAGEMENT AND MONITORING SYSTEM™

With the Irrigation Management and Monitoring System™ (IMMS™), automatic irrigation systems at multiple sites or multiple controllers on a single site can be programmed for functions that would typically be handled directly at each site's controller. Scheduling of days to water, run times, start times, cycle and soak operations, and more can now be done from a single computer at a desk miles away from the actual installation.

In addition, scheduled operation of non-irrigation components also in use at these sites – e.g., lighting systems at athletic fields, fountains at shopping centers – as well as pumps and sensors can also be programmed and monitored from a single central location.

A key function of the IMMS is its ability to monitor changing conditions. With the aid of such options as flow sensors, rain sensors, and other weather-sensing devices, the IMMS can receive reports on the current condition at every site it is linked with and then respond with the necessary adjustments should any of those conditions go beyond the limits that have been defined.

No system available today is more cost-effective than the Hunter IMMS. It's inexpensively priced and contains the most essential features needed for water management. It's able to team with any or all of the standard automatic controllers in the Hunter line-up, from the SRC to the Pro-C to the ICC. Plus, it's a system that's easy and affordable to upgrade, making it possible to accommodate an expanding network of controllers.

For more information on the IMMS, contact your local Hunter dealer.

POWER FAILURES

Due to the possibility of power failures, the controller has non-volatile memory to preserve the program indefinitely. There is no default program.

The Pro-C is also capable of keeping the current time and date for an extended period of time during power outage conditions.

SPRINKLER SYSTEM FUNDAMENTALS.....

There are three main components that are involved with all automatic sprinkler systems that are made today. They are the **controller**, **valves**, and the **sprinklers**.

The **controller** is what makes the whole system operate efficiently. It is technically the brain of the entire system, instructing the valves when to supply water to the sprinklers and for how long to do so. The sprinklers, in turn, will direct the water towards the surrounding plants and lawn.

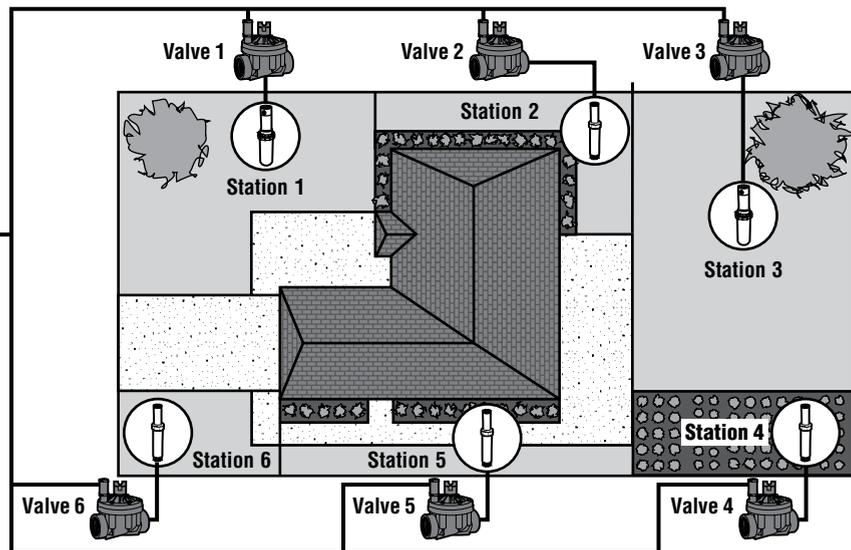
A **valve** controls a group of sprinklers called a watering **station**. These stations are laid out in a fashion according to the type of plant, the locations of the plants, and the maximum amount of water that

can be pumped to the location. Each valve is connected via wire to the controller. Here the wire is connected to a number that corresponds to the valve's station number.

The controller will operate the valves in numerical sequence, only one at a time. When a valve has completed its watering; it will switch to the next station that has been programmed. This process is called the watering cycle. The information pertaining to the watering times of the individual stations and the duration of them is called a **program**.



- Valve 1** – Activates Station 1 – Rotors water front yard lawn
- Valve 2** – Activates Station 2 – Sprays water side lawn and bubblers water flowers
- Valve 3** – Activates Station 3 – Rotors water back yard lawn
- Valve 4** – Activates Station 4 – Bubblers water garden
- Valve 5** – Activates Station 5 – Sprays water side lawn and bubblers water flowers
- Valve 6** – Activates Station 6 – Sprays water front corner lawn



CREATING A WATERING SCHEDULE.....

There are some guidelines that should be followed when determining when and how long to water. These factors are the soil type, the part of the landscape being watered, weather conditions, and the types of sprinklers being used. A watering schedule form is included with your Pro-C that can be used as a handy reference.

Station Number and Location – Identify the station number, location and the type of plant that is being watered.

Watering Day – Identify whether you want to use a calendar day, interval, or an odd or even day schedule. For a calendar day schedule circle the day of the week in which watering is desired. For an interval schedule, indicate the desired interval number.

Program Start Times – Indicate the time of day that the program will begin. Each program can have 1-4 start times. However, one start time will run an entire program. Write “OFF” for any Pump Start Time not used.

Station Run Time – Indicate the run time (1 minute – 6 hours) for each station. Write “0:00” for any station that you do not want to operate in the program.

Keep this schedule in a safe place for quick reference later.



NOTE: It is usually good to water one or two hours before sunrise. Water pressure will be at optimum levels during the early morning and the water can soak into the roots of the plants while evaporation is minimal. For most plants, watering during mid-day or in the evening may cause plant damage or possibly mildew.



NOTE: Keep an eye out for evidence of under- or over-watering. Over-watering is most commonly indicated by pools of water that take a long time to soak in or evaporate, while under-watered landscapes will show signs of discoloring and dryness. Make programming changes immediately when evidence is present.

WATERING SCHEDULE FORM EXAMPLE

HUNTER PRO-C		PROGRAM A						PROGRAM B						PROGRAM C								
DAY OF THE WEEK		M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S
ODD/ EVEN or INTERVAL		Every 1 day						Every 3 days						Every 20 days								
PROGRAM START TIMES		1	7:00 AM						9:00 AM						1:00 PM							
		2	OFF						OFF						OFF							
		3	OFF						OFF						OFF							
		4	OFF						OFF						OFF							
STATION	LOCATION	STATION RUN TIME						STATION RUN TIME						STATION RUN TIME								
1	Front Lawn	0:20						0:00						0:00								
2	Side Lawn	0:10						0:00						0:00								
3	Back Lawn	0:20						0:00						0:00								
4	Annuals	0:05						0:00						0:00								
5	Front Shrubs	0:00						0:15						0:00								
6	Back Shrubs	0:00						0:15						0:00								
7	Trees	0:00						0:00						3:00								
8																						
9																						
10																						
11																						
12																						
NOTES:																						

PROGRAMMING FUNDAMENTALS.....

A watering program can be created to operate valves in numerical sequence one at a time. To create a watering program:

1. Select a program (**A, B, or C**) by pressing the **PROG** button on the controller (it is recommended to start with **Program A**).
2. Set a program start time (only one program start time is required to activate a watering program).
3. Set the run time for each valve assigned to the program, and
4. Set the days that you would like the watering program to run.

We have included an example that will better illustrate the operation of a program:

Let's say you have a program start time set for 6:00 a.m. Stations 1 and 2 are going to have a run time of 15 minutes and station 3 is set for 20 minutes. Please note that stations 4, 5, etc. have not been included in this program, we will water them on separate programs.

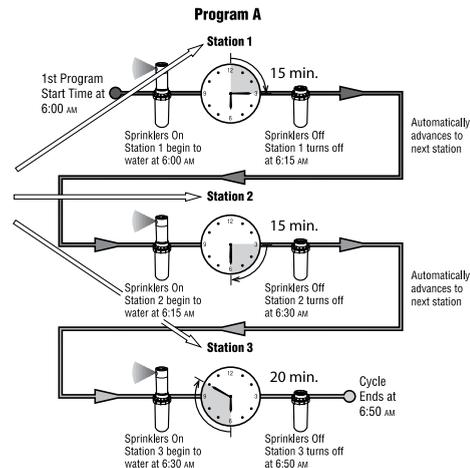
At 6:00 a.m. the controller will activate the watering cycle. The sprinklers on station 1 will run for 15 minutes and then shut off. The controller will automatically advance to station 2 sprinklers. These sprinklers will also run for 15 minutes and then shut off. Then, watering on station 3 will begin. The sprinklers will turn on for 20 minutes and shut off. Since no times were programmed for stations 4, 5, etc. the controller skips them. This will conclude the program and end the water cycle at 6:50 a.m.

As shown in the above example, only **one** program start time was required to run the three different stations. The controller automatically moves to the next station without the need for additional start times.

We realize that many consumers will have variations in their plant watering needs, so at Hunter we equipped the Pro-C with three different programs A, B, and C. These programs are independent of each other. However, no two programs can run at the same time. The Pro-C will automatically stack any programs that overlap.

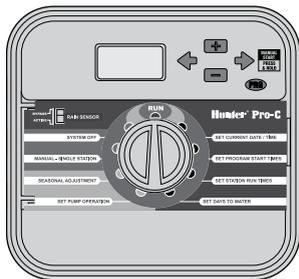
PROGRAMMING FUNDAMENTALS EXAMPLE

HUNTER PRO-C		PROGRAM A						
DAY OF THE WEEK		M	T	W	T	F	S	S
ODD/ EVEN or INTERVAL								
PROGRAM START TIMES	1							
	2							
	3							
	4							
STATION	LOCATION	STATION RUN TIME						
1	Front Lawn	15 minutes						
2	Shrub	15 minutes						
3	Side Yard	20 minutes						
4								
5								
6								
7								
8								
9								
10								
11								
12								
NOTES:								
Total Cycle of Program A = 50 minutes								



PROGRAMMING THE CONTROLLER

The display changes when the dial is rotated to indicate the specific programming information to enter. When programming, the flashing portion of the display can be changed by pressing the **+** or **-** buttons. To change something that is not flashing, press **←** or **→** until desired field is flashing.



To activate a program in your controller, you must enter the following information:

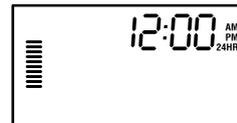
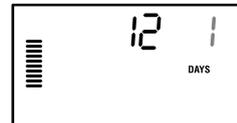
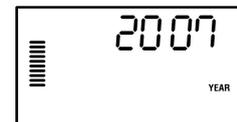
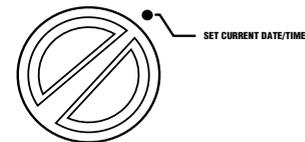
1. Set current day and time – turn dial to **SET CURRENT DATE/TIME**.
2. Set what time of day you would like the program to start – turn dial to **SET PROGRAM START TIMES**.
3. Set how long each valve will water – turn dial to **SET STATION RUN TIMES**.
4. Set the day(s) you would like the program to water – turn dial to **SET DAYS TO WATER**.



NOTE: All stations operate in numerical order. Only one program start time is required to activate a watering program.

Setting the Current Date and Time

1. Turn the dial to the **SET CURRENT DATE/TIME** position.
2. The current year will be flashing in the display. Use the **+** and **-** buttons to change the year. Push the **→** button to proceed to setting the month.
3. The month will be flashing. Use the **+** and **-** buttons to change the month. Press the **→** button to proceed to setting the day.
4. The day will be flashing. Use the **+** and **-** buttons to change the day of the month. Press the **→** button to proceed to setting the time.
5. The time will be displayed: Use the **+** and **-** buttons to select AM, PM, or 24 hr. Press the **→** button to move to hours. Use the **+** and **-** buttons to change the hour shown on the display. Press the **→** button to move onto the minutes. Use the **+** and **-** buttons to change the minutes shown in the display.

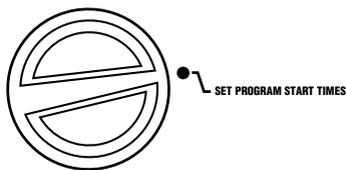


The date, day, and time have now been set.

PROGRAMMING THE CONTROLLER (continued)

Setting Program Start Times

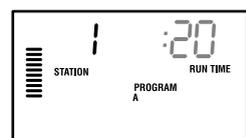
1. Turn the dial to the **SET PROGRAM START TIMES** position.
2. The factory preset is set on program **A**. If necessary you can select program **B** or **C** by pressing the **PRG** button.
3. Use the **+** and **-** buttons to change the start time. (Advances in 15-minute increments.) **One start time will activate all stations sequentially in that program.** This eliminates the need to enter a start time for each station.
4. Press the **➡** button to add an additional start time, or **PRG** button for the next program.



NOTE: If a program has all four start times turned off, then that program is off (all other program details are retained). Because there are no start times, there will be no watering with that program.

Setting Station Run Times

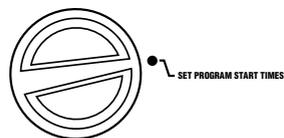
1. Turn the dial to the **SET STATION RUN TIMES** position.
2. The display will show the last program selected (**A**, **B**, or **C**) the station number selected, and the run time for that station will be flashing. You can switch to another program by pressing the **PRG** button.
3. Use the **+** and **-** buttons to change the station run time on the display. You may set station run times from 1 minute to 6 hours.
4. Press the **➡** button to advance to the next station.
5. Repeat steps 2 and 3 for each station.



NOTE: Regardless of the order in which the start times are entered, the Pro-C will always arrange the start times in chronological order when the dial is moved off the **SET PROGRAM START TIMES** position.

Eliminating a Program Start Time

With the dial set to the **SET PROGRAM START TIMES** position, push the **+** and **-** buttons until you reach 12:00 AM (Midnight). From this position push the **➡** button once to reach the **OFF** position.



Setting Days to Water

1. Turn the dial to the **SET DAYS TO WATER** position.
2. The display will show the last program selected (**A**, **B**, or **C**). You can switch to another program by pressing the **PRG** button.
3. The controller displays currently programmed active day schedule information. You can choose to water on specific days of the week, or you can choose interval watering, or choose to water on odd days or even days. Each program can only operate using one type of water day option.



PROGRAMMING THE CONTROLLER (continued)

Selecting Specific Days of the Week to Water

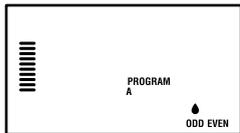
1. Press the **+** button to activate a particular day of the week to water (the display always starts with Monday). Press the **-** button to cancel watering for that day. After pressing a button the display automatically advances to the next day. A **●** icon indicates a water day. A blank space indicates a no water day.

After programming, set dial to **RUN** to enable automatic execution of all selected programs and start times.

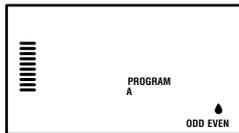
Selecting Odd or Even Days to Water

This feature uses numbered day(s) of the month for watering instead of specific days of the week (odd days: 1st, 3rd, 5th, etc.; even days: 2nd, 4th, 6th, etc.)

1. With the **▲** cursor on SU press the **➡** button once. The **●** icon will flash over **ODD**.
2. If is desired, turn the dial back to the run position.
3. If even day watering is desired, press the **➡** button once. The **●** icon will flash over **EVEN**. You can move back and forth from **ODD** to **EVEN** by pressing the **←** and **➡** buttons.



Odd Day Watering

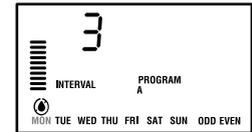
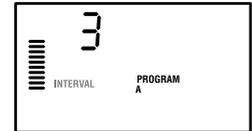
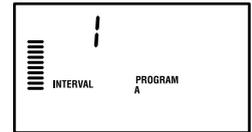


Even Day Watering

Selecting Interval Watering

This feature is convenient if you want to have a more consistent watering schedule without having to worry about the day of the week or the date. The interval you select is the amount of days between watering including the watering day.

1. Turn the dial to **SET DAYS TO WATER**. The water drop above Monday should be flashing.
2. Press the **➡** button until the drop over **EVEN** is flashing, then press the **➡** button one more time. The display will change to the interval mode and the Interval Day number will be flashing.
3. Press the **+** or **-** button to select the Interval Day(s) you desire.
4. Push the **➡** button once to advance to NO WATER DAYS to select any days you do not want the Pro-C to water (see page 20).



NOTE: If any days are selected as non-water days **⊙** at the bottom of the display, the Interval Day watering will exclude those days. For example, if the Interval Days are set at 5 and Monday is a non-water day, the controller will water every 5th day, but never on a Monday. If the interval water day falls on a Monday and Monday is a non-water day. The program would not water for 5 more days resulting in no irrigation for 10 days total.

PROGRAMMING THE CONTROLLER (continued)

Run

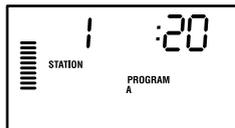
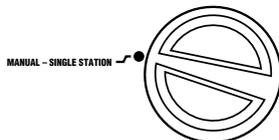
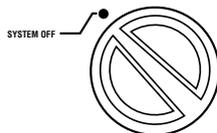
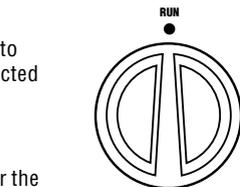
After programming is complete, turn the dial to **RUN** to enable automatic execution of all selected programs and start times.

System Off

Valves currently watering will be shut off after the dial is turned to the **SYSTEM OFF** position for two seconds. All active programs are discontinued and watering is stopped. To return controller to normal automatic operation, simply return dial to **RUN** position.

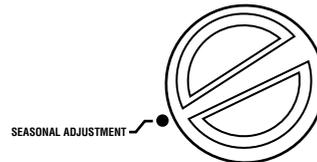
Manually Run a Single Station

1. Turn the dial to the **MANUAL-SINGLE STATION** position.
2. Station run time will flash in the display. Use the **➡** button to move to the desired station. You may then use the **+** and **-** buttons to select the amount of time for a station to water.
3. Turn the dial to the **RUN** position to run the station (only the designated station will water, then controller will return to automatic mode with no change in the previously set program).



Seasonal Adjustment

Seasonal Adjust is used to make global run time changes without re-programming the entire controller. This feature is perfect for making small changes that are necessary as the weather changes. For instance, hotter times of the year may require a bit more water. Seasonal adjust can be increased so that the stations will run longer than the programmed time. Conversely, as Fall approaches, the seasonal adjust can be reduced to allow for short watering durations.



1. Turn the dial to the **SEASONAL ADJUSTMENT** position.
2. Press the **+** or **-** buttons to set the percentage desired from 5% to 300%

To view the new adjusted run time, turn the dial to set run time's position. The displayed run times will be updated accordingly as the seasonal adjustment is made.



NOTE: The controller should always be initially programmed in the 100% position.



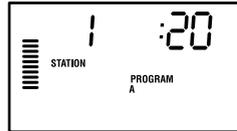
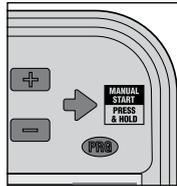
NOTE: The manual single station function will override the sensor.

PROGRAMMING THE CONTROLLER (continued)

One Touch Manual Start and Advance

You can also activate a program to water without using the dial.

1. Hold down the ➡ button for 2 seconds.
2. This feature automatically defaults to program **A**. You can select program **B**, or **C** by pressing the **PRG** program.
3. The station number will be flashing. Press the ⬅ or ➡ button to scroll through the stations and use the **+** and **-** buttons to adjust the station run times. (If no buttons are pressed during step 2 or 3, the controller will automatically begin program **A**.)
4. Press the ➡ button to scroll to the station you wish to begin with. After a 2 second pause, the program will begin.



This feature is great for a quick cycle when extra watering is needed or if you would like to scroll through the stations to inspect your system.

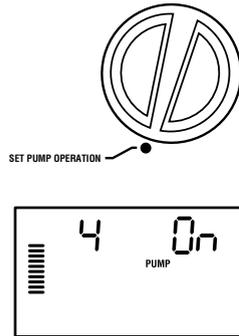
ADVANCED FEATURES

Set Pump/Master Valve Operation

The default is for all stations to have the master valve/pump start circuit **ON**. The master valve/pump start can be set **ON** or **OFF** by station, regardless of which program the station is assigned.

To program pump operation:

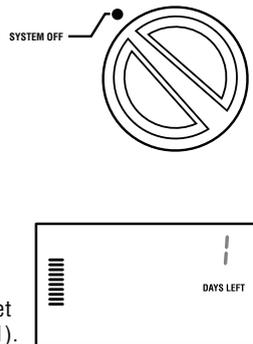
1. Turn the dial to **SET PUMP OPERATION** position.
2. Press the **+** or **-** buttons to toggle the master valve/pump start **ON** or **OFF** for the specific station.
3. Press the **➡** button to advance to the next station.
4. Repeat steps 2 and 3 for all necessary stations.



Programmable Rain Off

This feature permits the user to stop all programmed waterings for a designated period from 1 to 31 days. At the end of the programmable rain off period, the controller will resume normal automatic operation.

1. Turn the dial to the **SYSTEM OFF** position.
2. Press the **+** button and a 1 will be displayed and the **DAYS LEFT** icon will illuminate.
3. Press **+** as many times as needed to set the number of days off desired (up to 31).



4. Turn the dial back to the **RUN** position at which time, **OFF**, a **number** and the **DAYS** icon all remain on.
5. Leave the dial in the **RUN** position.

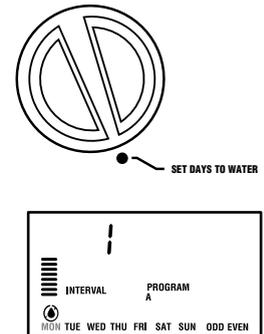
The days off remaining will decrease at midnight of each day. When it goes to zero, the display will show the normal time of day and normal irrigation will resume at the next scheduled start time.



Setting Specific Day(s) Off

Programming a No Water Day(s) is useful to inhibit watering on mowing days, etc. For instance, if you always mow the lawn on Saturdays you would designate Saturday as a **No Water Day** so you are not mowing wet grass.

1. Turn the dial to the **DAYS TO WATER** position.
2. Enter an interval watering schedule as described on page 21.
3. Press the **➡** button once. **MON** will be flashing.
4. Use the **➡** button until the cursor is at the day of the week you wish to set as a **No Water Day**.
5. Press the **-** button to set this day as a no water day. The **☉** will illuminate over this day.
6. Repeat steps 4 and 5 until all desired event day(s) are off.



HIDDEN FEATURES

Program Customization

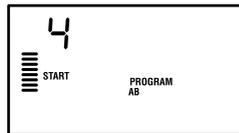
The Pro-C comes factory configured with 3 independent programs (A, B, C with four start times each) for different plant type requirements. The Pro-C can be customized to display only the required programs. You can hide those programs that are not required to ease programming.

To customize Pro-C programs:

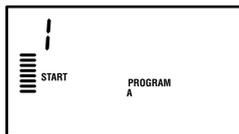
1. Press and hold the  button. Turn the dial to set days to water.
2. Release the  buttons.
3. Use the  and  button to change program modes.



Advanced Mode
(3 programs / 4 start times)



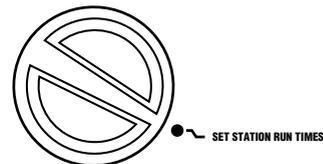
Normal Mode
(2 programs / 4 start times)



Limited Mode
(1 program / 1 start time)

Programmable Delay Between Stations

This feature allows the user to insert a delay between when one station turns off and the next station turns on. This is very helpful on systems with slow closing valves or on pump systems that are operating near maximum flow or have slow well recovery.



1. Start with the dial in the **RUN** position.
2. Press and hold the  button down while turning the dial to the **SET STATION RUN TIMES** position.
3. Release the  button. The display will show a delay time for all stations in seconds. The **DELAY** icon shall also be lit at this time.
4. Press the  and  buttons to increase or decrease the delay time between 0 and 59 seconds in 1 second increments and then in one minute increments up to four hours. **Hr** will be displayed when the delay changes from seconds to minutes and hours. Maximum delay is 4 hours.
5. Return the dial to the **RUN** position.



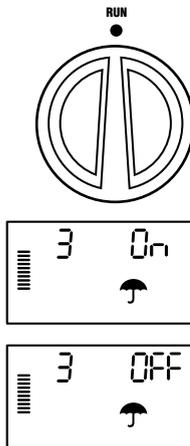
NOTE: The Master Valve/Pump Start circuit will operate during the first 15 seconds of any programmed delay to aid in the closing of the valve and to avoid unnecessary cycling of the pump.

HIDDEN FEATURES (continued)

Programable Sensor Override

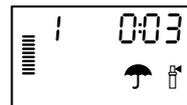
The Pro-C allows the user to program the controller so that the sensor disables watering on only desired stations. For example, patio gardens that have pots under overhangs and roofs may not receive water when it rains and will continue to need to be watered during periods of rain. To program sensor override:

1. Turn the dial to the **RUN** position.
2. Press and hold the  button down while turning the dial to **START TIMES** position.
3. Release the  button. The display will show the station number, ON, and the  icon, will be flashing.
4. Press the  or  button to enable or disable the sensor for the station shown.
ON = Sensor enabled (will suspend irrigation)
OFF = Sensor disabled (will allow watering)
5. Use the  or  buttons to scroll to the next station that you would like to program the sensor override.



NOTE: The controller default is for the sensor to disable watering on all zones when rain occurs.

When the Pro-C receives an input from the sensor to disable watering, the display will indicate those stations that have been programmed to override the sensor. A station that is running in the sensor override mode will flash  the and  icons alternately.



Total Run Time Calculator

The Pro-C keeps a running total of each program's station run times. This feature provides a quick way to determine how long each program will water.

1. While in the Set Station **Run** Time mode use the  button to advance to the highest station position.
2. Press the  button once to review the total of all run times programmed.
3. Use the  button to review additional programs.

Test Program

The Pro-C allows the user a simplified method for running a test program. This feature operates each station in numerical sequence, from the lowest to the highest. You can start with any station. This is a great feature to check the operation of your irrigation system.

To initiate the test program:

1. Press and hold the  button. The station number will be flashing.
2. Press the  or  button to scroll to the station you would like the test program to start with. Use the  and  button to set a run time of up to 15 minutes. The run time needs to be entered only once.
3. After a 2 second pause, the test program will begin.

HIDDEN FEATURES (continued).....

Easy Retrive™ Program Memory

The Pro-C is capable of saving the preferred watering program into memory for retrieval at a later time. This feature allows for a quick way of resetting the controller to the original programmed watering schedule.

To save the program into memory.

1. With the dial in the **RUN** position, press and hold the **+** and **PRO** buttons for 5 seconds. The display will scroll **≡** from left to right across the display indicating the program is being saved into memory.
2. Release the **+** and **PRO** buttons.

To retrieve a program that was previously saved into memory.

1. With the dial in the **RUN** position, press and hold the **-** and **PRO** buttons for 5 seconds. The display will scroll **≡** from right to left across the display indicating the program is being saved into memory.
2. Release the **-** and **PRO** buttons

Hunter Quick Check™

This circuit diagnostic procedure is can quickly identify “shorts” commonly caused by faulty solenoids or when a bare common wire touches a bare station control wire.

To initiate the Hunter Quick Check test procedure:

1. Press the **+**, **-**, **←** and **→** buttons simultaneously. In the standby mode, the LCD will display all segments (helpful when troubleshooting display problems).
2. Press the **+** button to begin the Quick Check test procedure. The system will search all stations to detect a high current path through the station terminals. When a field wiring short is detected, an ERR symbol preceded by the station number will momentarily flash on the controller LCD display. After the Hunter Quick Check completes running this circuit diagnostic procedure, the controller returns to the automatic watering mode.

Clearing Controller’s Memory/Resetting Controller

If you feel that you have misprogrammed the controller, there is a process that will reset the memory to factory defaults and erase all programs and data that have been entered into the controller. Press and hold the **PRO** button. Press and release the **RESET** button on the back of the front panel. Wait until the display shows 12:00am. Release the **PRO** button. All the memory has been cleared and the controller may now be reprogrammed.

WINTERIZING YOUR SYSTEM

In regions within the country where the frost level falls below the depth of the installed piping, it is common for these systems to be “winterized”. Several methods can be used to drain the water from the system. If the blow out method is used it is recommended that a qualified licensed contract perform this type of winterization.

WARNING! WEAR ANSI APPROVED SAFETY EYE PROTECTION!

Extreme care must always be taken when blowing out the system with compressed air. Compressed air can cause serious injury, including serious eye injury from flying debris. Always wear ANSI approved safety eye protection and do not stand over any irrigation components (pipes, sprinklers, and valves) during blow out. **SERIOUS PERSONAL INJURY MAY RESULT IF YOU DO NOT PROCEED AS RECOMMENDED.**

TROUBLESHOOTING GUIDE

PROBLEM	CAUSES	SOLUTIONS
The controller repeats itself or continuously waters, even when it should not be on (cycling repeatedly).	Too many start times (user error).	Only one start time per active program is required. Refer to “Setting Program Start Times” on page 19.
There is no display.	Check AC power wiring.	Correct any errors.
The display reads “ERR”.	Electrical noise is entering the system.	Check the SmartPort® wiring harness. If the wires were extended then they will need to be replaced with shielded cable. Contact your local distributor for information on shielded cable
The display reads “P ERR”.	There is a fault in the wire to the pump start or master valve.	Check the master valve or pump start wire for continuity. Replace or repair the shorted wire. Check that all wire connections are good and water tight.
The display reads a station number and ERR, such as “2 ERR”.	There has been a fault with the wire leading to that station.	Check the station wire for continuity. Replace or repair shorted wire. Check that all wire connections are good and water tight.
The display reads “NO AC”.	There is no AC power present (the controller is not receiving power).	Check to see if the transformer is properly installed.

TROUBLESHOOTING GUIDE (continued)

PROBLEM	CAUSES	SOLUTIONS
The display reads “SENSOR OFF”.	The rain sensor is interrupting irrigation or the sensor jumper is not installed.	Slide the Rain Sensor switch on front panel to the BYPASS position to bypass rain sensor circuit, or install the sensor jumper.
Rain sensor will not shut off system.	<p>Incompatible rain sensor or the jumper was not removed when sensor was installed.</p> <p>Manual Single Station Mode Used.</p>	<p>Make sure sensor is micro-switch type such as Mini-Clik®. Check that the the jumper has been removed from the the SEN terminals. Confirm proper operation (see "Testing a Weather Sensor" on page 9).</p> <p>Manual Single Station Mode will override the sensor. Use Manual All Station Mode to test sensor.</p>
The controller does not have a start time for each station.	Programming error, dial in incorrect position.	Be sure the dial is in correct position. Total number of stations can be easily checked by placing dial in SET STATION RUN TIMES position and pressing the back arrow.
Valve will not turn on	<p>Short in wiring connections.</p> <p>Bad solenoid.</p>	<p>Check field wiring.</p> <p>Replace solenoid.</p>

SPECIFICATIONS

Operating Specifications

- Station Run Time: 1 minute to 6 hours on programs A, B, and C.
- Start Times: 4 per day, per program, for up to 12 daily starts.
- Watering Schedule: 7-day calendar, interval watering up to a 31-day interval or true odd or even day programming, made possible by the 365-day clock/calendar.

Electrical Specifications

- Transformer Input: 120VAC, 60Hz
(230VAC, 50/60 Hz International Use)
- Transformer Output: 25VAC, 1.0 amp
- Station Output: 24VAC, .56 amps per station
- Maximum Output: 24VAC, .84 amps (includes Master Valve Circuit)
- Battery: 9-volt alkaline battery (not included) used only for non-AC programming, the non-volatile memory maintains program information
- Battery, Front Panel, Internal CR2032 Lithium for real time clock.

Dimensions

Indoor Cabinet

Height: 8.25"

Width: 9.5"

Depth: 3.75"

Outdoor cabinet is NEMA 3R, IP44 rated.

Outdoor Cabinet

Height: 9"

Width: 10"

Depth: 4.5"

Default Settings

All stations are set to zero run time. This controller has a non-volatile memory that retains all entered program data even during power outages, without need for a battery.

Cleaning

Clean only with cloth dampened with mild soapy water.

FCC NOTICE.....

This controller generates radio frequency energy and may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna
- Move the controller away from the receiver
- Plug the controller into a different outlet so that controller and receiver are on different branch circuits

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington, D.C., Stock No. 004-000-00345-4 (price – \$2.00)

CERTIFICATE OF CONFORMITY TO EUROPEAN DIRECTIVES

Hunter Industries declares that the irrigation controller Model Pro-C complies with the standards of the European Directives of "electromagnetic compatibility" 87/336/EEC and "low voltage" 73/23/EEC.



Project Engineer



This product should not be used for anything other than what is described in this document. This product should only be serviced by trained and authorized personnel.

Hunter Industries Incorporated • The Irrigation Innovators

1940 Diamond Street • San Marcos, California 92078
www.HunterIndustries.com

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P/N 700761 LIT-424 02/08

Arc Adjustments

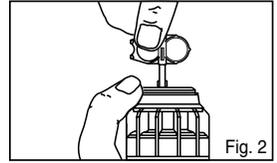
All I-25 Ultra adjustable arc sprinklers are preset at approximately 180°. Sprinklers may be adjusted with water on or off. It is recommended that initial adjustment be made before installation.

1. Using the palm of your hand, rotate the nozzle turret counterclockwise to left stop to complete any interrupted rotation cycle (Fig. 1).
2. Rotate the nozzle turret clockwise to right stop. This is the fixed side of the arc. The nozzle turret must be held in this position for all arc adjustments.



To Increase Arc

1. Insert the key end of the Hunter wrench into the adjustment socket (Fig. 2 & Fig. 3).
2. While holding the nozzle turret at the right stop, turn the wrench clockwise. Each 360° turn of the wrench increases the arc 45°.
3. Adjust to any arc between 50° and 360°.
4. Wrench will stop turning, or there will be a ratcheting noise, when the maximum arc (360°) is reached.
5. When set to 360°, the sprinkler will rotate continually counter-clockwise.



To Decrease Arc

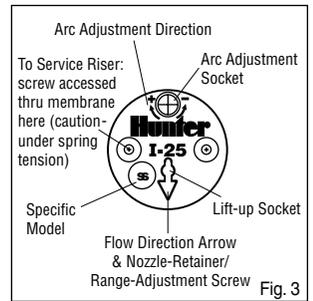
1. Insert the key end of the Hunter wrench into the adjustment socket (Fig. 2 & Fig. 3).
2. While holding the nozzle turret at the right stop, turn the wrench counterclockwise. Each 360° turn of the wrench decreases the arc 45°.
3. Adjust to any arc between 50° and 360°.
4. Wrench will stop turning, or there will be a ratcheting noise, when the minimum arc (40°) is reached.

Radius Adjustment

Insert the hex end of the Hunter wrench into the nozzle-retainer/range-adjustment screw (Fig. 3). Turn the screw clockwise into the stream of water to decrease the radius, or counterclockwise to increase the radius.

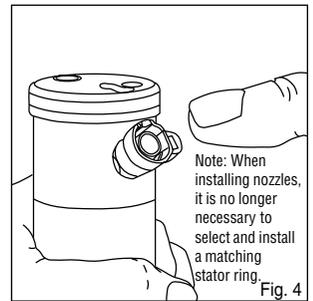
Precipitation Rate Adjustment

Where excessively wet or dry areas are a problem, the precipitation rate may be adjusted. Simply replace the existing nozzle with a larger one to increase, or a smaller one to decrease the rate of precipitation.

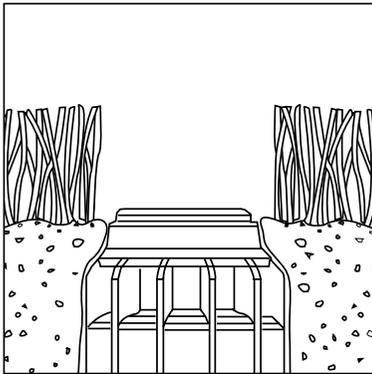


Nozzle Installation

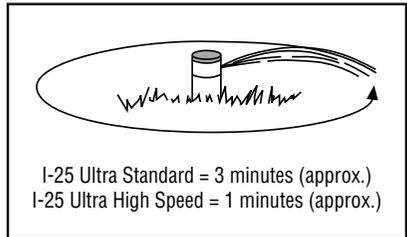
1. Insert the key end of the Hunter wrench into the lifting socket of a pop-up sprinkler and rotate 90°. Pull the riser up to gain access to the nozzle opening in rotating turret.
2. Using the Hunter wrench, loosen the nozzle-retainer/range-adjustment screw. If a nozzle is already installed in the sprinkler, it may now be removed with pliers by grabbing the tab in the center and pulling out.
3. Slip the desired nozzle into the nozzle socket. Note that the socket is angled up 25° (Fig. 4). Make sure that nozzle is fully seated and does not protrude from housing. Tighten the nozzle retainer/range-adjustment screw.



Typical Installation



Full Circle Rotation Speed



Data represent test results in zero wind. Adjust for local conditions. Radius may be reduced up to 25% with adjustment screw (this may alter the uniformity of the spray pattern).

I-25 Ultra Nozzle Performance Data

Nozzle	Pressure PSI	Radius ft.	Flow GPM	Precip in/hr ▲	
 4 Yellow	40	40'	3.8	0.46	0.53
	50	41'	4.3	0.49	0.57
	60	42'	4.7	0.51	0.59
	70	43'	5.1	0.53	0.61
 5 White	40	43'	4.4	0.46	0.53
	50	44'	4.8	0.48	0.55
	60	45'	5.3	0.50	0.58
	70	46'	5.6	0.51	0.59
 7 Orange*	40	45'	6.6	0.63	0.72
	50	47'	7.0	0.61	0.70
	60	48'	7.5	0.63	0.72
	70	49'	7.9	0.63	0.73
 8 Lt. Brown	40	47'	7.7	0.67	0.77
	50	49'	8.3	0.67	0.77
	60	50'	9.2	0.71	0.82
	70	51'	9.9	0.73	0.85
 10 Lt. Green*	50	51'	10.1	0.75	0.86
	60	52'	11.1	0.79	0.91
	70	53'	12.1	0.83	0.96
	80	54'	12.9	0.85	0.98
 13 Lt. Blue	50	53'	11.2	0.77	0.89
	60	54'	12.3	0.81	0.94
	70	55'	13.3	0.85	0.98
	80	55'	14.3	0.91	1.05
 15 Gray*	50	56'	13.4	0.82	0.95
	60	57'	14.3	0.85	0.98
	70	57'	15.2	0.90	1.04
	80	58'	16.4	0.94	1.08
 18 Red	50	58'	14.5	0.83	0.96
	60	59'	15.7	0.87	1.00
	70	62'	16.9	0.85	0.98
	80	63'	18.2	0.88	1.02
 20 Dk. Brown*	60	62'	17.8	0.89	1.03
	70	63'	19.2	0.93	1.08
	80	64'	20.5	0.96	1.11
	90	65'	21.8	0.99	1.15
 23 Green	60	64'	21.9	1.03	1.19
	70	65'	23.6	1.08	1.24
	80	66'	25.6	1.13	1.31
	90	67'	27.0	1.16	1.34
 25 Dk. Blue*	60	66'	23.5	1.04	1.20
	70	68'	25.5	1.06	1.23
	80	69'	28.0	1.13	1.31
	90	70'	29.5	1.16	1.34
 28 Black	70	68'	26.9	1.12	1.29
	80	70'	28.7	1.13	1.30
	90	71'	30.6	1.17	1.35
	100	71'	31.5	1.20	1.39

I-25 Ultra High-Speed Nozzle Performance Data

Nozzle	Pressure PSI	Radius ft.	Flow GPM	Precip in/hr ▲	
 4 Yellow	40	37'	3.8	0.53	0.62
	50	38'	4.3	0.57	0.66
	60	38'	4.7	0.63	0.72
	70	39'	5.2	0.66	0.76
 5 White	40	38'	4.4	0.59	0.68
	50	39'	4.8	0.61	0.70
	60	40'	5.5	0.66	0.76
	70	41'	6.0	0.69	0.79
 7 Orange*	40	40'	6.1	0.73	0.85
	50	41'	6.9	0.79	0.91
	60	42'	7.5	0.82	0.95
	70	44'	8.1	0.81	0.93
 8 Lt. Brown	40	42'	7.2	0.79	0.91
	50	43'	8.1	0.84	0.97
	60	44'	8.9	0.88	1.02
	70	45'	9.8	0.93	1.08
 10 Lt. Green*	50	46'	10.1	0.92	1.06
	60	48'	11.1	0.93	1.07
	70	49'	12.1	0.97	1.12
	80	50'	12.9	0.99	1.15
 13 Lt. Blue	50	48'	11.2	0.94	1.08
	60	49'	12.3	0.99	1.14
	70	51'	13.3	0.98	1.14
	80	51'	14.3	1.06	1.22
 15 Gray*	50	49'	13.4	1.07	1.24
	60	51'	14.3	1.06	1.22
	70	53'	15.2	1.04	1.20
	80	54'	16.4	1.08	1.25
 18 Red	50	50'	14.5	1.12	1.29
	60	53'	15.7	1.08	1.24
	70	55'	16.9	1.08	1.24
	80	57'	18.2	1.08	1.25
 20 Dk. Brown*	60	53'	17.8	1.22	1.41
	70	56'	19.2	1.18	1.36
	80	58'	20.5	1.17	1.35
	90	59'	21.8	1.21	1.39
 23 Green	60	56'	21.9	1.34	1.55
	70	58'	23.6	1.35	1.56
	80	60'	25.6	1.37	1.58
	90	61'	27.0	1.40	1.61
 25 Dk. Blue*	60	58'	23.5	1.34	1.55
	70	62'	25.5	1.32	1.47
	80	64'	28.0	1.38	1.52
	90	66'	29.5	1.30	1.51
 28 Black	70	60'	26.9	1.44	1.66
	80	62'	28.7	1.44	1.66
	90	65'	30.6	1.39	1.61
	100	67'	31.5	1.35	1.56

I-25 Ultra Nozzle Performance Data - Metric

Nozzle	Pressure kPa	Radius m	Flow l/min	Precip mm/hr ▲			
 4 Yellow	2.5	248	11.9	0.82	13.6	12	13
	3.0	303	12.2	0.91	15.2	12	14
	3.5	352	12.5	0.98	16.4	13	15
	4.0	400	12.5	1.05	17.5	13	16
	4.5	448	12.8	1.11	18.4	16	16
5.0	496	13.1	1.18	19.6	14	16	
 5 White	2.5	248	12.8	0.95	15.9	12	13
	3.0	303	13.1	1.04	17.3	12	14
	3.5	352	13.4	1.11	18.5	12	14
	4.0	400	13.4	1.17	19.6	13	15
	4.5	448	13.7	1.24	20.6	13	15
5.0	496	14.0	1.29	21.5	13	15	
 7 Orange*	2.5	248	13.4	1.44	24.0	16	19
	3.0	303	14.0	1.54	25.6	16	18
	3.5	352	14.3	1.61	26.9	16	18
	4.0	400	14.3	1.68	28.0	16	19
	4.5	448	14.6	1.75	29.1	16	19
5.0	496	14.9	1.81	30.1	16	19	
 8 Lt. Brown	2.5	248	14.0	1.65	27.5	17	19
	3.0	303	14.3	1.81	30.1	18	20
	3.5	352	14.9	1.94	32.3	17	20
	4.0	400	15.2	2.05	34.2	18	20
	4.5	448	15.2	2.16	36.0	19	22
5.0	496	15.5	2.27	37.8	19	22	
 10 Lt. Green*	3.0	303	15.2	2.15	35.8	18	21
	3.5	352	15.5	2.32	38.6	19	22
	4.0	400	15.8	2.48	41.3	20	23
	4.5	448	16.2	2.63	43.9	20	23
	5.0	496	16.2	2.78	46.3	21	25
5.5	552	16.5	2.94	48.9	22	25	
 13 Lt. Blue	3.0	303	15.8	2.38	39.6	19	22
	3.5	352	16.2	2.57	42.8	20	23
	4.0	400	16.5	2.75	45.7	20	23
	4.5	448	16.5	2.91	48.5	21	25
	5.0	496	16.8	3.07	51.2	22	25
5.5	552	16.8	3.24	54.0	23	27	
 15 Gray*	3.0	303	16.8	2.86	47.7	20	24
	3.5	352	17.1	3.05	50.8	21	24
	4.0	400	17.4	3.22	53.7	21	25
	4.5	448	17.4	3.38	56.3	22	26
	5.0	496	17.4	3.53	58.8	23	27
5.5	552	17.7	3.69	61.5	24	27	
 18 Red	3.0	303	17.4	3.08	51.4	20	24
	3.5	352	17.7	3.31	55.2	21	24
	4.0	400	18.0	3.52	58.7	22	25
	4.5	448	18.3	3.72	62.0	22	26
	5.0	496	18.9	3.91	65.2	22	26
5.5	552	19.2	4.11	68.5	22	26	
 20 Dk. Brown*	4.0	400	18.6	3.97	66.2	23	27
	4.5	448	18.9	4.20	70.1	24	27
	5.0	496	19.2	4.42	73.7	24	28
	5.5	552	19.5	4.66	77.7	25	28
	6.0	600	19.8	4.86	81.0	25	29
6.5	648	20.1	5.05	84.2	25	29	
 23 Green	4.0	400	19.2	4.88	81.3	26	31
	4.5	448	19.5	5.18	86.3	27	31
	5.0	496	19.8	5.47	91.1	28	32
	5.5	552	20.1	5.78	96.3	29	33
	6.0	600	20.3	6.04	100.6	30	34
6.5	648	20.4	6.29	104.8	30	35	
 25 Dk. Blue*	4.0	400	19.8	5.23	87.1	27	31
	4.5	448	20.1	5.58	93.1	28	32
	5.0	496	20.4	5.92	98.7	28	33
	5.5	552	21.0	6.29	104.9	28	33
	6.0	600	21.0	6.60	110.0	30	34
6.5	648	21.3	6.90	115.1	30	35	
 28 Black	4.5	448	20.1	5.93	98.8	29	34
	5.0	496	20.7	6.21	103.5	29	33
	5.5	552	21.3	6.52	108.6	29	33
	6.0	600	21.3	6.77	112.8	30	34
	6.5	648	21.6	7.01	116.9	30	35
7.0	696	21.6	7.24	120.7	31	36	

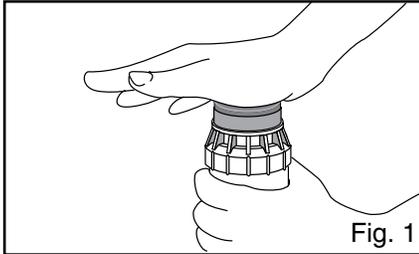
I-25 Ultra High-Speed Nozzle Performance Data - Metric

Nozzle	Pressure kPa	Radius m	Flow l/min	Precip mm/hr ▲			
 4 Yellow	2.5	248	11.0	0.81	13.6	14	16
	3.0	303	11.3	0.91	15.1	14	16
	3.5	352	11.6	0.99	16.4	15	17
	4.0	400	11.6	1.06	17.6	16	18
	4.5	448	11.4	1.13	18.6	17	19
5.0	496	11.9	1.19	19.9	17	19	
 5 White	2.5	248	11.3	0.93	15.5	15	17
	3.0	303	11.6	1.04	17.3	16	18
	3.5	352	11.9	1.13	18.9	16	18
	4.0	400	12.2	1.22	20.3	16	19
	4.5	448	12.2	1.30	21.6	17	20
5.0	496	12.5	1.38	22.9	18	20	
 7 Orange*	2.5	248	11.9	1.32	22.0	19	22
	3.0	303	12.2	1.46	24.3	20	23
	3.5	352	12.5	1.57	26.2	20	23
	4.0	400	12.8	1.68	27.9	20	24
	4.5	448	13.1	1.78	29.6	21	24
5.0	496	13.4	1.87	31.1	21	24	

ARC ADJUSTMENTS (NON-OPPOSING NOZZLE MODEL)

All I-40 group adjustable heads are preset to approximately 180°. Sprinklers may be adjusted with water on or off. It is recommended that initial adjustment be made before installation.

- Using the palm of your hand, rotate the nozzle turret counterclockwise to left stop to complete any interrupted rotation cycle (Fig. 1).



- Rotate the nozzle turret clockwise to right stop. This is the fixed side of the arc. The nozzle turret must be held in this position for all arc adjustments.

To Increase Arc

- Insert the key end of the Hunter wrench into the adjustment socket (Figs. 2 & 3).
- While holding the nozzle turret at the right stop, turn the wrench clockwise. Each 360° turn of the wrench increases the arc 45°.



- Adjust to any arc between 50° and 360°.
- Wrench will stop turning, or there will be a ratcheting noise, when the maximum arc (360°) is reached.
- When set to 360°, the sprinkler will rotate continually counterclockwise.**

To Decrease Arc

- Insert the key end of the Hunter wrench into the adjustment socket (Figs. 2 & 3).
- While holding the nozzle turret at the right stop, turn the wrench counterclockwise. Each 360° turn of the wrench decreases the arc 45°.
- Adjust to any arc between 50° and 360°.
- Wrench will stop turning, or there will be a ratcheting noise, when the minimum arc (50°) is reached.

Radius Adjustment

Insert the hex end of the Hunter wrench into the nozzle-retainer/range-adjustment screw (Figs. 2 & 3). Turn the screw clockwise

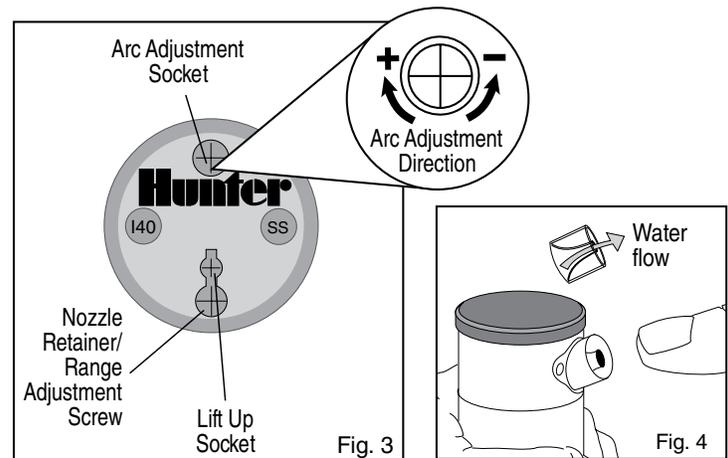
into the stream of water to decrease the radius, or counterclockwise to increase the radius.

Precipitation Rate Adjustment

Where excessively wet or dry areas are a problem, the precipitation rate may be adjusted. Simply replace the existing nozzle with a larger one to increase or a smaller one to decrease the rate of precipitation.

Nozzle Installation

- Insert the key end of the Hunter wrench into the lifting socket of a pop-up sprinkler. Pull the riser up to gain access to the nozzle socket.
- Using the Hunter wrench, loosen the nozzle-retainer/range-adjustment screw. If a nozzle is already installed in the sprinkler, it may now be removed by briefly turning on the water.
- Discard nozzle if removed with pliers. Slip the desired nozzle into the nozzle socket. Note that the socket is angled up 25° (see Fig. 4). Tighten the nozzle-retainer/range-adjustment screw.

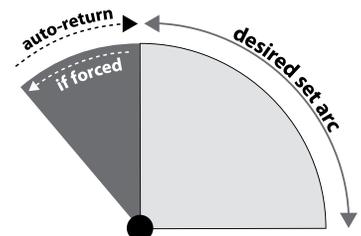


NON-STRIPPABLE BACKDRIVE

This sprinkler is designed with an internal device that prevents damage to the internal gear drive if it should be turned by vandals. This important feature works when the nozzle turret is turning in either direction. This makes the sprinkler very durable in all applications.

AUTO ARC RETURN

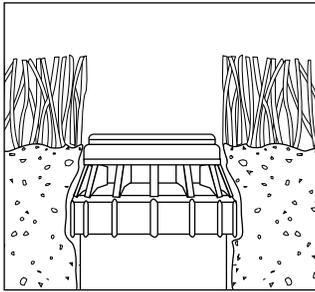
This sprinkler is designed with an internal device that re-aligns the arc if it is turned by vandals. This important feature works when the nozzle turret is turning in either direction. When forced outside of the originally set arc, the sprinkler takes the shortest path back to the pattern without going completely around. This saves the non-irrigated areas from getting wet! Always a good thing!



I-40
Nozzle Performance Data

Nozzle	Pressure PSI	Radius ft.	Flow GPM	Precip in/hr	
				■	▲
8 Lt. Brown (40)	40	44'	7.6	0.76	.87
	50	45'	8.4	0.80	.92
	60	46'	9.2	0.84	.97
10 Lt. Green (41)	50	49'	10.3	0.83	0.95
	60	50'	11.3	0.87	1.00
	70	51'	12.2	0.90	1.04
13 Lt. Blue (42)	50	50'	11.1	0.85	.99
	60	51'	12.3	0.91	1.05
	70	52'	13.3	0.95	1.08
15 Gray (43)	50	54'	13.8	0.91	1.05
	60	55'	15.7	1.00	1.15
	70	57'	16.6	0.98	1.14
23 Dk. Green (44)	60	62'	21.3	1.07	1.23
	70	64'	23.0	1.08	1.25
	80	65'	24.5	1.12	1.29
25 Dk. Blue (45)	60	66'	23.9	1.06	1.22
	70	67'	25.8	1.11	1.28
	80	68'	27.7	1.15	1.33

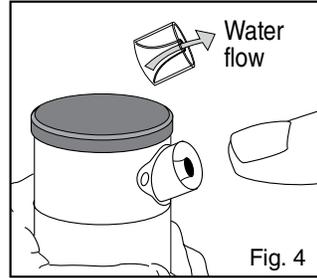
CORRECT INSTALLATION



I-40 High Speed
Nozzle Performance Data

Nozzle	Pressure PSI	Radius ft.	Flow GPM	Precip in/hr	
				■	▲
8 Lt. Brown (40)	40	41'	7.6	0.87	1.00
	50	41'	8.4	0.96	1.11
	60	42'	9.2	1.00	1.16
10 Lt. Green (41)	50	45'	10.3	0.98	1.13
	60	46'	11.3	1.03	1.19
	70	47'	12.2	1.06	1.23
13 Lt. Blue (42)	50	46'	11.1	1.01	1.17
	60	47'	12.3	1.07	1.24
	70	48'	13.3	1.11	1.28
15 Gray (43)	50	51'	13.8	1.02	1.18
	60	52'	15.7	1.12	1.29
	70	53'	16.6	1.14	1.31
23 Dk. Green (44)	60	58'	21.3	1.22	1.41
	70	59'	23.0	1.27	1.47
	80	60'	24.5	1.31	1.51
25 Dk. Blue (45)	60	59'	23.9	1.32	1.53
	70	61'	25.8	1.33	1.54
	80	62'	27.7	1.39	1.60

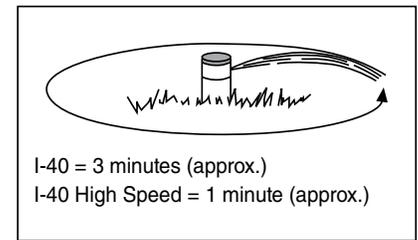
I-40 NOZZLE INSTALLATION



I-40 Dual Opposing
Nozzle Performance Data

Nozzle	Pressure PSI	Radius ft.	Flow GPM	Precip in/hr	
				■	▲
●	50	52'	13.0	0.46	0.53
	60	54'	13.2	0.44	0.50
	70	56'	14.4	0.44	0.51
	80	57'	15.5	0.46	0.53
●	50	58'	13.7	0.39	0.45
	60	59'	15.2	0.42	0.49
	70	60'	16.6	0.44	0.51
●	80	62'	17.8	0.45	0.51
	●	60	63'	19.1	0.46
70		64'	20.9	0.49	0.57
80		66'	22.3	0.49	0.57
●	90	66'	23.9	0.53	0.61
	●	60	65'	20.4	0.46
70		66'	22.3	0.49	0.57
80		67'	24.0	0.51	0.59
●	90	68'	25.6	0.53	0.62
	●	60	66'	22.0	0.49
70		68'	24.0	0.50	0.58
80		69'	25.9	0.52	0.60
●	90	70'	27.2	0.53	0.62
	●	70	70'	28.9	0.57
80		72'	30.9	0.57	0.66
90		74'	32.9	0.58	0.67
●	100	76'	33.7	0.56	0.65

FULL CIRCLE ROTATION SPEED



I-40
Nozzle Performance Data – Metric

Nozzle	Pressure		Radius m	Flow		Precip mm/hr	
	Bars	kPa		m ³ /hr	l/min	■	▲
8 Lt. Brown (40)	2.5	250	13.1	1.63	27.2	19	22
	3.0	300	13.4	1.80	30.0	20	23
	3.5	350	13.7	1.94	32.3	21	24
	4.0	400	14.0	2.06	34.4	21	24
	4.5	450	14.0	2.18	36.3	22	26
10 Lt. Green (41)	5.0	500	14.3	2.29	38.2	22	26
	3.0	300	14.6	2.20	36.6	21	24
	3.5	350	14.9	2.37	39.4	21	24
	4.0	400	15.2	2.52	42.0	22	25
	4.5	450	15.5	2.67	44.5	22	25
13 Lt. Blue (42)	5.0	500	15.5	2.81	46.8	23	27
	5.5	550	15.8	2.96	49.3	24	27
	3.0	300	14.9	2.36	39.4	21	24
	3.5	350	15.2	2.55	42.6	22	25
	4.0	400	15.5	2.73	45.5	23	26
15 Gray (43)	4.5	450	15.5	2.90	48.3	24	28
	5.0	500	15.8	3.06	51.0	24	28
	5.5	550	16.2	3.23	53.9	25	29
	3.0	300	16.2	2.93	48.8	22	26
	3.5	350	16.5	3.19	53.2	24	27
23 Dk. Green (44)	4.0	400	16.8	3.44	57.3	24	28
	4.5	450	17.1	3.67	61.2	25	29
	5.0	500	17.4	3.89	64.9	26	30
	5.5	550	18.0	4.14	68.9	26	30
	4.0	400	18.9	4.76	79.4	27	31
25 Dk. Blue (45)	4.5	450	19.2	5.03	83.9	27	32
	5.0	500	19.5	5.29	88.1	28	32
	5.5	550	19.8	5.56	92.7	28	33
	6.0	600	20.1	5.79	96.5	29	33
	6.5	650	20.1	6.01	100.2	30	34

I-40 High Speed
Nozzle Performance Data – Metric

Nozzle	Pressure		Radius m	Flow		Precip mm/hr	
	Bars	kPa		m ³ /hr	l/min	■	▲
8 Lt. Brown (40)	2.5	250	12.2	1.63	27.2	22	25
	3.0	300	12.5	1.80	30.0	23	27
	3.5	350	12.8	1.94	32.3	24	27
	4.0	400	12.8	2.06	34.4	25	29
	4.5	450	13.1	2.18	36.3	25	29
10 Lt. Green (41)	5.0	500	13.4	2.29	38.2	25	29
	3.0	300	13.4	2.20	36.6	24	28
	3.5	350	13.7	2.37	39.4	25	29
	4.0	400	14.0	2.52	42.0	26	30
	4.5	450	14.0	2.67	44.5	27	31
13 Lt. Blue (42)	5.0	500	14.3	2.81	46.8	27	32
	5.5	550	14.6	2.96	49.3	28	32
	3.0	300	13.7	2.36	39.4	25	29
	3.5	350	14.0	2.55	42.6	26	30
	4.0	400	14.3	2.73	45.5	27	31
15 Gray (43)	4.5	450	14.3	2.90	48.3	28	33
	5.0	500	14.6	3.06	51.0	29	33
	5.5	550	14.9	3.23	53.9	29	33
	3.0	300	15.2	2.93	48.8	25	29
	3.5	350	15.5	3.19	53.2	26	30
23 Dk. Green (44)	4.0	400	15.8	3.44	57.3	27	32
	4.5	450	15.8	3.67	61.2	29	34
	5.0	500	16.2	3.89	64.9	30	34
	5.5	550	16.5	4.14	68.9	31	35
	4.0	400	17.4	4.76	79.4	32	36
25 Dk. Blue (45)	4.5	450	17.7	5.03	83.9	32	37
	5.0	500	17.7	5.29	88.1	34	39
	5.5	550	18.0	5.56	92.7	34	40
	6.0	600	18.3	5.79	96.5	35	40
	6.5	650	18.6	6.01	100.2	35	40

I-40 Dual Opposing
Nozzle Performance Data – Metric

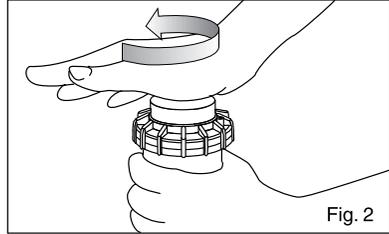
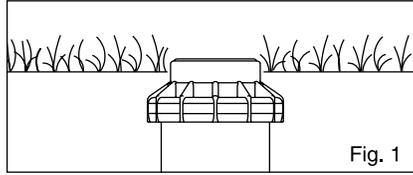
Nozzle	Pressure		Radius m	Flow		Precip mm/hr	
	Bars	kPa		m ³ /hr	l/min	■	▲
●	3.0	300	15.2	2.75	45.8	12	14
	3.5	350	15.8	2.91	48.5	12	13
	4.0	400	16.2	3.06	51.0	12	14
	4.5	450	16.8	3.20	53.3	11	13
●	5.0	500	17.1	3.32	55.4	11	13
	5.5	550	17.4	3.46	57.7	11	13
	3.0	300	17.4	2.90	48.3	10	11
●	3.5	350	17.7	3.15	52.5	10	12
	4.0	400	18.0	3.38	56.4	10	12
	4.5	450	18.0	3.61	60.1	11	13
	5.0	500	18.3	3.82	63.7	11	13
	5.5	550	18.9	4.05	67.5	11	13
●	4.0	400	18.9	4.26	71.1	12	14
	4.5	450	19.2	4.54	75.6	12	14
	5.0	500	19.5	4.80	80.0	13	15
	5.5	550	20.1	5.08	84.7	13	15
	6.0	600	20.8	5.32	88.7	14	16
●	6.5	650	20.1	5.55	92.5	14	16
	4.0	400	19.5	4.55	75.8	12	14
	4.5	450	19.8	4.85	80.8	12	14
	5.0	500	20.1	5.14	85.6	13	15
	5.5	550	20.4	5.45	90.8	13	15
●	6.0	600	20.7	5.71	95.1	13	15
	6.5	650	20.7	5.96	99.4	14	16
	4.0	400	20.1	4.92	82.1	12	14
	4.5	450	20.4	5.23	87.2	13	14
	5.0	500	20.7	5.52	92.0	13	15
●	5.5	550	21.0	5.84	97.3	13	15
	6.0	600	21.3	6.10	101.7	13	15
	6.5	650	21.3	6.36	106.0	14	16
	4.5	448	21.0	6.38	106.4	14	17
	5.0	496	21.3	6.68	111.3	15	17
●	5.5	552	21.9	7.00	116.7	15	17
	6.0	600	22.3				

PGP INSTALLATION:

Arc Adjustments:

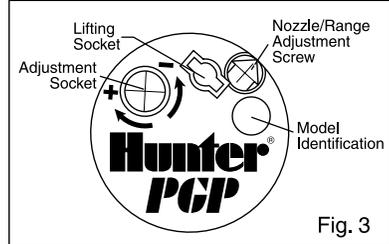
Adjustable heads are preset to approximately 180°. Sprinklers may be adjusted with water on or off. It is recommended that initial adjustments be made before installation.

- Using the palm of your hand, rotate the nozzle turret counterclockwise to the left stop to complete any interrupted rotation cycle (Fig. 2).
- Rotate the nozzle turret clockwise to the right stop. This is the fixed side of the arc. The nozzle turret must be held in this position for arc adjustments. The right stop does not change.



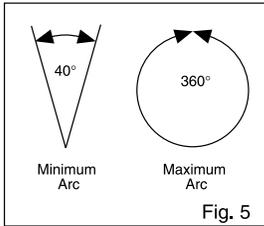
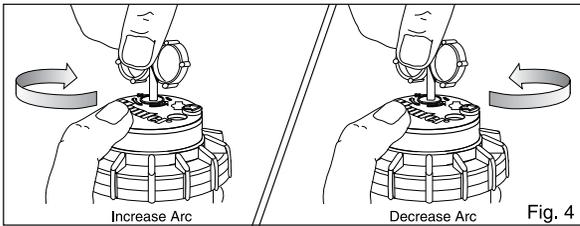
To Increase the Arc:

- Insert the plastic key end of the Hunter wrench into the adjustment socket (Fig. 3 & 4).
- While holding the nozzle turret at the right stop, turn the wrench clockwise. Each full 360° turn of the wrench will increase the arc 90°.
- Adjust to any arc between 40° and 360° (Fig. 5).
- The wrench will stop turning, or there will be a ratcheting noise, when the maximum arc of 360° (full circle) has been reached.



To Decrease the Arc:

- Insert the plastic key end of the Hunter wrench into the adjustment socket (Fig. 3 & 4).
- While holding the nozzle turret at the right stop, turn the wrench counterclockwise. Each full 360° turn of the wrench will decrease the arc 90°.
- Adjust to any arc between 40° and 360° (Fig. 5).
- The wrench will stop turning, or there will be a ratcheting noise, when the minimum arc of 40° has been reached.



Note: It is not necessary to disassemble the sprinkler to make adjustments.

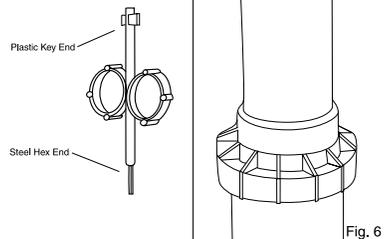
RADIUS / DISTANCE OF THROW

Insert the steel hex end of the Hunter wrench into the radius adjustment screw (Fig. 6). Turn the screw clockwise (into the stream of water) to decrease the radius, or counterclockwise to increase the radius. Radius can be reduced up to 25%.

Caution: Turning the adjustment screw clockwise more than five full turns may result in a lost radius adjustment screw.

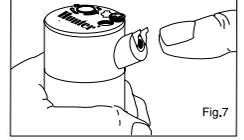
PRECIPITATION RATE ADJUSTMENT

If you have excessively wet or dry areas, you can change the nozzle in the sprinkler to increase or decrease the precipitation rate. For dry areas, install a larger nozzle. For wet areas, install a smaller nozzle.

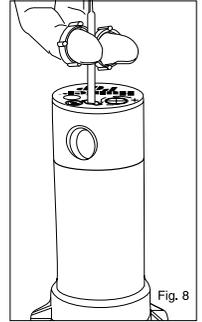


NOZZLE INSTALLATION

- Insert the plastic key end of the Hunter wrench into the lifting socket of the sprinkler and turn 90°. Pull the riser up to gain access to the nozzle socket (Fig. 8).



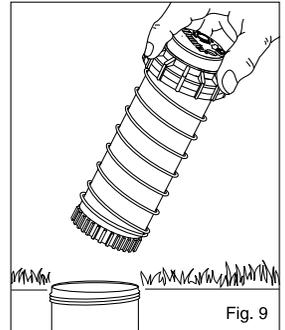
- Using the hex key of the Hunter wrench, turn the radius adjustment screw (Fig. 6) counterclockwise to be sure it is not blocking the nozzle socket opening. If a nozzle is already installed, it can be removed by backing out the adjustment screw and turning on the water, or by pulling outward on the nozzle "ears" with a pair of needle-nosed pliers.



- Slip the desired nozzle into the nozzle socket (Fig. 7). Note that the socket is angled up 25°. The "ears" should be adjusted so that the nozzle range screw threads directly down between them. Then tighten the nozzle range screw. The raised bump with an arrow on the rubber cover will always indicate the location of the nozzle and direction of water flow when the sprinkler is retracted.

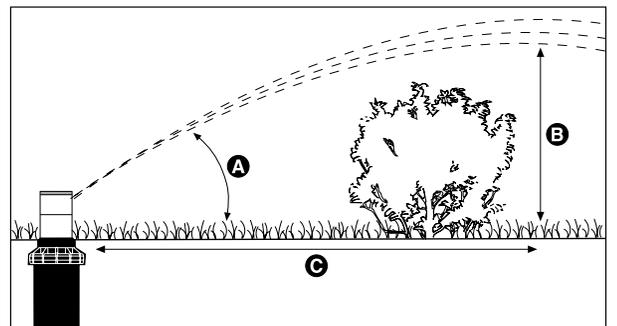
ALIGNING THE RIGHT (FIXED) SIDE OF ARC

If the right side of the arc is not properly aligned, the results may be a wet walkway or a dry turf area. The right side arc can easily be realigned. One way to realign the right stop is to turn the whole sprinkler body assembly and the fitting below it, left or right to the desired position. This may require temporary removal of the soil around the sprinkler to allow you to grip the sprinkler housing.



Another way to reset the right arc is to unscrew the body cap counterclockwise and remove the internal assembly from the body. Once removed, rotate the nozzle turret to the right stop, screw the internal assembly back into the body with the nozzle aligned to the right side of the area you want irrigated (Fig. 9). At this point you have realigned the right arc stop, and you can adjust the left arc to an appropriate setting.

Note: It is not necessary to dig up and remove the whole sprinkler to realign the right arc.



Hunter Nozzle Height and Trajectory Chart					
Model	Nozzle No.	Pressure in PSI	A Degrees of Trajectory	B Max Height of Spray (ft.)	C Distance from head (ft.) to Maximum Height
PGP®	1	50	26	7'	22'
	2	50	26	7'	22'
	3	50	26	8'	23'
	4	50	26	8'	23'
	5	50	27	9'	26'
	6	50	27	10'	28'
	7	50	26	11'	30'
	8	50	26	11'	30'
	9	50	27	12'	32'
	10	60	25	13'	32'
	11	60	25	13'	38'
	12	60	25	13'	40'
PGP Low Angle	4	50	15	5'	22'
	5	50	15	4'	22'
	6	50	14	4'	22'
	7	50	14	4'	22'
	8	50	14	5'	24'
	9	50	15	5'	26'
	10	60	15	6'	30'
PGP Blue	1.5	45	25	8'	23'
	2.0	45	25	8'	23'
	2.5	45	25	9'	26'
	3.0	45	25	10'	28'
	4.0	45	25	11'	30'
	5.0	45	25	11'	30'
	6.0	55	25	12'	32'
	8.0	55	25	13'	32'

PGP Red Standard Nozzle Performance Data P/N 130900



Nozzle	Pressure PSI	Radius ft.	Flow GPM	Precip in/hr	Precip in/hr
1	30	28'	0.5	0.12	0.14
	40	29'	0.6	0.14	0.16
	50	29'	0.7	0.16	0.19
	60	30'	0.8	0.17	0.20
2	30	29'	0.7	0.16	0.19
	40	30'	0.8	0.17	0.20
	50	30'	0.9	0.19	0.22
3	30	30'	0.9	0.19	0.22
	40	31'	1.0	0.20	0.23
	50	31'	1.2	0.24	0.28
4	30	32'	1.2	0.23	0.26
	40	33'	1.4	0.25	0.29
	50	34'	1.6	0.27	0.31
5	30	34'	1.6	0.27	0.31
	40	36'	1.8	0.27	0.31
	50	38'	2.0	0.27	0.31
6	30	34'	2.0	0.33	0.38
	40	36'	2.4	0.36	0.41
	50	38'	2.7	0.36	0.42
7	30	34'	2.6	0.43	0.50
	40	38'	3.0	0.40	0.46
	50	40'	3.4	0.41	0.47
8	30	37'	3.2	0.45	0.52
	40	39'	3.7	0.47	0.54
	50	41'	3.9	0.45	0.52
9	30	38'	3.6	0.48	0.55
	40	41'	4.3	0.49	0.57
	50	44'	5.2	0.52	0.60
10	30	44'	6.0	0.60	0.69
	40	46'	6.8	0.62	0.71
	50	47'	7.6	0.66	0.76
11	30	46'	8.0	0.73	0.84
	40	48'	8.9	0.74	0.86
	50	50'	9.8	0.75	0.87
12	30	46'	10.5	0.96	1.10
	40	48'	11.9	0.99	1.15
	50	50'	12.7	0.98	1.13

Note: All precipitation rates calculated for 180 degree operation. For the precipitation rate for a 360 degree sprinkler, divide by 2.

PGP Blue Standard Nozzle Performance Data P/N 665300



Nozzle	Pressure PSI	Radius ft.	Flow GPM	Precip in/hr	Precip in/hr
1.5	25	29'	1.2	0.27	0.32
	35	31'	1.4	0.28	0.32
	45	31'	1.5	0.30	0.35
	55	32'	1.8	0.34	0.39
	65	32'	1.9	0.36	0.41
2.0	25	33'	1.4	0.25	0.29
	35	33'	1.7	0.30	0.35
	45	34'	2.0	0.33	0.38
	55	34'	2.1	0.35	0.40
	65	32'	2.3	0.43	0.50
2.5	25	33'	1.7	0.30	0.35
	35	35'	2.1	0.33	0.38
	45	35'	2.5	0.39	0.45
	55	35'	2.6	0.41	0.47
	65	35'	2.9	0.46	0.53
3.0	25	35'	2.2	0.35	0.40
	35	36'	2.7	0.40	0.46
	45	38'	3.0	0.40	0.46
	55	39'	3.4	0.43	0.50
	65	39'	3.7	0.47	0.54
4.0	25	37'	3.0	0.42	0.49
	35	39'	3.5	0.44	0.51
	45	40'	4.0	0.48	0.56
	55	41'	4.5	0.52	0.60
	65	41'	4.8	0.55	0.63
5.0	25	37'	3.7	0.52	0.60
	35	39'	4.5	0.57	0.66
	45	42'	5.0	0.55	0.63
	55	42'	5.7	0.62	0.72
	65	42'	6.2	0.68	0.78
6.0	25	38'	4.3	0.57	0.66
	35	40'	5.6	0.67	0.78
	45	43'	6.0	0.62	0.72
	55	44'	6.7	0.67	0.77
	65	44'	7.3	0.73	0.84
8.0	25	37'	6.0	0.84	0.97
	35	41'	7.0	0.80	0.93
	45	44'	8.0	0.80	0.92
	55	46'	9.0	0.82	0.95
	65	46'	9.8	0.89	1.03

Note: All precipitation rates calculated for 180 degree operation. For the precipitation rate for a 360 degree sprinkler, divide by 2.

*“Looks good, works hard.
Commit to Hunter’s Blue Nozzles
for choice coverage with no more
over- or underwatering and an
appearance that’s received higher
customer satisfaction ratings.
Buy Blue and go for the gold.”*

PGP Gray Low Angle Nozzle Performance Data P/N 233200



Nozzle	Pressure PSI	Radius ft.	Flow GPM	Precip in/hr	Precip in/hr
4	30	22'	1.4	0.56	0.64
	40	24'	1.7	0.57	0.66
	50	26'	1.8	0.51	0.59
	60	28'	2.0	0.49	0.57
5	30	25'	1.6	0.49	0.57
	40	27'	1.9	0.50	0.58
	50	28'	2.1	0.52	0.60
6	30	27'	2.1	0.55	0.64
	40	30'	2.5	0.53	0.62
	50	33'	2.8	0.49	0.57
7	30	29'	2.8	0.64	0.74
	40	32'	3.1	0.58	0.67
	50	35'	3.5	0.55	0.64
8	30	31'	3.4	0.68	0.79
	40	34'	3.9	0.65	0.75
	50	37'	4.4	0.62	0.71
9	30	33'	4.3	0.76	0.88
	40	37'	5.0	0.70	0.81
	50	40'	5.6	0.67	0.78
10	30	33'	4.3	0.76	0.88
	40	37'	5.0	0.70	0.81
	50	40'	5.6	0.67	0.78

P Blank nozzle plug for turning off selected sprinklers during repairs, maintenance, etc.

Note: All precipitation rates calculated for 180 degree operation. For the precipitation rate for a 360 degree sprinkler, divide by 2.

PGP Red Standard Nozzle Performance Data P/N 130900



Nozzle	Pressure Bars	Pressure kPa	Radius m	Flow m³/hr	Flow l/min	Precip mm/hr	Precip mm/hr
1	1.7	172	8.2	0.10	1.7	3	3
	2.0	200	8.5	0.11	1.8	3	3
	2.5	248	8.5	0.13	2.1	4	4
	3.0	303	8.8	0.15	2.4	4	4
	3.5	352	8.8	0.16	2.7	4	5
	4.0	400	9.1	0.18	2.9	4	5
2	1.7	172	8.5	0.14	2.4	4	5
	2.0	200	8.8	0.16	2.6	4	5
	2.5	248	8.8	0.17	2.9	4	5
	3.0	303	9.1	0.19	3.2	5	5
	3.5	352	9.1	0.21	3.5	5	6
	4.0	400	9.4	0.22	3.7	5	6
3	1.7	172	8.8	0.18	3.0	5	5
	2.0	200	9.1	0.20	3.3	5	5
	2.5	248	9.1	0.22	3.7	5	6
	3.0	303	9.4	0.25	4.1	6	6
	3.5	352	9.4	0.27	4.5	6	7
	4.0	400	9.8	0.29	4.8	6	7
4	1.7	172	9.4	0.24	4.1	5	6
	2.0	200	9.8	0.27	4.4	6	6
	2.5	248	9.8	0.30	5.0	6	7
	3.0	303	10.1	0.34	5.6	7	8
	3.5	352	10.1	0.37	6.2	7	8
	4.0	400	10.4	0.40	6.6	7	9
5	1.7	172	10.1	0.33	5.5	7	8
	2.0	200	10.4	0.36	5.9	7	8
	2.5	248	10.4	0.39	6.5	7	8
	3.0	303	11.0	0.43	7.2	7	8
	3.5	352	11.6	0.46	7.7	7	8
	4.0	400	11.6	0.49	8.1	7	8
6	1.7	172	10.1	0.42	6.9	8	10
	2.0	200	10.4	0.45	7.5	8	10
	2.5	248	10.7	0.51	8.5	9	10
	3.0	303	11.0	0.57	9.4	9	11
	3.5	352	11.6	0.61	10.2	9	11
	4.0	400	11.6	0.66	10.9	10	11
7	1.7	172	10.1	0.54	9.0	11	12
	2.0	200	10.4	0.58	9.7	11	12
	2.5	248	11.0	0.65	10.8	11	12
	3.0	303	11.6	0.72	12.0	11	12
	3.5	352	12.2	0.78	12.9	10	12
	4.0	400	12.2	0.83	13.8	11	13
8	1.7	172	11.0	0.66	11.0	11	13
	2.0	200	11.3	0.71	11.8	11	13
	2.5	248	11.6	0.79	13.2	12	14
	3.0	303	11.9	0.87	14.5	12	14
	3.5	352	12.5	0.94	15.6	12	14
	4.0	400	12.5	1.00	16.6	13	15
9	1.7	172	11.3	0.73	12.2	11	13
	2.0	200	11.6	0.80	13.4	12	14
	2.5	248	11.6	0.92	15.4	14	16
	3.0	303	12.5	1.05	17.5	13	16
	3.5	352	13.4	1.15	19.2	13	15
	4.0	400	13.4	1.25	20.9	14	16
10	1.7	172	12.2	1.14	19.0	15	18
	2.0	200	12.8	1.29	21.4	16	18
	2.5	248	13.4	1.44	24.0	16	18
	3.0	303	14.0	1.56	26.1	16	18
	3.5	352	14.3	1.68	28.0	16	19
	4.0	400	14.3	1.79	29.9	17	20
11	1.7	172	12.8	1.55	25.9	19	22
	2.0	200	13.7	1.73	28.7	18	21
	2.5	248	14.0	1.90	31.7	19	22
	3.0	303	14.6	2.05	34.1	19	22
	3.5	352	14.9	2.18	36.3	20	23
	4.0	400	15.2	2.30	38.4	20	23
12	1.7	172	12.8	2.03	33.8	25	29
	2.0	200	13.4	2.26	37.7	25	29
	2.5	248	14.3	2.51	41.8	24	28
	3.0	303	14.6	2.70	45.0	25	29
	3.5	352	14.9	2.88	48.1	26	30
	4.0	400	15.2	3.06	50.9	26	30

Note: All precipitation rates calculated for 180 degree operation. For the precipitation rate for a 360 degree sprinkler, divide by 2.

PGP Gray Low Angle Nozzle Performance Data P/N 233200



Nozzle	Pressure Bars	Pressure kPa	Radius m	Flow m³/hr	Flow l/min	Precip mm/hr	Precip mm/hr
4	1.7	172	6.4	0.30	4.9	14	17
	2.0	200	6.7	0.32	5.3	14	16
	2.5	248	7.0	0.35	5.9	14	17
	3.0	303	7.3	0.39	6.5	15	17
	3.5	352	7.9	0.42	7.0	13	15
	4.0	400	8.5	0.45	7.5	12	14
5	1.7	172	7				

RAIN BIRD®

5000 & 5000 Plus Series Rotors (including PRS models) Installation Instructions

Radius Adjustment slot

Cavité de réglage de la portée
Strahlstörsschraube
Ranura de ajuste del radio de alcance
Ranhura de ajuste do raio de alcance
Alloggiamento vite rompigetto
Schroef om de sproeistraat in te stellen
Mesafe ayar girişi
Σχισμή ρύθμισης της ακτίνας
εκτόξευσης

Pull-up slot

Cavité de soulèvement de la tige
Öffnung zum Hochziehen
Ranura de elevación
Ranhura de puxar
Alloggiamento chiave di sollevamento
Sleuf voor omhoogtrekken stijgbuis
Gövdeyi kaldırma girişi
Σχισμή για δυνατότητα
τραβήγματος

Flow Shut-off slot (5000 Plus only)

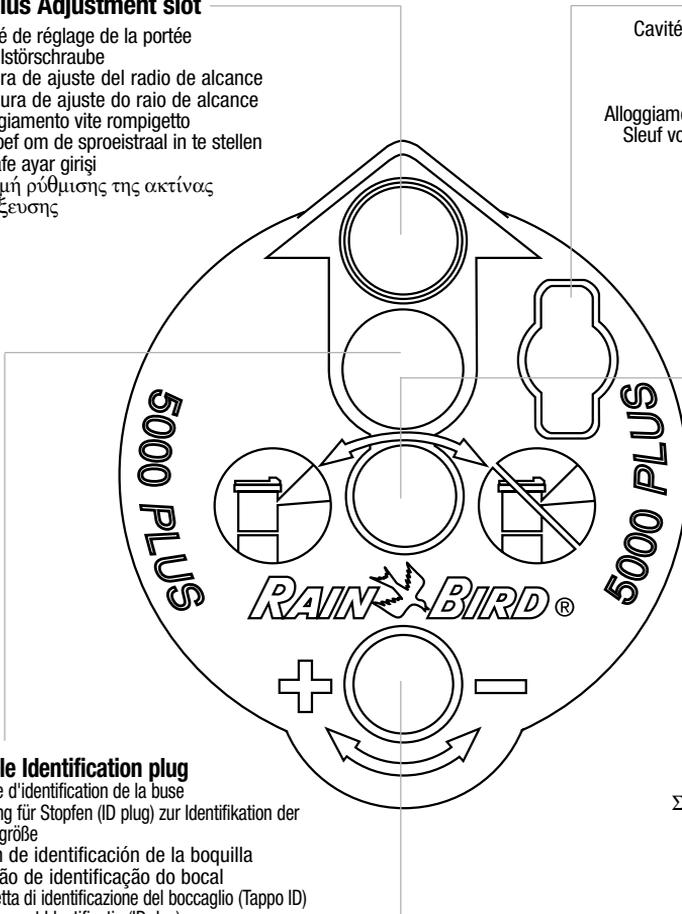
Cavité pour
arrêt de l'arroseur
(5000 Plus uniquement)
Sleuf om water
af te sluiten
(Alleen 5000 plus)
Ranura de cierre del flujo
(Solamente 5000 Plus)
Ranhura de
fechamento do fluxo
(Apenas 5000 Plus)
Alloggiamento chiave
di arresto del flusso
(5000 Plus unicamente)
Schlitz zum Abstellen
(nur 5000 Plus)
Su akışını durdurma girişi
(Sadece 5000 Plus)
Σχισμή διακοπής παροχής
(5000 Plus μόνο)

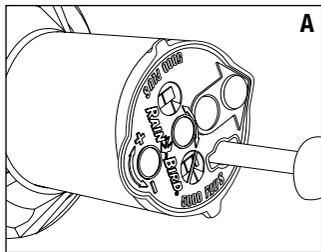
Nozzle Identification plug

Pastille d'identification de la buse
Fassung für Stopfen (ID plug) zur Identifikation der
Düsengröße
Tapón de identificación de la boquilla
Tampão de identificação do bocal
Targhetta di identificazione del bocaglio (Tappo ID)
Nozzle maat identificatie (ID dop)
Nozul tanımlama girişi
Βύσμα αναγνώρισης ακροφυσίου

Arc Adjustment slot

Cavité de réglage du secteur
Schlitz zur Sektoreinstellung
Ranura de ajuste del arco de cobertura
Ranhura de ajuste do arco de cobertura
Alloggiamento vite regolazione settore
Sproeihoek afstelsleuf
Açı ayar girişi
Σχισμή ρύθμισης αρδευόμενου τομέα





English Installation Instructions

Installing and Removing Nozzles:

1. Insert tool into pull-up slot, turn 90 degrees, and lift up stem. **(A)**
2. Insert the desired nozzle into the nozzle socket, and turn the radius adjustment screw clockwise to secure the nozzle in place. **(B)**
3. Insert the selected nozzle's identification plug into the opening on the top of the rotor. **(B)**
4. To remove the nozzle, back out the radius adjustment screw, place the blade of the screwdriver under the nozzle removal tab and press the handle down. **(C)**

Setting the Arc:

The arc is adjustable from 40 –360 degrees (PC units only). The rotor is factory set to 180 degrees.

Align Fixed LEFT Edge:

1. Pull up turret and turn to the left trip point (counterclockwise). **CAUTION:** If the rotor does not turn easily to the left, first turn it right (clockwise) to the right trip point.
2. Rotate entire case to the desired fixed left position, OR unscrew cap and pull out assembly. Rotate internals to re-align left trip point to the desired point and re-install.

To increase or decrease the arc: (D)

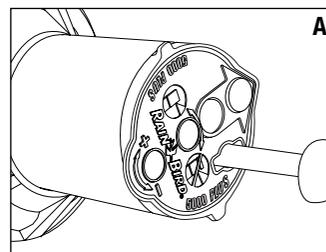
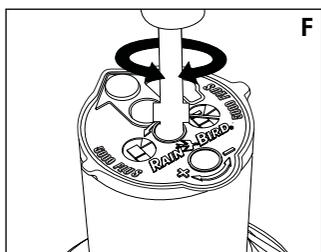
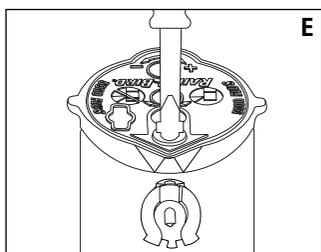
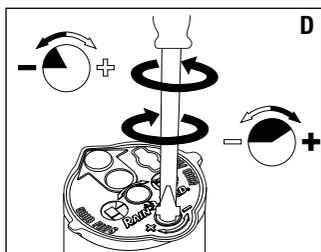
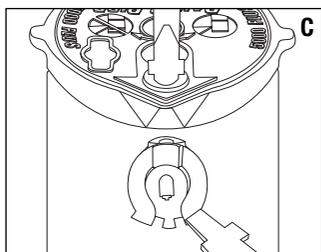
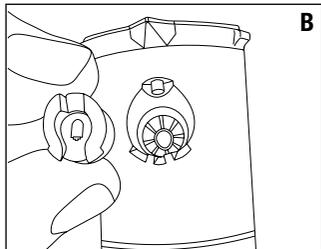
1. While holding the nozzle turret at the fixed LEFT stop, insert tool or screwdriver into the adjustment socket.
- 2a. Turn the screwdriver clockwise, (+) to INCREASE arc.
- 2b. Turn the screwdriver counterclockwise, (-) to DECREASE arc.
3. Each full clockwise turn of the screwdriver will add or remove 90 degrees of arc.
4. When the maximum arc of 360 degrees or minimum arc of 40 degrees has been set, you will hear a ratcheting noise. Do not adjust the rotor beyond the maximum or minimum arc.

Radius Adjustment: (Radius can be reduced up to 25%) (E)

1. Insert screwdriver into the radius adjustment socket.
2. Turn the screwdriver clockwise to reduce radius, and counterclockwise to increase radius.

(5000 PLUS ONLY) Turning Flow On or Off (F)

1. Insert screwdriver into Flow Shut-off Slot.
2. Turn screwdriver clockwise 180 degrees to stop the flow of water.
3. Turn screwdriver counterclockwise 180 degrees to start the flow of water.



Deutsche Installationsanleitung

Einsetzen und Herausnehmen der Düsen:

1. Stecken Sie das Werkzeug in die dafür vorgesehene Öffnung, drehen es um 90° und ziehen den Aufsteiger hoch. **(A)**
2. Setzen Sie die gewünschte Düse in die Düsenbasis ein und drehen die Strahlstörsschraube in Uhrzeigerichtung, um die Düse zu arretieren. **(B)**
3. Setzen Sie den Identifikationsstopfen für die gewählte Düse in die Öffnung oben auf dem Regner.
4. Um die Düse herauszunehmen, drehen Sie die Strahlstörsschraube wieder zurück, stecken einen Schraubendreher unter die Aussparung der Düse und heben sie heraus. **(C)**

Sektoreinstellung:

Der Sektor ist von 40° bis 360° einstellbar (nur für Teilkreismodelle); die werkseitige Einstellung ist 180°.

Einstellen des fixierten LINKEN Anschlags:

1. Ziehen Sie das Düsengehäuse hoch und drehen es zum linken Anschlag (gegen die Uhrzeigerichtung). **ACHTUNG:** wenn es sich nicht leicht nach links drehen läßt, drehen Sie es zuerst nach rechts (in Uhrzeigerichtung) zum rechten Anschlag.
2. Drehen Sie das ganze Gehäuse in die gewünschte Position mit dem fixierten linken Anschlag ODER schrauben Sie den Deckel ab und nehmen das Innenteil heraus. Dann drehen Sie das Innenteil zum gewünschten Punkt, um den linken Anschlag auszurichten und setzen es danach wieder ein.

Vergrößerung oder Verkleinerung des Sektors: (D)

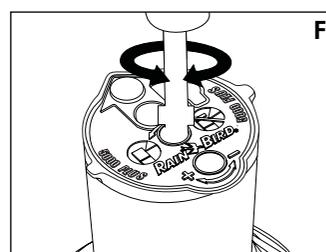
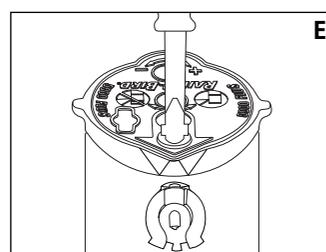
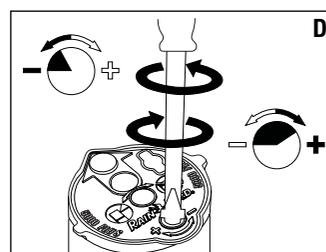
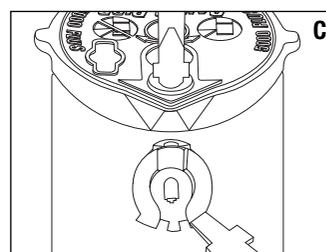
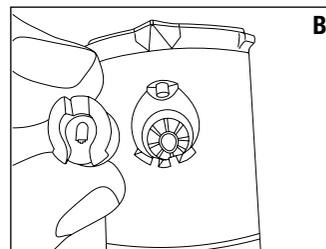
1. Während Sie das Düsengehäuse am fixierten LINKEN Anschlag festhalten, stecken Sie das Spezialwerkzeug oder einen Schraubendreher in den Schlitz zur Sektoreinstellung.
- 2a. Drehen Sie den Schraubendreher in Uhrzeigerichtung (+), um den Sektor zu vergrößern.
- 2b. Drehen Sie den Schraubendreher gegen die Uhrzeigerichtung (-), um den Sektor zu verkleinern.
3. Jede volle Umdrehung des Schraubendrehers in Uhrzeigerichtung/gegen die Uhrzeigerichtung vergrößert/verkleinert den Sektor um 90°.
4. Wenn der max. Sektor von 360° oder der min. Sektor von 40° eingestellt ist, hören Sie ein Einrasten. Gehen Sie nicht über den maximalen oder minimalen Sektor hinaus.

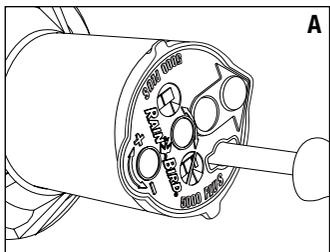
Einstellung der Wurfweite (die Wurfweite kann bis zu 25 % reduziert werden): (E)

1. Stecken Sie den Schraubendreher in den dafür vorgesehenen Schlitz.
2. Drehen Sie den Schraubendreher in Uhrzeigerichtung zum Verringern der Wurfweite und gegen die Uhrzeigerichtung zum Vergrößern der Wurfweite.

(nur 5000 Plus) An- oder Abstellen des Durchflusses: (F)

1. Stecken Sie den Schraubendreher in den Schlitz zum Abstellen.
2. Drehen Sie den Schraubendreher um 180° in Uhrzeigerichtung, um den Wasserdurchfluss zu stoppen.
3. Drehen Sie den Schraubendreher um 180° gegen die Uhrzeigerichtung, um den Wasserdurchfluss anzustellen.





Οδηγίες εγκατάστασης

Εγκατάσταση και απομάκρυνση ακροφυσίων:

1. Τοποθετείτε το εργαλείο στη σχισμή τραβήγματος, περιστρέψτε 90 μοίρες, και ανυψώνετε το στέλεχος του εκτοξευτήρα (A)
2. Τοποθετείτε το επιθυμητό ακροφύσιο στη σχισμή του ακροφυσίου, και περιστρέψτε τη βίδα ρύθμισης της ακτίνας εκτόξευσης προς τη κατεύθυνση κίνησης των δεικτών του ρολογιού, για να ασφαλίσετε το ακροφύσιο στη θέση του. (B)
3. Τοποθετείτε το επιλεγμένο βύσμα αναγνώρισης ακροφυσίου στο ανοίγμα στο πάνω μέρος του εκτοξευτήρα.
4. Για να απομακρύνετε το ακροφύσιο, ξεβιδώνετε τη βίδα ρύθμισης της ακτίνας, τοποθετείτε το άκρο του κατσαβιδιού κάτω από το σημείο απομάκρυνσης του ακροφυσίου και πατάτε το χερούλι προς τα κάτω. (C)

Ρύθμιση του τομέα άρδευσης:

Ο τομέας άρδευσης ρυθμίζεται από 40-360 μοίρες (το μοντέλο τμήματος κύκλου μόνο). Ο εκτοξευτήρας ρυθμίζεται εξ εργοστασίου στις 180 μοίρες.

Ευθυγράμμιση της σταθερής ΑΡΙΣΤΕΡΗΣ γωνίας:

1. Τραβίστε προς τα επάνω το στέλεχος του εκτοξευτήρα και περιστρέψτε προς το αριστερό σημείο διαδρομής (προς την αντίθετη κατεύθυνση της κίνησης των δεικτών του ρολογιού). ΠΡΟΣΟΧΗ: Αν ο εκτοξευτήρας δεν περιστρέφεται εύκολα προς τα αριστερά, πρώτα περιστρέψτε τον δεξιά (προς τη κατεύθυνση κίνησης των δεικτών του ρολογιού) προς το δεξιά σημείο της διαδρομής.
2. Περιστρέψτε ολόκληρη τη θήκη του εκτοξευτήρα στο επιθυμητό αριστερό σταθερό σημείο, ή ξεβιδώνετε το καπάκι και απομακρύνετε το εσωτερικό του. Περιστρέψτε το εσωτερικό του για να ευθυγραμμίσετε το αριστερό σημείο διαδρομής στο επιθυμητό σημείο και το επανα-εγκαθιστάτε.

Για να αυξήσετε ή να ελαττώσετε το τομέα άρδευσης: (D)

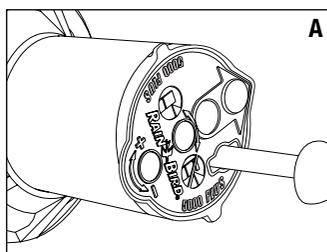
1. Κρατώντας τον πυργίσκο του ακροφυσίου στο σταθερό ΑΡΙΣΤΕΡΟ σημείο που σταματά, τοποθετείτε το εργαλείο ή το κατσαβίδι στη σχισμή ρύθμισης.
- 2a. Περιστρέψτε το κατσαβίδι προς τη κατεύθυνση κίνησης των δεικτών του ρολογιού, (+) για να αυξήσετε το τομέα.
- 2b. Περιστρέψτε το κατσαβίδι προς την αντίθετη κατεύθυνση της κίνησης των δεικτών του ρολογιού, (-) για να ελαττώσετε το τομέα.
3. Η κάθε πλήρης περιστροφή του κατσαβιδιού θα προσθέσει ή θα αφαιρέσει 90 μοίρες από το τομέα.
4. Όταν το μέγιστο των 360 μοιρών ή το ελάχιστο των 40 μοιρών έχει ρυθμισθεί, θα ακούσετε ένα διακριτικό θόρυβο. Μη ρυθμίσετε τον εκτοξευτήρα πέραν του μέγιστου ή ελάχιστου σημείου του τομέα.

Ρύθμιση της ακτίνας εκτόξευσης: Η ακτίνα μπορεί να μειωθεί έως και 25% (E)

1. Τοποθετείτε το κατσαβίδι στη σχισμή ρύθμισης της ακτίνας.
2. Περιστρέψτε το κατσαβίδι προς τη κατεύθυνση κίνησης των δεικτών του ρολογιού για να ελαττώσετε την ακτίνα, και αντίστροφα για να αυξήσετε την ακτίνα.

(5000 Plus μόνο) Ανοίγμα ή κλείσιμο της παροχής: (F)

1. Τοποθετείτε το κατσαβίδι στη σχισμή διακοπής παροχής
2. Περιστρέψτε το κατσαβίδι προς τη κατεύθυνση κίνησης των δεικτών του ρολογιού 180 μοίρες, για να σταματήσετε τη παροχή νερού.
3. Περιστρέψτε το κατσαβίδι προς την αντίθετη κατεύθυνση της κίνησης των δεικτών του ρολογιού 180 μοίρες, για την έναρξη παροχής νερού



Instrucciones para la instalación – español

Cómo instalar y remover las boquillas:

1. Introduzca la herramienta en la ranura de elevación, gire 90 grados y tire hacia arriba para levantar el vástago (portaaspersor). (A)
2. Introduzca la boquilla que desea en el soquete de la boquilla y gire el tornillo de ajuste del radio en el sentido de las agujas del reloj para fijar la boquilla en su lugar. (B)
3. Introduzca el tapón de identificación de la boquilla seleccionada en la abertura en la parte superior del rotor.
4. Para remover la boquilla, retire el tornillo de ajuste del radio de alcance, coloque la punta del destornillador debajo de la lengüeta de extracción de la boquilla y presione la manija hacia abajo. (C)

Cómo ajustar el arco de cobertura:

El arco de cobertura (sector de riego) puede ser ajustado de 40 a 360 grados (solamente en los modelos de círculo parcial – PC). El rotor ha sido ajustado en fábrica a 180 grados.

Aliñe el borde fijo izquierdo:

1. Levante la torrecilla hacia arriba y gire hacia el punto de inversión izquierdo (en el sentido contrario a las agujas del reloj). **CUIDADO:** Si el rotor no gira fácilmente hacia la izquierda, primero gírelo a la derecha (en el sentido de las agujas del reloj) hacia el punto de inversión derecho.
2. Gire la carcasa entera hasta la posición fija izquierda deseada o desenrosque la tapa y empuje el conjunto hacia fuera. Gire las piezas internas para realinear el punto de inversión izquierdo al punto deseado y reinstale.

Para aumentar o disminuir el arco de cobertura: (D)

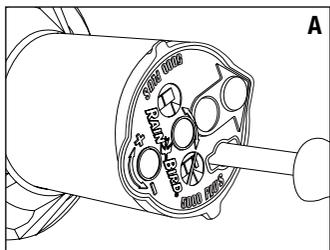
1. Mientras sostiene la torrecilla de la boquilla en el punto de inversión fijo izquierdo, introduzca la herramienta o el destornillador en el soquete de ajuste del arco de cobertura.
- 2a. Gire el destornillador en el sentido de las agujas del reloj (+) para AUMENTAR el arco de cobertura.
- 2b. Gire el destornillador en el sentido contrario a las agujas del reloj (-) para DISMINUIR el arco de cobertura.
3. Cada vuelta completa del destornillador aumentará o disminuirá el arco de cobertura 90 grados.
4. Cuando se haya fijado el arco de cobertura máximo de 360 grados o mínimo de 40 grados, usted escuchará como un matraqueo. No ajuste el rotor a un grado mayor o menor del arco de cobertura.

Ajuste del radio de alcance: (el radio de alcance puede ser reducido hasta en un 25%) (E)

1. Introduzca el destornillador en el soquete del ajuste del radio de alcance.
2. Gire el destornillador en el sentido de las agujas del reloj para reducir el radio de alcance y en el sentido contrario a las agujas del reloj para aumentar el radio.

(Solamente 5000 Plus) Cómo abrir o cerrar el flujo: (F)

1. Introduzca el destornillador en la ranura de cierre del flujo.
2. Gire el destornillador 180 grados en el sentido de las agujas del reloj para interrumpir el flujo del agua.
3. Gire el destornillador 180 grados en el sentido contrario a las agujas del reloj para iniciar el flujo del agua.



Instruções para instalar - português

Como instalar e remover bocais:

1. Insira uma ferramenta na ranhura de puxar, gire 90 graus e levante a haste. **(A)**
2. Insira o bocal desejado no soquete do bocal e gire o parafuso de ajuste do raio de alcance no sentido horário para fixar o bocal no lugar devido. **(B)**
3. Insira o tampão de identificação do bocal selecionado na abertura na parte superior do rotor.
4. Para remover o bocal, retire o parafuso de ajuste do raio de alcance, coloque a ponta da chave de fenda abaixo da lingüeta de remoção do bocal e pressione o cabo para baixo. **(C)**

Como ajustar o arco de cobertura:

O arco de cobertura pode ser ajustado de 40 a 360 graus (somente em modelos de círculo parcial - PC). O rotor é ajustado em fábrica a 180 graus.

Alinhe a borda fixa ESQUERDA:

1. Puxe a torre do rotor para cima e gire no sentido anti-horário até o ponto de inversão. **CUIDADO:** Se o rotor não girar facilmente, gire primeiro para a direita (sentido horário) até o ponto de inversão da direita.
2. Gire a caixa inteira até a posição fixa esquerda desejada OU desenrosque a tampa e puxe o conjunto para fora. Gire as peças internas para realinhar o ponto de inversão esquerdo no ponto desejado e reinstale.

Para aumentar ou diminuir arco de cobertura: (D)

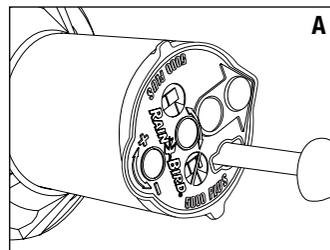
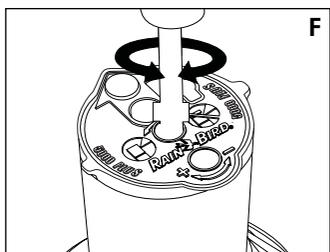
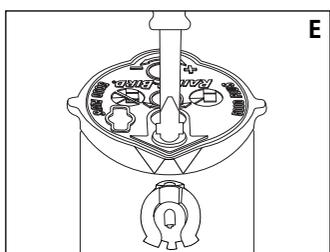
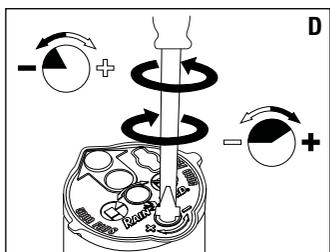
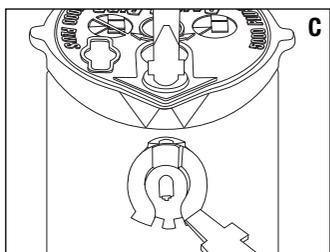
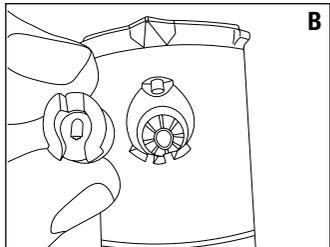
1. Enquanto estiver segurando o torno de bocal no ponto de inversão fixo ESQUERDO, insira a ferramenta ou chave de fenda no soquete de ajuste de arco de cobertura.
- 2a. Gire a chave de fenda no sentido horário (+) para AUMENTAR o arco de cobertura.
- 2b. Gire a chave de fenda no sentido anti-horário (-) para DIMINUIR o arco de cobertura.
3. Cada volta completa da chave de fenda adicionará ou diminuirá 90 graus ao arco de cobertura.
4. Quando for ajustado o arco de cobertura máximo de 360 graus, se escutará um ruído tipo catraca. Não ajuste o rotor além do arco de cobertura máximo.

Ajuste do raio de alcance: (o raio de alcance pode ser reduzido até 25%) (E)

1. Insira a chave de fenda no soquete de ajuste do raio de alcance.
2. Gire a chave de fenda no sentido horário para reduzir o raio de alcance ou no sentido anti-horário para aumentá-lo.

(Apenas 5000 Plus) Como abrir ou fechar o fluxo: (F)

1. Insira a chave de fenda na ranhura de fechamento do fluxo.
2. Gire a chave de fenda 180 graus no sentido horário para interromper o fluxo da água.
3. Gire a chave de fenda 180 graus no sentido anti-horário para iniciar o fluxo da água.



Istruzioni di installazione - italiano

Per Installare e Rimuovere gli Ugelli :

1. Inserire l'apposita chiave nell'alloggiamento previsto, ruotare di 90 gradi e sollevare il pistone. **(A)**
2. Inserire l'ugello desiderato nell'apposito foro ed avvitare in senso orario la vite di regolazione della gittata per bloccare l'ugello. **(B)**
3. Inserire la targhetta di identificazione dell'ugello scelto nell'alloggiamento predisposto sulla parte superiore dell'irrigatore.
4. Per rimuovere l'ugello, svitare la vite di regolazione della gittata, posizionare la lama del cacciavite sotto la sede dell'ugello e fare leva. **(C)**

Regolazione dell'Angolo di Lavoro (unicamente su irrigatori parzializzabili) :

L'angolo di lavoro è regolabile da 40 a 360 gradi. L'irrigatore è inizialmente regolato a 180 gradi alla fabbricazione.

Allineare il punto fermo di sinistra :

1. Sollevare il pistone e ruotarlo verso il punto fermo di sinistra (in senso antiorario). **ATTENZIONE :** Se l'irrigatore non gira facilmente verso sinistra, girarlo prima verso destra (senso orario) fino al punto fermo di destra.
2. Ruotare l'intero irrigatore nella posizione fissa di sinistra desiderata. O svitare la sommità dello stesso ed estrarre il dispositivo interno, quindi ruotarlo per allinearlo al punto fermo di sinistra desiderato e reinstallare il tutto.

Per aumentare o diminuire l'angolo di lavoro: (D)

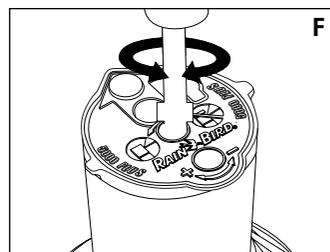
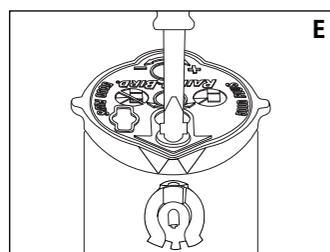
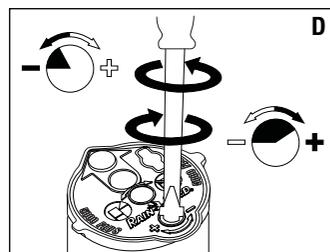
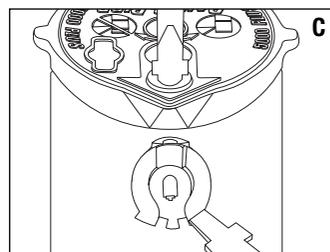
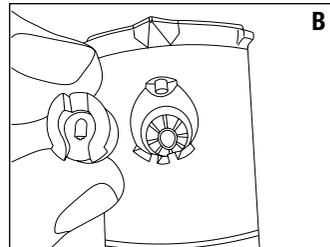
1. Mantenere la torretta porta ugelli nel punto fermo di SINISTRA, quindi inserire l'apposita chiave o un cacciavite nell'alloggiamento di regolazione dell'angolo di lavoro.
- 2a. Ruotare il cacciavite in senso orario (+) per AUMENTARE l'angolo di lavoro.
- 2b. Ruotare il cacciavite in senso antiorario (-) per DIMINUIRE l'angolo di lavoro.
3. Ogni giro completo del cacciavite, in senso orario o antiorario, aumenterà o diminuirà l'angolo di lavoro di 90 gradi.
4. Quando l'angolo di lavoro massimo di 360 gradi o minimo di 40 gradi è stato raggiunto, si sentirà un rumore meccanico. Non regolare l'irrigatore oltre l'angolo di lavoro massimo o minimo.

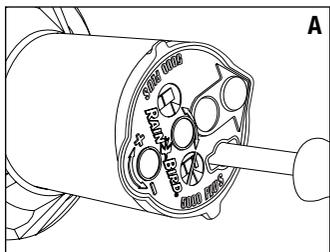
Regolazione della gittata : (Si può ridurre la gittata fino al 25%) (E)

1. Inserire l'apposita chiave o un cacciavite nell'alloggiamento di regolazione della gittata.
2. Ruotare il cacciavite in senso orario per diminuire la gittata e in senso antiorario per aumentare la gittata.

(5000 Plus unicamente) Per chiudere o aprire il flusso (F)

1. Inserire il cacciavite nella sede "Flow-off" (chiusura flusso)
2. Ruotare il cacciavite di 180 gradi in senso orario per arrestare il flusso d'acqua.
3. Ruotare il cacciavite di 180 gradi in senso antiorario per ripristinare il flusso d'acqua.





Instructions d'installation – français

Installer et retirer la buse :

1. Introduisez l'outil dans la cavité de soulèvement; tournez à 90 degrés et soulevez la tige escamotable. **(A)**
2. Insérez la buse désirée dans son logement et tournez la vis brise-jet dans le sens des aiguilles d'une montre afin de fixer la buse. **(B)**
3. Insérez la pastille d'identification de la buse dans l'ouverture au-dessus de l'arroseur.
4. Pour retirer la buse, dégagez d'abord la vis brise-jet. Placez la tête plate du tournevis sous la languette de la buse et appuyez sur le manche du tournevis pour faire levier et extraire la buse. **(C)**

Réglage du secteur arrosé :

Le secteur peut être réglé en tre 40 et 360 degrés (arroseurs secteur de cercle uniquement). L'arroseur est pré-réglé en usine à 180 degrés.

Alignez butée GAUCHE fixe :

1. Soulevez le porte-buse et tournez-le jusqu'au point d'arrêt de gauche (dans le sens inverse des aiguilles d'une montre). **ATTENTION :** si l'arroseur ne tourne pas facilement vers la gauche, tournez-le d'abord vers la droite (sens des aiguilles d'une montre) jusqu'au point d'inversion droit.
2. Ensuite, faites pivoter le boîtier de l'arroseur jusqu'à la position désirée, OU dévissez le couvercle du boîtier, sortez la partie interne, repositionnez-la comme désiré et revissez.

Pour agrandir ou réduire le secteur d'arrosage : (D)

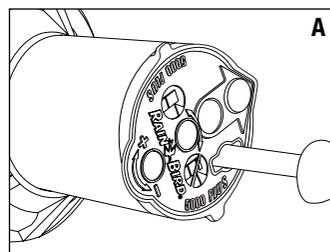
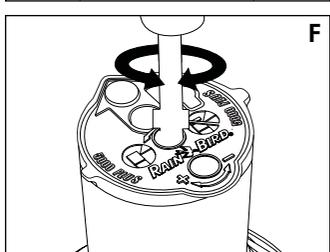
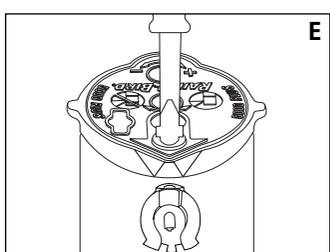
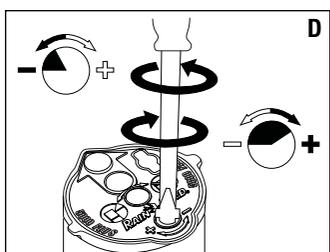
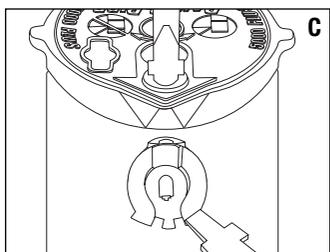
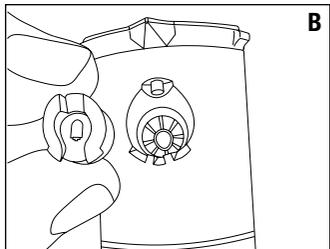
1. Tout en maintenant le porte-buse au point d'arrêt GAUCHE, insérez l'outil ou le tournevis dans l'orifice de réglage du secteur.
- 2a. Tournez le tournevis dans le sens des aiguilles d'une montre (+) pour AGRANDIR le secteur arrosé.
- 2b. Tournez le tournevis dans le sens inverse des aiguilles d'une montre (-) pour REDUIRE le secteur arrosé.
3. Chaque tour complet, dans le sens des aiguilles d'une montre ajoutera 90 degrés au secteur, dans le sens inverse des aiguilles d'une montre réduira le secteur arrosé de 90 degrés.
4. Quand le secteur maximum (360 degrés) ou minimum est atteint (40 degrés), vous entendrez un cliquetis. Ne réglez pas l'arroseur au-delà du secteur maximum ou au-dessous du secteur minimum.

Réglage de la portée : (la portée de l'arroseur peut être réduite jusqu'à 25%) (E)

1. Insérez le tournevis dans la fente de réglage de portée (vis brise jet).
2. Tournez le tournevis dans le sens des aiguilles d'une montre pour réduire la portée ou dans le sens inverse des aiguilles d'une montre pour augmenter la portée.

(5000 Plus uniquement) Arrêt d'un arroseur (F)

1. Insérez le tournevis dans la cavité d'arrêt de l'arroseur.
2. Tournez le tournevis à 180 degrés dans le sens des aiguilles d'une montre pour couper le débit.
3. Tournez le tournevis à 180 degrés dans le sens inverse des aiguilles d'une montre pour réactiver l'arroseur.



Nederlandse Installatie Handleiding

Installeren en Verwijderen van Nozzles:

1. Steek het hulpstuk in de sleuf, draai dit 90 graden en trek de stijgbuis omhoog. **(A)**
2. Schuif de te gebruiken nozzle in de daarvoor bestemde opening en draai de afstelschroef met de klok mee om de nozzle vast te zetten. **(B)**
3. Druk de juiste nozzle-identificatiedop in de daarvoor bestemde opening aan de bovenkant van de sproeier.
4. Om het mondstuk te verwijderen dient eerst de afstelschroef losgedraaid te worden. Plaats vervolgens een platte schroevendraaier onder het handsteeksel om het mondstuk te verwijderen en duw het handvat naar beneden. **(C)**

Instellen van de sproeihoek:

De sproeihoek is instelbaar van 40 - 360 graden (alleen sectorsproeiers). De sproeier is door de fabriek ingesteld op 180 graden.

Instellen van het vaste LINKER omkeerpunt:

1. Trek het sproeientje omhoog en draai dit tot het linker omkeerpunt. (tegen de klok in). **VOORZICHTIG:** Als het sproeientje niet gemakkelijk linksom gedraaid kan worden draai het dan eerst rechtsom (met de klok mee) tot het rechter omkeerpunt.
2. Draai de gehele sproeier tot het gewenste linker omkeerpunt bereikt is, OF verwijder het deksel en neem het binnenwerk uit. Draai het binnenwerk zodat het linker omkeerpunt zich op de gewenste plaats bevindt en installeer het weer.

Om de sproeihoek te vergroten of te verkleinen: (D)

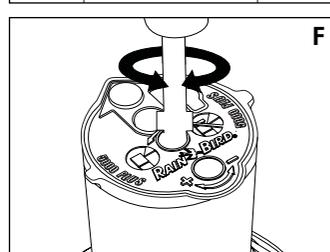
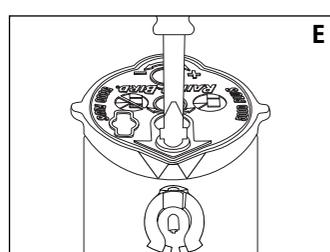
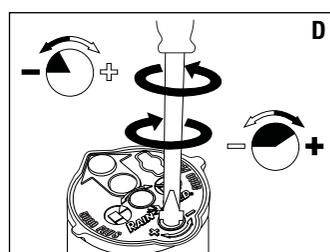
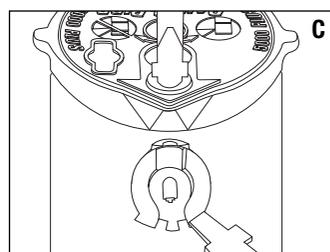
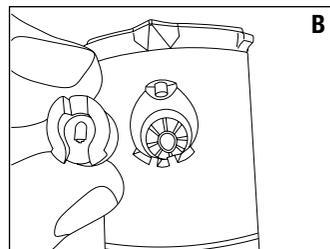
1. Steek, terwijl u het sproeientje op het LINKER omkeerpunt vasthoudt, het hulpstuk of een schroevendraaier in de afstelsleuf.
- 2a. Draai de schroevendraaier met de klok mee (+) om de sproeihoek te VERGROTEN.
- 2b. Draai de schroevendraaier tegen de klok in (-) om de sproeihoek te VERKLEINEN
3. Iedere volle draaicirkel met de schroevendraaier verandert 90 graden aan de sproeihoek.
4. Wanneer de maximale sproeihoek van 360 graden of de minimale sproeihoek van 40 graden bereikt is hoort u een tikgeluid. Stel de sproeihoek dan niet verder af.

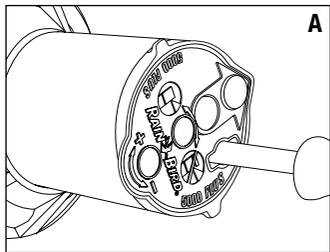
Instellen van de sproeistraal: (Straal kan maximaal tot met 25% worden teruggebracht) (E)

1. Steek een platte schroevendraaier in de sleuf van de afstelschroef.
2. Verminder de werpwijdte door de schroevendraaier met de klok mee te draaien en vermeerder deze door tegen de klok in te draaien.

(Alleen 5000 plus) Watertoevoer in- of uitschakelen (F)

1. Steek een platte schroevendraaier in de sleuf om water af te sluiten.
2. Draai de schroevendraaier 180 graden met de klok mee om de toevoer af te sluiten.
3. Draai de schroevendraaier 180 graden tegen de klok in om de toevoer weer open te zetten.

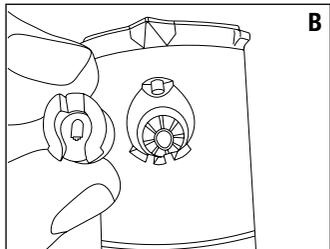




Türkçe kullanma kılavuzu

Nozulların yerleştirilmesi ve çıkartılması:

1. Gövdeyi kaldırma girişine aparatı sokarak 90 derece döndürün, ve gövdeyi kaldırın. (A)
2. İsteddiğiniz nozulu nozul yuvasına sokun, ve mesafe ayar vidasını saat yönünde döndürerek nozulun yuvasından çıkmayacak şekilde yerleşmesini sağlayın. (B)
3. Seçtiğiniz nozulun tanımlama parçasını rotorun üstündeki Nozul Tanımlama Girişine takın.
4. Nozulu yuvasından çıkartmak için, önce mesafe ayar vidasını saat yönünün tersine çevirerek yukarıya kaldırın. Tornavidanın düz ucunu nozul çıkartma çıkıntısının altına sokup, tornavidayı aşağıya doğru bastırın. (C)

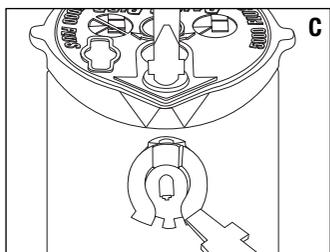


Açı Ayarı:

Açı, 40-360 derece arasında ayarlanabilir (Açı ayarlı modeller). Rotor fabrikada 180 dereceye ayarlanmıştır.

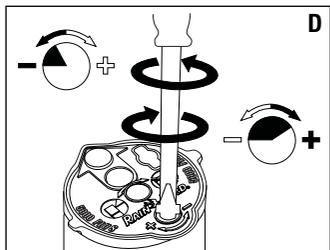
SOL sabit noktaya hizalama:

1. Gövdeyi yukarı kaldırın ve rotor kafasını sol durma noktasına kadar çevirin (saat yönünün tersine) DİKKAT: Eğer rotor sola doğru rahatça dönmezse, önce sağa doğru (saat yönünde) sağ durma noktasına varıncaya kadar çevirin.
2. Rotoru (dış kabıyla beraber) istenen sol sabit noktaya doğru çevirin, YA DA üst kapağı açarak iç aksamı çıkartın. İç aksamı döndürerek seçtiğiniz sol durma hizasına getirip tekrar yerine yerleştirin.



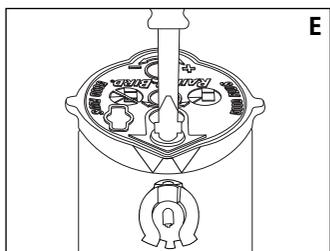
Açıyı arttırmak ya da azaltmak: (D)

1. Nozul kafasını SOL durma noktasında sabit tutarken, aparatı ya da düz uçlu bir tornavidayı açı ayar girişine sokun.
- 2a. Tornavidayı saat yönünde çevirin, (+) açığı ARTTIRMAK için.
- 2b. Tornavidayı saat yönünün tersine çevirin, (-) açığı AZALTMAK için.
3. Tornavidanın saat yönündeki her bir tam dönüşü açığı 90 derece arttıracak ya da azaltacaktır.
4. Maksimum açı olan 360 dereceye ya da minimum açı olan 40 dereceye ulaşıldığında, bir dişli sesi duymaya başlayacaksınız. Bu durumda tornavidayı döndürmeyi bırakın.



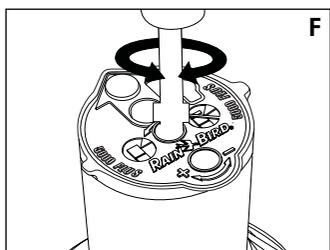
Mesafe ayarı (Yarıçap atış mesafesi %25 oranında azaltılabilir) (E)

1. Aparatı ya da düz uçlu bir tornavidayı mesafe ayar girişine sokun.
2. Yarıçap atış mesafesini azaltmak için tornavidayı saat yönünde, arttırmak için saat yönünün tersine çevirin.



(Sadece 5000 Plus) Su akışını durdurmak ya da durdurmak (F)

1. Düz uçlu tornavidayı Su Akışını Durdurma Girişine sokun.
2. Su akışını durdurmak için tornavidayı saat yönünde 180 derece döndürün.
3. Su akışını başlatmak için tornavidayı saat yönünün tersine 180 derece döndürün.



5000/5000 Plus Nozzle Performance

(Standard)

Standard Angle Rain Curtain Nozzle Performance

Pressure psi	Nozzle	Radius ft.	Flow (GPM)	■	▲
				Precip. (in/h) Square	Precip. (in/h) Triangular
25	1.5	33	1.12	0.20	0.23
	2.0	35	1.50	0.24	0.27
	2.5	35	1.81	0.28	0.33
	3.0	36	2.26	0.34	0.39
	4.0	37	2.91	0.41	0.47
	5.0	39	3.72	0.47	0.54
	6.0	39	4.25	0.54	0.62
35	8.0	36	5.90	0.88	1.01
	1.5	34	1.35	0.22	0.26
	2.0	36	1.81	0.27	0.31
	2.5	37	2.17	0.31	0.35
	3.0	38	2.71	0.36	0.41
	4.0	40	3.50	0.42	0.49
	5.0	41	4.47	0.51	0.59
45	6.0	43	5.23	0.54	0.63
	8.0	43	7.06	0.74	0.85
	1.5	35	1.54	0.24	0.28
	2.0	37	2.07	0.29	0.34
	2.5	37	2.51	0.35	0.41
	3.0	40	3.09	0.37	0.43
	4.0	42	4.01	0.44	0.51
55	5.0	45	5.09	0.48	0.56
	6.0	46	6.01	0.55	0.63
	8.0	47	8.03	0.70	0.81
	1.5	35	1.71	0.27	0.31
	2.0	37	2.30	0.32	0.37
	2.5	37	2.76	0.39	0.45
	3.0	40	3.47	0.42	0.48
65	4.0	42	4.44	0.48	0.56
	5.0	45	5.66	0.54	0.62
	6.0	47	6.63	0.58	0.67
	8.0	50	8.86	0.68	0.79
	1.5	34	1.86	0.31	0.36
	2.0	35	2.52	0.40	0.46
	2.5	37	3.01	0.42	0.49
8.0	3.0	40	3.78	0.45	0.53
	4.0	42	4.83	0.53	0.61
	5.0	45	6.16	0.59	0.68
	6.0	48	7.22	0.60	0.70
	8.0	50	9.63	0.74	0.86

(Metric)

Standard Angle Rain Curtain Nozzle Performance

Pressure bar	Nozzle	Radius m	Flow m ³ /h	Flow l/s	■	▲
					Precip. (mm/h) Square	Precip. (mm/h) Triangular
1,7	1,5	10,1	0,25	0,07	5	6
	2,0	10,7	0,34	0,09	6	7
	2,5	10,7	0,41	0,11	7	8
	3,0	11,0	0,51	0,14	8	10
	4,0	11,3	0,66	0,18	10	12
	5,0	11,9	0,84	0,23	12	14
	6,0	11,9	0,97	0,27	14	16
2,0	8,0	11,0	1,34	0,37	22	26
	1,5	10,2	0,28	0,08	5	6
	2,0	10,8	0,36	0,10	6	7
	2,5	10,9	0,44	0,12	7	9
	3,0	11,2	0,55	0,15	9	10
	4,0	11,6	0,71	0,20	11	12
	5,0	12,1	0,91	0,25	12	14
2,5	6,0	12,4	1,05	0,29	14	16
	8,0	11,8	1,45	0,40	21	24
	1,5	10,4	0,31	0,09	6	7
	2,0	11,0	0,41	0,11	7	8
	2,5	11,3	0,50	0,14	8	9
	3,0	11,2	0,62	0,17	9	11
	4,0	12,3	0,81	0,22	11	13
3,0	5,0	12,7	1,03	0,29	13	15
	6,0	13,2	1,21	0,34	14	16
	8,0	13,3	1,63	0,45	19	21
	1,5	10,6	0,34	0,10	6	7
	2,0	11,2	0,45	0,13	7	8
	2,5	11,3	0,56	0,16	9	10
	3,0	12,1	0,69	0,19	9	11
3,5	4,0	12,7	0,89	0,25	11	13
	5,0	13,5	1,13	0,31	12	14
	6,0	13,9	1,34	0,37	14	16
	8,0	14,1	1,79	0,50	18	21
	1,5	10,7	0,37	0,10	7	8
	2,0	11,3	0,49	0,14	8	9
	2,5	11,3	0,60	0,17	9	11
4,0	3,0	12,2	0,74	0,21	10	12
	4,0	12,8	0,97	0,27	12	14
	5,0	13,7	1,23	0,34	13	15
	6,0	14,2	1,45	0,40	14	17
	8,0	14,9	1,93	0,54	18	20
	1,5	10,6	0,40	0,11	7	8
	2,0	11,1	0,52	0,15	8	10
4,5	2,5	11,3	0,64	0,18	10	12
	3,0	12,2	0,80	0,22	11	12
	4,0	12,8	1,04	0,29	13	15
	5,0	13,7	1,32	0,37	14	16
	6,0	14,9	1,55	0,43	15	17
	8,0	15,2	2,06	0,57	18	21
	1,5	10,4	0,42	0,12	8	9
5,0	2,0	10,7	0,55	0,15	10	11
	2,5	11,3	0,68	0,19	11	12
	3,0	12,2	0,84	0,23	11	13
	4,0	12,8	1,10	0,30	13	15
	5,0	13,7	1,40	0,39	15	17
	6,0	14,6	1,64	0,47	15	18
	8,0	15,2	2,19	0,61	19	22

Precipitation rates calculated at 50% diameter "head to head" spacing, half circle operation.

Tasa de precipitación en base a un diámetro de alcance de 50%, con el aspersor operando en círculo parcial.

Pluviometria baseada em 50% do diâmetro de alcance, com o aspersor operando em meio-círculo.

Pluviometria calcolata con interdistanza pari al 50% della gittata e una rotazione di 180°.

Pluviométrie horaire calculée pour des arroseurs fonctionnant en demi-cercle et écartés de 50% du diamètre arrosé.

Die Berechnungsdichte bezieht sich auf 180° bei einem Regnerabstand von 50% des berechneten Durchmessers.

Neerslagintensiteiten berekend voor afstand tussen sproeiers van 50% van diameter, met sectorinstelling 180 graden.

Presipitasyon oranları, rotorlar arası mesafenin, çaplarının %50'si olduğu düşünülerek ve yarı tur çalışmaları varsayılarak hesaplanmıştır.

Η ένταση της βροχόπτωσης υπολογίζεται στο 50% της διαμέτρου σε διάταξη 'από εκτοξευτήρα σε εκτοξευτήρα', λειτουργίας μισού κύκλου.

5000/5000 Plus Low Angle Nozzle Performance

(Standard)

Low Angle Nozzle Performance

Pressure psi	Nozzle	Radius ft.	Flow (GPM)	■	▲
				Precip. (in/h) Square	Precip. (in/h) Triangular
25	1.0 LA	25	0.76	0.22	0.26
	1.5 LA	27	1.15	0.30	0.35
	2.0 LA	29	1.47	0.34	0.39
	3.0 LA	29	2.23	0.51	0.59
35	1.0 LA	28	0.92	0.21	0.25
	1.5 LA	30	1.38	0.30	0.34
	2.0 LA	31	1.77	0.35	0.41
	3.0 LA	33	2.68	0.47	0.55
45	1.0 LA	29	1.05	0.23	0.26
	1.5 LA	31	1.58	0.32	0.37
	2.0 LA	32	2.02	0.38	0.44
	3.0 LA	35	3.07	0.48	0.56
55	1.0 LA	29	1.17	0.25	0.29
	1.5 LA	31	1.76	0.35	0.41
	2.0 LA	33	2.24	0.40	0.46
	3.0 LA	36	3.41	0.51	0.58
65	1.0 LA	29	1.27	0.27	0.32
	1.5 LA	31	1.92	0.38	0.44
	2.0 LA	33	2.45	0.43	0.50
	3.0 LA	36	3.72	0.55	0.64

(Metric)

Low Angle Nozzle Performance

Pressure bar	Nozzle	Radius m	Flow m ³ /h	Flow l/s	■	▲
					Precip. (mm/h) Square	Precip. (mm/h) Triangular
1,7	1,0 LA	7,6	0,17	0,05	6	7
	1,5 LA	8,2	0,26	0,07	8	9
	2,0 LA	8,8	0,33	0,09	9	10
	3,0 LA	8,8	0,51	0,14	13	15
2,0	1,0 LA	8,0	0,18	0,05	6	6
	1,5 LA	8,6	0,28	0,08	8	9
	2,0 LA	9,1	0,36	0,10	9	10
	3,0 LA	9,3	0,55	0,15	13	15
2,5	1,0 LA	8,6	0,20	0,06	5	6
	1,5 LA	9,2	0,32	0,09	8	9
	2,0 LA	9,5	0,41	0,11	9	10
	3,0 LA	10,1	0,62	0,17	12	14
3,0	1,0 LA	8,8	0,22	0,06	6	7
	1,5 LA	9,4	0,35	0,10	8	9
	2,0 LA	9,7	0,45	0,13	10	11
	3,0 LA	10,6	0,68	0,19	12	14
3,5	1,0 LA	8,8	0,24	0,07	6	7
	1,5 LA	9,4	0,38	0,11	9	10
	2,0 LA	9,9	0,49	0,14	10	11
	3,0 LA	10,8	0,74	0,21	13	15
4,0	1,0 LA	8,8	0,26	0,07	7	8
	1,5 LA	9,4	0,41	0,11	9	11
	2,0 LA	10,1	0,52	0,15	10	12
	3,0 LA	11,0	0,80	0,22	13	15
4,5	1,0 LA	8,8	0,27	0,08	7	8
	1,5 LA	9,4	0,44	0,12	10	11
	2,0 LA	10,1	0,56	0,15	11	13
	3,0 LA	11,0	0,84	0,23	14	16

Precipitation rates calculated at 50% diameter "head to head" spacing, half circle operation.

Tasa de precipitación en base a un diámetro de alcance de 50%, con el aspersor operando en círculo parcial.

Pluviometria baseada em 50% do diâmetro de alcance, com o aspersor operando em meio-círculo.

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Pluviométrie horaire calculée pour des arroseurs fonctionnant en demi-cercle et écartés de 50% du diamètre arrosé.

Die Berechnungsdichte bezieht sich auf 180° bei einem Regnerabstand von 50% des berechneten Durchmessers.

Neerslagintensiteiten berekend voor afstand tussen sproeiers van 50% van diameter, met sectorinstelling 180 graden.

Presipitasyon oranları, rotorlar arası mesafenin, çaplarının %50'si olduğu düşünülerek ve yarım tur çalıştıkları varsayılarak hesaplanmıştır.

Η ένταση της βροχόπτωσης υπολογίζεται στο 50% της διαμέτρου σε διάταξη 'από εκτοξευτήρα σε εκτοξευτήρα', λειτουργίας μισού κύκλου.

5000/5000 Plus PRS Nozzle Performance

(Standard)

Standard Angle Rain Curtain Nozzle Performance

Inlet Pressure psi	Nozzle	Radius ft.	Flow (GPM)	■	▲
				Precip. (in/h) Square	Precip. (in/h) Triangular
25	1.5	33	1.12	0.20	0.23
	2.0	35	1.50	0.24	0.27
	2.5	35	1.81	0.28	0.33
	3.0	36	2.26	0.34	0.39
	4.0	37	2.91	0.41	0.47
	5.0	39	3.72	0.47	0.54
	6.0	39	4.25	0.54	0.62
	8.0	36	5.90	0.88	1.01
35	1.5	34	1.35	0.22	0.26
	2.0	36	1.81	0.27	0.31
	2.5	37	2.17	0.31	0.35
	3.0	38	2.71	0.36	0.41
	4.0	40	3.50	0.42	0.49
	5.0	41	4.47	0.51	0.59
	6.0	43	5.23	0.54	0.63
	8.0	43	7.06	0.74	0.85
45	1.5	35	1.54	0.24	0.28
	2.0	37	2.07	0.29	0.34
	2.5	37	2.51	0.35	0.41
	3.0	40	3.09	0.37	0.43
	4.0	42	4.01	0.44	0.51
	5.0	45	5.09	0.48	0.56
	6.0	46	6.01	0.55	0.63
	8.0	47	8.03	0.70	0.81
55 - 75	1.5	35	1.59	0.25	0.29
	2.0	37	2.14	0.30	0.35
	2.5	37	2.60	0.37	0.42
	3.0	40	3.20	0.39	0.44
	4.0	42	4.15	0.45	0.52
	5.0	45	5.27	0.50	0.58
	6.0	46	6.22	0.57	0.65
	8.0	47	8.31	0.72	0.84

Precipitation rates calculated at 50% diameter "head to head" spacing, half circle operation.

Tasa de precipitación en base a un diámetro de alcance de 50%, con el aspersor operando en círculo parcial.

Pluviometria baseada em 50% do diâmetro de alcance, com o aspersor operando em meio-círculo.

Pluviometria calcolata con interdistanza pari al 50% della gittata e una rotazione di 180°.

Pluviométrie horaire calculée pour des arroseurs fonctionnant en demi-cercle et écartés de 50% du diamètre arrosé.

Die Berechnungsdichte bezieht sich auf 180° bei einem Regnerabstand von 50% des berechneten Durchmessers.

Neerslagintensiteiten berekend voor afstand tussen sproeiers van 50% van diameter, met sectorinstelling 180 graden.

Presipitasyon oranları, rotorlar arası mesafenin, çaplarının %50'si olduğu düşünülerek ve yarım tur çalıştıkları varsayılarak hesaplanmıştır.

Η ένταση της βροχόπτωσης υπολογίζεται στο 50% της διαμέτρου σε διάταξη 'από εκτοξευτήρα σε εκτοξευτήρα', λειτουργίας μισού κύκλου.

(Metric)

Standard Angle Rain Curtain Nozzle Performance

Inlet Pressure bar	Nozzle	Radius m	Flow m ³ /h	Flow l/s	■	▲
					Precip. (mm/h) Square	Precip. (mm/h) Triangular
1,7	1,5	10,1	0,25	0,07	5	6
	2,0	10,7	0,34	0,09	6	7
	2,5	10,7	0,41	0,11	7	8
	3,0	11,0	0,51	0,14	8	10
	4,0	11,3	0,66	0,18	10	12
	5,0	11,9	0,84	0,23	12	14
	6,0	11,9	0,97	0,27	14	16
	8,0	11,0	1,34	0,37	22	26
2,0	1,5	10,2	0,28	0,08	5	6
	2,0	10,8	0,36	0,10	6	7
	2,5	10,9	0,44	0,12	7	9
	3,0	11,2	0,55	0,15	9	10
	4,0	11,6	0,71	0,20	11	12
	5,0	12,1	0,91	0,25	12	14
	6,0	12,4	1,05	0,29	14	16
	8,0	11,8	1,45	0,40	21	24
2,5	1,5	10,4	0,31	0,09	6	7
	2,0	11,0	0,41	0,11	7	8
	2,5	11,3	0,50	0,14	8	9
	3,0	11,2	0,62	0,17	9	11
	4,0	12,3	0,81	0,22	11	13
	5,0	12,7	1,03	0,29	13	15
	6,0	13,2	1,21	0,34	14	16
	8,0	13,3	1,63	0,45	19	21
3,0	1,5	10,6	0,34	0,10	6	7
	2,0	11,2	0,45	0,13	7	8
	2,5	11,3	0,56	0,16	9	10
	3,0	12,1	0,69	0,19	9	11
	4,0	12,7	0,89	0,25	11	13
	5,0	13,5	1,13	0,31	12	14
	6,0	13,9	1,34	0,37	14	16
	8,0	14,1	1,79	0,50	18	21
3,5 - 5,2	1,5	10,6	0,35	0,10	6	7
	2,0	11,2	0,47	0,13	8	9
	2,5	11,3	0,58	0,17	9	11
	3,0	12,1	0,71	0,20	10	11
	4,0	12,7	0,92	0,26	12	13
	5,0	13,5	1,17	0,32	13	15
	6,0	13,9	1,39	0,38	14	17
	8,0	14,1	1,85	0,52	18	21

5000/5000 Plus PRS Low Angle Nozzle Performance

(Standard)

Low Angle Rain Curtain Nozzle Performance						
Inlet Pressure psi	Nozzle	Radius ft.	Flow (GPM)	Precip.		
				(in/h) Square	(in/h) Triangular	
25	1.0 LA	25	0.76	0.22	0.26	
	1.5 LA	27	1.15	0.30	0.35	
	2.0 LA	29	1.47	0.34	0.39	
	3.0 LA	29	2.23	0.51	0.59	
35	1.0 LA	28	0.92	0.21	0.25	
	1.5 LA	30	1.38	0.30	0.34	
	2.0 LA	31	1.77	0.35	0.41	
	3.0 LA	33	2.68	0.47	0.55	
45	1.0 LA	29	1.05	0.23	0.26	
	1.5 LA	31	1.58	0.32	0.37	
	2.0 LA	32	2.02	0.38	0.44	
	3.0 LA	35	3.07	0.48	0.56	
55 - 75	1.0 LA	29	1.09	0.25	0.29	
	1.5 LA	31	1.64	0.33	0.38	
	2.0 LA	32	2.09	0.39	0.45	
	3.0 LA	35	3.18	0.50	0.58	

(Metric)

Low Angle Rain Curtain Nozzle Performance						
Inlet Pressure bar	Nozzle	Radius m	Flow m ³ /h	Flow l/s	Precip.	
					(mm/h) Square	(mm/h) Triangular
1,7	1,0 LA	7,6	0,17	0,05	6	7
	1,5 LA	8,2	0,26	0,07	8	9
	2,0 LA	8,8	0,33	0,09	9	10
	3,0 LA	8,8	0,51	0,14	13	15
2,0	1,0 LA	8,0	0,18	0,05	6	6
	1,5 LA	8,6	0,28	0,08	8	9
	2,0 LA	9,1	0,36	0,10	9	10
	3,0 LA	9,3	0,55	0,15	13	15
2,5	1,0 LA	8,6	0,20	0,06	5	6
	1,5 LA	9,2	0,32	0,09	8	9
	2,0 LA	9,5	0,41	0,11	9	10
	3,0 LA	10,1	0,62	0,17	12	14
3,0	1,0 LA	8,8	0,22	0,06	6	7
	1,5 LA	9,4	0,35	0,10	8	9
	2,0 LA	9,7	0,45	0,13	10	11
	3,0 LA	10,6	0,68	0,19	12	14
3,5 - 5,2	1,0 LA	8,8	0,23	0,06	6	7
	1,5 LA	9,4	0,36	0,10	8	10
	2,0 LA	9,7	0,47	0,13	10	12
	3,0 LA	10,6	0,70	0,20	13	15

Precipitation rates calculated at 50% diameter "head to head" spacing, half circle operation.

Tasa de precipitación en base a un diámetro de alcance de 50%, con el aspersor operando en círculo parcial.

Pluviometria baseada em 50% do diâmetro de alcance, com o aspersor operando em meio-círculo.

Pluviometria calcolata con interdistanza pari al 50% della gittata e una rotazione di 180°.

Pluviométrie horaire calculée pour des arroseurs fonctionnant en demi-cercle et écartés de 50% du diamètre arrosé.

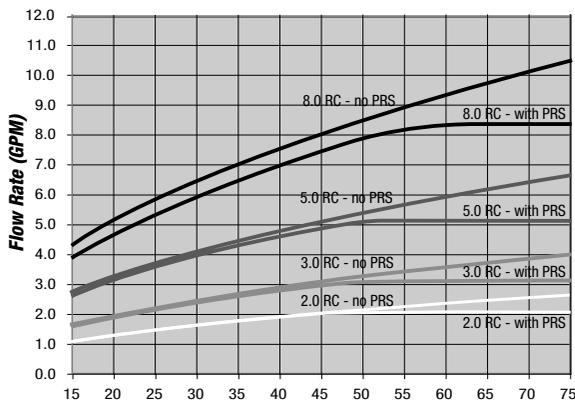
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Neerslagintensiteiten berekend voor afstand tussen sproeiers van 50% van diameter, met sectorinstelling 180 graden.

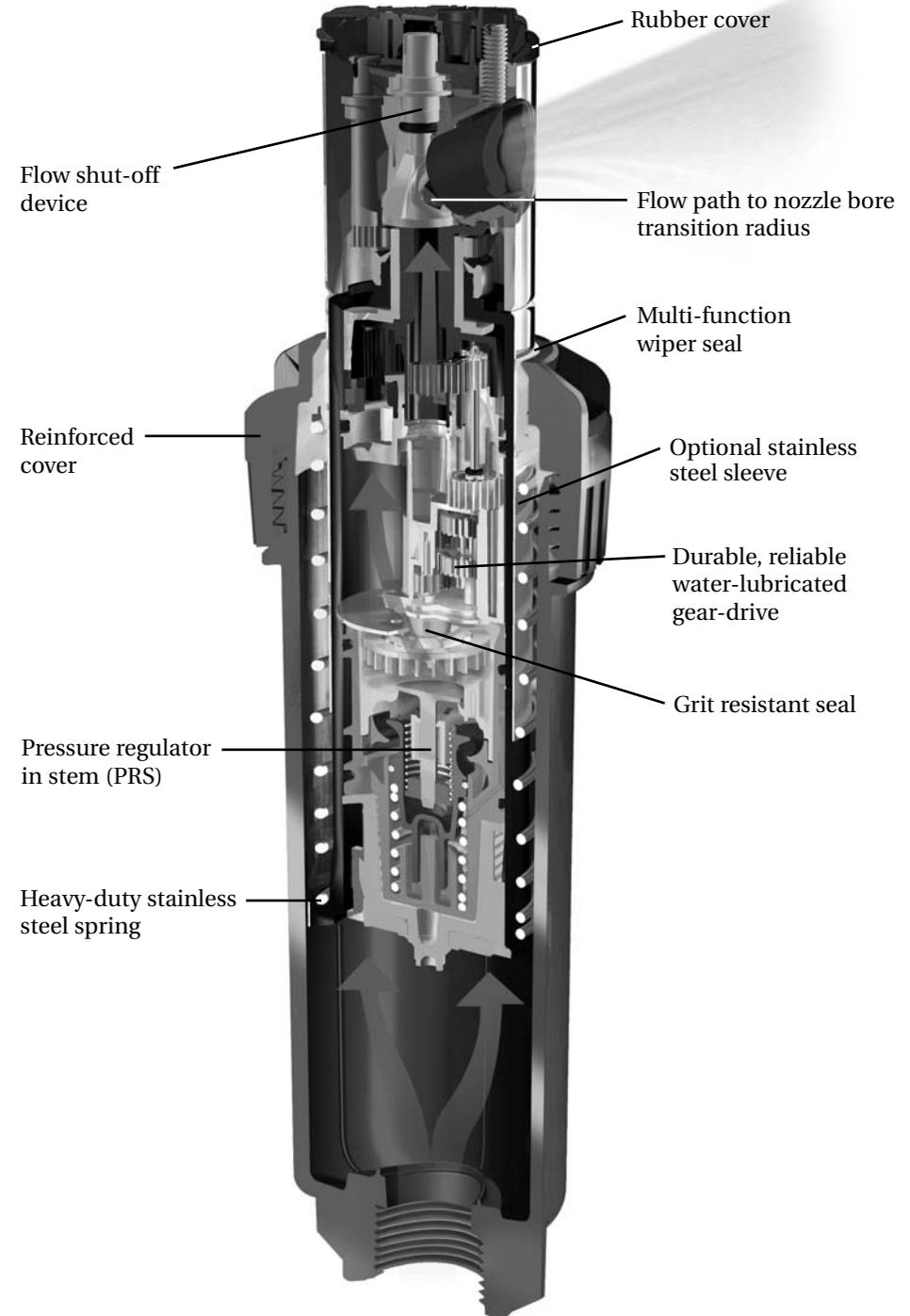
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Η ένταση της βροχόπτωσης υπολογίζεται στο 50% της διαμέτρου σε διάταξη 'από εκτοξευτήρα σε εκτοξευτήρα', λειτουργίας μισού κύκλου.

Flow Rate v Inlet Pressure – Rain Curtain Nozzles



5000/5000 Plus PRS Series Rotor



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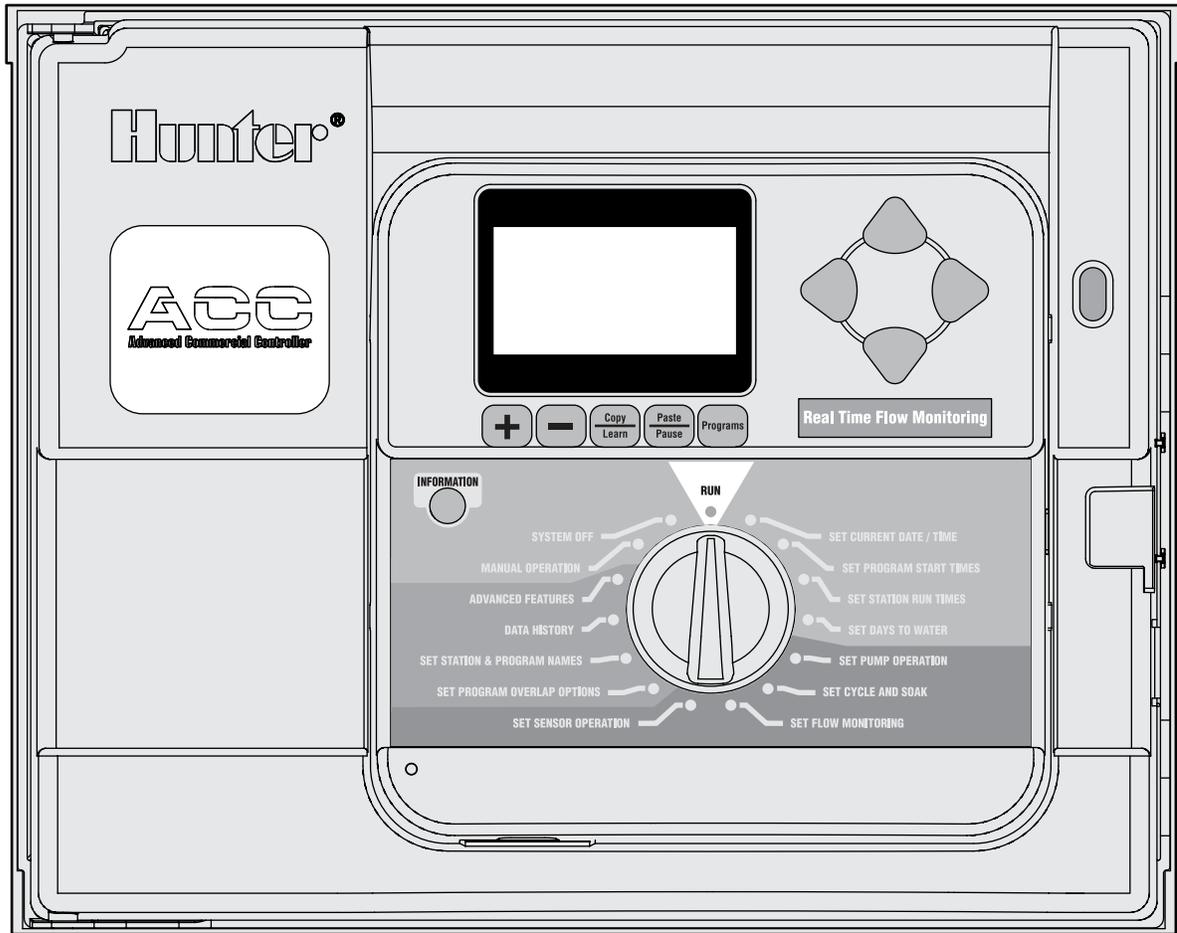
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ACC

Advanced Commercial Controller



Owner's Manual, Installation, and Programming Instructions for ACC and ACC Decoder Controllers

- ACC-1200 12 Station Controller, 42 Station Capacity, Metal Cabinet
- ACC-1200-PP 12 Station Controller, 42 Station Capacity, Plastic Pedestal
- ACC-99D 2-Wire Decoder Controller with 99 Station Capacity, Metal Cabinet
- ACC-99D-PP 2-Wire Decoder Controller with 99 Station Capacity, Plastic Pedestal

Hunter[®]

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INTRODUCTION

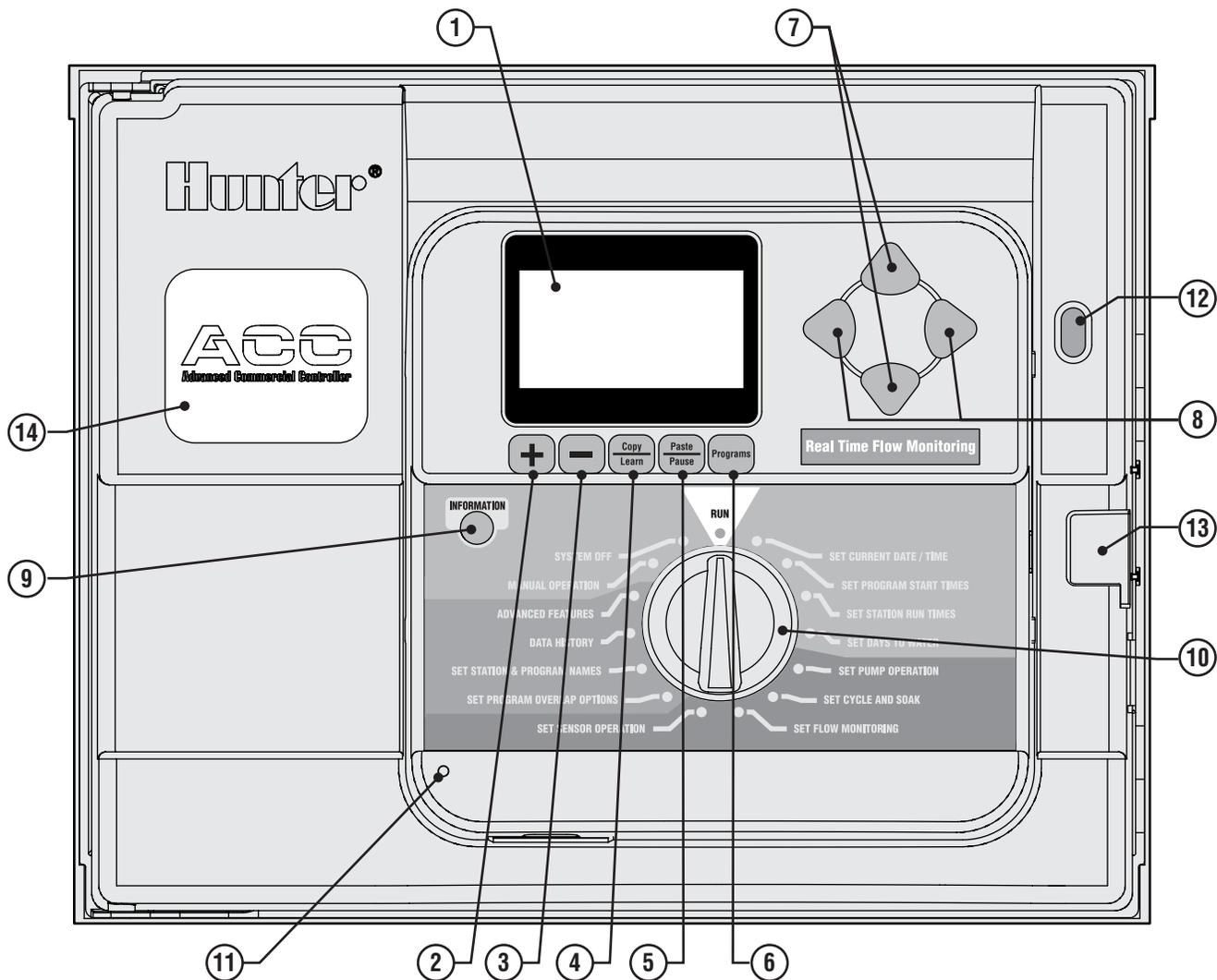
The ACC controller, in its many modular configurations, is Hunter's premium industrial-grade controller for high-performance irrigation control. Its primary purpose is to operate 24 VAC irrigation solenoids or low-draw solid state relays for specific durations at specific times. It can also be connected to various sensors, providing automatic shutdown and notification in case of emergencies, and actual flow records and responses in real time.

With plug-in Com and other modules, the ACC can also communicate with a computerized central control system via hardwired cable, radio, dial-up telephone, or cellular modem. ACC is also prewired to accept Hunter wireless remote controls.

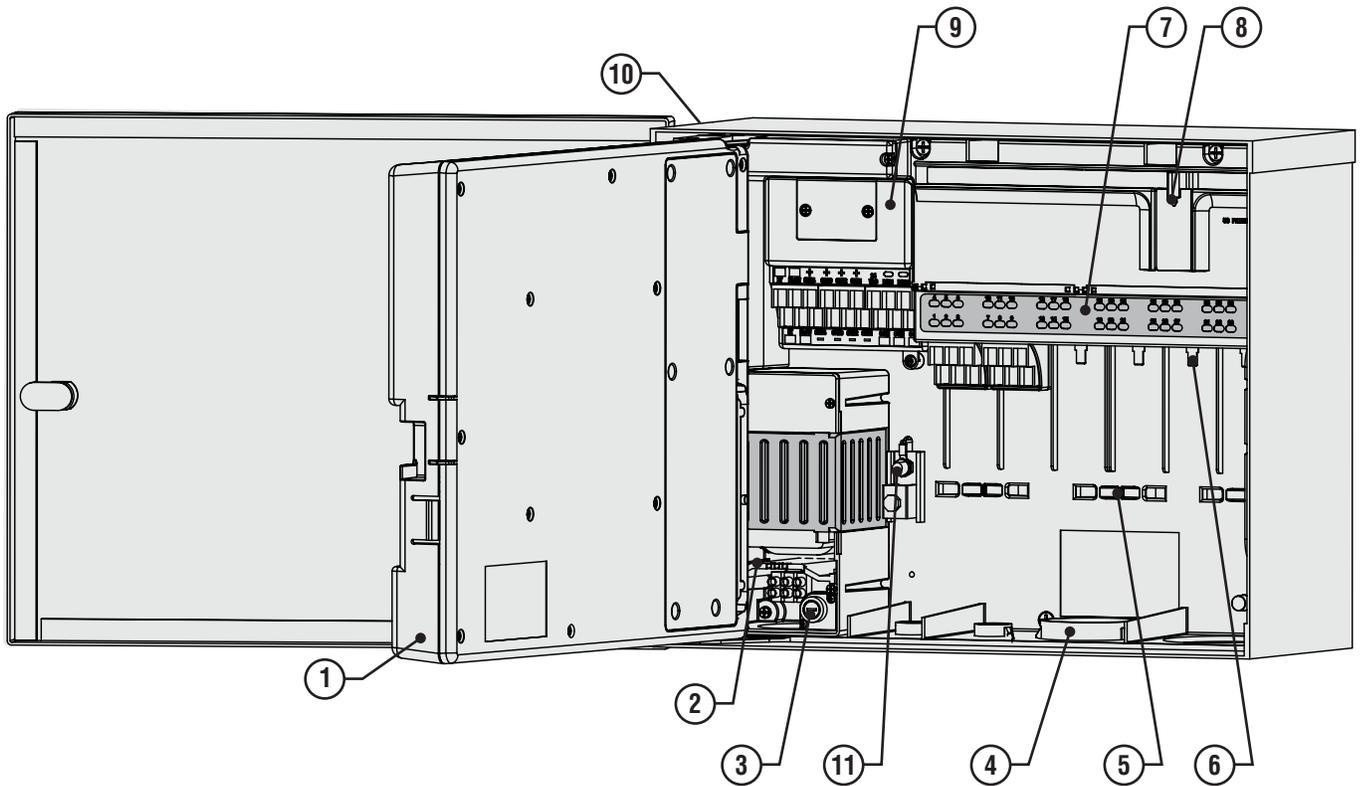
- This product should not be used for anything other than what is described in this document.
- This product should only be serviced by trained and authorized personnel.
- This product is designed for continuous outdoor use above sea level to 15,000 feet/4.5 km at temperatures 32–122° F.
- These units have an IPX4 rating.
- This controller is not intended for use by young children or infirm persons without supervision; young children should be supervised to ensure that they do not play with the appliance.
- **Hunter Technical Support: 1 (800) 733-2823**

ACC INTERFACE AND KEY COMPONENTS

1. **LCD Display** – Backlit, adjustable contrast display (re-lights when any button is pressed)
2. **+ Button** – Increases flashing value, depending on function
3. **- Button** – Decreases flashing value. Most items in ACC screens “wrap” so that you can continue in either direction through all the choices
4. **Copy/Learn Button** – Copies a time or value in a flashing field, for pasting into similar fields. Also used to learn typical flow (when a flow sensor has been installed)
5. **Paste/Pause Button** – Pastes a copied time or value into a new field. Also used as Pause/Resume feature during watering, shuts off devices for 30 minutes or until resumed
6. **Programs Button** – Selects one of the automatic Programs (A-F), starts Test program, allows Reset (with Reset button)
7. **Up and Down Arrow Buttons** – Used to move up and down through adjustable functions in various screens, and to select higher or lower numbered items
8. **Left and Right Buttons** – Used to move left and right in some screens
9. **Information Button** – Lights display, and provides instant help and other information, depending on dial position. Also used to access Extended Features, when held down while turning to specific dial positions
10. **Programming Dial** – Used to access all functions of ACC. The most basic automatic watering can be set up in the first 4 dial positions
11. **Reset Button** – Recessed switch erases some or all memory when combined with pressing specific buttons
12. **Facepack Release Button** – Hold down while removing facepack from inner door panel
13. **Door Grip** – Convenient finger grip for opening inner door
14. **Logo Badge** – Removable for installation of optional communications modules



WIRING COMPARTMENT INTERIOR



1. **Inner Door** – Opens to main wiring compartment
2. **AC Wiring compartment** – For connection of 120/230V AC power with 1 x 0.75" (19 mm) conduit opening
3. **Fuse** – 2 Amp (fast) 250V, 6 x 20 mm
4. **Conduit Openings, Low Voltage** – 2" x 2½" (64 mm), 2" x ¾" (19 mm)
5. **Wire Tie Holders for Valve Wires** – Valve wiring area
6. **Station Output Terminals (Valve Wires)** – screw terminals on 6-station output modules
7. **Upper Deck Panel with Led Status Indicators** – Numbered station lights, green for active, red for faults
8. **Sliding Lock for Output Modules** – Permits addition or removal of output modules, locks wired modules in place
9. **Master Module** – Includes sensor, Pump/Master Valve, and other accessory connections
10. **SmartPort®** – Integrated connector for ICR/SRR receiver (on side of cabinet)
11. **Earth Ground Lug** – For connection of earth ground copper wire (for surge protection only). Do not connect valve commons – see Master Module for Common wiring of solenoids and valves.

Explanation of Symbols

 AC



Consult Documentation



Hazardous Voltage Present

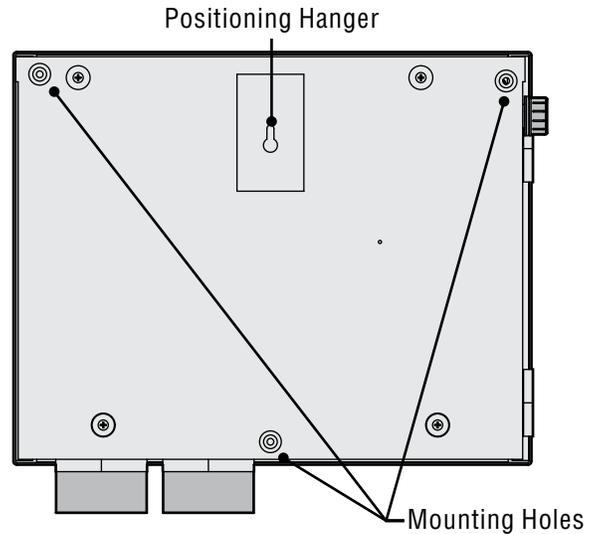
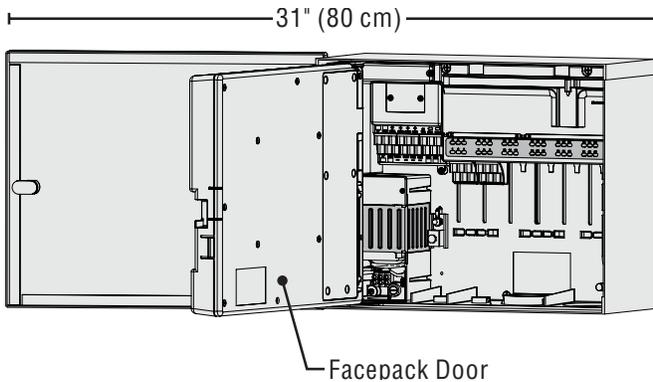


Double Insulated

METAL CABINET, WALL MOUNT INSTALLATION

Tools required:

- Long drill bit and extension
- Philips screwdriver or bit (for use with long extension) – magnetic recommended
- Wire strippers



Location Requirement: A) a switch or circuit-breaker shall be included in building installations; B) the switch or breaker shall be in close proximity to the controller, and within easy reach of the operator; C) the switch or breaker shall be marked as the disconnecting device for the controller.

Avoid direct exposure to sprinkler spray.



Do not install controller within 20" (7 m) of high-voltage electrical sources, such as service transformers, pump station motors, etc.

Shaded or partially shaded areas are preferable to prolonged direct sunlight.

The ACC controller is relatively heavy, about 30 lbs/13.6 kg in the metal wall mount configuration. Mounting includes a positioning hanger to assist with installation.

Mounting hardware has been included, but it is the installer's responsibility to insure that adequate hardware is used for the physical location.

ACC is approximately 15½" (40 cm) wide. Allow another 15½" (40 cm) to the left of the controller for the door to open freely.

Before mounting, it is easier to remove the metal cabinet door. Swing the door open, grasp the top securely, and push up on the bottom of the door, near the lower hinge. The hinges should disengage and the metal door can be removed.

Remove the facepack assembly from the controller.

1. Open the facepack door using the recess on the right.
2. Disconnect the gray ribbon cable from the back of the facepack. Pull gently on the ribbon cable; a slight rocking motion may help disengage the connector.
3. Push up on the upper door hinge, and tilt the door so that it disengages the hinge posts. Remove the facepack and set aside in a safe location.
4. OPTIONAL: Locate the positioning hanger in the upper center of the controller's location on the wall, leaving adequate clearance for the opened door to the left.
5. Drill a pilot hole for the anchor and insert.
6. Install one #10 (5 mm) screw in this hanger position, leaving approximately ¼" (6 mm) out of the anchor to allow the controller to hang from this screw.
7. Hang the controller from the keyhole slot in the positioning hanger.
8. Place a level on the top of the controller cabinet and level.
9. Locate the 3 mounting holes in the cabinet. These are visible from the front, with the facepack removed, in deep recesses in the top two corners, and another shallow recess in the bottom center.
10. Mark each of these 3 locations and install anchors.
11. Reposition controller on the hanger and use a long screwdriver or drill extension (3"/75 mm) with magnetic tip to install the remaining 3 screws, one at each anchor position, and secure.

CONNECTING AC MAIN POWER, WALL MOUNT CABINET.....

The ACC can operate with either 120 VAC or 230 VAC power, depending on how the incoming AC wires are connected.

Supply wires must be 14 AWG (2 mm) or larger.

The ACC is prewired for 120V operation but can easily be changed to 230V.

Consult or hire a licensed electrician for these connections as required.

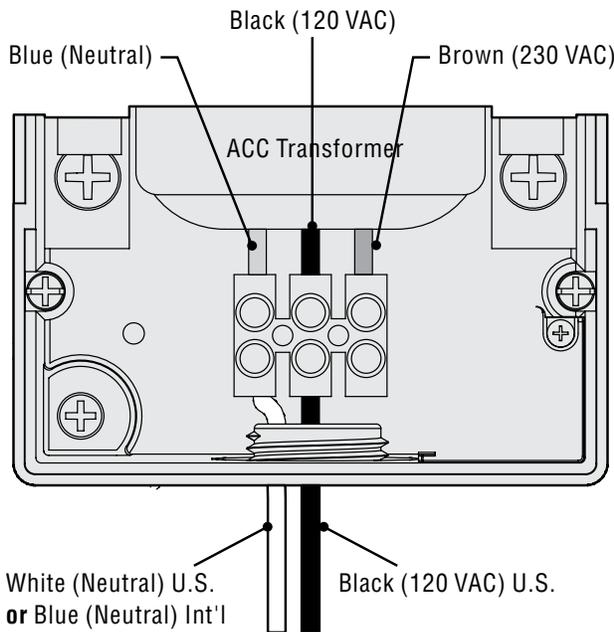
- Turn AC power off at the source, and verify that it is off.
- Remove the wiring compartment screws and the wiring compartment door.
- Strip approximately ½" (13 mm) of insulation from the end of each of the AC power wires, and route into the wiring compartment through the conduit.
- Locate the white plastic terminal block, and wire according to the following diagrams.

For 120V~ operation, connect the incoming black power wire (hot) to align in the wiring block with the black wire lead from the transformer.

Insert the incoming black wire lead into the hole opposite the black transformer wire and tighten screw securely.

Connect the incoming neutral (white) wire to align with the blue lead from the transformer.

Cap off the brown (230 VAC) wire if applying 120V and not using a wiring block. The brown wire will be hot and have a 230V charge.

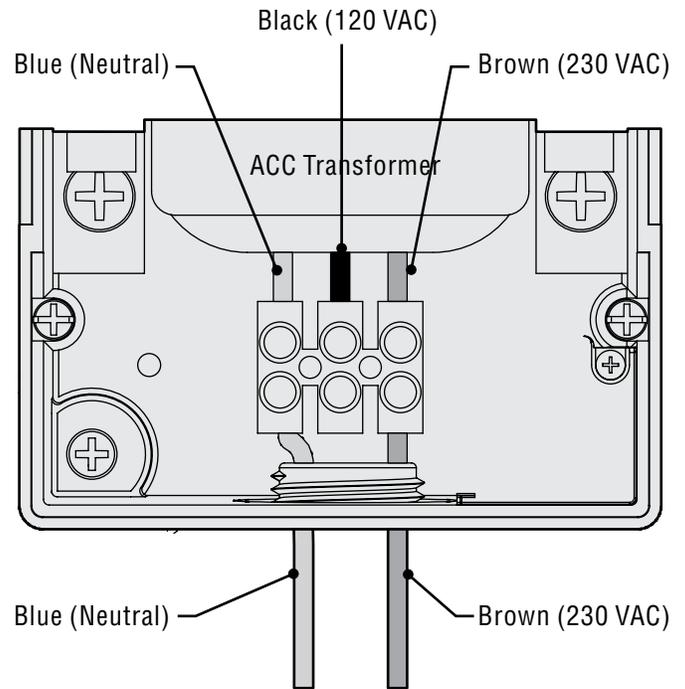


The green, or green-and-yellow safety ground may not be required or permitted with this floating ground, double-insulated transformer. If desired and permitted, connect it to the earth ground lug on the controller. Install a conduit junction T-box below the supplied junction box in the controller, and route the safety ground out of the T to the earth ground lug of the controller.

Tighten screw and replace cover.

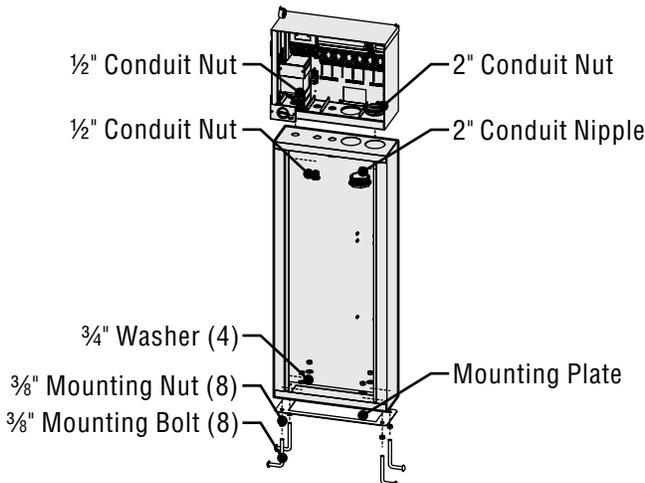
For 230V~ operation, connect the incoming power wire (hot, brown in many wiring standards) to align in the wiring block with the brown wire lead from the transformer. Connect the incoming Neutral (blue in some international standards) wire to align with the blue lead from the transformer. Tighten screws and replace cover.

Apply AC~ power and test. Refer to Earth Ground and Station Wiring sections for additional connections.



METAL CABINET OPTIONAL PEDESTAL INSTALLATION

Location Requirement: A) a switch or circuit-breaker shall be included in building installations; B) the switch or breaker shall be in close proximity to the controller, and within easy reach of the operator; C) the switch or breaker shall be marked as the disconnecting device for the controller.



3. Level the mounting bolts before the concrete sets.
4. After the concrete sets, remove the door of the pedestal and slide the pedestal down onto the four bolts. Secure the pedestal to the bolts using the enclosed washers and nuts.
5. Remove the door and faceplate of the ACC and attach the metal cabinet of the ACC to the top of the pedestal using the 1/2" (13 mm) and 2" (50 mm) metal conduit nuts in the pedestal. Tighten securely by engaging teeth with a screwdriver and tapping in a clockwise direction.

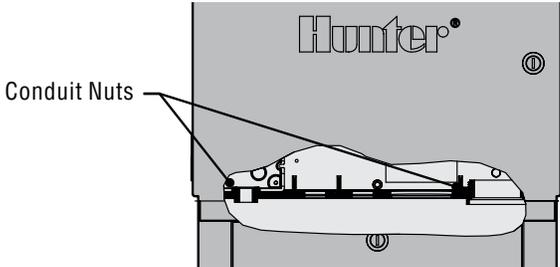
CONNECTING THE METAL PEDESTAL MAIN AC POWER

1. Connect AC power wiring as in the metal wall cabinet. Route the AC power wiring through the metal pedestal and up into the ACC wiring compartment. Follow the AC wiring instructions for the metal wall cabinet closely.
2. Replace the pedestal door first and then replace the faceplate and the cabinet door. The pedestal door cannot be removed or replaced when the cabinet door is closed.

Installing the Pedestal

1. Assemble the mounting template using the instructions provided with the pedestal.
2. Using the enclosed mounting template, locate the bolts two inches deep in the concrete pad, in the locations indicated. The pad can be any size but at least a two-foot square is recommended.

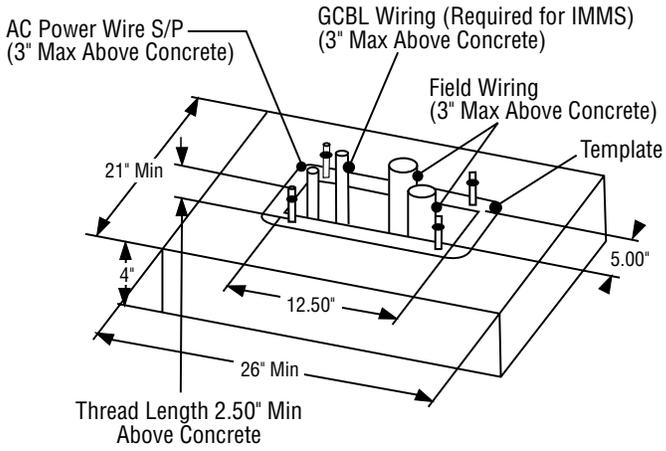
Refer to Earth Ground and Station Wiring sections for additional connections.



PLASTIC PEDESTAL INSTALLATION

Select a location for installation of the controller based upon these factors:

1. Availability of 120/230 VAC~ power.
2. Do not locate under overhanging branches of trees or any structure that may attract lightning.
3. Avoid locations where sprinklers spray upward onto the controller, and low areas subject to flooding.
4. Locate controller in a location that is central to all valves/sprinklers that it controls to maintain visible operation and reduce wire lengths/costs.



CONCRETE BASE INSTALLATION

1. Set forms for a 21" (533 mm) wide x 26" (660 mm) long concrete base. The base pad should be 2" (50 mm) above grade for proper drainage.
2. Position a 1½" to 3" (38 to 76 mm) diameter conduit sweep elbow for the field wires (size will vary depending upon the number of valve wires entering the controller), a 1" (25 mm) conduit sweep elbow for the power supply, and a 1" (25 mm) conduit sweep elbow for any communication wires, if applicable. Secure the sweeps so they will enter the bottom of the controller correctly.
3. Allow approximately 3" (76 mm) of conduit above the surface of the concrete pad.
4. Shape the concrete base to shed any water away from the controller.
5. Prepare the template for insertion in the concrete. Twist one nut on each of the four J-bolts to the

bottom of the thread and slide each bolt through the hole in the template. Put a washer and nut on each J-bolt to secure it to the template (allow a minimum of 2½" (63 mm) of thread protruding above each nut).

6. Work the J-bolts down into the concrete until the template sits level on top of the concrete. Smooth and allow the concrete to cure (at least 24 hours).
NOTE: It is important with plastic pedestals to ensure a smooth mounting surface. Uneven surfaces may cause the pedestal to distort, preventing proper sealing of the doors.
7. Remove the nuts and washers from the concrete base. Place the pedestal over the bolts and secure with nuts and washers.

NOTE: Remove both doors and lift the pedestal from the main body. Two people are required for this task.

CONNECTING PLASTIC PEDESTAL AC MAIN POWER.....

The ACC Pedestal controller can operate with either 120 VAC or 230 VAC power.

Supply wires must be 14AWG (2 mm) or larger.

The controller power must be connected to a branch circuit protected by a 15 A rated over-current protective device (circuit breaker, fuse, etc).

With the main AC power OFF, route the AC power wires from the supply panel through the sweep elbow placed for this purpose in the concrete pad.

Do not route low voltage wiring with the AC power wires in the same conduit.

Locate the junction box below the transformer assembly on the left side of the controller. The AC power connections are made to the terminal block inside this junction box.

Route the AC power lines through conduit (if applicable) into the junction box.

All connections are to be made by qualified electrical personnel, only. Local electrical codes must be followed and may vary, depending upon country, state, and local codes.

120 VAC CONNECTION

Place the Voltage Selector Switch in the “115V” position.

Connect the incoming black (or “hot”) wire to the Red wire from the controller transformer. The Red wire is labeled Hot, Phase, and Active. Connect either with the supplied terminal block, or with approved high voltage electrical wire nuts. If using wire nuts, tape the connection securely with electrical tape.

Connect the incoming white wire (neutral) to the blue wire from the controller transformer (labeled “Neutral”), either with the terminal block or approved wire nuts. If using wire nuts, tape securely.

The green or bare copper safety ground is not required with this UL listed floating ground, double-insulated transformer. If desired, you may connect it to the earth ground lug on the controller. Install a conduit junction T-box below the supplied junction box in the controller, and route the safety ground out of the T to the earth ground lug of the controller.

230 VAC CONNECTION

Place the Voltage Selector Switch in the “230V” position.

Connect the incoming Brown power wire to the Red wire from the controller transformer, with the supplied terminal block. The Red wire is labeled Hot, Phase, and Active.

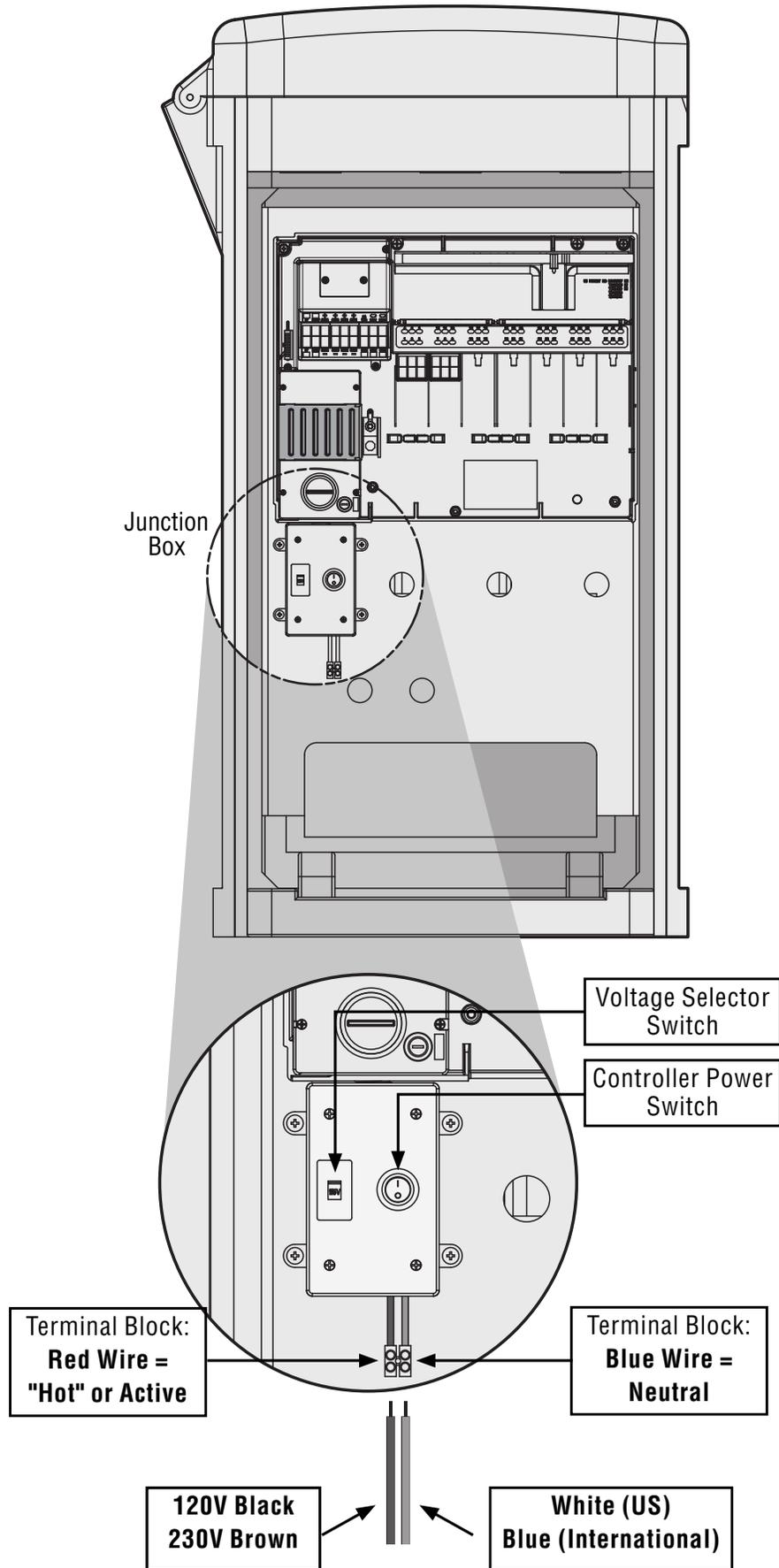
Connect the incoming Blue power wire to the Blue wire from the controller transformer at the terminal block. The Blue wire is labeled Neutral.

The green, or green-and-yellow safety ground may not be required or permitted with this floating ground, double-insulated transformer. If desired and permitted, connect it to the earth ground lug on the controller. Install a conduit junction T-box below the supplied junction box in the controller, and route the safety ground out of the T to the earth ground lug of the controller.

Place the connections up into the junction box through the opening in the bottom. Secure conduit if applicable.

Turn breaker power on, then turn the controller power switch on and test.

The controller is equipped with a 6 x 20 mm, 250V, 2 Amp fast-blow fuse on the transformer assembly. Incorrect power wiring may cause this fuse to open. Check wiring and incoming power if the fuse opens when power is turned on.



CONNECTING EARTH GROUND (ALL CONFIGURATIONS).....

The ACC features a copper earth ground lug, to the immediate right of the transformer assembly.

This earth ground connection is isolated from the primary AC power and is used to ground incoming surges from the communications and output valve wires.

With the controller power Off, loosen the slotted screw in the center of the ground lug.

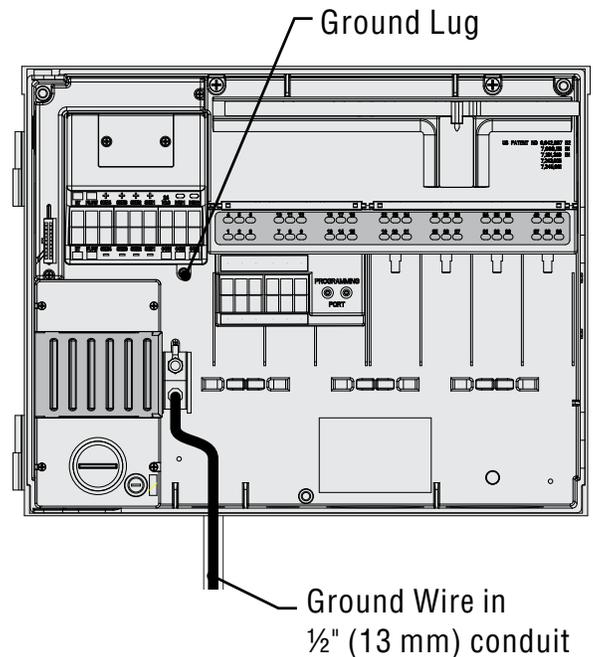
Route a bare 6 AWG (4.11 mm) earth ground wire into the wiring area through the 0.75" (19 mm) conduit opening directly beneath the ground lug, in the bottom of the controller cabinet. Do not route the ground wire through the same conduit as the incoming primary AC power!

Loosen the ground lug screw, insert the ground wire into the ground lug and tighten the screw to secure the ground wire. Do not overtighten.

Grounding hardware should be selected according to standards established by American Society of Irrigation Consultants Earth Grounding guideline 100-2002 (available at their website, www.asic.org).

Acceptable grounding consists of an 8' (2.5 m) copper-clad rod or stake, or a 4" x 96" (100 mm x 240 cm) copper plate, or both, placed in the earth at least 8' (2.5 m) away from the controller, and with the ground wire at right angles to the communications and valve wires, if possible. Ideal grounding resistance would be 10 Ohms or less as measured with a "megger" or similar device. Please consult the ASIC reference for more detailed considerations of this critical step.

Improper connection to earth ground voids the effectiveness of the output module surge protection.



INSTALLING STATION MODULES.....

ACC expands in 6-station increments with intelligent output modules, requiring no tools to install and only a screwdriver for station wiring connections. The base configuration is 12 stations (two 6-station modules installed) with a maximum station capacity in a metal wall cabinet of 42 stations (7 total output modules x 6 stations each).

ACC can be expanded at any time with either of the following types of modules:

1. ACM600, 6-station output module with surge suppression and diagnostic LEDs
2. AGM600, 6-station output module with heavy-duty surge suppression and diagnostic LEDs

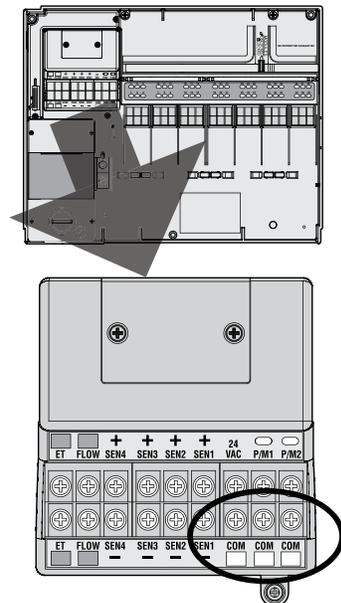
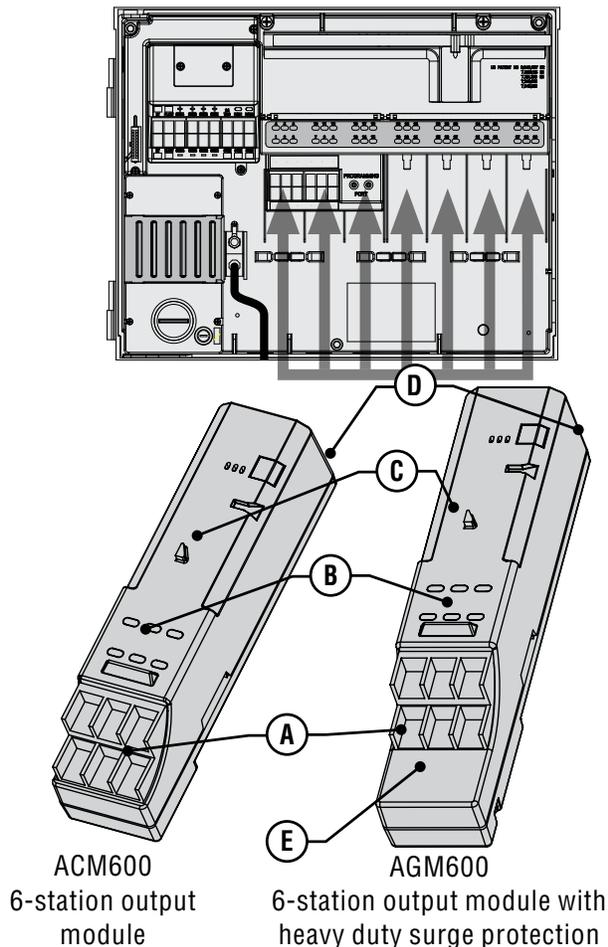
These two types of modules may be mixed within the same installation if desired.

OUTPUT MODULES (ACM600, AGM600)

- A. Station Output Screw Terminals – Connect no more than two solenoids each.
- B. Station Status LEDs – Green for station activity, Red for fault or short
- C. Locking lugs – For module lock
- D. Gold plated electrical contacts – Lower rear of module
- E. Additional surge components, AGM versions – Visible through module

1. To install expansion modules, turn the dial to the “Run” position.
2. Open the inner facepack door, and locate the module lock. Slide the module lock to the “Power Off” position.
3. Flip up the upper deck cover. Slide the modules up, into the next available position. Slide the modules up, into the next available position, viewed from left to right. Do not skip slots by leaving them empty.
4. Install a module by aligning it firmly in the lower portion of the next available slot and sliding straight up until it clicks into place. Once module is in place, slide power bar to the "Power On" position. The first two lights of the bottom and top row of each module installed will light up red for 1 second, indicating proper contact and the new module has been recognized. The red lights will then turn off, in sequence, from left to right across the modules that are installed.
5. The silver contact on the back of the controller cabinet must engage a mating slot in the back of the expansion module. Do not “tip” or force the module into place. Slide straight up, from the bottom of the slot.
6. While at the Run dial position, press the Information button. The current station size will be shown, and should include any new modules you have added.

Station Modules



CONNECTING THE VALVE WIRES

Each station output module has 6 screw terminals for connection of individual station wires. The terminals will accept from 22 AWG (0.64 mm) to 12 AWG (2.05 mm) wires.

Each station output is rated for 0.56 A, max or enough to operate two typical Hunter solenoids simultaneously.

Once the output module is installed in the slot, the station numbers assigned to the output module appear in the upper deck label above each slot.

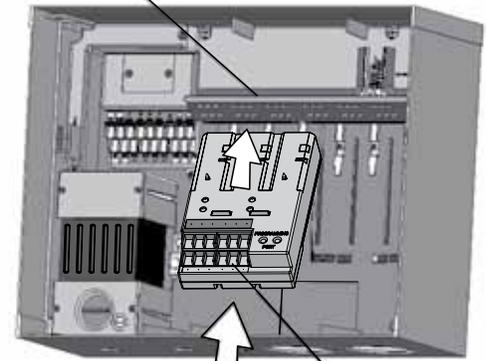
1. The modules may be removed, if necessary, without disconnecting the field wiring. However, they must be reinserted into exactly the same slot, or the station addresses will be switched.
2. Connect the return wires from the valves to one of the 3 terminals on the Master Module marked COM. Since many valve solenoid wires will need to connect to these 3 common terminals,
3. Route valve wires between control valve location and controller.
4. At valves, attach a common wire to either solenoid wire of all valves. This is most commonly a white colored wire. Attach a separate control wire to the remaining wire of each valve. All wire splice connections should be done using waterproof connectors.
5. Open hinged faceplate on the controller to access the terminal area.
6. Route valve wires through the conduit and attach conduit to the controller at the large conduit openings on the right side of the bottom of the cabinet.
7. Strip ½" (13 mm) of insulation from ends of all wires. Secure valve common wire to COM (Common) terminals on the Master Module. Then attach all individual valve control wires to appropriate station terminals.

DECODER OUTPUT MODULE (ADM99)

- A. Two Wire Path Terminals – Connect no more than one pair of red and blue wire paths to each output terminals
- B. Status LEDs– Decoder Fault, Module/Line Activity, Communicating, Line Status
- C. Locking Lugs
- D. Gold-plated Electrical Contacts
- E. Programming Port – Port where decoder wires get plugged into in order to program the decoder

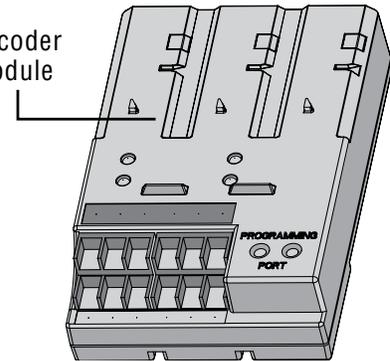
Decoder Output Module

Upper Deck cover



Slide ADM99 in first 3 slots

ADM99 Decoder Output Module



1. Decoder output modules may NOT be mixed with the "conventional" ACM/AGM-600 output modules.
2. Decoder output modules are always installed in the first three slots.
3. Install the ADM99 by aligning it firmly into the first three station module slots, and sliding straight up until clicks into place. As soon as the ADM99 is slide into place, the Module/Line Activity light will light red for one second, and then the Line Activity light will illuminate green. Unlike the station modules, the ADM99 will illuminate the status lights with the power bar in the "Power Off" position.

CONNECTING DECODER OUTPUT PATH WIRES

Up to 99 stations may be operated over a single pair of wires (known as a "path") using decoders. The decoder output module allows up to 6 two-wire paths to the field decoders. The maximum number of decoder stations is still 99, but multiple paths allow the shortest wire runs. You may use any number of paths to reach all 99 stations.

Each path should consist of Hunter Industries Model IDWIRE1 or IDWIRE2 color-coded decoder wire. This is a twisted, solid-core wire suitable for direct burial, and is always color-coded red and blue.

All red/blue connections in the two-wire path must be made with DBR6 waterproof connectors or equal.

Each path has a red and a blue terminal with its number on the decoder output module.

1. Route decoder path wires through the conduit into the wiring compartment. Leave adequate slack in the wires for thermal contraction.
2. Strip ½" (13 mm) of insulation from the red and blue ends.
3. Connect the red wire to the red "1" terminal, and the blue wire from the same pair to the blue "1". Repeat for any other paths as needed.

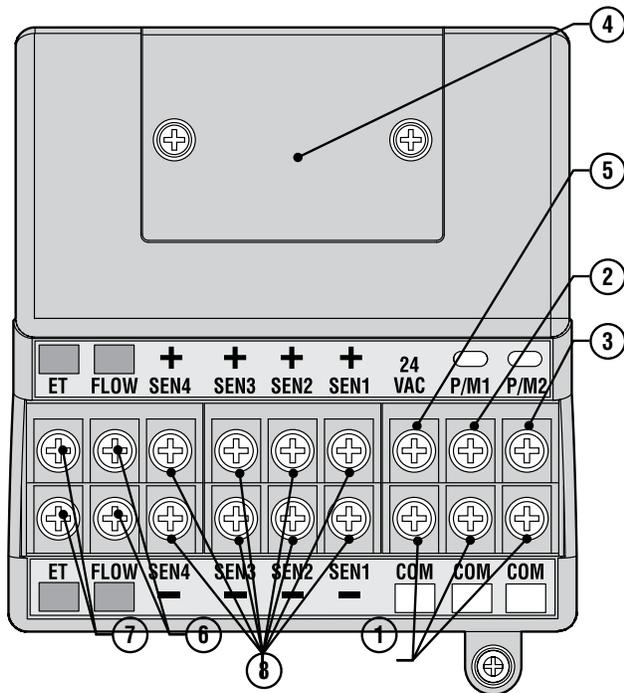
Do not connect the paths in a loop, or back to any other point in the controller. Leave the red and blue paths

separate at the end of each two-wire run. Simply insert decoders in the path until complete, and stop at the last decoder on the path. If this is not possible, simply cap each of the ends of the two wire path with a DBR6 waterproof connectors or equal.

Do not connect a wire path from one controller to another controller!

When a decoder output module is installed, the controller facepack will recognize it and the station size will change to "99" (regardless of how many stations are in use). This will also unlock the normally Extended Decoder displays in the following dial positions. *See DECODER OPERATIONS (ACC99D VERSIONS) on page 56 for more information.*

KEY CONNECTIONS.....



1. Common Ground Terminals (x 3) – For return wires (often white) from stations and master valves. Field wiring may be returned to any of these 3 terminals
2. P/M1 – Pump/Master Valve output 1, and status light (return Pump/Master valve circuit to any of the 3 Com common terminals). Output is 0.320 Amps max
3. P/M2 – Pump/Master Valve output 2, and status light (return Pump/Master valve circuit to any of the 3 Com common terminals). Output is 0.320 Amps max
4. Hardwire terminal connection cover – Remove to install optional ACC-HWIM for hardwired communications.
5. 24VAC – Always-on 24V test terminal, for locating valves in the field. Can also be used to power low-draw sensor receivers such as Hunter WRC. Output is 0.420 amps maximum
6. Flow Sensor connections (+ and -) – Connections for Hunter HFS flow sensor
7. ET connections (+ and -) – Not used. Connections for Hunter ET Sensor only. If upper ET terminal is colored red, Master Module requires update for use with ET.
8. If Master Module has a sticker that says "ET Ready," or if the version number of the module is 4.0 or later, the Master Module is ET ready
9. Sensor Connections (1-4) – Connections for up to 4 Clik-family sensors, or other normally closed switch contacts

24 VAC TEST TERMINAL

The Master Module features a “constant-hot” 24 VAC output which can be used as a test point for locating valves in the field:

1. After powering up the controller, attach the common wire to the COM terminals as described above.
2. Touch each wire to the terminal marked 24 VAC to identify the valve location.
3. Each valve will open electrically when the wire is touched to the 24 VAC terminal.

4. After identifying the valve location, you may then insert the wire into the appropriate terminal. This feature allows you to sequence the valves in the most logical order for the user without damaging the controller by “sparking” the wires.
5. The 24 VAC terminal may also be used to power wireless Clik sensor receivers. *See Connecting a Rain Or Freeze Shut Off Device on page 14 for more information..*

CONNECTING THE MASTER VALVE(S) AND/OR PUMP START RELAY(S)

The Pump/Master valve connections are located in the upper right of the Master Module, which is in the upper left corner of the controller itself.

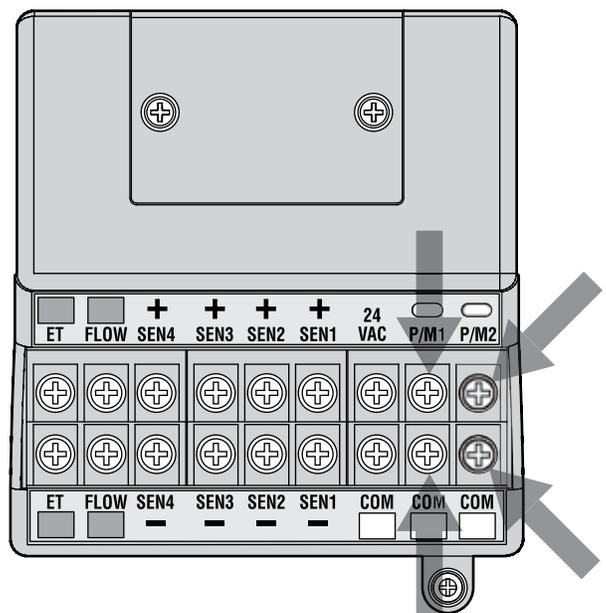
Locate the P/M1 and P/M2 screw terminals on the Master Module. These outputs are designed to supply 24 VAC, 0.320 A max, for a single Master Valve solenoid or a Pump Start Relay (or Relay Booster).

The return wire from each P/M device (solenoid or relay) must be connected to one of the COM terminals on the lower terminal strip of the Master Module.

Connect one output wire from each Pump relay or Master Valve solenoid to the desired 24 VAC P/M terminal.

Connect the return wire to one of the terminals marked COM immediately below the P/M outputs.

Configuration of the P/M terminals is covered in the Set Pump Operation section of the Programming and Operations portion of this manual.



CONNECTING A RAIN OR FREEZE SHUT OFF DEVICE

Up to 4 Hunter sensors can be connected to the ACC controller, including:

- Mini-Clik®
- Rain-Clik™ (including Wireless Rain Clik)
- Freeze-Clik®
- Mini-weather station

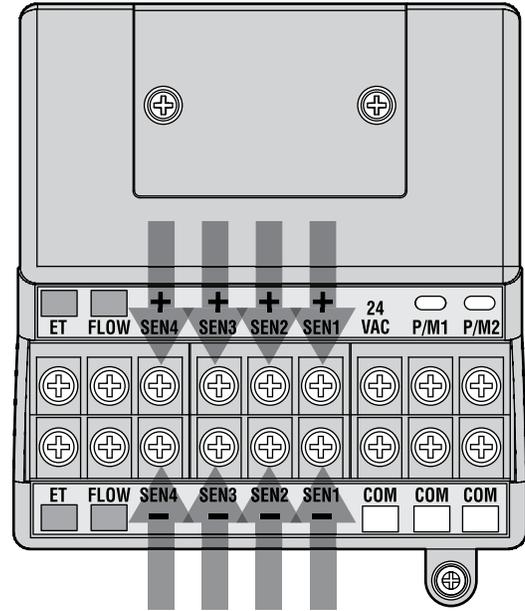
Hunter Flow-Clik™ can also be connected, but it is recommended that the HFS be used instead.

In the ACC controller, Clik sensors shut down individual programs, not necessarily the entire controller. Each sensor can be given its own response instructions by program.

Hunter Clik sensors are usually normally closed, and open on alarm. This signals the controller to suspend irrigation. Other dry contact closure sensors can be used without warranty, provided that a.) they require no voltage; and b.) open the circuit when a shutdown condition is sensed. Hunter makes no claims or representations that such connections will be effective.

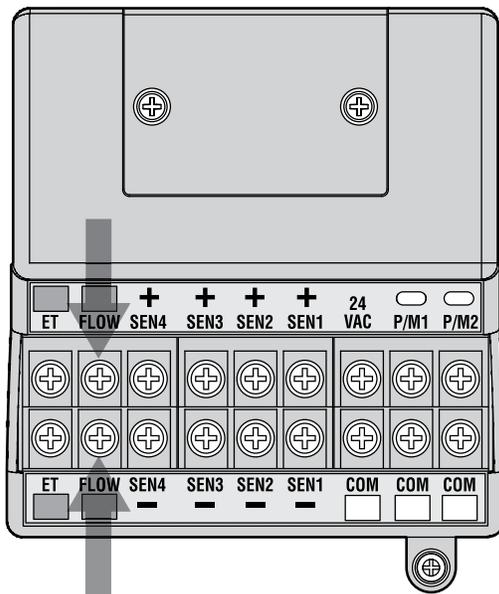
1. To connect Clik sensors, locate the SEN [1-4] terminals on the Master Module (upper right corner of controller).
2. Route the pair of wires from each sensor into the cabinet through one of the low voltage conduit openings in the bottom of the enclosure.

3. The sensor connections are made in dedicated pairs: one wire to the sensor number + terminal, the other wire from the sensor to its – terminal. Do not twist common wires together from different sensors and connect them to the same terminal.
4. Loosen the screw for the first sensor terminal (SEN1), and connect either of its wires to the + terminal and tighten.
5. Connect the other wire from that sensor to the SEN1 – terminal and tighten.
6. To connect the wireless Rain Klik (WRC) or wireless Rain-Freeze Klik receiver, consult the instructions supplied with the WRC for mounting and addressing.
7. Connect either of the receiver’s Yellow power wires to the “24 VAC” terminal on the Master Module (the “24 VAC” terminal has a 400 mA maximum capacity and is adequate for Klik receivers).
8. Connect the other Yellow receiver wire to any of the COM terminals.
9. Complete the wireless Klik installation according to the WRC instructions.



All additional programming is performed at the facepack and is described in the Set Sensor Operation section of Programming and Operations.

CONNECTING THE HUNTER FLOW SENSOR.....



The HFS is the primary flow meter for which ACC flow functions have been designed. Additional types of flow sensor connections may also be possible. Consult flow sensor manual for wiring and calibration information.

1. To connect a HFS, route the pair of 18 AWG (1 mm) wires from the sensor into the cabinet through one of the low voltage conduit openings in the bottom of the enclosure.
2. Locate the “Flow” red and black coded terminals near the left side of the Master Module. Connect the red wire from the HFS to the red terminal, and the black wire from the HFS to the black terminal.
3. Reversing the red and black connections will probably not damage the units, but will not allow the ACC to read flow.
4. Flow setup, learning, and configuration is described in the Set Flow Monitoring section of Programming and Operations.

CONNECTING OTHER FLOW SENSORS.....

Some other brands or models of flow sensors may be compatible with the ACC controller. One known-compatible model is Data Industrial model IR-220B (also sold as Hunter model GENDATFL).

NOTE: The ACC flow sensor connection is a 20 VDC pulsed output which senses interruptions as “clicks”. It is DC voltage, and the polarity must be observed.

The red + terminal corresponds to the red wire on the HFS sensor, and if connecting to other brands of sensor insure that correct polarity is observed.

Connect the positive (+) wire to the red Flow terminal on the Master Module, and the negative (-) wire to the black terminal.

ICR REMOTE CONTROL.....

The ACC controller has an integrated SmartPort®, on the cabinet’s upper left side, or inside the front panel of the plastic pedestal. This connection is automatically compatible with Hunter ICR and SRR remote receivers.

To connect: remove the weather-resistant rubber cover (metal cabinet versions), align the remote receiver’s pins with the mating receptacle, and push firmly until the receiver is fully seated. If the ET System adapter is installed, plug the receiver into the mating connector on the adapter.

If the receiver address is to be changed, hold in the green button while plugging the receiver into the SmartPort, in accordance with the ICR instructions.

Refer to the remote control’s instructions for additional addressing and operations. However, there are some significant differences in operating the remotes with the ACC controller, from previous Hunter controllers.

When a program or station is started by ICR, the ACC display will (as always) show why the program or station is running. Remote starts are followed by “ICR” in the display (Fig.1).

To set up an ICR remote control for operations with ACC, consult the ICR instructions. Use the Mode button on the ICR transmitter to select a station size of “240” to allow access to all ACC programs and stations. Only ICR Remotes manufactured September 2006 or later are compatible with ACC. If you have an older ICR remote, the maximum station size is 48. Therefore, if you are using an older remote and an ACC decoder controller, the highest station you will be able to control is station 48. You must obtain a newer ICR to operate correctly with any ACC controller.



Figure 1

MULTIPLE STATIONS SIMULTANEOUSLY

ACC is an overlapping controller, and will allow up to 6 stations to run simultaneously. While other Hunter controllers will stop existing stations when a new ICR remote start command is received, the ACC will continue to run existing stations along with the new stations, until the maximum of 6 events has been reached (Fig. 2). If 6 events are running and an ICR command is received to start another, the command will be ignored. No new remote commands will be accepted until one of the 6 events times out.



Figure 2

ACC can therefore run automatic programs, manual station and programs, and ICR commands simultaneously. Each running event will be shown on the display with the reason for running (programs will be shown with the program letter followed by "ICR" if they were started by the remote), and the remaining time for the event.

The display shown here is possible with ACC: six events are running, including ICR station starts (ICR), ICR program starts (A-ICR), manual single-stations (MAN), manual program starts (C-MAN), and an automatic program (D-AUTO).



Figure 3

If simultaneous operation is not desired, press the Off button on ICR before starting another program or station. Off will stop everything the controller is running, regardless of what started it.

Stacking and SmartStack rules are not observed when manual single station ICR commands are sent to the ACC. Stacking and SmartStack rules do apply when manual program ICR commands are sent to the ACC. If a program

is not set to overlap, the ICR command will be ignored when trying to start the manual program.

ICR manual single station commands will be obeyed if the controller is in the OFF position, or in a sensor shutdown mode. ICR manual program commands will NOT be obeyed and will be ignored in the OFF position. If the controller is in a sensor shutdown mode and an ICR command is sent to activate a program, the ACC will obey the sensor shutdown if that program is assigned to pause or suspend according to the sensor. The manual program ICR command will be shown in the display as in pause or suspend mode, depending on how you have your sensor programmed. (Fig 3) If the program that you are trying to manually start with an ICR command is not programmed to pause or suspend a sensor, the command will be obeyed and the program will run.

If you are utilizing a simultaneous station group, or SSG, you may run an individual station that is included in the SSG. The fact that the station is included in the SSG will be ignored, and you may run that station by itself.

CONNECTING TO IMMS HUNTER IRRIGATION MANAGEMENT AND MONITORING SYSTEM

ACC controllers can be upgraded to provide full two-way communications with central control software (IMMS 2.0).

The ACC Com modules are installed in place of the logo badge on wall mount controllers, and under the facepack door in a special bracket (APPBRKT) in pedestal units.

ACC controllers can be connected with hardwired cable (GCBL), dial-up telephone (POTS or "plain old telephone service"), or GSM cellular communications (using Circuit Switched Data or CSD).

Multiple controllers can share a connection, with additional runs of hardwired cable or UHF radio communications. Advance to Daylight Saving and use +/- to select YES.

No tee splices are permitted within the GCBL and all hardwired devices must be in one single continuous wire run.

DIAL-UP TELEPHONE (ACC-COM-POTS)

Connection must be within 6 ft (2 m) of the telephone company connection, via standard RJ-11 jack..

IMMS 2.0 and dial-up Com modules require analog lines with dial tone. These products do not have digital dialing capabilities.

Dial-up must be via dedicated line. The controller will always answer on the first ring and must not share with fax machines or other devices.

CELLULAR/GSM (ACC-COM-GSM, GSM-E)

GSM cellular service must have reliable coverage at installed site.

GSM service must permit and provide Circuit Switched Data (CSD). IMMS 2.0 connections require CSD and will use the Data telephone number. No other form of cellular communications will work. There are no CDMA options for ACC communications at this time.

UHF RADIO

All UHF radio communications require a license.

All radio communications for ACC work with RAD3 radio module or later. IMMSR radios, designed for original IMMS Site Interfaces and Controller Interfaces, will NOT work with ACC controllers.

RAD3 radios are not supplied with antennas, but an antenna must be provided for the radio to operate, and the antenna must be installed outside of any metal enclosure (including the ACC metal cabinet).

Radio communications for the ACC are only to communicate with other ACCs, and do not provide communications directly with a central computer. This should be established with an IMMS-CCC and a hardwire interface, or by telephone using ACC-COM-POTS or ACC-COM-GSM (or GSM-E for international applications).

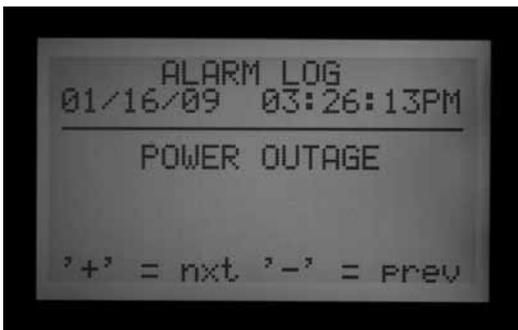
For golf applications using Surveyopr central control software only, the AGCHUBR provides a direct radio interface to all radio-equipped ACC/AGC controllers.

See Hunter's ACC System Design Guide for important details regarding design of central control systems.

POWER FAILURES

The ACC's real time clock is independent of external power or the 9 VDC battery, and will keep time during a power failure of virtually any length. When external power is restored, the ACC will still have the correct time and will be ready to irrigate.

A Power Outage message will be stored in the Alarm Log, with time of the outage. Another log is stored when power is restored.



QUICK START

For experienced operators, the fastest steps to initial programming are as follows.

- 1. Set Current Date/Time:** Use the arrow buttons to navigate, and the +/- buttons to change. Set the Date and Time and choose Units of Measure.
- 2. Set Watering Start Time:** Each automatic Program has 10 start times. At this position, use the Programs button to select individual programs, and the 10 possible start times for that program will appear. Use arrows to navigate and +/- to change. See *SETTING PROGRAM OVERLAP OPTIONS* on page 36 for more information..
- 3. Set Station Run Times:** At this dial position, use the Programs button to select the program you are

setting up. Then, use the +/- buttons to change the hours:minutes:seconds run time for each station. Use the up and down arrows to move to the next station. TIP: Use the Copy and Paste buttons to move quickly through large numbers of similar stations. Set the first station's run time, then press Copy. Use the Up arrow to move to the next station, and press Paste.

- 4. Set Days to Water:** Use the Programs button to select the Program. Use the arrows to move to Day Sched, and choose Schedule Type (Day of Week, Interval, or Odd/Even).
- 5. Set Pump Operation (optional):** The two Pump/Master Valve outputs may be set by station at this position. If no pump or Master Valve is in use, this is not required.

6. **Return the dial to the Run position.** This is all that is required for the most basic operations. ACC will water automatically in any dial position except “OFF”.
7. **Test:** The Test program will start every station in the controller sequentially, in numerical order, for the specified time. **The minimum time is one second for conventional controllers, and 15 seconds for decoder controllers. The maximum run time in Test Program is 15 minutes per station.** Turn the dial to the Run position. Test is started by holding down the Programs button for 3 seconds. Enter the Test time and wait 5 seconds for the Test cycle to begin. Each station LED on the output modules will light green when a station is running, red if a fault is detected. Decoder controllers cannot show individual station activity, but the ADM99 lights will show activity on the Communicating and Module/Line Activity lights during operations. Decoder controllers will start all 99 stations in the test mode. It does not matter how many decoders are installed in the field, the controller will try to run all 99 stations. The controller will receive alarms for any stations that are not present in the field, or stations that are not assigned to a decoder. When running the Test Program in a decoder controller, you can manually end the Test by turning the dial to

Off after the last “real” station has run.

Test actually starts stations, and this will cause actual watering in a fully installed system.

8. **Manual Start:** Turn the dial to the Manual Operation dial position to manually start any Program, or single station. When the display shows Manual Program, use the Programs button to select the Program, and turn the dial to the Run position. The program will start in a few seconds. TIP: You can also hold down the right arrow button for 3 seconds to shortcut to Manual starts.
9. **To start a Single Station:** When “Program” is flashing, use the + button to change to Manual “One Station”. Use the down arrow to move to the station number, and +/- to select a station. Use the down arrow to move to the run time, and +/- to change the run time (hh:mm:ss format, from 1 second to 6 hours). Turn the dial back to the Run position, and the station will start within a few seconds.

CONTROLLER PROGRAMMING AND OPERATION.....

USING THE INFORMATION BUTTON

The Information button is used to provide programming tips, summary information and/or to unlock extended features, depending on the dial position. If a flow meter is installed, press the Information button (with dial in the Run position) to see actual flow at any time.

If the backlit display turns off while you are programming (it will time out after 5 minutes of inactivity), press the Information button to relight it (to prevent accidental changing of any settings by pressing the other keys).

Pressing and holding the Information button will change the screen to either a summary screen of that dial position or will provide a programming tip. Releasing the button will return you to the normal programming screen for that dial position.

Some dial positions have extended features that are accessible by holding down the Information button, and then turning the dial to that position.

This will unlock the extended features. Extended features are features that are protected from accidental re-programming because they are critical to the proper operation of the controller. Programming these extended

features is explained in the Extended Features section. The ACC has the following Extended Features:

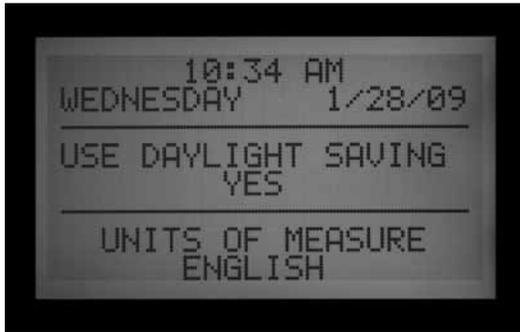
- No Water Window
- Delay between Stations
- Making the M/V circuit Normally On (instead of Normally Off) and M/V circuit location (Controller or ADM for Decoder controllers)
- Setting the Flow Sensor size and type
- Set individual station parameters (Flow, Limit, and Delay) and flow sensor location (Controller or ADM for ICD-SEN sensor decoder)
- Set sensor location: set each sensor to controller, ADM for for ICD-SEN location, or ET for individual ET sensors
- SSG (Simultaneous Station Group) setup
- Custom Manual program setup
- Test Program
- Easy Retrieve™ backup

SETTING CURRENT DATE AND TIME

Three items are programmed at this position:

- Time of Day and Date, the day of the week sets automatically
- Daylight Savings time usage
- Units of measure, English or Metric

Turn the dial to the SET CURRENT DATE/ TIME position



Press the + or – button to change the value of the flashing cursor. Hold the button down to advance rapidly over a large range of numbers.

Press the arrow buttons to change cursor position. Set the hour and the minutes, then advance to the AM/PM field. Use + or – to select AM, PM, or 24 hour clock (international, or “military” time). If 24 hour clock is selected, Program Start Times and other controller times will also be displayed in 24 hour format.

Press the arrow buttons to advance and set the date in MM/DD/YY format.

ACC Daylight Saving Time has been updated for the new USA requirements. If set to Yes, time will offset one hour forward at 2 AM on the second Sunday in March, and reset (“fall back”) on the first Sunday in November.

Units of Measure: choose English or Metric. This will set the unit type for the entire controller.

SETTING PROGRAM START TIMES

Three items are programmed at this position:

- Overlap or Stack start time priority
- Start times for each of the six programs (A – F)
- Extended Feature: No Water Window

To Set Program Start Times



1. Turn the dial to the SET PROGRAM START TIMES position
2. Select the Program (A – F) by pressing the Program button
3. Press the arrow buttons to change cursor position
4. Press the + or – button to change the value of the flashing cursor
5. Select Stack or Overlap for the Program. It is important to know that if the setting within the Set Program Overlap Options dial position is not set to “Stack or Overlap,” the option of selecting Stack or Overlap (at the Start Times position) will not be possible.
6. The copy and paste buttons may be used to speed up programming (press the Copy button at any Start Time position, then move to another position and press the Paste button. The same Start Time will be pasted there).

Stacked Start Times

Stacking means that programs are not allowed to overlap; if one Program is set to start before another Program has completed, it will be pushed back (“stacked”) regardless of its actual start time.

Each of the six programs (A – F) has ten start times available, for a total of sixty available automatic starts. The default is to stack the start times in alphanumeric order. Program A will read Overlap, but all other programs will read Stack. For instance, start time “Program A at 8:15 AM” would start before “Program B at 8:15 AM” because A comes before B. The Start Time for Program B at 8:15 AM would start following the completion of Program A’s watering.

Overlapping Start Times

Overlapping start times allows more irrigation to occur simultaneously. Overlap starts Programs at their exact Start Times, regardless of other Programs that may be running (it is the opposite of Stacking). All six programs can be programmed to Overlap and thus potentially run simultaneously. This is great when a short watering window is necessary and the hydraulics of the system allows for high total water flow.

CAUTION: Understand your irrigation system's hydraulic restrictions before allowing programs to overlap. Overlapping programs may overdrive the hydraulics of your system. Overdriving your hydraulics will damage the components and result in inferior sprinkler performance.

More advanced programming overlap options are available by turning the dial to the SET PROGRAM OVERLAP OPTIONS dial position.

Normally, the cursor will be positioned at the first Start Time hour position when turning the dial to the Set Program Start Time position.

- To change the Stack/Overlap settings for the Program, use the arrow key to navigate up to the Stack/Overlap indication.
- Use + or – to change between Stack and Overlap.
- Use the arrow keys to move back down to the Start Times if necessary.



Multiple Start Times

To set Start Times for the Program, move to the Start Time number, and use the + or – buttons to set the hour, then minutes, and then AM/PM settings unless using 24-hour option.

- If a Start Time is skipped (for example, a time is set for 1, 2 is left at OFF, and a time is set for 3), the Start Time will be accepted, but when returning to this dial position, the Start Times will be moved to a sequential order (the Start Time set for 3 will have been moved to 2). This is by design.
- If an earlier Start Time is set for a higher-numbered Start (for example, Start 1 is set to 4:00 AM, and Start 2 is set to 3:00 AM), when returning to this dial position the Start Times will have been reorganized in chronological order. The lowest numbered Start Time will always have the earliest time of day (in the example, Start 1 will be at 3:00 AM and Start 2 will be at 4:00 AM).



Press the Information button while in the Set Watering Start Times position to show a summary of all Start Time information for the selected Program. This will show total station run time per start, number of starts, and total time for the program.

No-Water Window

Programming this feature is explained in the Extended Features section.



SETTING STATION RUN TIME DURATION

Three items are programmed at this position:

- Station watering duration
 - Seasonal Adjust value for the Program
 - Hidden Feature: Timed Delay between Stations
1. Turn the dial to the SET STATION RUN TIMES position.
 2. Select the Program (A – F) by pressing the Program button
 3. Press the + or – button to change the value of the flashing cursor. The cursor initially appears in the minutes field.
 4. Press the right and left arrow buttons to change from minutes to hours or seconds cursor positions. Set the run time in h:mm:ss format.
 5. Run times may be from 1 second to 6 hours, or any increment in between.
 6. Press the up and down arrow buttons to change to a different station number
 7. The copy and paste buttons may be used to speed up programming.

NOTE: If the ACTUAL value is different from the PROGRAMMED value, Seasonal adjust has been changed from the default of 100% to a new value. The actual run time is the duration the station will water.



Press the Information button with any station selected at the Set Station Run Times dial position to see a summary of all watering for a specific station, including all programs in which it will run.



CHANGING SEASONAL ADJUST

Season adjust is used to make global or program specific run time changes without the need to reprogram every station's run time. Seasonal adjust made at the controller level is global (GLBL), and the controller can be adjusted in 1% increments, from 1 to 300%. This will change run times by the set percentage.

For example, a 10 minute run time that is adjusted to 70% will run for 7 minutes. When the controller is set back to 100%, the station will return to a 10 minute run time.

Programs that are set to GLBL will use the Global Seasonal Adjust setting that has been set for the controller.

It is also possible to set Seasonal Adjust percentages for individual programs (also 1–300%). The programs will use their own percentages and will not be affected by the controller-level Global Setting. The percentages are not multiplied together. If the controller is set to 150%, but an individual program is set to 70%, the stations in the programs will run for 70% of the original run time, not 70% x 100%.



Turn the dial to the SET STATION RUN TIMES position.

Using the Global Setting

1. Press the left arrow button until the cursor is on the percentage below the GLBL. The percentage immediately below GLBL is the seasonal adjustment percentage for the entire controller.
2. Press the + and – buttons to adjust the global seasonal adjust value between 0 and 300%.

Using a Program Specific Setting (set Season Adjust by Program)

1. Press the left arrow button until the cursor is on the GLBL.
2. Press the + and – buttons to adjust the season adjust value between 0 and 300%.

NOTE: If it is desired to return to the global season adjust, move the cursor to the season adjust percentage then use the + and – buttons to change the value to GLBL. GLBL is located between the 101 and 100% positions.

Timed Delay between Stations

Programming this feature is explained in the Extended Features section.

SETTING DAYS TO WATER

Each Program's days to water are programmed at this position.

Set Days to Water

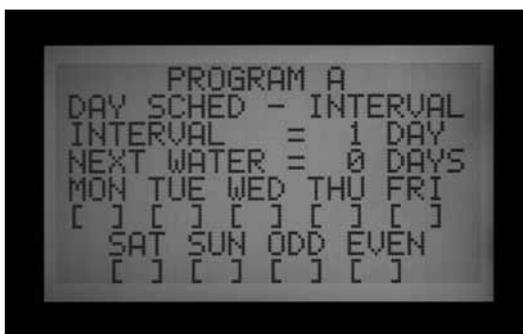
1. Turn the dial to the SET DAYS TO WATER position
2. Select the Program (A – F) by pressing the Program button
3. Press the + or – buttons to change from DAYS (day of the week), INTERVAL (1 – 31 DAYS), or ODD or EVEN days of the month.

Day of the Week Watering



1. Select the Program and DAYS .
2. Press the down arrow button to move the cursor to Monday
3. Press the + button to water on Mondays or the – button to not water on Mondays
4. As the cursor moves from day to day, press the + or – button to water or not water on that day of the week. Press the right and left arrow buttons to move quickly to a specific day.

Interval Watering



1. Select the Program and INTERVAL with the + or – buttons.
2. Press the down arrow button to Interval
3. Press the + or – button to select the number of days between watering
4. Press the down arrow button to Next Water
5. Press the + or – button to select the number of days until the next watering. If Next Water has "0 days" for a value, that indicates that any scheduled watering for that day will water at its programmed start time. If it has a value of "1 Day," the scheduled programming will water tomorrow.

Non-Water Days: This feature can be used to omit watering on mowing days, etc. The days with N will not water, even if they would normally occur at one of the Interval days set above.

1. Press the down button to MON
2. Press the right and left arrow buttons to move the cursor between the days

3. Press the – button when the cursor is on a day that you do not want to water. An "N" will appear, to show that day is never able to water, regardless of the schedule.
4. If you select Odd or Even while in the Interval schedule, the Odd or Even days will not be watered even if they happen to be one of the Interval days to water.
5. To change a non-water day back to a water day, use the arrow buttons to go to that day and press the + button. The "–" will disappear, and the day will be available for Interval watering again.

Odd/Even Watering



1. Select the Program and ODD/EVEN with the + or – buttons, as shown above in First Step
2. Press the down arrow button once, to select Odd or Even.
3. Press the + or – button to toggle between ODD or EVEN day watering

Non-Water Days: This feature is frequently used to omit watering on mowing days, etc.

1. Press the down button to MON
2. Press the right and left arrow buttons to move the cursor between the days
3. Press the – button when the cursor is on a day that you do not to water. An "N" will appear, to show that day is never able to water, regardless of the schedule.
4. To change a non-water day back to a water day, use the arrow buttons to go to that day and press the + button. The "–" will disappear, and the day will be available for Odd or Even watering again.

SETTING PUMP AND MASTER VALVE OPERATION

Two items are programmed at this position:

- Pump or Master Valve (P/MV) operation by station. Each station may have any combination of P/MV outputs 1, 2, both, or neither, which will activate as specified whenever the station is turned on.



- Extended Feature: Change the master valve from the default of normally closed (N.C.) to normally on (N.O.) Change the location of the P/MV between Controller (wired directly into the Master Module) and ADM (P/MV is connected to a decoder on the two-wire path)

Set Pump and Master Valve Operation

1. Turn the dial to the SET PUMP OPERATION position
2. Press the right and left arrow buttons to move between P/MV 1 and P/MV 2
3. Press the up and down arrow buttons to change the station number
4. Press the + or – button to enable or disable the specific Pump or Master Valve for the given station

Changing from Normally Closed to Normally On and Location of P/MV

Programming this feature is explained in the Extended Features section.

SETTING STATION CYCLE AND SOAK DURATIONS

Each Station's Cycle and Soak settings are programmed at this position. Cycle and Soak allows the user to break up the total run time of a station into more usable watering durations (cycles), and a minimum soak time between the watering cycles. This feature is great to use on slopes and tight soils because it puts the water down more slowly, helping to prevent run off.

Set Station Cycle and Soak Durations



1. Turn the dial to the SET CYCLE AND SOAK position
2. Press the up or down arrow keys to change stations
3. Press the right and left arrow buttons to move between hours and minutes and cycle and soak

4. Press the + or – button to change the Cycle cursor value. The default cursor value is N/A. Cycles can be set from 1 minute to 6 hours.
5. Press the right arrow button to move from Cycle to Soak, once a value has been entered into the Cycle field.
6. Press the + or – button to change the Soak cursor value. The default cursor value is N/A. Soaks can be set from 1 minute to 9 hours.
7. Press the down arrow to move to the next station.
8. The Copy and Paste functions are useful for large numbers of stations with similar Cycle and Soak requirements. To use, set a station's Cycle and Soak information, then press the Copy button.
9. Use the up or down arrows to advance to the next station, and press Paste. Both the Cycle and Soak value will be pasted into the fields.

You can continue to advance through the stations with the up or down arrows, and press Paste to continue pasting the same Cycle and Soak values into subsequent stations.

CYCLE AND SOAK SUMMARY

In the Set Cycle and Soak dial position, press the Information button to view a summary of Cycle and Soak with any selected station's run time. It will display the total run time of that station per Start Time in the program, not including the soak time. It will also display the station's programmed cycle time and soak time, and the number of cycles that station will incur due to the programmed runtime and cycle time. If the station's run time is less than one complete programmed cycle time, the number of cycles displayed will be shown as 0+. To view Cycle and Soak summaries for stations in other programs, simply release the Information button and while in the Cycle and Soak screen, hit the Program button. Hold down the Information button again and the display will now show that station's Cycle and Soak summary for the new program.



SETTING FLOW MONITORING.....

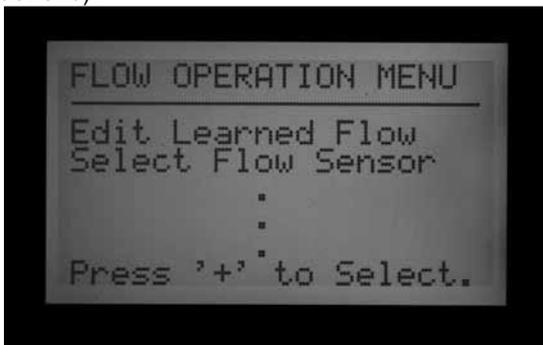
The ACC is capable of monitoring, learning, and reacting to Real-Time flow. The installation of the optional Hunter Flow Sensor (HFS) or a Data Industrial flow sensor is required for this feature to function. The ACC must first learn the normal flow, by station, for flow sensing to operate correctly.

Step 1: Select The Flow Sensor



Press and hold the INFORMATION button while you turn the dial to the SET FLOW MONITORING position. Press the down arrow button once so the cursor blinks on SELECT FLOW SENSOR.

Press the plus button until the correct HFS FCT size is displayed. HFS sensors are always installed in a Hunter FCT fitting, and selecting the fitting size automatically sets calibration for sensor (see sensor installation instructions).

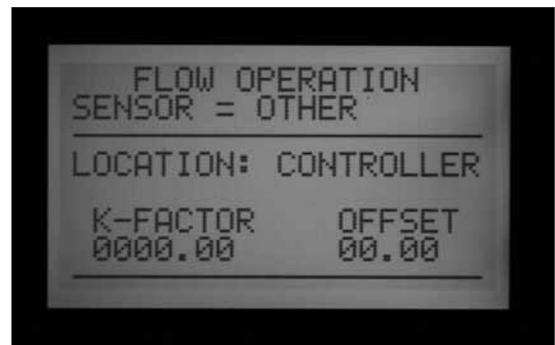


Location is normally set to Controller. If the controller has a ADM99 decoder output module installed and you wish to connect the Flow meter to an ICD-SEN sensor decoder, use the arrow button to move to Location, and change with + or - buttons to ADM. This will assign the single Flow Meter to an ICD-SEN decoder down the two-wire path, instead of the Flow terminals on the controller's master module.



If you are using a Data Industrial or similar Flow Sensor, press the plus button until OTHER is in the display. Then use the plus, minus and arrow buttons to set the K-Factor and Offset. These values can be found in the Data Industrial or similar suppliers' literature.

Once the flow sensor is selected, turn the dial off the SET FLOW MONITORING and the flow sensor that has been selected will be shown.



Menu Choices: FCT size	Pipe diameter	Pipe Class
100	1"	Sch. 40
150	1½"	Sch. 40
158	1½"	Sch. 80
200	2"	Sch. 40
208	2"	Sch. 80
300	3"	Sch. 40
308	3"	Sch. 80
400	4"	Sch. 80
OTHER	K-factor & offset	K-factor & offset



Step 2: Viewing Real-Time Flow

1. Once the flow meter is configured, ACC can display real time flow. Turn the dial to the Run position, and press and hold the Information button.
2. The display will show which stations, if any, are running, the current flow (in gallons or liters per minute, depending on your Unit of Measure settings), and the Flow Limit allowed.



3. The actual flow display is not updated “live” while the blue Information button is pressed. To see an updated view of changing flow conditions, release the Information button, and press again after a few seconds.

To see a live flow status that is continuously updated, turn the dial to Advanced Features and select Utility Functions (version 4 facepack firmware or later). Select View Sensor Status. This will show Flow by location, and a continuously updated actual flow amount.



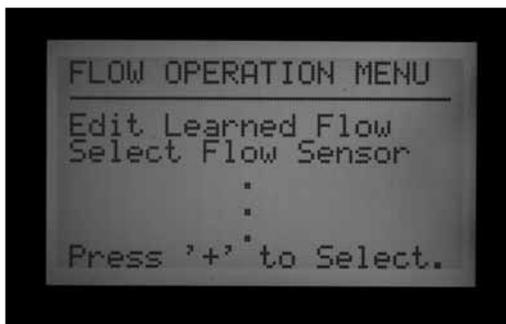
4. If some individual stations do not have learned flow, the display will show Flow Not Learned at the top, when the Information button is pressed with the dial in the Run position. When a station with no learned flow is running, flow monitoring is temporarily disabled. This is because the controller will not be able to account for any flow caused by an “unlearned” station. To run stations without learned flow, and without disabling the Flow Monitoring feature, set the stations to “Not Monitored” from the Edit Learned Flow function (Extended Features, Set Flow Monitoring position). This is useful for non-irrigation devices such as lighting that may be controlled by the controller stations.



- If the flow sensor selection has been changed to NONE after learning, the display will show FLOW NOT MONITORED. The actual flow may still be viewed, even if all stations have been set to Not Monitored. Station level alarm diagnostics would not be available, but the flow will be visible.

Step 3: Preparing for Flow Learning

- ACC will only learn flows for stations which have run times in Automatic Programs. Verify that each station has a run time in an Automatic Program (A through F).
- ACC can be taught to ignore flow monitoring for stations which operate non-irrigation devices.
- Turn the dial to another position, then hold the Information button while turning back to the Set Flow Monitoring position.

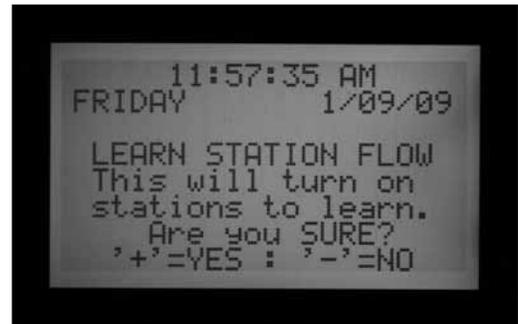


- Select Edit Learned Flow (even if no flow has been learned, yet).
- Use the – button to set the non-irrigation stations to Not Monitored. Use the up and down arrow buttons to advance through the stations, and set any stations necessary to the Not Monitored setting.



Step 4: Learning the Flow

- Turn the dial back to the RUN position.
- Press the LEARN button. The screen will display that the controller will run the stations and it will also ask you to confirm that you want to begin watering to learn flow.



- The ACC will begin watering at the lowest station number to learn its typical flow. Normally this will be station 01, unless it is Not Monitored or has no run time in any programs.



It will run the station for a minimum of 15 seconds, and then begin sampling flow at 5-second intervals until flow has stabilized (at least 4 readings, 5 seconds apart, within a reasonable flow range of one another). It will then store the average flow for this station in its memory, and move on to the next station. It will continue in this manner through all stations which have at least one run time in one of the Automatic Programs, and which are not set to Not Monitored in the Set Flow Monitoring station settings.



Only stations with a run time in an Automatic Program will be learned. Stations which are not programmed in any Programs will not be sampled, and should be set to Not Monitored to ensure proper operation of the flow meter.

If the station Delay setting has been changed, the controller will run the station for Delay period (instead of the 15 second minimum) before sampling and learning flow.

- It may take a full hour or longer to learn flows for an entire 42-station controller. Each station may take from 35 seconds to 5 minutes to be learned, depending on stability of the flow.

Step 5: Review And Edit Flow

The flow values and settings for each station can be reviewed, and manually edited, at the Set Flow Monitoring dial position. It is important to verify the flow settings for each station before leaving the controller in automatic operation.

- Turn the dial to the Set Flow Monitoring position.
- Use the up and down arrows to navigate through all stations, and verify that they have a learned flow or a Not Monitored setting.
- Do not leave any station with a "Not Learned" message—either enter a flow manually, or set it to Not Monitored.



- To edit a station's flow data, turn the dial to any other position, hold down the Information button, and turn the dial back to the Set Flow Monitoring position. Select "EDIT LEARNED FLOW."
- Use the up and down arrow buttons to move through each station.
- Use the +/- buttons to adjust the flow. Each station can be set from 0.5 GPM (1.9 LPM) to 999.5 GPM (2770LPM) in 0.5 GPM /1.9 LM increments. Between the highest value (999.5) and the lowest (0.5/1.9 LPM), the Not Learned and Not Monitored choices also appear, as the +/- buttons are pressed.



You can manually replace a Learned flow with another value, if you wish.

- LIMIT: Use the left and right arrow buttons to move to the Limit field (LMT) to edit it, if desired.

The default Limit is always 115%, meaning the station must exceed the flow by 15% before it will be treated as an alarm (to prevent false alarms due to normal flow fluctuations). 110% is the minimum possible Limit setting, and 300% is the maximum.

- DELAY: Use the left and right arrows to move to the Delay setting to edit it, if desired.

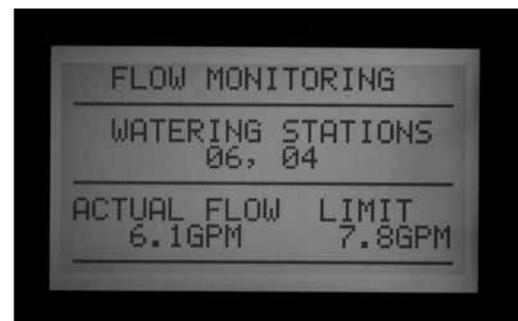
The default delay is 01:00 in minutes:seconds format. This means the station's flow will be ignored for the first 1:00 of operation, before the flow will be considered for alarm purposes. The Delay can be set from 0:15 to a maximum of 9:59. Some delay is recommended to prevent false alarms, particularly when stations are initially activated.

You can Copy and Paste to edit flow settings for multiple stations with similar characteristics. Select the station with the Flow you wish to copy and press the Copy button. You may then Paste (Paste button) the flow value into any other stations.

The Limit and Delay settings may also be copied and pasted together, separately from the Flow Value.

- Review all stations to verify their flows, limits, and delays.
- Once station flows have been learned, flow monitoring is in effect. If the Information button is pressed during irrigation, the actual flow will be shown, along with the combined limit of all active stations.
- Stations that do not operate irrigation devices, and stations that are not used, must be set to Not Monitored to avoid false alarms.

FLOW ALARMS



When a Flow Alarm has been detected, the controller will begin diagnostics, which can be seen in the display.

The controller will shut down all station activity for 1 full minute. The display will show the stations as Paused during this interval.

The controller will then test each station that was running at the time of the alarm, individually. It will start the lowest-numbered station that had been running, and allow it to run for the Delay period set in Set Flow Monitoring. After the Delay has elapsed, it will sample the flow rate, to see if it is within the Flow Limit.

If the station passes (runs within the Limit), the controller will Pause the station, and move on to test the next station that had been running (if applicable).

If the station fails, (runs outside of the Limit), the station's run time will be ended, and an alarm message will be placed in the Alarm Log.

The display will show ATTENTION: Flow Alarm if any stations have failed the test. Irrigation (for passing stations) continues to run normally, even if this display is present.

Details for the stations that failed, including time of day and Over or Underflow, will be stored in the Alarm Log (Data History dial position).

To get detailed information about any Attention display, turn the dial to Data History and select the Alarm Log.



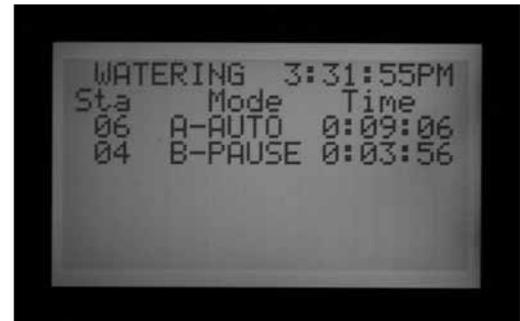
After irrigation is completed, the display will continue to show that alarms occurred, until any button is pressed. This will usually result in multiple flow alarms since ACC will try to restart stations after Pausing for one minute.



Since ACC can run multiple stations at once (Overlap, SSGs, etc.), it will add up the learned flows for all stations that are running, and compare the total to the actual flow, in real time. If an alarm occurs with multiple stations, ACC will enter a diagnostic mode to try to isolate the problem stations.

All station delays must be met before the alarm will occur. If multiple stations are running and have different delay times set for Flow Alarm limits, the longest delay must be met before the alarm will occur.

To view the diagnostics while they are in progress, press the Information button. This will clear the Attention, Flow Alarm display and show the actual status of the affected stations. While isolation is in progress, the display will then show individual stations in Pause status, as each station's flow is sampled one at a time.



ALARM LOGS

See Data History on page 38 for more information.

When a Flow Alarm is shown on the display, turn the dial to Data History to view the Alarm Logs for an explanation of the alarm (select Alarm Logs and press +).



The Last Event is always shown first. Press the – button to step backwards through the logs to view them one at a time.

A Missed Irrigation report will be logged for each station event that causes a station to shut down for Overflow or Underflow reasons. The report will show the date and time of the event, and which type of flow alarm occurred (Over or Under).



TIPS ON FLOW ALARMS

- There is only one flow meter per ACC controller, and controllers do not share information with one another. If a controller with a meter “sees” flow caused by another controller, drawing water from the same point of connection to the water supply, the controller will experience many false alarms, because it cannot account for the flow. Do not combine controllers on the same point of connection.
- Most false alarms occur because the Limit % is set too close to “normal” or learned flow. Irrigation systems often experience fluctuations in the amount of flow and increasing the limit % reduces the possibility of false flow alarms.

- The primary purpose of Underflow alarms is to protect a Pump from deadheading, if a station has failed to open. If a station that has learned flow is activated for test purposes without turning on an actual valve, an Underflow alarm may occur. This is normal.
- When two stations are running together with very different flows, such as a high volume spray or rotor zone running together with a low-volume drip zone, it is possible that an alarm condition on the low flow zone may be missed. This is because the Limit % of the high flow zone may include the entire flow range of the low flow zone. For example, a 40 GPM zone with a limit of 115% needs to see 46 GPM to alarm. If it is running together with a 4 GPM drip zone set to 115%, the drip zone could exceed its alarm limit (4.6 GPM) but the total would still be under the combined alarm limit for both stations.

SETTING CLIK™ SENSOR OPERATION

The ACC is capable of monitoring four individual Clik-type sensors, in addition to the flow sensor. Typically these sensors are weather-related sensors such as the Mini-Clik® or Rain-Clik™ rain sensors, the Freeze-Clik® temperature sensor, or the Wind-Clik® wind sensor.

Each Program has three response options. OFF, SUSPEND or PAUSE.

ACC version 4 or later is also capable of monitoring an ET Sensor as an alarm input, and may also receive Clik (and Flow) sensor inputs via an ICD-SEN sensor decoder. These options are enabled with the extended features at Set Sensor Operation for setting Locations. *See Sensor Locations on page 35 for more information.*

Each sensor (1–4) will also show its current state, as either ACTIVE (in alarm) or INACTIVE (normal or no alarm). ACC sensor inputs are normally closed. An open sensor is ACTIVE and shows an alarm condition.

- OFF indicates that the sensor will not respond to that sensor. If the selection is set to "OFF," the current state will always be shown as "Active," unless a sensor is connected to the sensor terminals. In that case, the state will change to "Inactive," because the circuit will be closed. The programs will still ignore the sensor, however, because the setting is set to "OFF."

- SUSPEND indicates that the program will stop any current watering, and inhibit watering from beginning should a start time pass. If a SUSPENDED Program is resumed, it will resume where it should be in “real time”. The stations that were missed will not irrigate, but the Program will end at its normal time.



SUSPEND is the recommended setting for irrigation programs when a sensor shutdown is desired.



PAUSE indicates the controller will stop watering until the sensor allows watering again (resets to normal state).

PAUSE should be used with caution! Paused watering (caused by a sensor) never expires. It is held in memory until the sensor returns to the normal position (normally closed), and then the watering events will be allowed to run whenever this occurs. This may cause unexpected behavior. This is different from the manual Pause (pushing the Pause button), which will time out in 30 minutes automatically

Watering that is Paused by a sensor alarm will technically remain forever (up to 10 start times worth will be stored), and will resume when the sensor becomes normal or inactive again.



SET SENSOR OPERATION

1. Use the Program button to select each Program and set the sensor responses. Each Program must have a response set individually for shutdowns. If it is necessary to shut down the entire controller on the sensor input, insure that all 6 Programs (A-F) have shutdowns set for the sensor.
2. Use the Up and Down arrow buttons to move through the individual sensors.
3. Use the +/- buttons to select the response to each sensor for that program.
4. Use the Program button to advance to the next Program and set its responses.

Once a response (SUSPEND or PAUSE) has been set for a Program, all sensor responses must either be the same, or Off. A Program cannot be both Paused and Suspended at the same time.

If a Pause response is set for Program A to Sensor 2, then Pause is the only response that can be set for Program A. Changing Sensor 3 to Suspend A will cause Sensor 2 to change to Suspend A.

If the entire controller is required to shut down on an individual sensor input, each program (A-F) must be individually set to Pause or Suspend for that sensor.

Depending on how many sensors you are installing, only change the sensor response to pause or suspend according to sensor number one. Do not change the response for sensor two, three and four. This will cause the controller to engage in numerous sensor alarms. In a different scenario, if the sensor response is changed to pause or suspend, and the sensor has not been connected to the corresponding sensor terminals, the state change will remain active, indicating an open circuit. This too will cause a sensor alarm.

: Only change the sensor responses to pause or suspend for the Sensor inputs that are in use.

Example: If you only have one sensor, and it is wired into sensor input number one, set the response for Suspend or Pause, according to sensor number one. Do not change the response for sensors two, three, and four. Leave them set to Off.

Example #2: In this scenario, a Rain-Clik™ is connected to Sensor 1. It will Suspend the sprinkler stations in programs A through E when active.

Sensor 2 has a photo sensor connected, which will Suspend only Program F (which can be used for items like lighting, via 24VAC relay). The Rain-Clik™ sensor will not affect the lighting, and the photo sensor will not affect the sprinklers.

Programs	A	B	C	D	E
Sensor 1	Suspend	Suspend	Suspend	Suspend	Off
Sensor 2	Off	Off	Off	Off	Suspend
Sensor 3	Off	Off	Off	Off	Off
Sensor 4	Off	Off	Off	Off	Off

SENSOR ALARMS (CLIK SENSORS SEN 1-4 ONLY).....

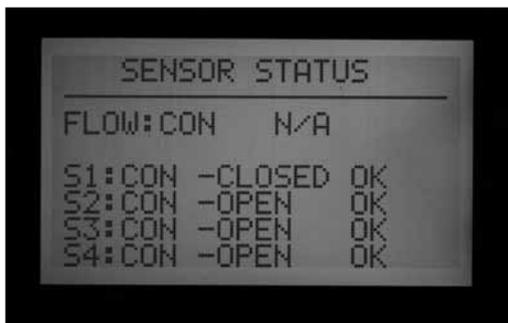
Whenever a sensor alarms (changes to Open from its Normally Closed state), an ATTENTION message appears in the display if a program response has been configured for that sensor.

Details for each sensor alarm will be found in the Alarm Log (Data History dial position). If the sensor response is changed to Pause or Suspend, and the sensor has not been connected to the corresponding sensor terminals, the sensor will remain active, and cause a sensor alarm.



If the sensor is set to OFF for all programs, it will not cause an alarm or ATTENTION display.

However, the state of the sensor may be observed at the Advanced Features dial position, Utility Functions, and then View Sensor Status. The screen will explain if the sensor is in a closed or open state. If the sensor's response was set to suspend or pause in the Set Sensor Operation dial position, the display will also show an alarm message in this screen if the circuit is open. You can also see the state of the sensor, even with the sensor response set to "OFF," in the Set Sensor Operation dial position.



If a Program configured for shutdown by that sensor was active when the alarm occurred, it will either Suspend or Pause as configured.



CLEAR MESSAGE



Press the + button to clear the alarm message, and view the status of the programs. Pressing + only clears the message, not the alarm. The display will then show the status of Programs in response to the sensor.



Programs that were Suspended will continue to show the stations and count down the time remaining, but will say SUSPEND along with automatic program letter and no watering will occur. If the sensor is reset, they will resume watering instantly where they should be in real time.

Programs that were Paused by the sensor will show the Program letter and Pause, and the time remaining will be frozen. No count down occurs because events are Paused. If the sensor is reset, the Paused Programs will resume instantly, wherever they left off when the alarm occurred.

Sensor alarms have no effect on Manual Single-station starts that are running.

Sensor alarms have no effect on Custom Manual programs.

Sensor alarms have no effect on the Test program.

All of these types of programs are initiated by a human operator so the sensor settings do not apply.



Note: Sensors have no effect on Surveyor generated System Events, or System Manual Events, when operating in Event mode. Sensor shutdowns are designed to be transmitted from the central in Surveyor systems. If an automatic Program (A-F) was started Manually, it will be shut down by an active sensor that is configured to shut down that program.

The sample display on the right shows a single active sensor alarm in process, with a range of possible responses. The operator has pressed the + button after the FAULT display, to view controller status.



Station 02 was running in Program A, and that Program has been Suspended (the seconds timer would still be counting, but watering would be stopped).

Station 06 was running in Program B, and has been Paused. The seconds timer would be frozen (and watering would be stopped).

Station 05 was running in a Custom Manual program, and the sensor would have no effect on it. Station 05 would still be watering in Custom Manual 1.

There is no direct Override for a Klik sensor. Depending on what needs to be accomplished, the Test program is still available (for winterization functions) and individual stations can still be started from the Manual position.

If a sensor is alarmed, and a Manual Program start is attempted for a Program with a response for that sensor, the display will show "CANNOT RUN MANUAL. A sensor is active for this program." That program cannot be manually started until the sensor is reset.

If the Manual Program was running prior to the state change in the sensor, the Manual Program will be put into either Suspend or Pause mode. The Manual Program will resume if the state of the sensor changes back to a closed circuit while there is still time left on the program. If the program that you are trying to manually run is not set to a Suspend or Pause response for the alarmed sensor, the Manual Program will be able to run manually.

If the Manual Program was running prior to the state change in the sensor, the Manual Program will be shut down and be put into either Suspend or Pause mode. The Manual Program will resume if the state of the sensor

changes back to a closed circuit. If the program that you are trying to manually run is not set to a Suspend or Pause response according to that sensor, the Manual Program will be able to run manually.

If full operations must be restored when a sensor is in alarm, turn the dial to the Set Sensor Operation position, and use +/- to change the sensor response to Off (by program).

View recent alarms, or alarm history, by turning the dial to the Data History position and selecting Alarm Logs See *Data History on page 38 for more information.*



SENSOR LOCATIONS

ACC versions 4 and later support two additional types of sensor inputs.

- ICD-SEN Sensor Decoders: Standard "klik" sensors (as well as the Flow meter) may be connected to ICD-SEN decoders in the two-wire path. The controller still has 4 sensor inputs, but you may set the location of each sensor to Controller (for the terminals on the controller's master module) or ADM (the decoder output module is called ADM99, and setting a sensor to this location means the input is assigned to a sensor decoder).

- ET Sensor: A Hunter model ET Sensor may be used for certain alarm inputs. The ET Sensor is a sensor platform, and three of its individual sensors can be used as sensor inputs for alarm purposed to the ACC Controller. The controller still has four sensor inputs, but you may set the location of each sensor to Controller (terminals SEN 1–4 on the controller's master module) or ET (Rain, Wind, and Temp). If the controller has a decoder output module, the third choice ADM will also appear.

Assigning sensor locations is called "mapping" and tells the controller where to look for each of its four sensor inputs.

Mapping sensor locations is the first step to setting up ICD-SEN operation, and is also an optional step in setting up ET Sensor operation.

To map sensor locations, unlock the extended features by holding down the blue information button, and turning the dial to Set Sensor Operation.

The Sensor Configuration screen will show the locations of each sensor, one at a time.

Type and Style cannot be changed. Most sensors are CLICK type and N. C. (normally closed) style.

Location: Use the down arrow to move to the Location field.

Press the + or – buttons to view other choices for the sensor's location.

If an ADM99 decoder module is detected by the controller, the choices will be Controller or ADM.

If an ET Sensor has been detected and the controller has been programmed to "Use ET Sensor" within the Advanced Features dial position, the choices will include ET Rain, ET Temp, and ET Wind.

Select the sensor's Location with the + or - buttons.

Press the up arrow button to move back to the Sensor number, and use + or – to move to the next Sensor.

Assign each sensor input that is to be used to the correct location. When you are finished, turn the dial to another position. If some sensors are unused, leave them set to Location: Controller.



SENSOR LOCATIONS

Individual ET sensors can be used to perform alarm shutdowns, by assigning them to the Sen 1-4 positions in the controller. The ET Sensors will then function exactly like “Clik” Sensor inputs. They may have Suspend or Pause responses set by Program.

Assigning ACC Sensor 1-4 alarm functions to an ET Sensor is done without connecting any additional wires. The controller will use the sensor data as a virtual alarm.

ET Sensor shutdowns only apply to the controller to which the ET Sensor is connected.

The ACC cannot shutdown other controllers as a result of these alarms.

ET Sensor shutdowns are not instantaneous, and there may be a delay of up to 18 minutes between an ET Sensor alarm and the actual shutdown. If this is not acceptable, a separate sensor (such as Rain-Clik or Freeze-Clik) should be installed and wired directly to one of the Sen 1-4 inputs for instant shutdowns.

The controller will automatically check the ET Sensor for updated sensor readings every 15 minutes. If an ET sensor causes a controller Pause or Suspend, that action will remain in effect for at least 15 minutes until the controller updates the readings. If the sensor returns to normal the Suspend or Pause settings will be cancelled, as with any other sensor.

Note: ET functions will only appear as a Location option with the updated versions of the facepack firmware (4 or higher), and an updated ET-ready Master Module. Once the controller is equipped with these components, ET must then be enabled in the programming. Turn the Dial to Advanced Features and select “ET Functions.” Select “ET Operation,” and press the plus button to confirm that the controller will “Use ET Sensor.” The ET location option will then be available to choose as a location for the controller’s sensors.

When the controller is set to “Use ET Sensor,” more options are also unlocked within the Advanced Features “ET Functions” screen. One of these unlocked screens is labeled “ET Alarm Setup.” Use the Down arrow to move to the “ET Alarm Setup” screen. Press the plus button, and you can adjust the shutdown levels for Rain, Temperature, and Wind.

Rain Max: The maximum amount of rain that will be permitted before a program is shutdown for the rest of the day. Move to this position with the arrow keys and use +/- to set the maximum.



The ET Rain sensor will shutdown programs after 0.02” (0.51mm) of rainfall within an hour (this amount is not programmable), but the program may be permitted to run again if no more rain is detected. The ET Sensor checks for rainfall every 15 minutes.

If the Rain Max amount is reached, the controller will no longer attempt to run the program that day.

Temp: The air temperature can be used as a freeze sensor to stop automatic programs, and the temperature at which shutdown occurs is programmable (from 25° to 45° Fahrenheit, -3.8° to 7.2° Celsius). Move to this position with the arrow keys and use +/- to set the low temperature shutdown.

Wind: If the optional ET Wind is installed, the wind speed (in mph or kph) can be used to shut down designated programs.

Reminder: Alarm settings are not in effect until the Sensor 1-4 inputs have been assigned to them at the Set Sensor Operation dial position, and responses have been configured by program.

SETTING PROGRAM OVERLAP OPTIONS.....

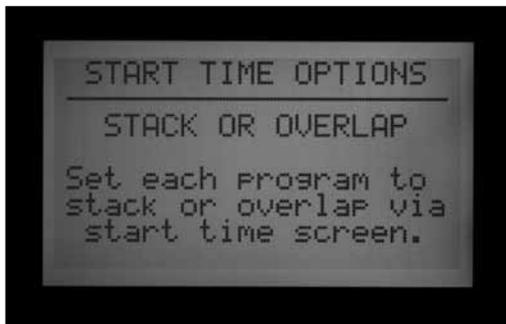
There are three program overlap options. These options allow you to maximize the number of stations operating simultaneously, if the system's hydraulics can support the flow.

To program the Program Overlap option:

1. Turn the dial to the SET PROGRAM OVERLAP OPTIONS position
2. Use the Up and Down buttons to navigate to changeable portions of each display.
3. Use the +/- buttons to see and set the choices.

Once the Program Overlap Option has been selected for the controller, individual programs can be set to Overlap or Stack at the Set Program Start Times position.

OPTION ONE: STACK OR OVERLAP



STACK means that the programs will run in alphanumeric order by Program letter and start time chronology. STACK is the default.

OVERLAP means that each program will start at the time it is scheduled to start, regardless of what else is watering. This is true under the condition that each program is set to Overlap. If Program A is set to Overlap and Program B is set to Overlap, both programs will start at the time they are scheduled to start, and run at the same time. If Program A is set to Overlap, and Program B is set to Stack, Program B will NOT run at the same time. Program B will not come on until Program A is finished with its scheduled run time. If you want multiple programs to water at the same time, each one of those Programs needs to be programmed to "Overlap."

Leaving this setting in the "Stack or Overlap" position means that each program can be set to Stack or Overlap, individually.

The OVERLAP option does not allow for multiple stations within the same Program to OVERLAP, or water at the same time. Only different programs may OVERLAP and run at the same time.

A more detailed explanation of this option can be found in the Setting Program Start Times section of this manual.



OPTION TWO: SMARTSTACK™



SmartStack will limit simultaneous operations to the number of stations specified here. The operator may program as many overlapping programs as desired, and the controller will permit overlap up to the number specified here, and stack the rest.

- SmartStack allows from two to five stations to operate simultaneously, before forcing additional stations into a stacked queue.
- Use the up and down arrow buttons to move to the number of stations allowed (after choosing SmartStack).
- Use the +/- buttons to set the number of stations allowed to overlap.

This is a great way to minimize the watering window by allowing the controller to run at maximum electrical capacity, if you have sufficient water pressure and flow to support multiple programs.

OPTION THREE: SSG/SMARTSTACK™



See SSG (Simultaneous Station Group) Setup on page 47 for more information..

An SSG (Simultaneous Station Group) is a group of up to four stations that water at the same time, for the same duration. Any 2 to 4 stations can be placed into an SSG, and from that time on, they will be programmed and operated as a single unit.

Combining stations into SSGs shortens programming time, and can also shorten watering time (by running multiple stations at once). SSGs should normally combine similar stations, with similar watering needs and flows, to be used to their best advantage.

When using SSGs, the controller can electrically only handle one SSG, two stations, and two Master Valves simultaneously, maximum. You must choose this option if you plan on using SSGs.

If SSG/SmartStack is chosen:

- Use the up and down arrow buttons to navigate to the number of stations (allowed to overlap with an SSG).
- Use the +/- buttons to set the number of stations permitted to overlap an SSG.
- Since an SSG may contain up to 4 stations, setting this number to "1" means that up to 5 stations may run at once (up to 4 in the SSG, plus one additional station). Setting the number to "2" means that up to 6 stations may run at once. Setting this to 0 means SSGs must run by themselves and may not overlap individual stations.
- ACC does not adjust overlap and stacking for SSGs which have fewer than 4 stations in them... it assumes that all SSGs have four stations, and the number of stations allowed with an SSG applies, regardless of the SSG's actual size.
- If the Program Overlap option has been set to SSG/SmartStack with a limit of 2, and an SSG is activated manually, the controller will assume the SSG may have up to 4 stations, and therefore, only 2 other stations will be permitted to run at the same time manually.
- Once a station is programmed into an SSG that station that may not have a run time by itself in any other program.

CAUTION: Understand your irrigation system's hydraulic restrictions before allowing stations to Smartstack or SSG/SmartStack. Overlapping stations may overtax the hydraulics of your system. Overtaxing your hydraulics will damage the components and result in inferior sprinkler performance. Mixing dissimilar stations in SSGs may cause over or underwatering of certain plant types.

SET STATION & PROGRAM NAMES

All set Station and Program names of the ACC can be named for easy reference. This can either be setup via the IMMS central control software, or it can be programmed at the controller using the keypad. The Contact Info screen can also be programmed at this position. This sets the display which appears when the controller is turned on, and which also appears in many of the Information screens. The factory default setting is Hunter Industries contact information, but it can be replaced with the company name, telephone number, and/or web site of the appropriate installing or servicing personnel.

ASSIGN CONTACT INFORMATION

1. Turn the dial to SET STATION and PROGRAM NAMES position. Use the +/- buttons to select a letter, number, or character for each letter position. It is possible to reprogram a character right over the existing text.



2. Hold the + or - button down continuously to advance rapidly through all choices, including capitals, lower case, numbers, and characters.
3. Use the left and right arrow buttons to advance to the next character position, and select the next character.
4. Continue until the line is complete. Use the arrow buttons to move down and reprogram each line.
5. Turn the dial to any other position, at any time, to save the text in the Contact Info screen.



6. Turn the dial to any other position, at any time, to save the text in the Contact Info screen.

DATA HISTORY

Name a Program (Up to 12 Characters and Spaces)

1. Turn the dial to the SET STATION & PROGRAM NAMES position.
2. Press the PLUS button once.
3. Use the up and down arrow buttons to select the program you wish to name.
4. Use the plus and minus buttons to select the letter or symbol you wish to use.
5. Press the right arrow button to advance the cursor and then repeat, using the plus and minus buttons to select the next letter or symbol.
6. Repeat until the name is completed.



Name a Station (Up to 12 Characters and Spaces)

1. Turn the dial to the SET STATION & PROGRAM NAMES position.
2. Press the + twice or the – button once.
3. Use the up and down arrow buttons to select the program you wish to name
4. Use the plus and minus buttons to select the letter or symbol you wish to use first, press the right arrow button to advance the cursor and then repeat using the plus and minus buttons to select the next letter or symbol. Repeat until the name is completed.

Shortcut: Use Copy and Paste for similar names, and change only the characters that are unique to the station.



5. Turn to any other dial position to save names.

This dial position allows you to view flow totals and various logs containing important histories of all activity.

Flow totals can be viewed for

- The entire controller
- An individual program
- An individual SSG
- Or an individual station.

Controller totals are based on total measured flow. Program, SSG, and station totals are extrapolated and are “educated guesses” that should closely approximate their totals, but they cannot be as accurate as the total Controller flow. Daily totals show decimals of gallons or liters, but weekly and larger totals round up to the nearest whole unit of measure.

Once the flow item is selected you can then view:

- The total for today and yesterday
- Week to date & last week totals
- Month to date and last month totals
- Or year to date and last year totals

When viewing these menu selections, the left arrow button on the facepack will operate as a Back button. Some selections lead to another list of choices, and the Back button will return you to the next highest level, without having to turn the dial.

VIEW FLOW TOTALS

1. Turn the dial to the DATA HISTORY position
2. Press the plus button once.
3. Press the plus or minus button until the item you would like to view is displayed
4. Press the down arrow button to highlight TODAY
5. Press the plus or minus button until the period you would like to view is displayed

VIEW ALARM LOGS

1. Turn the dial to the DATA HISTORY position
2. Press the down arrow button to select ALARM LOG
3. Press the plus button to view the log
4. Press the plus and minus buttons to scroll through the log. Alarms are logged by type of alarm, and time and date of occurrence.
5. The Alarm Log will store up to the last 250 events (the oldest events are replaced by new ones).



Alarm log items labeled “Missed Irrigation” are important, because they have caused stations to not water when they should. The reason for the missed irrigation will always be indicated, as “Overcurrent” (electrical) or “Overflow/Underflow” (hydraulic), etc. A complete list of possible Alarm Log messages appears at the end of this manual.

Each alarm log entry will have the exact time of the occurrence of the missed irrigation event.

VIEW CONTROLLER LOGS

1. Turn the dial to the Data History position.
2. Press the down arrow button to select Controller Log.
3. Press the + button to view the log.
4. Use + and – buttons to scroll through the log of Controller level events.

The Controller Log will store the last 250 Controller-level events, with date and time stamp. These include critical changes, such as dial turned to OFF position, Controller time reset by user, Easy Retrieve Restore, and other major changes. A complete list of possible Controller Log messages appears at the end of this manual.



VIEW STATION LOGS

1. Turn the dial to the Data History position.
2. Press the down arrow button to select Station Log.
3. Press the + button to view the log.
4. Use + and – buttons to scroll through the log of Station level events.

The Station Log will store up to 1500 events, and records all station activity, including every start and stop of each station. It may include alarm events if applicable. A complete list of possible Station Log messages appears near the end of this manual.



All logs (Alarm, Controller, and Station) replace the oldest events when they are full, and contain only the most recent events within the controller memory’s holding capacity. They will never fill up, but the oldest records will be overwritten (first in, first out, or FIFO).

All logs are cleared in computerized central systems after the central computer uploads this data as part of its communications. The log will then display NO RECORDS TO SHOW and the logs will be available in the central software, instead.



ADVANCED FEATURES

This dial position is used to verify the version and size of the controller, and to configure and use some of the ACC controller’s more powerful features.

A list of functions will appear at the Advanced Features dial position, but they will depend on the devices installed in the controller, and the version of the controller.



If station size is incorrect, or shows “0” or “1”, check that Powerlock slide is in the ON (locked) position. Check that all station module contacts are in good order and that the modules are fully inserted. Make sure powerlock tabs on front of modules have good contact with the slide lock. An incorrect station count may indicate a damaged module, if it persists after all checks have been made.

When the info button is not pressed, the Advanced Features may show all or some of the following items:

Utility Functions: ET Functions (only if ET Ready Master Module and firmware are installed)

Event Mode Options: *See Event Mode Options (agc, surveyor) on page 75 for more information.* (Golf only).

Decoder Functions (only if ADM99 decoder output module is installed)

When viewing these menu selections, the left arrow button on the facepack will operate as a Back button. Some selections lead to another list of choices, and the Back button will return you to the next highest level, without having to turn the dial.

Select Utility Functions to see the following choices:

View Firmware Versions: Select to see version numbers of all modules in use in the controller.

VIEW VERSION AND STATION SIZE

Turn to Advanced Features dial position.

Press and hold the Information button.

This will display contact information for help. This information is programmable at the Set Station and Program Names dial position, if you wish to change it.

FP Temp is the internal facepack temperature. It is not used and is informational only.

The Revision number is the version of ACC firmware loaded in the controller. You can download the latest version of firmware from www.hunterindustries.com and flash update the controller facepack from a laptop computer.

Please note this version number whenever asking a question from technical support about the ACC controller.

Station Size: Shows the number of station outputs recognized by the facepack. This does not show how many valves are in the field, or in use. It is the count of station output modules (number of ACM600 or AGM600 modules x 6 stations each), or it will show “99” if an ADM99 Decoder Output module is detected.



View Sensor Status: This will show the location and status of the flow meter and all sensor inputs (1-4). CON means Controller, or the screw terminals for sensor connections inside the controller.





ADM means the ADM99 decoder output module, and shows that the meter or sensor input has been assigned to an ICD-SEN sensor decoder in the two-wire path.

ET followed by a sensor name means the input has been assigned to an ET Sensor.

ET Functions are described in their own section in this manual.

Event Mode Functions are described in their own section in this manual.

Decoder Functions are described in their own section in this manual.

COMMON ALARM (ATTENTION) MESSAGES.....

OVERCURRENT

In a conventionally-wired controller with ACM600 or AGM600 outputs, Overcurrent means that the station has exceeded 0.56 Amps output. This indicates that either too many solenoids are connected or the field wiring or solenoid has a problem, causing an unacceptably high current. All solenoids are different and not all solenoids may be "doubled" on an ACC output. A solenoid with a holding current of 0.3 A is acceptable, but two of them (equaling 0.6 A) would exceed the 0.56 A max limit and cause an Overcurrent.



The Alarm Log will indicate whether the alarm was associated with a station number, or "ADM", referring to the ADM99 decoder output module.

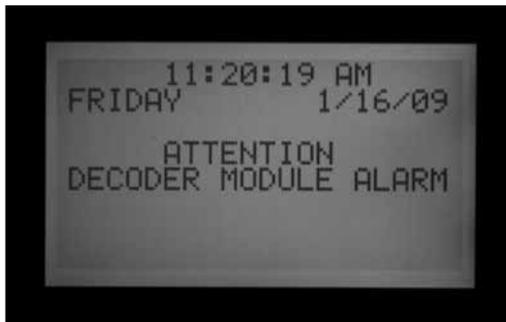
A station Overcurrent in a decoder system indicates a high-draw condition on the output side of the decoder, to the solenoids, usually a shorted solenoid.

In decoder controllers, Overcurrent may have more complex causes, but still indicates an unacceptable high current on the decoder line.



An ADM Overcurrent message means the total draw on the two-wire path(s) was greater than 2.2 amps, but the ADM99 was not able to identify a particular station causing the problem.

Any ACC display that shows ATTENTION is indicating an alarm or other condition that should be investigated. You should immediately turn the dial to Data History and select the Alarm Log to view all details associated with the alarm. This will often reveal the real problem at a glance.



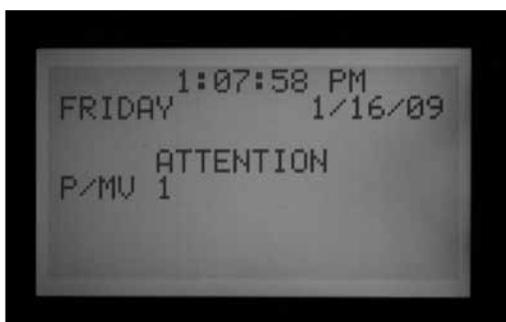
The ATTENTION message in the display will not stop irrigation by itself, but the condition it is reporting may. If a station is in Overcurrent, the station cannot run, but other stations may continue running even when ATTENTION is in the display. Press the information button to clear the ATTENTION message if you want to see the normal status screen.



OVERFLOW

A station has exceeded its learned flow upper limit during irrigation. ACC totals the upper limit of the learned flow for all running stations, and compares them to the actual flow at the flow meter. When the combination of stations exceeds the total upper limits (after all Delay times have elapsed), the controller will Pause and go into alarm diagnostic mode.

P/MV outputs have a max output of 0.325 A. Pump start relays with very high current requirements may need a dedicated transformer and an additional relay (such as Hunter Model PSRB) for reliable operations.





Alarm diagnostics consist of pausing all operations, then starting each station that was running at the time of the alarm individually. Each of these suspect stations has its flow sampled alone, to see if it caused the overflow. If the controller identifies a station as having high flow, it will create a Missed Irrigation report and attempt to continue watering with other stations.

POWER OUTAGE/POWER RESTORED

Power Outage and Power Restored messages often appear one after the other, and show when AC power to the facepack was lost and when it is restored. By comparing the dates and times of the messages, you can determine how long the power was off to the controller. Power Outage and Power Restored messages are also caused whenever the facepack is removed from the controller and replaced.



UNDERFLOW

A station has caused too little flow, indicating a possible problem. The underflow amount cannot be set directly, but is twice the percentage of the Limit amount set for overflow. If a station is set 115% for the upper limit (normal flow + 15%), then 70% will be the underflow amount (normal flow = 30%).



EXTENDED FEATURES

CONTRAST ADJUSTMENT

At the Run position, press INFORMATION button and + button together.

The contrast of the LCD display can be adjusted from 1 to 90 to make it more visible in different light conditions. In the Run position, press the blue Information button and the + button at the same time for a few seconds, until the Contrast = 50 display appears. The + and - buttons can then be used to adjust the display for maximum visibility.



NO WATER WINDOW

No Water Windows prevent any automatic irrigation from occurring during certain hours, by Program. This can be used to protect high traffic areas from accidental programming, or the results of Seasonal Adjust, during busy times of day.

Start in any other dial position, hold the Information button down, and turn the dial to Set Program Start Times. Release the Information button.

The display will now permit programming of No Water Windows.

To set a No Water Window

1. Use the Program button to select the program for which a No Water Window is desired.
2. Use the +/- button to set the time for the beginning of the No Water Window ("FROM") in hh:mm format, including AM/PM if applicable.



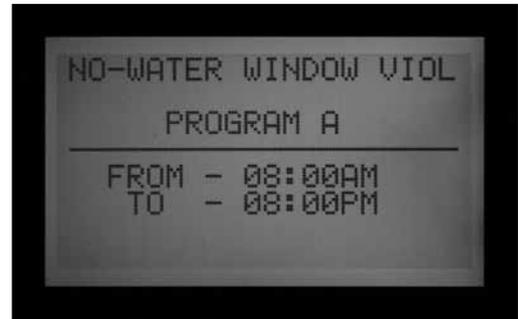
3. Use the down arrow to move to the "TO" position, to set the end of the No Water Window.
4. Use +/- to set the end of the window, also in hh:mm format.

The No Water Window is now set. Use the Program button to set a No Water Window for another Program, or exit the dial position to save the settings.

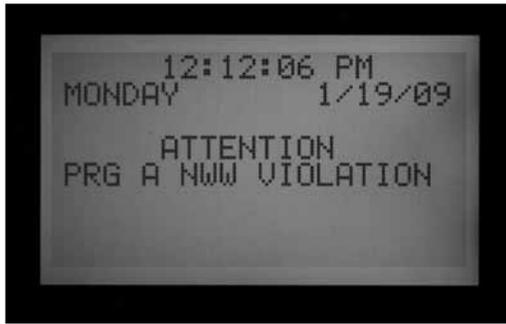
No Water Window rules

- Each Program may have a different No Water Window.
- If the operator attempts to program a Start Time that falls within a No Water Window, the display will flash a warning. If the warning is ignored, the Start Time will be saved, but will not run during the No Water Window.

If a start time has already been programmed, and the operator attempts to enter a No Water Window which overlaps the start time, the display will flash a warning.



- If a Program starts at a "legal" time, but runs past the beginning of a No Water Window, irrigation will be stopped (display will show "Suspend"). If the No Water Window ends and the program still has time left, the irrigation will resume where it should be for that time of day. Any irrigation that was suspended during the No Water Window will be missed. Likewise, if a start time has already been programmed and the operator attempts to enter in a No Water Window, and the start time falls within the No Water Window time period being set, the display will flash a warning as well.
- Programs that continue into a No Water Window because of Cycle & Soak settings, or because of Seasonal Adjust settings, will also be suspended. However, there will be no warning in the display when these changes are made at Cycle & Soak or Seasonal Adjust.
- In version 4 and later, an ATTENTION message will be displayed whenever a Non-Water Window violation causes watering to be missed, and the missed stations will be listed in the Station Log.



DELAY BETWEEN STATIONS

Delay between Stations allows the operator to set an automatic delay between sequential stations by Program, from 1 second to 6 hours. The original purpose of Delay between Stations was to provide time for slow-closing valves to shut down before the next valve was started, and these delays are usually set in seconds. The Delay can also be used to allow time for a well or pump reservoir to refill before the next station begins.

In the ACC, Delay Between Stations can be set by Program, which can be very useful when only certain types of stations (large rotor zones, low flow drip) are grouped within a program.

Start in any other dial position, hold the Information button down, and turn the dial to Set Station Run Times. Release the Information button.

The display will now permit programming of Delay between Stations.



To set a Delay

1. Use the Program button to select the Program for which the Delay is to be set.
2. Use the +/- keys to set the delay in h:mm:ss format. Use the left and right arrows to move through the hour, minutes, and seconds fields until the delay is set.



The Delay Between Stations for the Program is now set.



Use the Program button to set a select another Program, or exit the dial position to save the settings.

Delay Between Stations rules:

- Delays occur equally between all stations in a Program.
- Delays do not occur before the first station, nor after the last station.
- Delays may cause a Program to run into a No Water Window, and no warning will be flashed. The No Water Window will still prevent any irrigation during the No Water Window times.
- The delay time is not included in the "Total Program Runtime" screen, or the "Total Station Runtime" screen.

P/MV STYLE (NORMALLY CLOSED/NORMALLY ON)

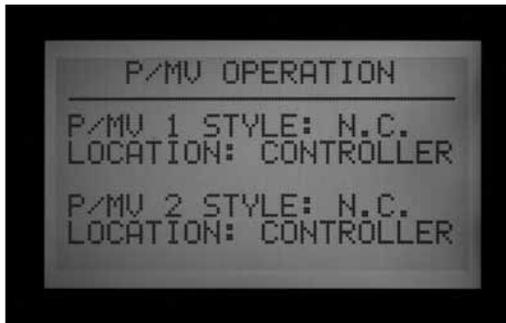
The ACC controller is designed to work with Normally Closed master valves (MV). The P/MV Style setting allows you to reverse this operating feature for very specialized applications, by making Normally Closed valve "on" all the time, except when a station is running. Then the normally closed master valve will turn off and close.

This is not a normal irrigation setting but may be useful for some specialized applications. The ACC controller is NOT designed to operate with true Normally Open valves.

ACC's two Pump/Master Valve outputs (labeled on the master module terminals as P/M1 and P/M2) are preset to Normally Closed (NC), but either of them can be set to Normally Open (NO).

A Normally On P/M setting means the station output is always hot (providing 24 VAC) until an associated station is activated, at which time the P/M output turns off.

- Start in any other dial position, hold the Information button down, and turn the dial to Set Pump Operation. Release the Information button.



The display will now permit selection of P/MV1 and P/MV2 settings.

To change the Normal condition of P/M outputs

Use the +/- keys to set P/M1 to NC or NO. Use the right arrow to move to P/M2, and use +/- to change it between NC or NO.



The Location field is only changeable in Decoder controllers. In a decoder controller, the Location field may be changed from "Controller" to "ADM" (decoder module). If you select ADM as the Location, this indicates that the Pump or Master Valve is connected to a decoder that has been programmed to be the Pump or Master Valve decoder, and the decoder is connected to the two-wire path.

If a P/M output is set to NO, the green light on the Master Module for output activity is always lit, until a station with that P/M is activated. Then the station activity light will go out, to show the output has shut off.

SETTING THE FLOW SENSOR SIZE AND TYPE

ACC's Real Time Flow Monitoring is designed to work with Hunter HFS flow sensors. It is necessary to tell ACC what size fitting the HFS has been installed into, so that flow can be measured accurately for pipe size.

The ACC may also work with other standard types of flow sensors or meters available, but additional calibration is required. These sensors are set up under the selection "OTHER". One known compatible sensor is Data Industrial Model IR-220B (also sold as Hunter model GENDATFL), and other Data Industrial sensors with the same signal characteristics should perform satisfactorily.

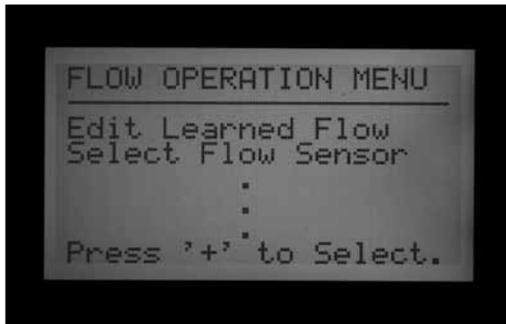
The HFS must be installed into one of the mating FCT fittings designed for that purpose. At this time, there are 7 possible sizes ranging from 1" diameter (25 mm) to 4" (100 mm), in two different classes of pipe, according to the following table.

Pipe Size	Metric (rounded)	Class	Fitting Model	Minimum Flow (GPM/LPM)
1"	25mm	Schedule 40 (white)	FCT100	6/22
1.5"	38mm	Schedule 40 (white)	FCT150	13/49
1.5"	38mm	Schedule 80 (gray)	FCT158	13/49
2"	50mm	Schedule 40 (white)	FCT200	20/75
2"	50mm	Schedule 80 (gray)	FCT208	20/75
3"	76mm	Schedule 40 (white)	FCT300	50/189
3"	76mm	Schedule 80 (gray)	FCT308	50/189
4"	100mm	Schedule 80 (white)	FCT400	60/227

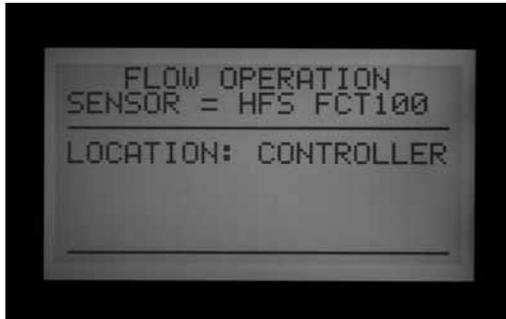
The HFS cannot read flow below the minimum rate (in GPM/LPM) listed for the pipe size.

After connecting the flow meter according to the HFS installation instructions, the Pipe Size must be entered into ACC for the measurements to be accurate.

1. To calibrate flow sensor readings: Start in any other dial position, hold the Information button down, and turn the dial to Set Flow Monitoring. Release the Information button to view the Flow Operation screen.



2. Use the down arrow button to move to Select Flow Sensor, and press the + button to choose it.



3. Use the + button to advance through the pipe sizes shown in the Fitting Model column until the correct size is displayed. The last selection after the standard FCT models is OTHER.

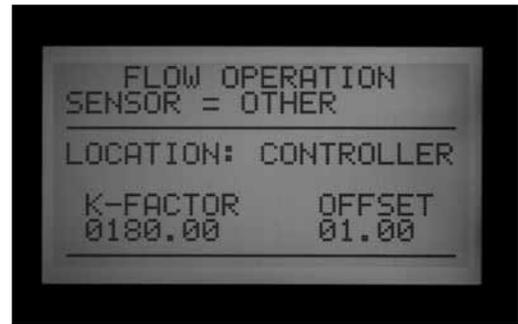


4. If the controller has a decoder output module, and the flow meter will be connected to an ICD-SEN sensor decoder on the two-wire path, use the down arrow to move to Location. Change Location to ADM with the + or - buttons.



5. Exit the dial position to save the settings, unless you have selected OTHER.

Additional settings for OTHER



Most other brands of flow sensor require two settings for calibration, the K-factor and the Offset. The correct settings for these values are found in the sensor manufacturer's documentation, and they are based on the pipe type and size.

1. Consult the "Other" flow sensor's documentation for the correct values for a given pipe size.
2. If Other is chosen, use the down arrow to move to the K-factor setting.
3. Use the right arrow to skip over any places that need to be left at "0".
4. At any digit which needs to be changed, use the +/- buttons to enter the digit. Then move to the next place and repeat until the correct K-factor is displayed.
5. Use the down arrow to move to the Offset value, and repeat.

When the correct values are shown for both K-factor and Offset, exit the dial position to save the settings. The flow sensor will now be calibrated for the pipe size.

SSG (SIMULTANEOUS STATION GROUP) SETUP

Turn the dial to the Set Program Overlap Options position
See SETTING PROGRAM OVERLAP OPTIONS on page 36 for more information.

SSGs are groups of 2, 3, or 4 stations which are grouped together electronically. They will then all run together and are programmed as a single unit. Up to 20 SSGs can be created in the ACC controller.

This powerful feature can be used to balance flow, shorten the water window, simplify programming, and expedite common tasks. SSGs can be included in automatic programs or custom manual programs, and can be started manually from controller at any time. They can also be named to make using them easier.

SSGs are not required to operate the ACC controller. They are a valuable extra feature for advanced users.

See SSG Rules on page 49 for more information.

To create and use SSGs: In order to create and use SSGs, the controller must first be placed into the SSG/Smartstack mode.



1. Turn the dial to the Set Program Overlap Options position.
2. Use the +/- buttons to select SSG/SmartStack.
3. Turn the dial to any other position to save the setting.
4. Hold down the Information button, and turn the dial back to the Set Program Overlap Options position.
5. Release the Information button, and the SSG Setup screen will appear.



6. The first possible SSG will be presented as STA GRP 01, and will display 4 rows (dashed lines in a new installation, station numbers if they have already been programmed). Each line is for a station that can become a member of the SSG.
7. Use the down arrow to go to the first dashed line (or existing station number).
8. Use the +/- buttons to select a station number. Once a station has been assigned to an SSG, it is no longer available for other SSGs, and will not appear as one of the choices while pressing + or - in other SSGs. Once a station has been programmed into an SSG, this station will no longer be available individually as a single station outside of the SSG. If a station in an SSG is viewed individually in the Station Run Times position, the run time will be filled with asterisks (**:**:**) and the screen will show the SSG to which the station belongs, instead. No run time may be entered for an SSG station individually. If a station has an individual run time in a program, that station will not be able to be programmed into an SSG. While entering stations into an SSG, the stations that already have a programmed run time will be skipped over, and the only stations with no run time will be shown.



9. Use the down arrow to go to the next station line, to add another station to the SSG.
10. Include 2, 3, or 4 stations in the SSGs as needed. (It is possible to create an SSG of only 1 station, but this defeats the purpose of the SSG- single stations may be mixed in a program with SSGs, as long as they are not SSG members.)



11. When the SSG is complete, you can create another SSG without exiting the dial position.
12. Use the up arrow to move back to the STA GRP location.
13. Press +/- to select another STA GRP number.
14. Continue to add stations and create SSGs until all desired groups are created and populated.
15. Turn the dial to any other position to save. The SSG groups that you have programmed can be found within the "Set Station Run Times" position after the last station number in the controller, or by going backwards from station 1. The same is true for the "Manual Operation" dial position (the SSG groups will be found after the highest-numbered individual station).

You may run a station individually, even if it has been programmed in an SSG, by selecting the "One Station" manual in the Manual Operation dial position, and then selecting the specific station you would like to run. You may also run a station individually that has been programmed in an SSG by using a remote control.

EDIT AN SSG

Changing or deleting an existing SSG is done from the same Extended Feature.



1. Hold down the Information button, and turn the dial back to the Set Program Overlap Options position.
2. Release the Information button to view the SSG Setup screen.
3. The first SSG will be displayed and highlighted. Change to a different SSG by pressing + or – to move through all SSGs.
4. When the SSG to be edited is selected, use the down arrow to move to the stations area of the display.
5. To replace a station in an SSG (with a different station): Highlight the station to be replaced. Press the + or – buttons to change the line to the new station number.
6. To delete a station in an SSG (without replacement): Highlight the station to be replaced, and use the + or – buttons until the dashed line appears. This choice appears between the highest numbered station, and the lowest station remaining which has not been assigned to an SSG. Leave the dashed line and move to a different field in the display with the arrow buttons.
7. To add a station to an SSG: Use the down arrow to move to the next blank dashed line.
8. Use the + or – to select the station to be added. Once all 4 lines are full (contain station numbers or names), the SSG is full and no more can be added.



ADDING AN SSG

Enter the SSG Setup mode (Information + Set Program Overlap Options).

The first SSG will be highlighted.

Use the + button to advance through all existing SSGs, until the next unused SSG appears (having all dashed lines with no station selections), and select stations as desired.

Once the controller is in ACC Setup mode, all 20 SSGs are available, whether they are used or not.

DELETING AN SSG

Technically SSGs are never deleted, as there are always 20 available. Instead, simply select the unwanted SSG, and delete the stations contained in it until no stations are listed under the SSG name.



SSG FLOW DATA

SSGs use the combined learned flow data for all their member stations. They do not have a flow assigned directly to them. If the stations in an SSG are edited (added or deleted), the flow for the whole SSG will change by the amount of that station.

SSG RULES

A station which is included in an SSG may still be started separately at the Manual Operation function or from the ICR remote control.

A station which is included in an SSG is not available for individual placement in automatic Programs, while the controller is in SSG/SmartStack mode.

In the Set Station Run Times position, individual stations which are SSG members will be shown, but their run times will show as **:**:** and cannot be changed. The display will show the number of the SSG to which they belong, and the run time for the SSG should be changed instead.

SSGs are shown at the end of the station list when setting run times, and most other functions. For example, in a 12 station controller, the stations would be displayed as 1, 2, 3...12 followed by SSG 01, SSG 02, etc.

Beginning from station 01, use the – button to see the SSGs quickly (like going backward from the beginning of the list to the end of the list).

CUSTOM MANUAL PROGRAM SETUP

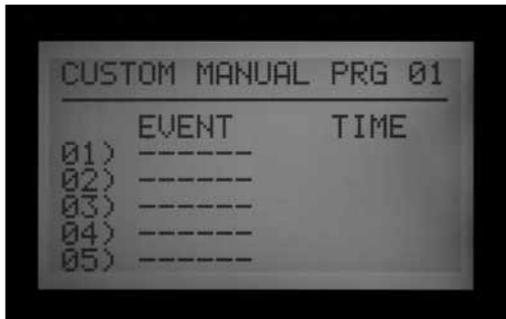
Press the INFORMATION button and turn the dial to Manual Operation.



Custom Manual programs are “preset” irrigation sequences which do not run automatically, but can be started at any time from the Manual Operations position. The ACC permits up to 4 Custom Manual programs.

Custom Manual programs can be used for many specialized functions that are commonly started from the controller, to save tedious setup each time the function is needed. They also permit very flexible programming for unusual applications.

To create a Custom Manual program: Press the Information button, and turn the dial the Manual Operations position. The Custom Manual setup screen will appear.



The screen will show a setup form for Custom Manual Prg 01.

To set up a different Custom Manual, press the Programs button to advance.

To continue setting up the selected Custom Manual, press the down arrow to advance to the first Event.

Events can be stations, SSGs, or even Delays. Events are the order in which items will run.

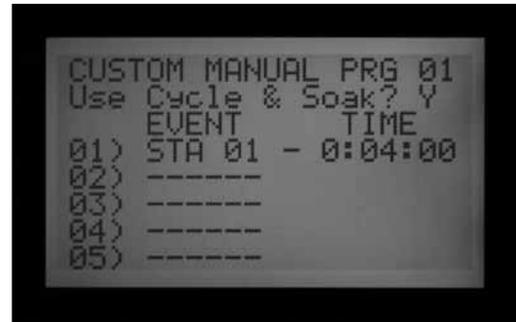
Use the + or – button to choose a station or SSG for the first event.

Use the right arrow to move to the duration (time) for the event. This can be completely different from any run times that item may have in regular programs (A-F).

After run times are entered, the “Use Cycle and Soak?” question will appear, if the station or SSG has been

programmed to use Cycle and Soak with the “Y” selected. If you want the stations or SSGs to use their normal Cycle and Soak settings (if applicable), leave the option set to “Y.” If not, change the “Y” to “N” with the + or – buttons.

For specialized applications where longer run times are desired (such as leaching), leave the Use Cycle and Soak to N and the station or SSG's Cycle and Soak settings will be ignored.



Use the down arrow to move to the next event, and continue until the Custom Manual program is complete.

CUSTOM MANUAL RULES



- Delays can be inserted as Events. Use the + or – buttons (the – button is often closer) to scroll through the stations and SSGs to DELAY (occurs below Station 01, and above the highest numbered station or SSG). Set a time for the delay as though it were a station.
- Stations and SSGs may be mixed in a Custom Manual.
- The same station (or SSG) may be included multiple times in a Custom Manual.
- Stations (or SSGs) may run in any order in Custom Manuals, unlike automatic programs.
- Custom Manuals are always run in an overlapping mode, because they are manually started.

For example, if an automatic program, manual, or ICR command is already running, the custom manual will run at the same time within the six station maximum rule. If there are already three stations running, and the first event in the Custom Manual is an SSG, the screen will explain in the Manual Operation dial position that it cannot run the Custom Manual because the max number of stations is already running.

START A CUSTOM MANUAL

- Turn the dial to the Manual Operation position.
- Use the Program button to select the Custom Manual program (Custom Manual programs will appear after the A through F selections).
- Turn the dial to Run, to start the Program at the beginning. The display will show "To Manually Start Station 01...", but this only indicates that it will start at the beginning of the program. Each station will run for its programmed time, and stations with no run time in the selected program will be skipped.



- To start later in the Program (at a higher numbered station), use the down arrow to move to the station number, and press the +/- buttons to advance to the desired station (or SSG) number.
- Turn the dial back to Run to start the Program at the desired station. The Program will begin at that station and continue until the last event, then stop.

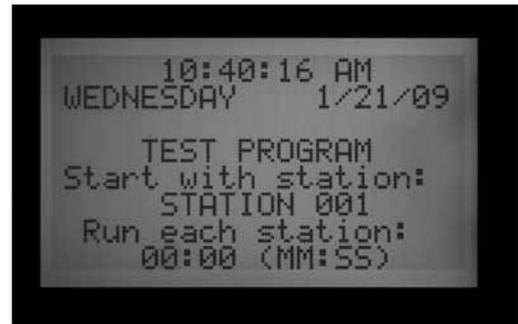
The display will show #-CUST under Mode, to show why the stations are running.

TEST PROGRAM



Press and hold the Programs button

ACC has a quick Test program which will run all stations for a selectable period of time, in numerical order. The Test is an easy way to walk through every station in the system to verify proper operation, or perform diagnostics. It also features a quick advance for stepping through stations with the arrow button.



Test does not run SSGs or programs. It activates each individual station output in turn.

Run a Test Program

- Turn the dial to the Run position.
- Press and hold in the Programs button for approximately 3 seconds.
- The Test Program screen will appear below the time/date display.
- The screen will show Station 01 (and its name, if applicable) and the run time field will be highlighted.
- To start the Test Program on a station higher than 01, use the Up and Down arrow buttons to advance the starting station number.
- Use the +/- buttons to set the test run time, in mm:ss format. The maximum run time in Test mode is 15 minutes. The minimum run time for Test is one second in conventional controllers and 15 seconds in decoder controllers.
- Use the right and left arrow buttons to move between the minutes and seconds fields to set the universal test time, and then wait a few seconds.
- The Test program will begin running in 3 seconds if no further buttons are pressed. Each station will show the time remaining in the display.
- Once the Test program is running, the stations can be advanced or reversed without waiting for the run times to complete. Press the right arrow button to step up one station immediately. Press the left arrow button to back up one station (this will restart the previous station with a new Test run time).

- The Test Program will try to start ALL stations counted by the controller. If you are running a Test Program on a decoder controller, the Test Program will attempt to activate all 99 stations. If you do not have 99 stations installed in the field, this may cause multiple alarms for decoder stations that are not present and do not respond.

EASY RETRIEVE™ BACKUP

Press the INFORMATION and Programs button at the same time with the dial set at Run position).



This saves the complete controller setup, including programs, start times, run times, etc., in a safe part of the controller's memory.

Once this info is saved, it can be recalled and the controller can be restored to that condition regardless of what has been programmed or altered since.

Remember to save an Easy Retrieve backup after the controller is programmed and fully operational. If other people make unauthorized changes or don't know what has been done to the controller times, the Easy Retrieve restore function can be used to restore the controller to the original program set up.

- To save an Easy Retrieve backup: First, make sure the controller is in the desired state of programming, including Days to Water, Start Times, Run Times, names, etc.
- Turn the dial to the Run position.
- Press the Information and the Programs buttons at the same time.
- The Easy Retrieve save screen will appear.



SAVE will be highlighted. Press the + button to save the program, and a confirmation message will appear. The Save can still be cancelled with the – button, or press + to complete the save. The backup will be complete if + is pressed.



- To Restore an Easy Retrieve program: Turn the dial to the Run position.
- Press the Information and the Programs buttons at the same time, and the Easy Retrieve screen will appear.
- Use the down arrow button to move from Save to Restore.
- Press the + button to Restore. A confirmation message will appear.



- Press – to cancel the Restore, or + to continue with it.
- If + is pressed to confirm, the original saved Easy Retrieve program will replace the existing controller information.
- If you wish to make a new backup, leave Save highlighted and press + to create a new backup. This will completely replace the original Easy Retrieve backup with the new one.
- If no backup has ever been made, the Restore option will not be shown until an Easy Retrieve backup has first been saved.

ONE TOUCH MANUAL START



One-Touch Manual Program Start with Station Advance (right arrow button)

With dial in Run, press and hold the right arrow button approximately 3 seconds to enter Manual Program start mode.

Choose desired program with Programs button, and wait.

Program will start in approximately 3 seconds, if no other buttons are touched. The controller will run the selected program until it is finished. Note that the program will still run automatically at the scheduled start time (if it is a watering day).

You have the option of beginning on a higher-numbered station or SSG, if you do not wish to run the whole program.

Before the program starts, use the down arrow button to move to the station number in the display.

Press the + button to move to a higher-numbered station or SSG, and wait approximately 3 seconds.

The program will begin on that number. It will not “circle around” and water the lower numbered stations. It will begin at the number you selected, continue to the end, and stop.

Once the Program is started, press the right arrow again to advance, to the next highest-numbered station (or SSG) in the Program with a run time. You may continue to

advance through all the stations/SSGs in a Program.

- If the controller is running that last (highest numbered) station or SSG with a run time in the selected program, and the right arrow button is pressed again, the station will be stopped and no new stations will be started (the program will have completed).
- The Station Advance feature does not work in reverse. You may advance, but you may not step back down through the lower numbered stations and SSGs.
- SSG groups are advanced as a group. If the SSG running contains 1, 2, and 3, and the advance button is pressed, 1, 2, and 3 are all stopped and replaced by the next station or SSG in the program. If the next item was an SSG containing 3, 4, and 5, then stations 1,2, and 3 will be replaced by stations 3, 4, and 5.
- You may start multiple programs with the One-Touch Manual Program Start. Start the first program and wait for it to begin. Then press and hold the right arrow again. Until you change programs, the display will show "CANNOT RUN MANUAL. This program is already running."



- Press the Programs button to select another program and wait about 3 seconds for the program to begin.
- Stack and Overlap settings are observed in Manual Starts. You may only run multiple programs manually if they are all set to Overlap.

MANUAL OPERATION DIAL POSITION

This dial position enables immediate operation of either a single station (including P/MV1 or P/MV2), or an Automatic Program. It can also be used to start an SSG or a Custom Manual Program (if these optional items have been created).



- Turn the dial to the Manual Operation position.
- Use the +/- buttons to switch between Manual Program, or Manual One Station.



“Program” will allow an entire Program to be run immediately, and will also allow the Program to be started at any station (to run from that point to the end).

- Use the Program button to select the Program (Custom Manual programs will appear after the A through F selections).
- Turn the dial to Run, to start the Program at the beginning. The display will show “To Manually Start Station 01...”, but this only indicates that it will start at the beginning of the program. Each station will run for its programmed time (including Cycle and Soak settings), and stations with no run time in the selected program will be skipped.
- You may change the run time for the station selected by using the +/- buttons to set the desired run time in h:mm:ss format. Changing the run time in this screen will only affect the station that is currently being displayed; it will not change other station’s run times in the manual program. Changing the run time in the “Manual Operation” screen will not change the run time for that station in the “Set Station Run Times” screen, which applies to the programmed automatic run time for that station.
- To start later in the Program (at a higher numbered station), use the down arrow to move to the station number, and press the +/- buttons to advance to the desired station (or SSG) number.
- Turn the dial back to Run to start the Program at the desired station. The Program will begin at that station and continue until the last event, then stop.

Manually started Programs and Custom Manual programs do not run for multiple start times. Programs started at a higher station than their beginning station do not start over at the beginning; they run from the designated station and run to the end, then stop.

“Manual One Station” allows any individual station, SSG, or P/MV to be started.



- Use the +/- keys to select a station. Any SSGs will appear at the end of the station list.
- From the Station 01 position, the – button will go immediately to the highest numbered station, or the SSGs. The Manual One Station function is the only way to activate P/MV outputs by themselves, without an associated station. You can assign a run time from 1 second to 6 hours to either of the P/MV outputs for manual watering or other purposes.
- Use the left and right arrow buttons to move between the hours:minutes:seconds fields.
- Use the +/- buttons to set the desired run time in h:mm:ss format.
- Turn the dial to the RUN position, and observe the display. The station or SSG will begin irrigating within a few seconds.

The display will always show a list of items running, why they are running, and the remaining time for each item.



SYSTEM OFF.....

To completely stop all irrigation, including any stations which are already running, turn the dial to the System Off position.

Within a few seconds a large OFF will appear in the display. Any stations which were running will be shut down, and no new automatic irrigation will be allowed to start.



The controller cannot run automatic programs with the dial in the Off position. However, ICR remote controls will still operate stations manually when the dial is in OFF.

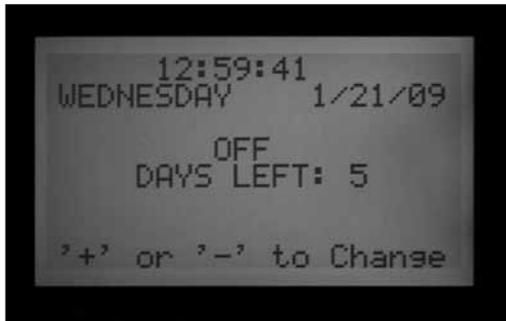
RAIN OFF.....

It is also possible to set a programmable period (from 1 to 31 days) for Off, after which the system will automatically return to automatic irrigation. This is useful for halting irrigation when weather fronts or conditions are expected to persist for several days.

To set a programmable Rain Off duration: turn the dial to the Off position.

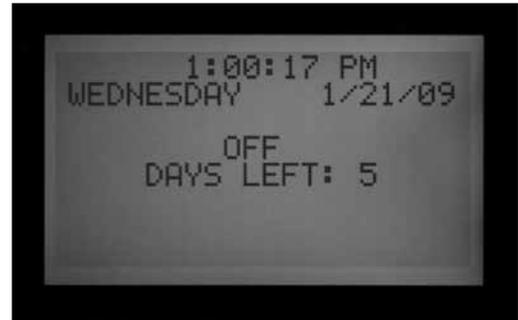
While the controller is in the OFF mode, press the + button and hold for approximately 3 seconds.

The Days Left: xx display will appear. Release the + button, and then use the + or – button to set the desired number of Days Off before automatic irrigation will resume.



Turn the dial back to Run immediately (the days off setting will time out if it is left more than 5–6 seconds).

The display at the Run position will then show the number of days for the Off setting. This display will count down each day, showing the remaining days until automatic irrigation will resume.



RESET.....

The ACC controller can be reset, erasing most programmed information. There are 5 different levels of Reset command available, but once any of them is chosen, the information will be permanently erased.



To Reset the ACC controller: Turn the dial to the Run position.

Press and hold the Programs button, and at the same time press in the recessed Reset button with the tip of a ballpoint pen. Release the Reset button and continue holding the Programs button until the Reset Memory screen appears (then release the Programs button).

These operations are not reversible!

Reset should only be performed if:

- a “clean start” is desired for programming purposes, or
- if directed to do so by Hunter Technical Services as a troubleshooting technique.

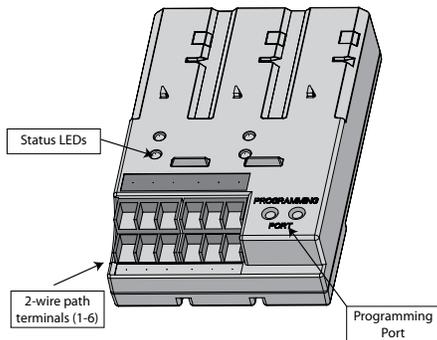
The display will show the following Reset options:

- Programs: Erases Day schedules, start times, and run times.
- Flow Totals: Clears the running flow total histories (they will restart with 0.0 for all entries), only.
- Logs: Clears alarm, controller, and station logs, only.
- Names: Clears all user-programmed names, including Programs, Stations, and SSGs.
- All Data: Clears all of the above items, and controller returns to original out-of-the-box programming state.
- Use the up and down arrows to highlight the desired type of Reset .
- Press the + button to select it.
- A confirmation message will appear. If + is pressed again, the selection will be reset.

None of the reset functions will erase the Easy Retrieve ‘backup’, if one has been made.



DECODER OPERATIONS (ACC99D VERSIONS)

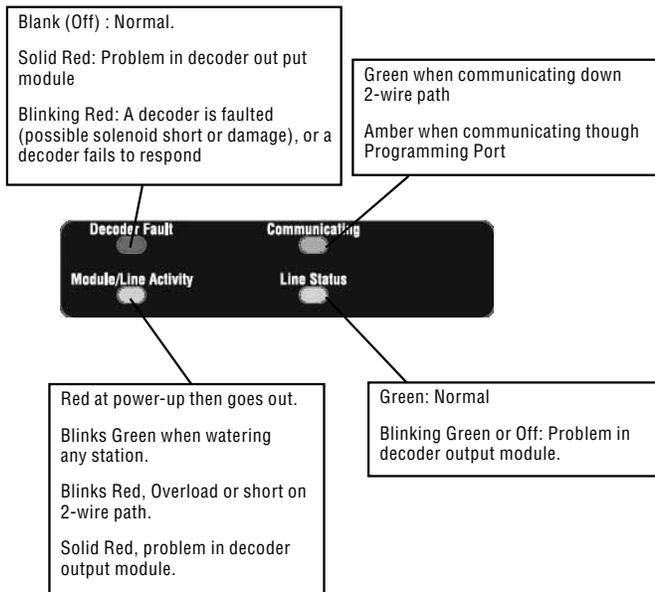


CONNECTING THE 2-WIRE PATHS

1. Turn Controller power OFF.
2. If the decoder output module is a replacement for an existing decoder installation, simply reconnect the 2-wire paths to their screw terminal assignments. If more than one path has been used, attach the original red and blue pairs to the red and blue terminals with the appropriate number.
3. If this is a new installation, or conversion of a conventional controller to decoder operations:
 - Route the red and blue wire paths from the field up through the wire openings or conduit into the controller wiring compartment.
 - Connect the red and blue 2-wire paths to the decoder output screw terminals.
 - There are two rows of screw terminals on the decoder output module, one red and one blue, labeled 1-2-3-4-5-6. Each numbered pair represents a possible 2-wire path to the field (some systems only use one pair, others may use all 6).
 - Connect the red wire from a twisted pair to a

numbered red terminal, and connect the blue wire to the blue terminal with the same number. Do not connect more than one wire to any of the terminals. Do not mix red from one pair with the blue from another pair. Keep each pair separate, red to red and blue to blue, until all pairs are connected to their numbered terminals.

4. Turn controller power back ON and test. The Module/ Line Activity LED on the decoder output module should light up red for a few seconds. The red light should then disappear and the Line Status LED on the decoder output module should be a steady green, with no other line activity or stations running.



The decoder output module should now be completely installed and ready for normal operations.

STATUS LIGHTS (ADM-99 OUTPUT MODULE)

The ADM-99 decoder output module has four status LEDs which can be helpful with setup and diagnostics. The replacement upper deck label is used to label these lights.

Place the decoder light label over the controller deck lid windows, not directly on the ADM99. The holes in the replacement label should allow lights to shine through. The decoder label aligns with station numbers 5, 2, 12, and 9.

DECODER PROGRAMMING

Each decoder is programmed with station address(es) at the controller, before installing it in the 2-wire path. The decoder output module has two holes in the lower right called "Programming Port." Program the station number(s) into the decoders, and then write the station number assignments on the metallic tag on the decoders.

Before programming any stations, you should have an exact plan on paper for the location of each decoder and station in the system.

ICD decoders are available in 1, 2, 4, and 6-station sizes, and they may be mixed in the same system. However, the numbered station assignments for each decoder will be filled in automatically, depending on the size of the decoder.

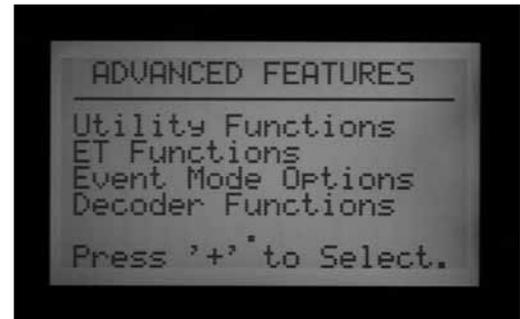
Do not program the same station number into two different decoders!

When programming a 2, 4, or 6-station decoder, you only assign a station number to the first station output. The other stations are automatically filled in by the decoder in numerical order, depending on the decoder size.

For example, a 4-station decoder (ICD-400) will activate stations 20, 21, 22, and 23.

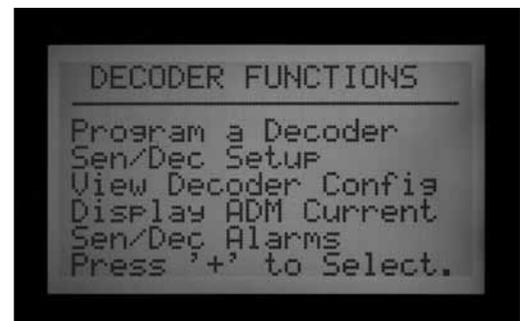
In programming, the decoder is assigned "20". Because it is a 4-station decoder, it will automatically fill in the other stations with 21, 22, and 23.

Single-station decoders (ICD-100) only receive the station number that is selected for them.



PROGRAM DECODER STATIONS

1. Turn controller power ON.
2. Insert the stripped end of the red wire from a decoder into one of the two holes labeled Programming Port on the lower right of the decoder output module.



3. Insert the blue wire from the decoder into the other Programming Port hole. Do not let the wires touch each other!



4. Turn the controller dial to the hAdvanced Features position.

5. The display will show “DECODER FUNCTIONS,” at the bottom of the selections. Use the down arrow button to select Decoder Functions. Press the + button to select.
6. The Decoder Functions screen will appear, with “Program a Decoder” highlighted.

(The other functions are explained in detail in the Special Decoders Section). Press + to select. The display will then show “Checking for a decoder...” as it attempts to communicate with the decoder in the Programming Port. The Communicating LED on the output module will light amber when the programming port is in use (communicating with a decoder.)



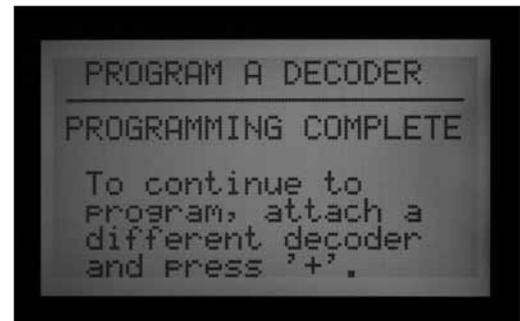
7. The decoder output module will check for the presence of a decoder. If the wires are correctly inserted into the Programming Port, a screen will appear with the decoder settings.

8. If a decoder is recognized, the display will show current settings for the decoder. If the decoder is recognized as a station decoder, the size of the decoder (1, 2, 4 or 6) will show in the DEC TYPE area. Decoder type can be Station or Pump. Most decoders in most systems are type “Station”, which activate irrigation solenoids.

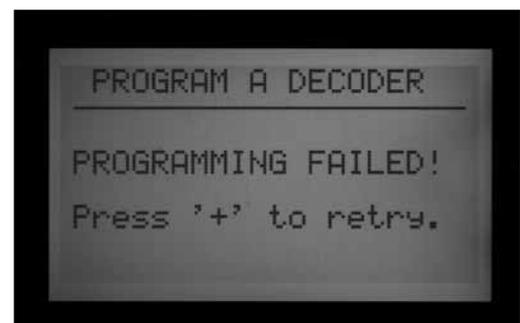
- Use the up and down arrow buttons to highlight different settings, and the + and – buttons to change them.
- Station number (When Dec Type is “Station”) can be any number from 001 to 099. **Do not allow more than one decoder in a system to have the same station number!**
- Power Factor is normally 2 and this is correct for most installations. Possible range is 1 to 5. In certain situations it may be necessary to change this value to hold in heavier solenoid loads. These values will change the duty cycle of the power supplied to the decoder from 10 to 38% in approximately 7% increments. **This value should not be adjusted unless absolutely necessary as it may adversely affect the performance of the rest of the system.**
- Inrush is normally set to 3 and this is correct for most installations. Possible range is 1 to 9. These values will change the timing of the initial powering of the solenoid from 0 to 90 mS in 10 mS increments to aid in activating solenoids and relays with higher inrush current requirements.



9. When the decoder settings are correct, push the Program button to send them to the decoder. The display will show “Programming...” for a few seconds until the information is downloaded into the decoder.



10. If the programming (of the decoder) is successful, the display will show “PROGRAMMING COMPLETE” and prompt for another decoder. Using a ball point pen, write the station numbers for each output of the decoder on the aluminum label for later reference. If the decoder has been accidentally disconnected or malfunctions, the display will show “Programming Failed!” This means the decoder was not programmed (check connection, and try again).



11. When all decoders and stations have been programmed, turn the dial to Run or any other position to continue working with the controller.

Decoders may be reprogrammed at any time. If it is necessary to change the station numbers or other settings of a previously programmed decoder, the decoder may be reconnected to the Programming Port. The old settings will be displayed at the “Program a Decoder” screen. Change the settings and press Program to download the new station numbers or settings into the decoder.

DECODER PUMP/MASTER VALVES

Decoders can be assigned as either, or both, of the 2 possible Pump/Master Valve outputs per controller.

- Pump/Master Valve decoders should be ICD-100 single station decoders. If a multi-station decoder is assigned as a P/M, the other station outputs on that decoder are no longer available. It is possible to use the 200, 400, or 600 as a P/M output, but the other outputs will not function.
- The ACC or AGC controller only supports 2 Pump/Master Valve outputs, total, regardless of how they are connected. There are two “hardwired” output terminals on the controller’s Master Module (P/M1 and P/M2). Any combination of the Master Module terminals and the decoder stations is possible, but there can never be more than two P/M outputs, regardless of where they are connected.

To choose whether Pump/Master Valve outputs will be from the Controller or the Decoder, unlock the Extended Feature by holding down the Information button on the facepack, while turning the dial to the Set Pump Operation position.

Release the button, to see the P/MV Operation screen.

STYLE: “N.C.” means Normally Closed, which is the normal setting for most Master Valves (this works the same whether a Decoder is selected or not).

It is not recommended to use the N.O. setting if the pump/master valve will be controller by a decoder.

LOCATION: P/MV 1 and P/MV2 can each be set to either Controller (meaning the hardwired screw terminal position on the Master Module), or ADM, if a decoder output module has been recognized by the facepack.

- The ADM option is only shown if the ADM99 module has been installed and recognized by the controller.



“Controller” means the selected P/MV output will operate through the screw terminal with that number on the Master Module, in the controller.

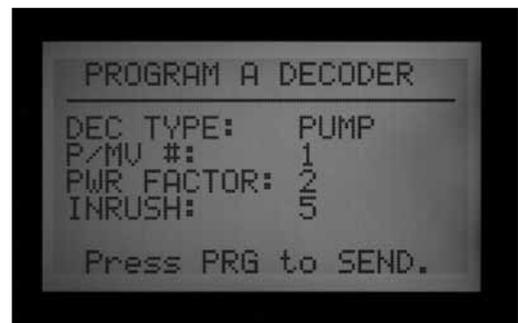
“ADM” means that the selected P/MV will operate through one of the decoders instead.

- Use the Up and Down arrow buttons to move to the Location for the P/MV you wish to change.
- Use the + or – buttons to change the Location from Controller to ADM, for any Pump/Master Valve you want to reassign.

The ADM location will not work until a Decoder has been programmed for Pump operation (P/M1 or P/M2) in Decoder Programming.

The decoder programming for a pump or master valve is similar to programming a station decoder. Insert the red and blue wires into the programming port, turn the dial to Advanced Features and arrow down to Decoder Functions. Press the + button. While “Program a Decoder” is highlighted, press the + button. The display will then show current settings for the decoder.

- With the Decoder type highlighted, press + or – to change the Type from 1-Station to “PUMP.”
- The heading for the station number will change to P/MV. Select either 1 or 2 for the P/MV output. Do not allow more than one decoder in a system to have the same pump number!



- Press the Program button to send the PMV address to the decoder.

This decoder will become the designated P/MV output for the controller.

ICD-SEN SENSOR DECODER SETUP

The ICD-SEN sensor decoders accept input from sensors, and report them to the controller via the two-wire path. Each sensor decoder has two input “ports” (A and B) consisting of a looped wire.

To use a port, cut the wire and attach the sensor leads according to detailed instructions with the ICD-SEN.

Do not cut the wire on ports that will not be used.

Hunter HFS flow meters may only be connected to Port A. Clik sensors may be attached to either port.

When the flow meter is installed into the two-wire path, the ACC must be configured to read the sensor decoder. This will be explained in detail in the next section, Set Up Overview.



SETUP OVERVIEW

Connect an HFS Meter to an ICD-SEN

Hold the Information button, and turn dial to Set Flow Monitoring dial position.

Choose "Select Flow Sensor."

Change Location to ADM.



Connect a Clik Sensor to an ICD-SEN

Hold the Information button, and turn dial to Set Sensor Operation dial position.

A separate screen will set Location for each Sensor (1 through 4).

At each Sensor input that will be attached to ICD-SEN, change Location to ADM.

Turn dial to Advanced Features, and select Decoder to begin programming a Sensor Decoder.

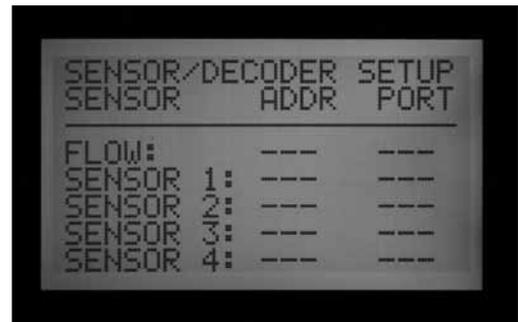
SEN/DEC SETUP

Before continuing, determine whether the HFS or Clik Sensors are to be connected to a ICD-SEN on the two-wire

path, and that the location of the HFS or Clik Sensors are mapped to the ADM, described in the section titled, "Set Up Overview."

This creates the special sensor input assignments for the ICD-SEN sensor decoders. This step must be completed so that the controller and decoder will know which type of sensor is connected where.

- There can be up to five ICD-SEN sensor decoders in a decoder control system. They can receive addresses 1 through 5. This does NOT take away the station output addresses 1 through 5. Sensor decoders have their own type of address numbers, and the controller will know which "5" is a station, versus a sensor decoder.
- Each sensor decoder has 2 ports, A and B.
- A Hunter HFS Flow Sensor may be connected to Port A, only.
- Any "Clik" family sensor may be connected to either Port A, or Port B. It is also possible to have an HFS connected to Port A and a Clik sensor connected to Port B on the same sensor decoder.



- Turn the Dial to Advanced Features and use the arrow keys to move down to Decoder Functions.
- Press the + button.



- Move to SEN/DEC SETUP. Press the + button.
- This screen allows for the creation of the sensor input assignments for the ICD-SEN sensor decoders. This step must be completed so that the controller and decoder will know which type of sensor is connected where.

- If you are unable to enter an address or port for a sensor or flow meter, the Location for that device has probably not been set to “ADM.” Return to the previous section and check the Location settings.



- Use the arrow keys to move through the Flow and each Sensor input, to map the correct Decoder Address and Port. This step should be completed before actually programming the ICD-SEN.
- Example: Configuring an HFS, Mini-Clik, and a Freeze Sensor with two ICD-SEN sensor decoders. This example shows two ICD-SEN sensor decoders. One of the ICD-SEN sensor decoders is assigned address 1. This decoder in the field has the HFS wired to port A, and one of the Clik sensors to Port B. The second ICD-SEN sensor decoder is given address 2. This sensor decoder would then have the remaining sensor wired to Port A on the decoder.
- Once this screen is programmed correctly, you may begin programming the ICD-SEN sensor decoder in the programming port.
- Insert the stripped end of the red wire from an ICD-SEN decoder into one of the two holes labeled Programming Port on the lower right of the decoder output module.
- Insert the blue wire from the decoder into the other Programming Port hole. Do not let the red and blue wires touch each other!
- Turn the dial to the Advanced Features dial position. Arrow down to the Decoder Functions selection. Press the + button. With “Program a Decoder” highlighted, press the + button. The display will show “Checking for a Decoder...” as it attempts to communicate with the decoder in the Programming Port.



- The decoder output module will check for the presence of a decoder. If the wires are correctly

inserted into the Programming Port, a screen will appear with the decoder settings.

- If the decoder is recognized, the screen will display that it is a Decoder Type: Sensor. Select a Sensor Decoder address number from 1 through 5. These are not the same as station addresses, and do not cause a conflict with station output addresses 1 through 5.
- Address the ICD-SEN Sensor decoder to match the sensor input you want this decoder to communicate with. If the address is correct, press the program button to send the information.
- The screen will then display “Programming Complete”. If it displays the “Programming Failed” message, reinsert the ICD-SEN wires and resend the information.
- Once the Programming is complete, you may view which sensors the ICD-SEN sensor decoder has been mapped to, as well as the address.



- With the programmed ICD-SEN sensor decoder still in the programming port, use the Back button, or left arrow button, to go back to the Decoder Functions main screen. Press the + button with “Program a Decoder” highlighted.



- Once the decoder has been acknowledged in the programming port, press and hold the Blue Information button. The screen will display the decoder address, and the type of sensor that is connected to each of the decoder ports. Following is a display showing the previous example of two sensors connected to an ICD-SEN : The second ICD-SEN sensor decoder would appear like this:
You may view the ICD-SEN sensor decoder information anytime after the decoder has been programmed in this manner. You may also change the

address or the sensor selections at anytime, if changes occur to the system.

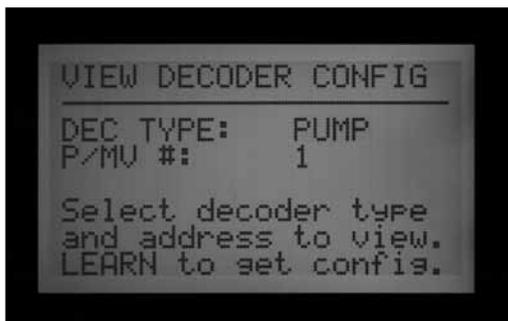
- Turn the dial to “Set Sensor Operation.” There is a display page for each Program, allowing the responses for each sensor to be set. Select “Suspend”, “Pause”, or “Off” for each sensor.
- Note that a program may not have both Pause and Suspend responses. A program cannot be in both Pause and Suspend at the same time. The responses will automatically change to agree with the most recent selection. If you set S1 to Pause, and then set S2 to Suspend, the S1 will automatically change to Suspend. It is impossible for a program to be in Pause and Suspend at the same time.

- Once the sensor decoders are configured, the controller will immediately begin polling the sensor decoder continuously to monitor the alarms. This may cause alarm messages until the sensor decoders are actually installed in the two-wire path. The polling function can be stopped to prevent false alarms. *See Other Special Decoder Functions (Advanced Features) on page 62 for more information.*

OTHER SPECIAL DECODER FUNCTIONS (ADVANCED FEATURES).....

VIEW DECODER CONFIG

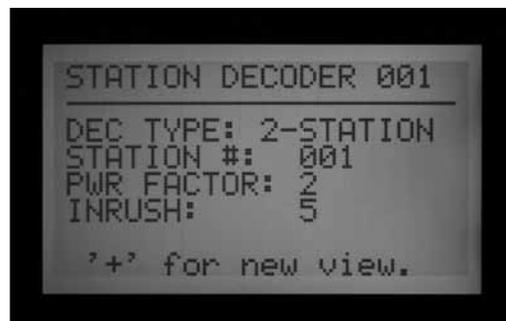
This allows the controller to search down the two-wire path and return the configuration of any installed decoder with an address. It can be used to determine whether a particular station belongs to a 1, 2, 4, or 6 station configuration, and can be used to retrieve the setup info for a specified Sensor Decoder.



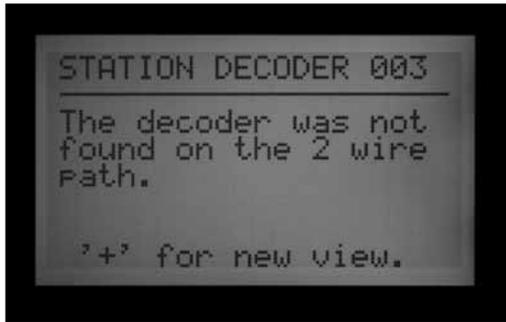
- Turn the Dial to Advanced Features. Arrow down to “Decoder Functions.” Press the + button.



- Arrow down to “View Decoder Config.” Press the + button.



- This is a view-only screen and cannot be used to edit the decoder.



- Select the Decoder Type (Station, Pump, or Sensor), and enter the address.
- Press the Copy/Learn button to search for the decoder.
- If the address is found on the two-wire path, the configuration information will be displayed. If the decoder address is not found, it may not be present in the two-wire path, or may have a problem.

DISPLAY ADM CURRENT



This shows the current draw in milliamps (mA) of all decoders connected to the decoder output module (ADM). It is used for diagnostic purposes.



- Turn the dial to Advanced Features. Arrow down to "Decoder Functions." Press the + button.
- Arrow down to "Display ADM Current." Press the + button.
- With no decoders connected, the reading will be fairly low, around 15 mA (there is no exactly correct value, but it should be in this range).
- Each decoder connected to a two-wire path will add

to the current draw, even when they are not running. Decoders require a tiny amount of current just to stay awake, about 5 mA.

- With a connected two-wire path, the mA reading in standby mode (no stations running) will vary depending on the number of decoders and other factors. The more decoders connected, the higher the standby reading.
- As stations are turned on, the current level will go up, about 20–40 mA per station.
- For diagnostic purposes, the relative increase in current is more important than the actual values. They can confirm that distant stations are working and can be used for other troubleshooting activities (such as isolating high current to a specific two-wire path, by disconnecting one at a time).
- The max value display is 2200 mA. This is informational only, and will not change. This is the overload point at which the decoder output module will shut down to protect from overcurrent damage.

SEN/DEC ALARMS

This allows alarm polling down the two-wire path to be temporarily shut off, for diagnostic or installation purposes.

- Turn the dial to Advanced Features. Arrow down to "Decoder Functions." Press the + button.
- Arrow down to "SEN/DEC Alarms." Press the + button.
- When a Sensor input to the controller has been assigned to a sensor decoder, the controller immediately begins polling the sensor decoder continuously to monitor the alarms.
- If you have not yet installed the ICD-SEN, or wish to quiet the line for diagnostic purposes, you can turn this polling off. However, this also means that you will not receive any alarms from a sensor decoder, until the polling is turned back on.
- Turning the Sen/Dec Alarms to the OFF position will suspend polling, and start a 24 hour timer.



- When completing the installation or diagnostics, the Sen/Dec alarm should be set back to the ON setting.
- If you forget to turn polling back on, the controller will automatically reset polling to ON after 24 hours have elapsed.

ACC SOLAR SYNC

ACC has the ability to work in standalone mode with the Solar-Sync Sensor. This requires facepack version 5.0 or later, and will also require a Solar-Sync compatible Master Module (version 5.0 or later).

ACC only requires the Solar-Sync sensor. It does not use the Solar-Sync Module. The Module functions are part of the new ACC facepack firmware.

Solar-Sync uses solar and temperature data from the sensor to change the Seasonal Adjust settings for each ACC program. You may choose which programs are adjusted by Solar Sync, and which are left alone.

YOU choose the base run times for the hottest time of the irrigation season.

ACC Solar-Sync adjusts those times for the actual conditions, as detected by the sensor.

Solar Sync adjusts every midnight, based on the last 3 days average ET (evapo-transpiration).

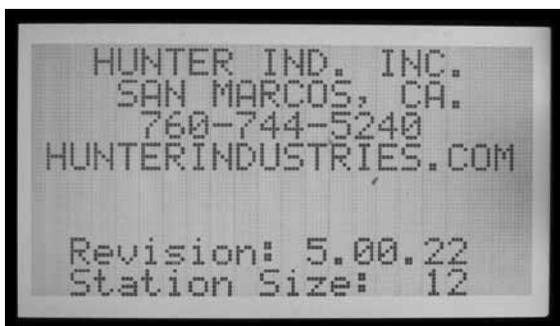
The Solar-Sync option does not interact with central systems and is designed for standalone operation of a single ACC controller. Do not connect multiple ACC controllers to a single Solar-Sync sensor.

PREPARATION

Facepack Version

The ACC facepack must be updated to version 5.0 or later. To check the Version number, turn the ACC dial to the Advanced Features dial position. Press and hold the Information button, and see the Revision number.

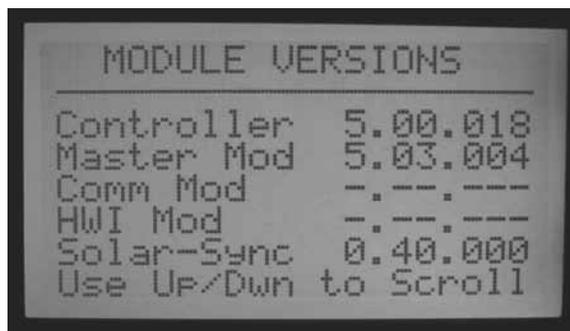
- Facepack updates may be obtained from the Resources section of the Hunter Industries web site (www.hunterindustries.com).



Master Module

The Master Module (part 572000) must be version 5.0 or later to be Solar-Sync compatible.

- To check the master module version, turn the dial to the Advanced Features position. Select Utility Functions, then select View Firmware Versions. The master module version number will appear in the list of Module Versions found in the controller.



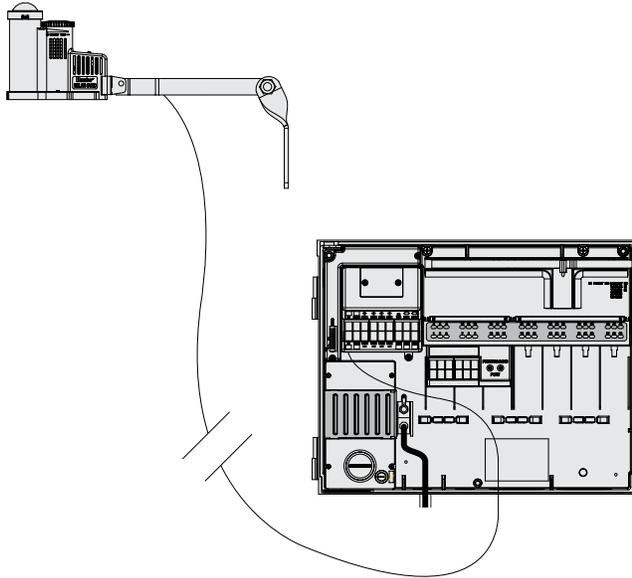
- Master Modules version 4 and later are “ET Ready”, meaning they will accept input from an ET Sensor for use within a central system. However, they must be updated to version 5 or later to operate with Solar-Sync.
- When new, a Master Module will ship with a Solar-Sync compatible sticker, if it is Solar-Sync ready.
- If the Master Module is not “ET Ready”, the value for ET will read, “Not Supported”.
- If the Master Module is “ET Ready” but the ET feature is not enabled, the value will read, “Not Used”.
- If either ET or Solar-Sync options are enabled, the correct sensor type will be shown.
- The Solar-Sync compatible master modules were not available before November, 2009.
- Master Modules cannot be updated in the field. Contact Hunter Technical Support if Solar-Sync is desired for use with an older ACC controller. The master module is easy to replace, and this will be required to update to the Solar-Sync version.
- Sensor version numbers will also be shown if the S-Sync option has been enabled, the sensor is installed, and communications has been established.

Base Run Times

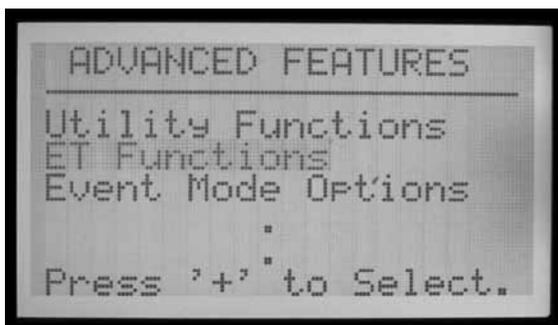
Program the ACC controller as specified in the Owners Manual for your controller. When setting station run times, enter the time that would normally be programmed during the peak summer watering season. The Solar-Sync is designed to adjust all run times daily based upon on-site weather conditions. This is done through the seasonal adjustment feature on your controller. It is recommended that all programming be conducted with the controller Seasonal Adjustment set at 100%.

INSTALLATION

- Mount the Solar-Sync sensor according to the sensor instructions. The sensor must be within 200ft/60m of the controller, and must be installed outdoor in full sun.



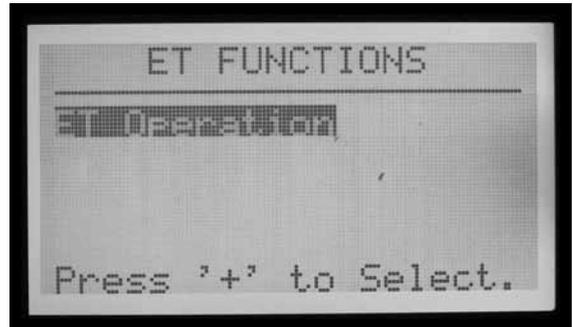
- The sensor should be allowed to receive the maximum sunlight possible at all times of day. Some locations may be shaded by trees or buildings during mornings or afternoons. Anticipate this when choosing the location. Maximum sunlight exposure during daylight is preferred.
- Route the wires into the controller cabinet through a low voltage conduit opening.
- Connect the wires according to color code to the ET terminals. The power and signals are DC, and the wires must be connected to + (Green) and - (Black) correctly. If the wires are reversed, the controller will not be able to receive signals from the sensor.
- All connections should be made inside the controller cabinet. If this is not possible, use waterproof connectors for any outside connections.



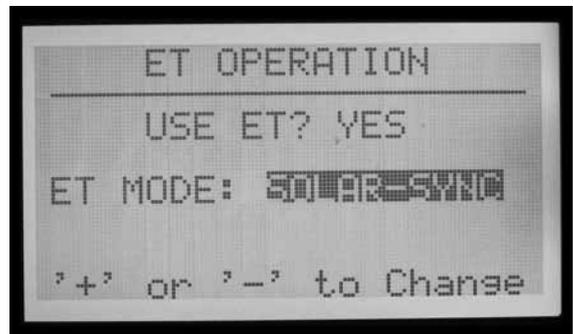
- The Solar-Sync sensor cannot be installed at the same time as a Hunter ET Sensor. Only one sensor can be connected to the ET terminals.

SETUP

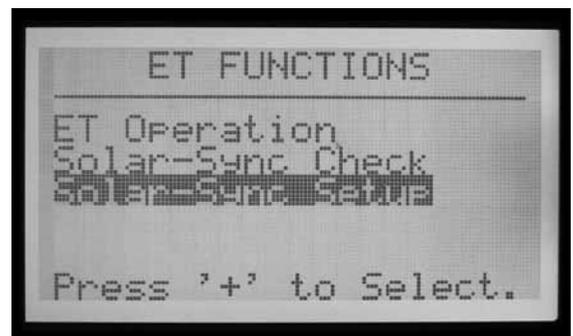
- When the installation is completed, turn the dial to the Advanced Features position. Select the ET Functions option (if ET Functions does not appear in the menu, the master module must be updated).
- Select the ET Operations option.



- The screen will display the ET Operation page. Set the Use ET option to "Yes" and the ET Mode to "SOLAR SYNC"
- Press the BACK button to return to the ET Functions menu.
- Select the Solar Sync Setup option.

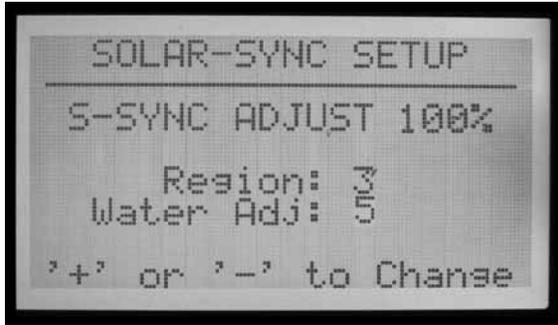


- The screen will display the Solar Sync setup page.
- The Solar-Sync Adjust value will show 100%* until the first midnight (this cannot be changed).

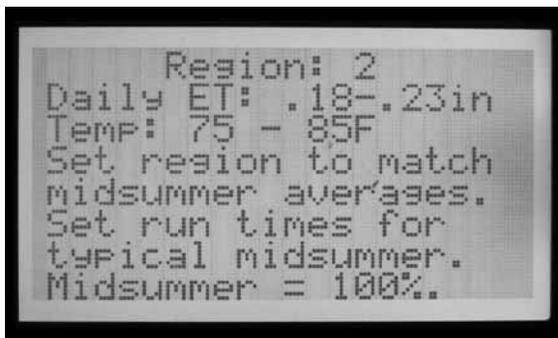


- At midnight, the Solar Sync Adjust will change to 80% or greater, based on the sensor. The asterisk disappears after a full 24 hours of sensor data has been collected.

- The settings will be set to Region 3, Water Adj. 5. Either of these factors can be changed, based on the following explanations.



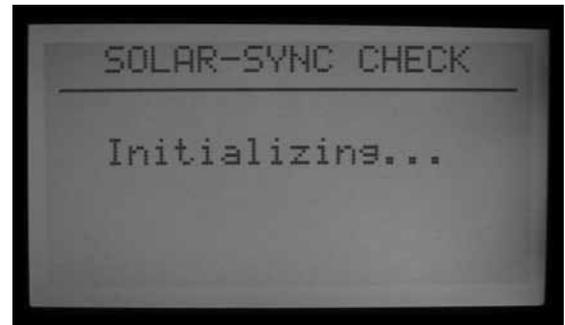
- Choose the Region that matches your location. Regions are defined by average ET in summer months.
- At each Regional Setting, the blue Information button on the ACC controller will also display help text for the type of Region.



- The Water Adjustment factor is the ideal setting to adjust watering for your specific landscape. This setting can be from 1 to 10.
- If the Water Adjustment number is increased, the system will water more. If the number is decreased, the system will water less. This will allow you to find the best balance between healthy plants and water savings.

SENSOR TEST

- When the sensor is installed, it is possible to test the connection to the Solar-Sync sensor.



- Turn the dial to the Advanced Features dial position.
- Select ET Functions.



IF ANY OF THE CHOICES IN THE ROWS APPLY TO YOUR SITUATION, THEN THAT IS YOUR REGION SETTING CHOICE.

	A	B	C
Region 1	If the average July ET is < 0.17" (4.3 mm) per day	If the average temperature for July is 65°-75° (18°C - 24°C)	<ul style="list-style-type: none"> • U.S. Northern States • Coastal Regions
Region 2	If the average July ET is 0.18" - 0.23" (4.6 mm - 5.8 mm) per day	If the average temperature for July is 75° - 85° (24°C - 29°C)	<ul style="list-style-type: none"> • Mountains • U.S. Northern Inland States
Region 3	If the average July ET is 0.24" - 0.29" (6.1 mm - 7.4 mm) per day	If the average temperature for July is 85° - 95° (29°C - 35°C)	<ul style="list-style-type: none"> • U.S. Southern States • Inland/High Desert
Region 4	If the average July ET is > 0.30" (7.6 mm) per day	If the average temperature for July is 95° - 105° (35°C - 41°C)	<ul style="list-style-type: none"> • Deserts

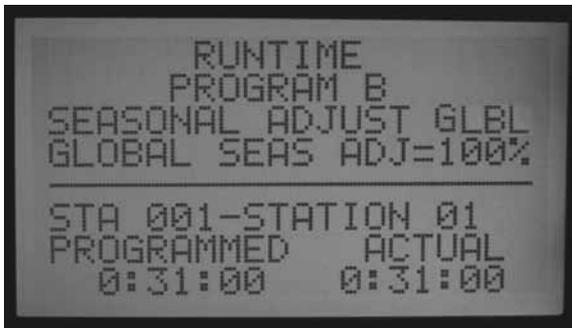
* For Southern hemisphere locations, use the month of January.

- Select Solar Sync Check. The screen will show “Initializing...” for a few seconds as the controller contacts the sensor.
- If the check is successful, the screen will show “Sensor Check OK”. Continue with the Operation and Adjustment procedures if necessary.
- If the check is not successful, the screen will show “Sensor Check Failed”. Check sensor wiring and try again. Remember, the wiring is DC polarized and the wire from the green ET terminal in the ACC must be connected to the green wire lead from the Solar-Sync sensor.

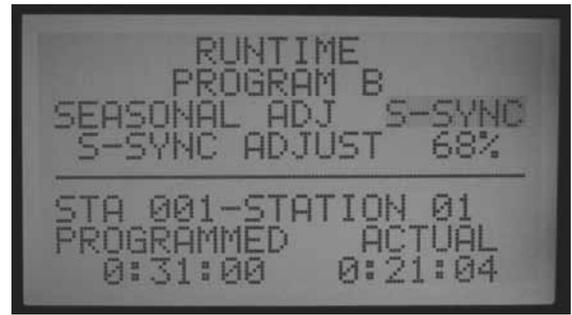


ASSIGN PROGRAMS

- Select which of the ACC programs are to be adjusted by Solar Sync. You may specify which of the 6 automatic programs will be adjusted. All programs set to Solar Sync will be adjusted by the same percentage, as determined by the Solar Sync.
- Programs which are not adjusted will continue with the same run times, and will not use the Solar Sync adjustment. They may be adjusted manually, however. This may be useful for specialized irrigation, or when programs are used to control non-irrigation devices.



- Turn the ACC dial to the Set Station Run Times dial position.
- Press the RIGHT arrow button to move through all the run time fields, until the Seasonal Adjust selection is highlighted.



- Use the + and – buttons to change the Seasonal Adjust to “S-SYNC”. This setting is between 100% and 101%, immediately after GLBL (global). When Seasonal Adjust is set to S-SYNC, it will be adjusted automatically according to the Solar Sync sensor.
- Use the Programs button to move through each of the programs, and select S-SYNC for any program that you want Solar Sync to adjust.
- Programs for which you do NOT want Solar-Sync adjustment should be set to GLBL (they will stay at the Seasonal Adjust level set manually for the rest of the controller), or they may have individual Seasonal Adjustments by Program as described in the Seasonal Adjustment settings in basic controller operations.
- If the “S-SYNC” selection does not appear for a program (between 100% and 101%), the Solar Sync option has not been properly enabled for the controller. Review the Preparation and Setup procedures to troubleshoot.

SENSOR SHUTDOWN PROGRAMMING

The Solar-Sync sensor can be used for sensor shutdown of watering at the controller. The Solar Sync can shut off irrigation automatically for Rain, or for freezing conditions.

In the ACC controller, sensors are programmed to shut down by individual program.

SENSOR MAPPING

- After the Solar-Sync sensor is set up and operational, the built-in sensor inputs in the ACC controller can be “mapped” to use the Solar Sync sensor instead of other external sensors.



- Press and hold the Information button, while turning the ACC dial to the Set Sensor Operation position. Then, release the Information button.
- This will display the Sensor Configuration screen. This is used to tell the ACC which of its 4 sensor inputs will operate with the Solar Sync sensor.



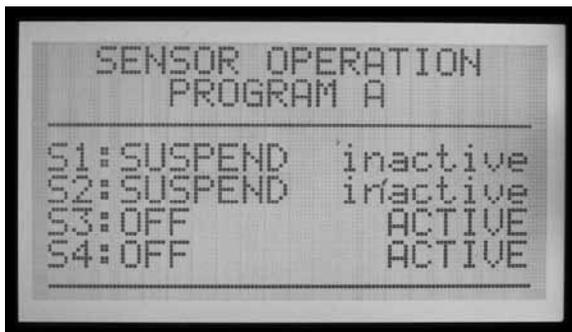
- Choose the sensor input number with + or – buttons while the Sensor number is highlighted.
- Then, press the down arrow button to move to “Location”. Use the + or – buttons to select “SSync Rain” or “SSync Temp” to make that sensor input respond to the Solar Sync sensor.



- When either or both Rain and Temp have been assigned to Sensor numbers, turn the dial to another dial position to save the setup.

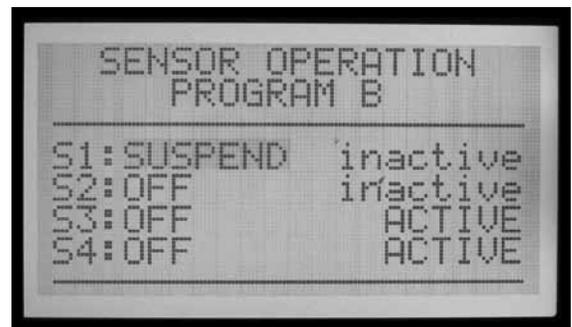
SENSOR SHUTDOWN BY PROGRAM

- Turn the dial back to Set Sensor Operation (without holding the Information button).



- The screen will display the sensor responses for Program A (unless another program has been selected). It will also display which sensors will shut down Program A.

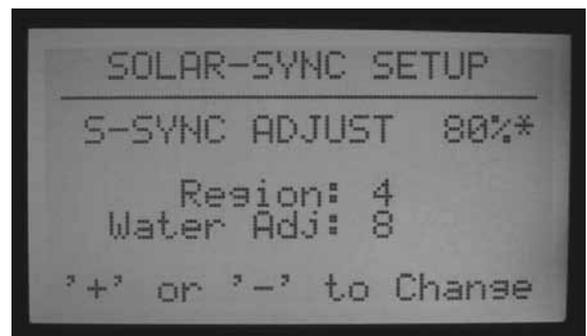
- If the Sensors (S1, 2, 3, and 4) are set to Off, they will not shutdown the selected Program.
- Use the + or – buttons to change Off to Suspend, or Pause. See the sensor section in the ACC manual for a complete description of the difference between Suspend and Pause.
- Suspend is generally the better choice for irrigation programs! Make sure to fully understand Pause before selecting this option.
- If Sensor 1 (S1) is assigned to SSync Rain, change the response for S1 from Off to Suspend (with the + or – buttons), to have the program stop watering when the SSync Rain sensor is alarmed (active).
- If Sensor 2 (S2) is assigned to SSync Temp, change the response for S2 from Off to Suspend (with the + or – buttons), to have the program stop watering when the SSync Temp nears freezing.



- Press the Programs button to move through each program, and configure the shutdown responses for the Solar Sync sensors, as desired.

OPERATION & ADJUSTMENT

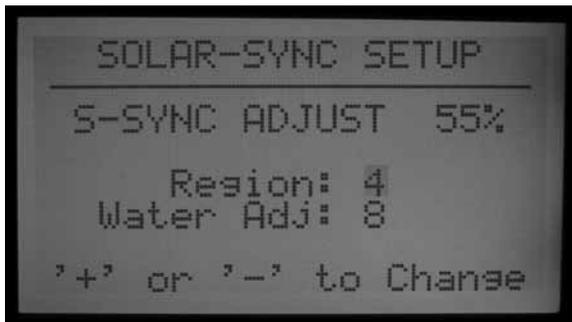
- Turn the dial to the Run position. The S-Sync Adjust status should appear in the display.
- When the system is newly installed, the S-Sync Adjust is set to 100% on the first day (this cannot be changed).
- At midnight, the S-Sync Adjust will change to 80% (or greater) based on the sensor.



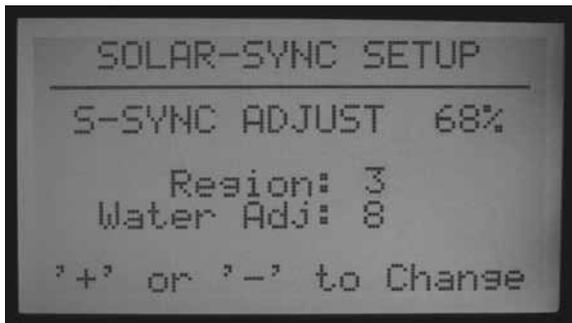
- The asterisk disappears from the Setup screen after a full 24 hour period of sensor data. The asterisk is not visible in the Run dial position display.

MAKING ADJUSTMENTS

After programming the Solar Sync module and your controller, allow the system to operate for 3 days to gather sun and temperature data.

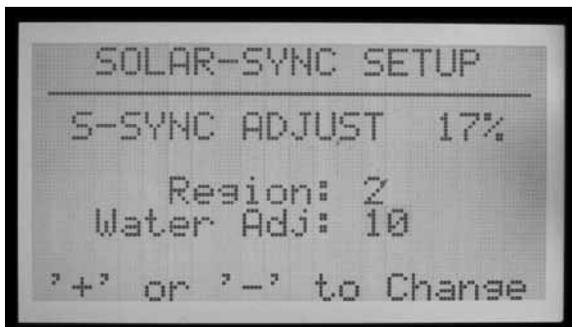


- Observe the S-Sync Adjust value on the controller display. If the amount seems to be lower or higher than expected for the time of year, use the Water Adjustment feature to correct.
- If necessary, the watering may be increased or decreased with the Water Adjustment factor. Only change the Region setting if you run out of adjustment range within your selected region. The Region setting adjusts sensitivity to weather change, and may have unexpected results.



INCREASE OR DECREASE WATERING

- Turn the dial to the Advanced Features dial position.
- Select ET Functions.
- Select Solar Sync Setup.
- Use the down arrow to select the Water Adj. setting, and use the + or – buttons to change the factor up or down.



- Notice that as the Water Adjustment factor is changed, the current S-Sync Adjust amount at the top of the screen is changed. This can help you predict how much more or less watering will occur, as a result of the change (the actual minutes can also be seen at the Set Station Run Times dial position, after adjustment).
- When adjustment is complete, return the dial to the Run position.

CHECK RUN TIMES

After adjusting the Water Adjustment factor, you can turn the dial to the Set Station Run Times to see the effects of the change, in minutes (or gallons or liters, if flow has been learned for the station).



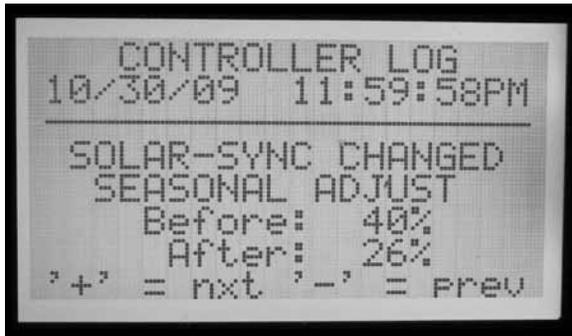
- Select a station in an adjusted program. The screen will show the “Programmed” run time, meaning the original run time, and “Actual”. The Actual run time is what will actually run with the effects of the Solar-Sync adjustment.
- If the controller has learned flow by station, press and hold the Information button, to view the estimated water usage (in gallons or liters) after the effects of the change.
- Run times occurring after midnight may be slightly different, since the next adjustment for today’s ET will occur at midnight.

NOTE: Set station run times for peak summer watering, with seasonal adjust set at 100%

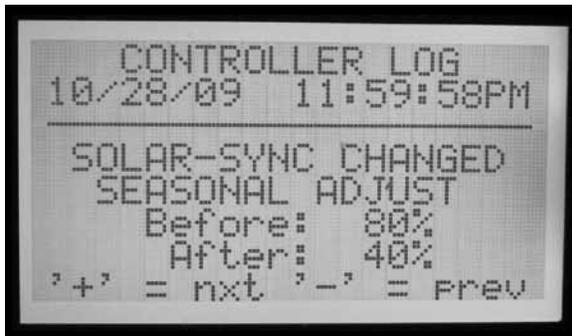
TRACKING THE ADJUSTMENT HISTORY (CONTROLLER LOG)

- It is possible to review the adjustments the controller has been making.
- Turn the dial to the Data History dial position.
- Use the arrow buttons to select the Controller Logs, and press the + button.
- The Controller Log displays significant events at the controller that are not alarms (alarms are tracked separately, in the Alarm Log). Every change to Seasonal Adjustment occurs approximately 2 seconds before midnight, and each change is recorded in the log.

- Use the – or + buttons to step backward and forward through the Controller Log to track the S-Sync changes. Each log will show the date and time, and the Before and After settings for Seasonal Adjustment.



- If the controller has been operating unattended for period of time, the performance of the Solar Sync adjustments can be verified in this manner.
- If a user changes the Solar Sync setup (either Region or Water Adjustment), this is also tracked in the Controller Log. It will also show the Before and After settings, but the log will show S-Sync Setup Changed At Controller. This means it was changed by a human operator.



- There may not be a Solar Sync log for each day! If the weather conditions are stable and the Solar Sync does not need to change, there will not be a log entry for the day. The logs are only created when Solar Sync makes a change to the Seasonal Adjustment settings.
- The Controller Log will store the most recent 250 controller events. The amount of other controller log activity will determine how many days of Solar Sync history are available.



SOLAR-SYNC SENSOR ALARMS

S-Sync RAIN ALARM, S-Sync TEMP ALARM



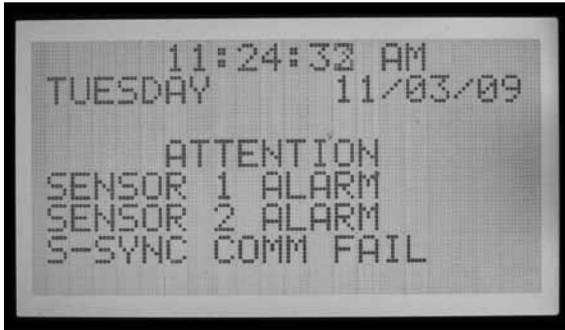
- If the Solar-Sync sensors have been mapped to the Sensor 1-4 inputs on the controller, and one of the Solar-Sync sensors (Rain or Temp) detects an alarm condition, the display will show : ATTENTION S-Sync RAIN (or TEMP) ALARM



- This means that rain or near-freezing conditions have suspended irrigation (as set in the Set Sensor Operation dial position) until the alarm is cleared.

S-SYNC COMM FAILURE

- If the Solar-Sync sensor fails to respond to the ACC controller, a Comm Failure message will be posted on the display and a log will be entered in the controller Alarm Log.



- This may indicate a problem with the wiring from the controller to the Solar Sync sensor. Use the Sensor Check function (Advanced Features dial position, ET Functions menu) to check current status of the sensor.
- Alarm Log records are created whenever an Attention message appears (Comm Fail and Restore, Rain and Temp Alarms and Alarm Clears). They are also created when an alarm condition is cleared. The Alarm Log can be helpful in tracking the duration of rain or freeze shutdowns, or communications failures with the sensor.
- Turn the dial to the Data History position, and select Alarm Log to view recent alarms. The most recent alarm is always shown first. Press the – button to step back through the alarm records, one at a time, up to the most recent 250 alarm records. Each record with have the date and time of the alarm event.



IMMS-ET AND THE ACC CONTROLLER.....

IMMS-ET is central control software, designed to use a central computer to track the deficits, and schedule irrigation to replenish only the moisture that has been lost. The goal is to reduce or eliminate excess watering and grow healthier plants, without constant adjustment by the operator.

ET= Evapo-transpiration. This is a technique for determining how much moisture has been lost from the soil reservoir for each station (often "zone", or valve) of irrigation, based on climatic data. Natural rainfall may replenish some or all of this deficit. Automatic irrigation will provide the balance of the moisture required to keep plants healthy.

When ACC is in a computer central control system, it can be used to report ET from a Hunter ET Sensor to the central computer via IMMS control software. The computer can use the ET information to create ET-based run times for many controllers, including the original source controller.

- IMMS-ET requires a central computer and communications to function.

The ET Sensor does not adjust the ACC controller directly in standalone or offline use, even though you can see the daily ET displayed.

The computer must perform a full sync for the ET information to be retrieved, processed, and sent back to the controller(s).

ET Requirements:

- Master Module (part 572000) version 4.0 or higher (identified by green ET terminal, top left corner of module, AND the presence of the "ET Ready!" sticker). If the Master Module is an older version (with a red ET terminal, or a green one without ET Ready displayed), the ET functions will not be displayed until the module is updated. The first production release version of the ET Ready master module is version 4.22.010.
- ACC facepack version 4.0xx or higher.
- Hunter model ET Sensor. The sensor is connected directly to the ET terminals, with two 18 AWG/1mm direct burial wires, color-coded for polarity. Max distance from sensor to controller is 100" (33 m), and this distance should not be extended. Note that the ET Module (from Hunter ET System) is not used, with IMMS ET. The version number of the ET Sensor needs to be 1,50.000.

ET SETUP AND OPERATIONS

Turn dial to Advanced Features dial position. If facepack and master module are updated to versions 4 or later, the ET Functions selection will appear in the menu selections.

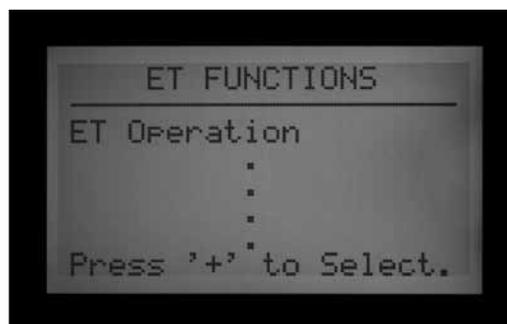


ET FUNCTIONS

The ET functions listed in Advanced Features only apply when an optional ET Sensor is connected.

After each ET function, it is possible to press the Back button (controller left arrow key) to return to the ET Functions menu and select another function.

While in the Advanced Features dial position, arrow down to "ET FUNCTIONS" and press the + button. If ET has not been enabled yet the screen will only give you the option of selecting ET OPERATION.



ET OPERATION

Set to YES to enable ET operation. After turning the dial to Advanced Features and selecting ET FUNCTIONS, press the + button with ET OPERATION highlighted. The screen will then ask you if you want to USE ET SENSOR. If you have an ET Sensor and a central control IMMS system, press the + button and set to YES to enable ET operation.



This will cause the controller display to begin showing "Current ET: x.xx" in inches or millimeters, when the dial is turned back to the Run dial position. Also, with ET

Operation enabled, and set to YES, more ET FUNCTION options will be available and viewed in the ET FUNCTIONS home screen.

NO will hide all ET functions and the daily ET will not be read or displayed, and no ET will be available for the central computer.

Other ET functions will not be available if ET Operation is not set to YES. Enabling ET Operation is mandatory if you choose to utilize the ET Sensors for irrigation shutdown. If ET Operation is not programmed to YES, then the location of ET Rain, ET Temp, and ET Wind will not be available in the Extended Features of Set Sensor Operation, as a selection in mapping sensor locations.

ET SENSOR CHECK

Turn the dial to Advanced Features and arrow down to ET FUNCTIONS. Press the + button. Arrow down to ET SENSOR CHECK, and press the + button to check the sensor, after the ET Sensor is connected. The controller will request an update from the sensor, and if a response



is received, will indicate OK. If the test fails (ET Sensor does not respond), check wiring to sensor, and try again. Note ET sensor connection is polarized (green terminal on the ACC master module must be connected to the green terminal on the ET Sensor, black terminal must connect to black terminal).



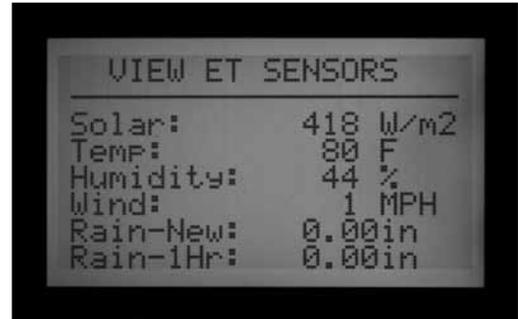
VIEW ET SENSORS

Displays current readings from all individual sensors on the ET sensor platform. Turn the dial to Advanced Features and arrow down to ET FUNCTIONS. Press the + button. Arrow down to VIEW ET SENSORS, and press the + button. The display will show current readings from all individual sensors on the ET sensor platform.

ET, Rainfall, Wind speed, and Temperature will be displayed according to the Units of Measure setting at the Set Current Date/Time dial position.

Readings can be updated at any time, by performing a new ET Sensor Check first.

Solar: always displayed in Watts/m², based on hourly average.



Temp: air temperature taken near top of each hour, displayed in Fahrenheit or Celcius.

Humidity: air humidity taken near top of each hour.

Wind: hourly average, in kilometers or miles per hour. If optional ET Wind is installed this will show actual wind at the location. Otherwise this value is set by the Automatic Prevailing Wind factor setting on the underside of the ET Sensor.

Rain-New: Rainfall in inches or millimeters since the last time the computer uploaded ET data.

Rain-1Hr: Rainfall in inches or millimeters within the last hour. The controller checks the sensor every 15 minutes, and two clicks of the rain gauge 0.02" (0.51 mm) within any 4 readings will create a rain alarm (if the ET Rain is configured as a Sensor input).

ET ALARM SETUP

Individual ET sensors can be used to perform alarm shutdowns, by assigning them to the Sen 1-4 positions in the controller. The ET Sensors will then function exactly like "Clik" Sensor inputs. They may have Suspend or Pause responses set by Program.

Assigning ACC Sensor 1-4 alarm functions to an ET Sensor is done without connecting any additional wires. The controller will use the sensor data as a virtual alarm.

For ET Alarm setup, you will need to assign or "map" the ET sensors to the Sen 1-4 inputs, at the Set Sensor Operation dial position "extended features". The ET Alarm setup function sets the shutdown levels for these sensors, but they will not be effective until the mapping is completed.

Press and hold the Information button, turn the dial to Set Sensor Operation, and release the Information button. Arrow down to Location selections. If ET is enabled, there will be three possible selections to map to sensor locations: ET Rain, ET Temp, and ET Wind. Select and assign to specific sensor numbers as desired.

Turn the dial to another position, and then back to the Set Sensor Operation dial position (without holding Information). At this location, choose the Suspend or Pause responses for each ET Sensor by program

ET Sensor shutdowns only apply to the controller to which the ET Sensor is connected.

The ACC cannot shutdown other controllers as a result of these alarms.



ET Sensor shutdowns are not instantaneous, and there may be a delay of up to 18 minutes between an ET Sensor

alarm and the actual shutdown. If this is not acceptable, a separate sensor (such as Rain-Clik or Freeze-Clik) should be installed and wired directly to one of the Sen 1-4 inputs for instant shutdowns.

The controller will automatically check the ET Sensor for updated sensor readings every 15 minutes. If an ET sensor causes a controller Pause or Suspend, that action will remain in effect for at least 15 minutes until the controller updates the readings. If the sensor returns to normal, the Suspend or Pause settings will be cancelled, as with any other sensor.

Shutdown Levels. Turn the dial to Advanced Features and arrow down to ET Functions. Press the + button. Arrow down to ET Alarm Setup, and press the + button. The ET Alarm Setup function sets the shutdown levels for the sensors that are mapped as a location for sensor shutdowns.

Rain Max: The maximum amount of rain that will be permitted before a program is shutdown for the rest of the day. Move to this position with the arrow keys and use +/- to set the maximum.



The ET Rain sensor will shutdown sensors after 0.02" (0.51 mm) of rainfall within an hour (this amount is not programmable), but the program may be permitted to run again, if no more rain is detected. The ET Sensor checks for rainfall every 15 minutes.

If the Rain Max amount is reached, the controller will no longer attempt to run the program that day.

Temp: The air temperature can be used as a freeze sensor to stop automatic programs, and the temperature at which shutdown occurs is programmable (from 25° to 45° Fahrenheit, -3.8° to 7.2° Celcius). Move to this position with the arrow keys and use +/- to set the low temperature shutdown.

Wind: If the optional ET Wind is installed, the wind speed (in mph or kph) can be used to shut down designated programs.

Reminder: Alarm settings are not in effect until the Sensor 1-4 inputs have been assigned to them at the Set Sensor Operation dial position, and responses have been configured by program.

EVENT MODE OPTIONS (AGC, SURVEYOR)

Event Mode is a special function of the controller designed to work with Surveyor Golf control software.

Event mode allows the controller to run individual station events which have been created for it by golf control software. These events may not be created or edited in the controller, and only special software can operate the controller in this mode.

If you are not using Surveyor control software, you should never use the Event Mode options.

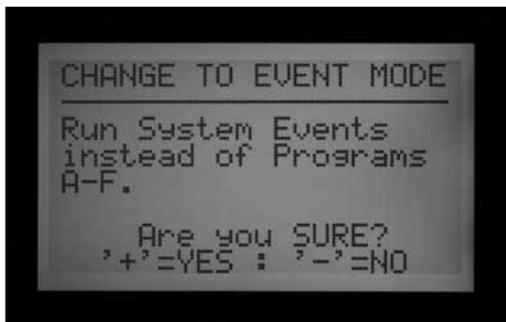
The normal operating mode of the controller is called FCP mode ("Field Controller Programs"). This means the controller will use Programs A, B, C, D, E, and F normally.

If the controller is switched to Event mode, the A through F Programs will not run.

Change to Event Mode: This will switch the controller to the System Event mode (Surveyor Golf customers, only).



Turn the dial to Advanced Features. Press the + button. Arrow down to Event Mode Options. Press the + button. The first selection is Change to Event Mode.



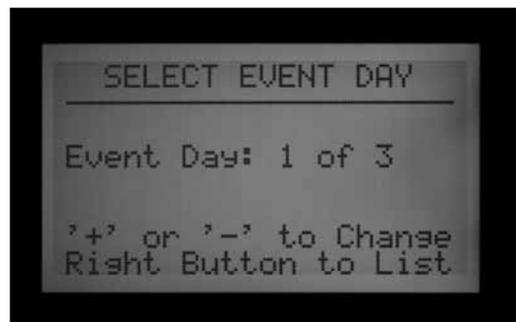
The display will advise that this will run System Events instead of programs A-F. If Event mode is selected, the display will always show System Event Mode On when the dial is in the Run position.



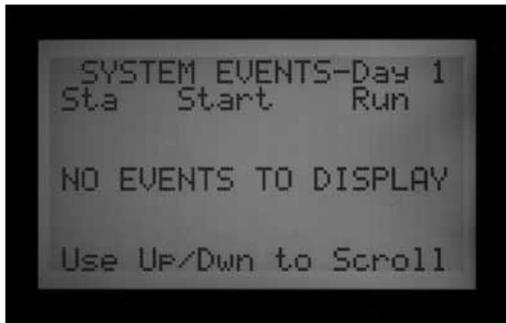
There is no special display when the controller is in the normal FCP mode... as long as System Event Mode On is not displayed at the Run position, the controller is in the conventional FCP mode.

The Event Mode Options screen allows the user to view three other selectable screens. While in the Event Mode Options screen, simply highlight the desired selection and press the + button. The three selections available are View System Events, Event Count, and Delete Events. These are only used in Surveyor Golf applications, to verify downloaded schedule information.

View System Events: This will allow you to view System Events for 1 to 3 days worth of downloaded System Events.



The AGC/ACC controllers are always either in Event mode, or FCP mode. The controllers can never be in both modes at once.



First, select the Event Day you wish to view (1, 2, or 3). Then press the right arrow button to view the downloaded events for that day. Use the down arrow to scroll through a large list of events.

Note: You cannot edit or change individual station events.



Event Count: This will show the total number of downloaded events. It is useful for verifying that an entire System Event download was received by the controller. The event count totals should match the total number of events in the Surveyor software.



Delete Events: This will permanently delete all downloaded System Events. The controller will not be able to irrigate until it has received a new System Event download, or until it is switched back to the FCP mode and FCP programs are created.

Types of Events: System Automatic Events are shown in displays as “SAE”. They are the individual station starts that have been scheduled by central software (Surveyor), and downloaded to the controller.

SAEs are the primary operating mode of Surveyor’s event-based irrigation scheduling. They may not be created or edited at the controller. They are only created when Surveyor applies flow processing to an event-type system program at the computer, and downloads the result to the controllers.

System Manual Events are displayed as “SME”. These are manual starts sent to the controller by an operator at the central computer. They are not part of the automatic irrigation but are started by Surveyor software when the controller is in Event Mode.

CENTRAL SOFTWARE AND ACC-AGC COMMUNICATION MODULES ..

The ACC-COM-xxx module provides communications for ACC/AGC series controllers. It can be used to communicate with a remote computer via hardwire cable (ACC-COM-HWR), dial-up telephone (ACC-COM-POTS) or cellular phone (ACC-COM-GSM in North America, or – GSM-E for international). This module may be installed in wall mounted or pedestal mounted controllers.

THEORY OF OPERATION

The Com module is a communications manager. It will contain the controller's unique identification (address), and enables communications into and out of the controller when combined with other devices. The Com module also coordinates communications between external devices and the ACC controller facepack.

The Com module may also communicate with other controllers, via optional RAD3 UHF radio modules (sold separately) with antenna for wireless communications, and/or an ACC-HWIM hardware interface module (sold separately) for hardwired communications over Hunter GCBL cable.

ACC-COM-POTS has dial-up communications ability built-in, but may also require the additional modules for outbound radio and/or hardwire connections with other controllers.

ACC-COM-GSM (-E) has cellular communications built-in, but requires a SIM card from the cellular provider, and may also require the additional ACC-HWIM and/or RAD3 modules for outbound radio and/or hardwire connections with other controllers.

Any Com module combined with a RAD3 radio installation will respond to Maintenance Radio commands from a UHF portable radio, equipped with a DTMF keypad.

Any Com module combined with a RAD3 radio installation will respond to Maintenance Radio commands from a UHF portable radio, equipped with a DTMF keypad. ACC Com modules have no effect on ICR (or SRR) remote control. The ICR and SRR remotes will work directly with ACC, whether a Com module is installed, or not.

The ACC-COM-POTS enables dial-up telephone communications via standard analog telephone line. It can also enable either UHF radio communications, or hardwired cable communications, or both. The hardwire and radio options require other components to work. Each communications option has different physical requirements.

Dial-up Telephone: Plan ahead for routing a telephone line into the controller. ACC-COM-POTS accepts a standard 4-wire RJ-11 telephone jack, but should be located within

6 ft./2m of the telephone outlet. Many trouble calls are caused by exceeding the telephone wiring distance, and routing telephone wires near electrically noisy equipment (electric motors, fluorescent lighting, etc.). Dial-up installations must be located as close to the telephone connection as possible. All outdoor runs of telephone line connections should be installed in metal conduit to reduce interference.

Once an ACC controller is connected via telephone, it can share the communications connection with other controllers via radio and hardwire. The following considerations apply to these optional outbound connections.

UHF RADIO

The Communication Module ACC-COM-HWR, ACC-COM-POTS, or the ACC-COM-GSM (E) does not contain a radio. It is designed for use with a Hunter RAD3 UHF radio, which must be ordered separately.

The RAD3 radio will require an antenna, which is also sold separately.

In steel enclosures, the antenna must be installed externally (signals will not communicate from inside a metal box).

- Plan ahead for mounting an external antenna. It will be necessary to route the antenna cable from the radio module inside the enclosure, to the antenna outside of the enclosure. A site survey with comparable radios is required before a final decision can be made about antenna types and placement.

In the plastic pedestal enclosure, the Hunter IMMS ANT 2 antenna is designed to be mounted in the pedestal lid and may be adequate for communications (to be determined in advance by site survey).

In North America and most other countries, a license is required before operating any radio transmission equipment. Verify your local regulations and make sure that you have obtained the proper licensing before operating radio equipment.

HARDWIRED CABLE

The Communication Module ACC-COM-HWR, ACC-COM-POTS, or the ACC-COM-GSM (E) does not contain a hardwire connection terminal.

Any controller needing hardwired communications must be equipped with an ACC-HWIM, in addition to the ACC-COM-xxx communications module. The HWIM is installed in the controller cabinet, on the ACC Master Module (see ACC-HWIM instructions).



Hardwired communications also requires Hunter GCBL

cable. This special cable uses 4 color-coded twisted conductors, shielded with foil, and grounded with an additional bare wire, in direct burial jacket. The cable is also ordered separately.

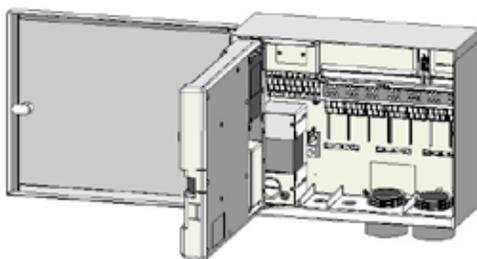
- Plan ahead for routing the hardwired cable. The cable must be routed from the ACC-HWIM terminal, out of the enclosure, to any devices to which it will be connected.

Turn the controller AC power OFF before installing the Com module. You can turn off the AC power circuit to the controller, or remove the fuse at the controller transformer assembly. Pedestal mounted controllers have a power switch, which can be pressed to the OFF position.

- Note that there are additional steps listed for installation with RAD3 radio modules.

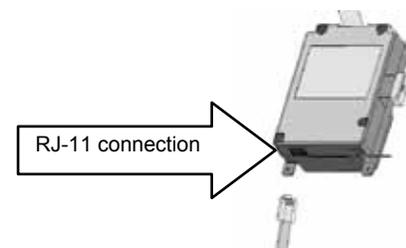
COMMUNICATION MODULE INSTALLATION FOR WALL MOUNT CONTROLLER

1. Turn controller AC power off.
2. Open the facepack door frame and locate the communications compartment cover on the back right side of the frame. You may find it easier to complete the following steps if the facepack door frame is completely removed from the controller (disconnect facepack door frame ribbon cable, open and lift up the door frame to compress top hinge, and tilt out of lower frame).
3. Remove the communications compartment cover (6 screws).
4. Remove the ACC logo cover (two screws).



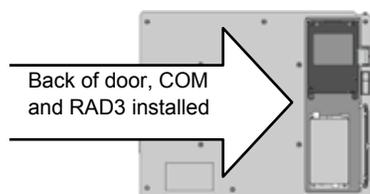
9-pin connector on the other end for connection to the radio. The 14-pin connector only plugs one way, and is keyed to assist proper orientation. Align the connector and push into place on the top of the Com module.

- When the Com module is installed in the opening, make sure that the ribbon cable is visible on the back of the unit, for connection to the RAD3 radio module.
5. If using the ACC-COM-POTS communications module, route the RJ-11 compartment via the low voltage conduit openings. Connect the telephone cable to the mating receptacle on the bottom of the ACC-COM-POTS modem, and insert until it clicks positively into place.



RADIO INSTALLATION, ADDITIONAL STEPS

If the Com module will be used with a RAD3 radio, the radio ribbon cable should be connected now, before installing the ACC-COM-xxx into its compartment.



- The radio ribbon cable has a rectangular 14-pin connector on one end for the Com module, and a DB-9

If using the ACC-COM-HWR or ACC-COM-GSM (E) communications module, no additional steps or connections need to be made. Continue on with the following steps.

6. Route the radio antenna cable (if applicable) through the recessed track next to the radio compartment, and then through the low voltage conduit openings in the cabinet, for connection to external antenna.
7. Leave sufficient slack in the telephone and antenna cables to allow the door to open and close without crimping.

8. Insert the ACC-COM module into the opening where the logo cover was, with the display and buttons protruding through the opening. Secure with 4 screws (supplied) on each corner. The screws are recessed and a small magnetic tip screwdriver is very helpful for this task.
9. Carefully insert the modular ribbon connector plug into the mating receptacle in the door frame. This connector is keyed and has slots which must be aligned correctly, so that the connector can only fit one way. Press firmly to make sure that the connector is fully seated.

RADIO CONNECTIONS, ADDITIONAL STEPS

- Before installing the RAD3 radio module, connect the DB-9 connector from the ribbon cable to the top of the RAD3 radio and secure with the connector screws (do not overtighten).
- Connect the radio power cable from the RAD3 radio to the radio power connection on the bottom of the Com module.
- Connect the male BNC radio antenna connector to

the RAD3, before installing the radio into the radio compartment.

- Install the radio into the radio compartment (see RAD3 installation instructions for additional information).

Reapply controller power and verify that the Com module display lights up and displays characters.

If there is no display:

1. Double check ribbon cable connection from Com module to facepack door frame receptacle.
2. Double check ribbon cable from facepack door frame to controller cabinet.

COMMUNICATION MODULE INSTALLATION FOR PLASTIC PEDESTAL CONTROLLER

(requires APPBRKT communications bracket, sold separately)

1. Turn controller AC power off with the AC power switch in the pedestal.
2. Open the facepack frame in the top of the pedestal, to expose the communications module mounting area.
3. Install the APPBRKT communications bracket with its supplied mounting hardware. This bracket is designed to hold the Com module and a RAD3 radio module (if radio is required).
4. Install the ACC-COM-xxx into the APPBRKT mounting bracket. Secure the Com module with screws on each of the 4 corners.

insure that there is only enough slack to allow the lid to open and close, without causing the cable to be pinched.

5. Connect the ACC-COM-xxx ribbon cable extension to the controller facepack connection on the underside of the facepack frame. This is the keyed 14-pin connector, top left, above the main facepack ribbon connection.
6. When using the ACC-COM-POTS connect the RJ-11 telephone cable to the telephone service mating receptacle. In high lightning environments, the telephone cable may be connected through a grounded surge suppression device (some computer power strips have these built in).
7. Reapply controller power and verify that all devices power up and have displays. Proceed to Setup and Addressing of the Com module, in the next section.

RADIO INSTALLATION, ADDITIONAL STEPS

- If radio communications will be used, connect the RAD3 radio module cables to the Com module with its ribbon cable and power connector first.
- Install the Com module into the bracket, and then install the RAD3 on the APPBRKT with supplied hardware.
- Install IMMS-ANT-2 in pedestal lid.
- Route antenna cable from the IMMS-ANT-2 through the slot in the metal frame for the facepack, down into the controller to the radio location.
- Connect the cable connector to the radio module (be sure to turn the BNC connector until it locks into place).
- Install the plastic cable guide (P-) with self tapping screw as shown. Adjust cable before tightening to

SETUP AND ADDRESSING THE COM MODULE

When powered up, the Com module display will show the version number, and will automatically check to see what other communications devices are installed. This will take a few seconds, and the display will show the type of COM Module installed, ACC-COM-xxx when complete.

Note the version number and include it whenever seeking technical assistance from Hunter Industries via phone or email.

The Com module controls use the up and down arrow buttons to make selections, a + and – button to change individual settings, and an Enter key (far right), also identified as the Backwards Arrow Button. ←

Set Controller ID: The controller ID, or address, is required before any communications can take place. An address may be any number between 1 and 999.

SET THE CONTROLLER ADDRESS

Press the Up arrow once. The display will show Controller Address. The Address will be 0 if the module is new.

Press Enter to enter the Address edit mode. Blinking boxes will appear over the controller Address number.

Use the + or – buttons to change the Address to the desired setting. If you hold the + or – button for more than a second, the numbers will change faster, in increments of

10. When you are close to the Address number you want to set, release and press again to fine tune the address to the precise number. You can go forward or backward with the + and – buttons to set the exact number.

Press the Enter button to enter the Address. The controller will now be addressed.

The controller Address is assigned to a Com module, not to the controller itself, nor to the ACC facepack. The controller Address can be reprogrammed at any time with the buttons, but it is important to remember that the facepack of the ACC controller does not have an address of its own. If you move an ACC facepack to another controller, the address remains with the Com module unless changed.

If you move a Com module with an Address number to another controller without readdressing, it will receive information meant for the first controller! The Addresses cannot be changed remotely (from the computer) and can only be set and changed at the Com module itself.

OTHER COM SETUP FUNCTIONS

ACC-COM-xxx detects other communications connections and displays information about them. It also allows operator control of some settings and functions.

Use the Up or Down arrow to navigate through main topics.

“0” is the setting in a new, unadjusted Com module, which can be changed after installation.

MASTER CONTROLLER

Shows YES if the controller has been designated as a Master Controller or NO if the controller has not been designated as a Master Controller. Press Enter to change, + or - to change, and Enter when done. The Master Controller designation is reserved for the first controller receiving communications with central for the Site.

Assigning a controller as a Master Controller or not as a Master Controller will have no effect on communications. It is reserved for future use.

CONTRAST

Default = 50. Adjusts display visibility for varying conditions. Press Enter to adjust, + or – to change, and press Enter when done. The display contrast may be adjusted for daylight conditions where reflection makes the display difficult to read.

RADIO TYPE

Shows a type of radio module, if one is found by the Com module.

Radio communications can be used in 2 distinct ways:

- To connect a controller to additional controllers within the same Site.
- To use a UHF Maintenance Radio (Hunter Model TRNR) as a remote control for the controller.

LAST MR CMD (RADIO ONLY)

Displays the characters in the last-received UHF Maintenance Radio command, for diagnostic purposes. This setting is not shown if there is no radio. This setting only applies to UHF Maintenance Radio and will not show ICR remote commands.

DTMF WAIT (RADIO ONLY)

Sets amount of time allowed between characters in a Maintenance Radio command, 1 – 5 seconds. The purpose of this setting (default = 2 seconds) is to tell the Com module how long to wait after hearing DTMF Maintenance Radio commands, before assuming the command is complete.

Maintenance Radio commands are sent from a UHF portable radio by pressing buttons which send DTMF (Dual Tone Multi-Frequency, also known as Touch-Tones) tones to the Com module. When a command has been started, the Com module assumes it is finished when the DTMF

wait period has elapsed or the radio carrier signal stops, with no more tones.

A longer DTMF wait allows slower typing speeds of the command on the radio. The trade-off is that the longer wait means that it will take longer for the action to be carried out (in other words, if the Wait is 5 seconds, it will be 5 full seconds after the command has been sent before the sprinkler turns on).

This setting is not shown if there is no radio. This setting does not affect ICR remote commands.

MR DEFAULT RUN TIME (RADIO ONLY)

Default = 30 Minutes. This sets the automatic run time for any station or SSG that is started by a Maintenance Radio command, if no run time has been specified in the On command. It is possible to turn a station or SSG on without specifying a run time, and this setting will automatically turn them off after the specified time if they are not turned off by an Off command. The Default Run Time can be changed in 1 minute increments up to a maximum of 60 minutes. This setting is not shown if there is no radio and does not affect ICR remote commands.

MODEM TYPE

Indicates presence of a telephone modem in the Com module. This display is informational and cannot be changed from the Com module.

COUNTRY CODE

If a telephone modem is detected, the country code may need to be changed to work with regional data modem requirements. The default setting is "0" and for most countries this is the correct selection.

If your country appears on the following list, change the code display to the number shown:

Country	Code
<i>Australia</i>	2
<i>Czech Republic</i>	3
<i>Hong Kong</i>	1
<i>Hungary</i>	1
<i>India</i>	1
<i>Indonesia</i>	1
<i>Israel</i>	1
<i>Japan</i>	4
<i>North Korea</i>	1
<i>Malaysia</i>	1
<i>New Zealand</i>	5
<i>Philippines</i>	1
<i>Poland</i>	1
<i>Singapore</i>	1
<i>Slovenia</i>	1
<i>South Africa</i>	6
<i>Vietnam</i>	1

To change the country code, press Enter and the code will be highlighted. Use the + or – buttons to select the code, and press Enter. The code will now be set.

HWIM

Indicates presence of a Hardwire Interface Module (ACC-HWIM) installed in the controller. "None" indicates no HWIM has been found, "Installed" indicates that the HWIM is installed and has been detected. This display is informational and cannot be changed from the Com module.

ENTER DIAGNOSTICS

To use the built-in communications diagnostics, press the Enter button at this display.

This will allow you to select from the following diagnostic functions (use the up or down arrow buttons to move through the choices).

Communications Status display [MOD RAD HW]

Pressing the left arrow button at any time will show a status display for communications, showing transmit and receive activity for each communications type. The display shows: MOD RAD HW #, indicating Modem, Radio, Hardwire, and number of data packets sent.

Under each item MOD, RAD, and HW, the letter T shows transmit activity and R shows receiving data for that communications component. The symbol * shows other radio traffic ("carrier detect").

This is a useful diagnostic tool.

MOD: Shows dial-up or cellular modem activity.

RAD: Shows T when the controller radio is transmitting, and R when it is receiving data from another radio.

HW: Shows T when the controller is transmitting over GCBL cable, and R when receiving data via GCBL.

#: Shows the count of individual packets of data as they are exchanged. This number continues to increase as events are counted until it reaches 255, then begins again at 1. Digital communications are divided into packets of data, and sent in pieces called "packets". After each packet is sent, a confirming response is expected. This counter tracks all communications in the module via radio, hardwire, and modem.

The * may indicate other radio traffic (from other sources). Communications problems that cannot be explained by hardware issues are sometimes caused by interference from other sources. If * is frequently present when no ACC communications are taking place, it may indicate that the frequency is very busy.

RADIO TONE TEST

If the controller does not have a RAD3 radio module installed, the screen will show NONE for this diagnostic function. Press the left arrow button twice to display the Radio Tone Test, and press Enter to start the test. The radio module will transmit a 5-second burst of data, to confirm whether the radio is working. The burst can be heard with another radio or scanner tuned to the same frequency.

For this test to be effective, you will need a two-way radio or scanner on the same frequency as the radio module.

- When the radio test is started, a burst of data indicates a working radio module in the controller.
- If nothing is heard, either the radio is inoperative or the wrong frequency has been selected for receiving.
- If a broken, rough-sounding, or very faint signal is heard, there may be a problem in the antenna, antenna cable, or connectors. This may also indicate a problem in the radio module, although antenna/cable/connectors. This may also indicate a problem in the radio module, although antenna/cable/connectors are more likely the cause. The easiest way to check this is to swap the radio module with a known good unit, connect to the same antenna and cable, and repeat the test... if the sound clears up, the problem was the module. If the sound is still poor, it is probably the antenna/cable/connector setup.

PING TEST

The ping test allows any controller to exchange communications with another controller for test purposes. Select a Target controller from the Source controller. Enter the target address by pressing the + button while the address number is blinking in the main Ping Test screen. Press Enter when the address is correct, and the Ping Test will begin. When the test is started, the Source controller will "ping" the Target controller repeatedly and show success or failure of the communications. Any other controllers which can hear the test will also show the results, while the test is taking place.

PING HUB

This test is used in Surveyor systems to ping test the central interface (AGCHUB) instead of another controller.

SOFT RESET

This "reboots" the communications module if it is temporarily confused. If the display or controls appear to be locked up, soft reset will restart the module without erasing data.

TOTAL RESET

This completely resets all data in the Com module. It will erase any settings including the address! If the com module is unresponsive and a soft reset does not solve the problem, Total reset allows you to start over with a clean installation. This is also useful when moving a Com module from one installation to another, or when you are uncertain what previous operators may have programmed into the module.

OPERATING THE COM MODULE

With the Com module installed and operational, the two most important steps are to verify that the controller address is correct, and that the software is set up correctly to connect to the Site.

The software documentation provides information on configuring Sites and the connections for each Site. In general, a com port must be assigned in the computer for outbound communications, the Site must be created, and a telephone number for the Site must be entered and saved.

When the software has this information, any communications for the Site will use the data to automatically dial and connect to the Master controller and any other controllers on the Site.

TROUBLESHOOTING.....

Problem	Causes	Solutions
No Display	<p>Check AC~ power to controller</p> <p>Facepack is not firmly seated and locked, and/or 9-pin connector is not fully connected</p> <p>Gray ribbon cable is not connected from back of inner panel to cabinet</p>	<p>Fix power supply</p> <p>Seat facepack in connector</p> <p>Connect ribbon cable on back of facepack door</p>
Display reads "Attention" (may be followed by Sensor number)	<p>ATTENTION indicates an alarm, an active sensor, or trouble in the system. ATTENTION means turn the dial to Data History, select the Alarm Log, and find detailed messages about each individual alarm with date and time. A complete list of alarm messages is included after this table</p>	<p>Turn dial to Data History, select Alarm Logs, and review for individual alarm events</p> <p>The Controller Log and Station Log may also be useful supporting information when diagnosing problems</p>
Station does not irrigate	<p>Field wiring or solenoid problem</p>	<p>Perform Manual One-Station start and observe display and output light</p> <p>If light is red, check solenoid and field wiring, including COM (common) wires. Station outputs must not exceed 0.56A total</p>
Controller does not irrigate automatically	<p>Possible programming errors</p> <p>Sensor shutdown</p> <p>Programmable Off in effect</p> <p>Time/Date errors</p>	<p>Verify all programs Days to Water, Start Times, and Station Run Times</p> <p>Check display for Fault indication (if yes, press + for status)</p> <p>Check display for Off days</p> <p>Verify controller time and date, including AM/PM/24 hour settings</p>
Rain or other Clik sensor does not shut down system	<p>Incorrect sensor type or connection</p> <p>Incorrect sensor settings for Program</p>	<p>Use one normally-closed Clik-type sensor per sensor port (SEN1-4). Verify that one wire from each sensor is to + and one to -. Do not connect multiple sensors to a single port</p> <p>Turn dial to Set Sensor Operation and verify correct response for each program to the sensor (Pause or Suspend)</p>
Controller does not recognize output module (station size shown incorrect)	<p>Module seated incorrectly</p> <p>Module slot skipped</p> <p>Station output module overloaded</p>	<p>Verify that modules are seated all the way up in wiring compartment, and module lock is On</p> <p>Verify that no module slots have been skipped, from left to right</p> <p>Re-seat module, and observe green station light flashing when module is recognized.</p> <p>No station light or red light</p> <p>Swap with known-good module, check for green light. If new module works, replace old module (probably surge overload). If new known-good module also fails to light, check gold and silver contacts for dirt, corrosion, pests.</p>
AC~ fuse blows	<p>Incorrect AC wiring</p> <p>Surge on AC power line</p>	<p>Verify that AC connections are correct for AC~ supply voltage</p> <p>Check for lightning damage in vicinity</p>
Multiple output module failures	<p>Lightning</p> <p>Modules not installed correctly</p> <p>Overcurrent message</p>	<p>Check and improve earth ground</p> <p>Insure that modules are inserted correctly with ground contact in back, and pushed all the way up- red light should light momentarily when module is recognized</p> <p>Too much current for station output (0.56 Amp max). Divide solenoids over more station outputs</p>

ACC/AGC LOG MESSAGES

The controller has 3 separate log files.

Each individual log has the date and time of the event at the top of the screen.

Each type of log will show the most recent event first.

Use the + and – buttons to step through events, forward or backward.

Alarm Log tracks all unusual events that require attention. The Attention display (or “Fault”, in earlier versions) that appears when the dial is in the Run position will almost always have one or more corresponding Alarm Log entries, with more detail. Turn the dial to Data History and select Alarm Log whenever an ATTENTION display occurs.

Controller Log tracks general changes or occurrences for the controller. Most of these are not alarm events.

Station Log tracks all station activity, including normal and abnormal activity. It can be used simply to verify whether irrigation occurred, or used as part of the diagnostic process.

ALARM LOG MESSAGES

Sensor State Change	Sensor changed state (Closed/Open)
Missed Irrigation	A station missed irrigating
Power Outage	Controller or facepack power was lost
Power Restore	Controller or facepack power was restored
ADM Fault	A fault was reported by ADM
Pump Fault	A pump decoder reported a fault
Station Fault	A station decoder reported a fault
Pump Dec Failure	A pump decoder failed
Sta Dec Failure	A station decoder failed
Sensor Decoder	A sensor decoder reported a fault

Alarm Log, Missed Irrigation “Mode” Labels

Mode appears when a station failed to complete irrigation for some reason, and indicates why the station was supposed be running in the first place.

Scheduled	Station was running as part of an automatic Field Controller Program (FCP) (A, B, C, D, E, or F)
System Event	Station was running as a System Automatic Event
Manual Prg All	Station was running as part of a Manual All Stations Program
Custom Manual	Station was running as part of a Custom Manual Program
Manual Station	Station was running as a Manual One Station
SME	Station was running as a System Manual Event
MR Program	Station was running as part of a Manual All Stations program started by Maintenance Radio
MR SSG	Station was running as part of a SSG started by MR
MR Station	Station was running as a Manual One Station started by MR
ICR Program	Station was running as part of a Manual All Stations program started by ICR remote
ICR Station	Station was running as a Manual One Station started by ICR
ETS Program	Station was running as part of a Manual All Stations started by ET System
ETS Station	Station was running as a Manual One Station started by ET System
Learn Event	Station was running as part of the Learn process
Test Event	Station was running as part of the Test program

Alarm Log, "Reason" Labels

The Reason label indicates the type of alarm condition.

Unknown	No reason specified
Overflow	Overflow alarm occurred
Underflow	Underflow alarm occurred
Overcurrent	Station Overloaded
Activated	Sensor Activated
Deactivated	Sensor Deactivated
Damaged	Decoder is damaged (continuous low voltage output)
Comm Fail	Decoder communications failure - no response
Unavailable	Cannot run station due to too many stations already running
Comm Restore	Communications was restored to a decoder
Config Fail	Failure occurred when attempting to configure a sensor decoder on the 2-wire path
Flow Totals	Failure occurred when attempting to get the flow totals from a sensor decoder
Flow Detail	Failure occurred when attempting to get the flow detail data from a sensor decoder
Sensor Alarm	The status of the Sensor Decoder Alarm Polling has changed
Lith Fail	The lithium battery in the facepack has failed
Clock Fail	A problem exists with the Real Time Clock (RTC) in the facepack

CONTROLLER LOGS

Track significant events at the controller, which are not necessarily alarms or malfunctions.

Message	Description
EASY RETRIEVE RESTORED	Easy retrieve programs were restored
PROGRAM X RESET BY CENTRAL	Field controller Program X was reset by central
OFF MODE SET AT CONTROLLER	Dial was put in OFF position
RUN MODE SET AT CONTROLLER	Dial was taken out of OFF position
PROGRAMMABLE OFF SET AT CONTROLLER	Programmable Off was initiated at the controller
PAUSE MODE SET AT CONTROLLER	Pause Mode was initiated at the controller
PAUSE MODE CANCELLED AT CONTROLLER	Pause Mode was cancelled at the controller
PROGRAMMABLE OFF SET BY CENTRAL	Programmable Off was initiated by central
PAUSE MODE SET BY CENTRAL	Pause Mode was initiated by central
PAUSE MODE CANCELLED BY CENTRAL	Pause Mode was cancelled by central
SUSPEND MODE SET BY CENTRAL	Suspend Mode was initiated by central
SUSPEND MODE CANCELLED BY CENTRAL	Suspend Mode was cancelled by central
PROGRAMMABLE OFF TIMEOUT	Programmable Off timed out
PAUSE TIMEOUT	Pause timed out
NO WATER WINDOW VIOLATION	A No Water Window Violation occurred
MEMORY CORRUPTED RESET TO DEFAULTS	Memory is suspect and was reset to defaults by microcontroller
ALL DATA RESET TO DEFAULTS	All data was reset in the controller
ALL LOGS RESET AT CONTROLLER	All logs were reset at the controller
FLOW TOTALS RESET AT CONTROLLER	All flow totals were reset at the controller
ALL PROGRAM DATA RESET AT CONTROLLER	All programs were reset at the controller
ALL NAMES RESET AT CONTROLLER	All names were reset at the controller
IRRIGATION STOPPED BY CENTRAL	Irrigation was stopped by the central

Message	Description
IRRIGATION STOPPED BY MAINT RADIO	Irrigation was stopped by maintenance radio
PAUSE MODE SET BY MAINT RADIO	Pause Mode set by Maintenance Radio
PAUSE MODE CANCELLED BY MAINT RADIO	Pause Mode cancelled by Maintenance Radio
FCP MODE SET AT CONTROLLER	FCP Mode set at controller
EVENT MODE SET AT CONTROLLER	Event Mode set at controller
FCP MODE SET BY CENTRAL	FCP Mode set by central
EVENT MODE SET BY CENTRAL	Event Mode set by central
PROG OFF CANCELLED AT CONTROLLER	Programmable Off was cancelled at controller
CUST MAN PROGRAM X RESET BY CENTRAL	Custom Manual Program X was reset by the central
ALL FCPs RESET BY CENTRAL	All Field Controller Programs (A to F) were reset by central
ALL CUST PROGRAMS RESET BY CENTRAL	All Customer Manual Programs (1 to 4) were reset by central
ALL STATION DATA RESET BY CENTRAL	All station related data was reset by central
ALL SSG DATA RESET BY CENTRAL	All SSG related data was reset by central
ALL P/MV DATA RESET BY CENTRAL	All Pump/Master Valve data was reset by central
ALL SENSOR DATA RESET BY CENTRAL	All Sensor 1 to 4 data was reset by central
ALL FLOW SENSOR DATA RESET BY CENTRAL	All Flow Sensor data was reset by central
FLOW ACCUMULATORS RESET BY CENTRAL	All Flow Accumulators were reset by central
FLOW TOTALS RESET BY CENTRAL	All Flow Totals were reset by central
TIME OR DATE CHANGED AT CONTROLLER	The time and/or date was changed at the controller
TIME OR DATE CHANGED BY CENTRAL	The time and/or date was changed by the central

STATION LOGS

Station Log records all station activity in the controller.

The Mode labels are the same as shown in the Run dial position, when stations are running.

Mode	Meaning
AUTO	Automatic Field Controller Program (FCP)
AUTOEV	Automatic System Event
MAN	Manual Station/Program
CUST	Custom Manual Program
MAN-EV	Manual System Event
MRP	Maintenance Radio Program
MRS	Maintenance Radio Station
ICR	ICR Program/Station
ETS	ET System Program/Station
LEARN	Learn Mode
TEST	Test Program
PAUSE	Paused Program/Station
SUSP	Suspended Program/Station

The Status portion shows the type of event, or the reason a station did not complete. Each start and stop of a station is recorded. If a station has a "Pause" or "Delayed" event, it does not necessarily indicate a malfunction. There are several causes that may occur during normal irrigation.

Status	Description
System Pause	Pause issued by controller or central
System Susp	Suspend issued by central
Sensor Pause	Pause initiated from sensor activation
Sensor Susp	Suspend initiated from sensor activation
No Water Win	Station ran into no water window
Complete	Station completed run time
Delayed	Soak completed
Interrupted	Indicates that a station was interrupted by pause/suspend
Max Sta Run	Station could not run since max stations were already running
Overcurrent	Station shut down due to overcurrent
Stopped	Station was stopped due to dial put in Off, Stop Irrigation command received or higher priority event
Man Sta Chg	Station stopped due to manual station advance
Flow Pause	Irrigation was delayed due to flow isolation process
ADM Flt Susp	Irrigation was suspended due to an ADM fault
Dec Com Fail	Irrigation was stopped due to a comm failure with decoder

SPECIFICATIONS

DIMENSIONS

ACC1200,ACC99D Cabinet :

12 $\frac{3}{8}$ " H x 15" W x 6 $\frac{7}{16}$ " D

(31.37 cm H x 39.37 cm W x 16.38 cm D)

ACCPED Metal Pedestal:

36 $\frac{1}{8}$ " H x 15" W x 5" D

(91.45 cm H x 39.37 cm W x 12.7 cm D)

ACC1200PP, ACC99D-PP Plastic Pedestal:

38 $\frac{3}{8}$ " H x 21 $\frac{1}{16}$ " W x 15 $\frac{7}{8}$ " D

(97.47 cm H x 54.61 cm W x 40.32 cm D)

ELECTRICAL

Transformer Input

Supply wires must be 14 AWG (1.85 mm) or larger!

120/230 VAC

50/60 Hz

1.2 A max at 120V/0.73 A max at 230V

Transformer output

24 VAC, 4A, @ 120 VAC

Station output: 0.56 A @ 24 VAC

Pump/Master Valve output: 325 mA @24 VAC

24 VAC Test terminal output: 420 mA @ 24 VAC

Solenoid capacity: 2 standard 24 VAC Hunter solenoids per output (0.56 Amps max), 14 solenoids max simultaneous (includes dual P/MV outputs).

Battery, facepack: 9 VDC alkaline, for facepack remote power only.

Battery, facepack, internal: CR2032 lithium for real time clock only.

Cleaning

Clean only with cloth dampened with mild soapy water.

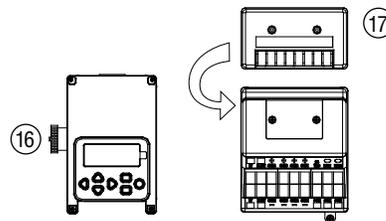
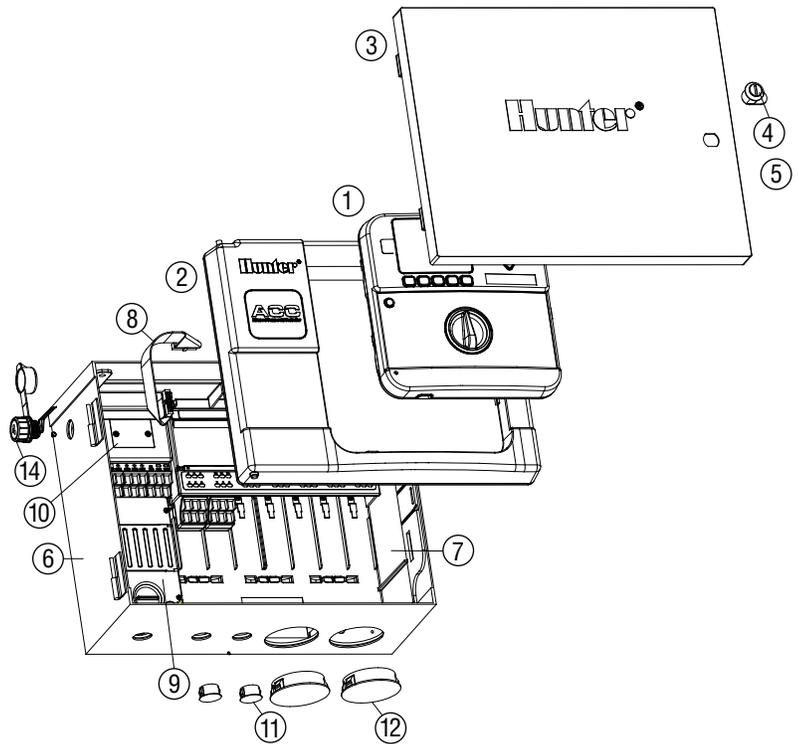
FEATURES & GENERAL SPECIFICATIONS

- 6 Automatic Programs
- 10 Start Times per program
- Station Run Times, 1 second to 6 hours in Conventional Controllers, and 15 seconds to 6 hours in Decoder Controllers
- Delay between Stations, 1 second to 9 hours, 59 minutes
- Interval Day scheduling, 1 to 31 days
- 4 Custom Manual programs (for manual or remote start only)
- 20 Simultaneous Station Groups with up to 4 stations each
- 2 normally closed Pump/Master Valve outputs, configured by station
- 1 Flow Meter, with Station level learning and diagnostics
- 4 Hunter "Clik" sensor inputs, with programmable shutdown by program
- Test Program run times: Conventional, 1 second to 15 minutes each, Decoder, 15 seconds to 15 minutes each
- Up to 42 stations, conventional
- Up to 99 stations, decoder

PARTS

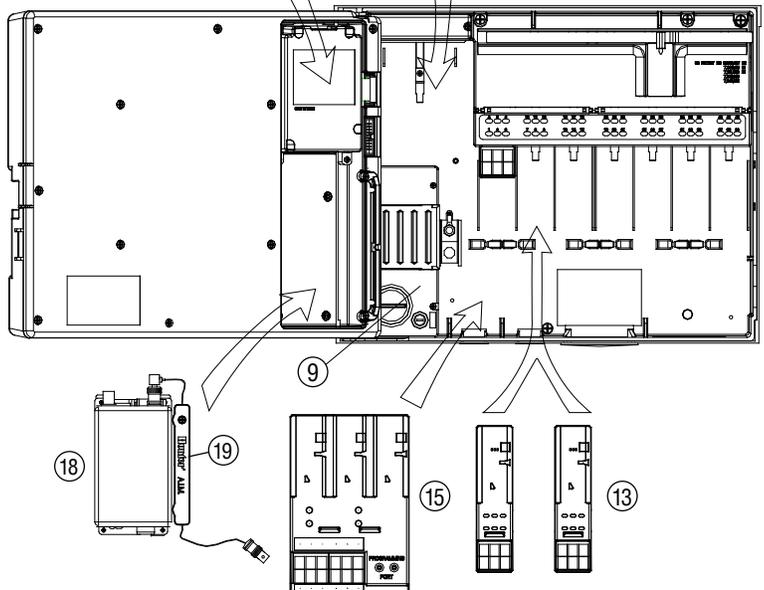
WALL MOUNT CONTROLLERS (ACC1200, ACC99D)

Item	Description	Catalog No.
①	Front Faceplate Face Pack	571500
②	Front Face Pack Door Frame	589000
③	Metal Front Door w/o Lock	585500
④	Lock & Key Set <i>(Not Shown)</i>	387300
⑤	Key Set (2) <i>(Not shown)</i>	122516
⑥	Metal Cabinet w/o Door	585000
⑦	Inner Controller only <i>(With 585100), no modules or transformer</i>	586005
⑧	Door Ribbon Cable <i>(Wall mount only)</i>	585100
⑨	Transformer Assembly	587000
⑩	Master Module	572000
⑪	Small Hole Plug	654400
⑫	Large Hole Plug	654500
⑬	Station Module(s) ACM-Module <i>(Standard)</i> AGM-Module <i>(Extreme service)</i>	ACM600 AGM600
⑭	SmartPort® Assembly including Nut	112200
⑮	Decoder Output Module	ADM99



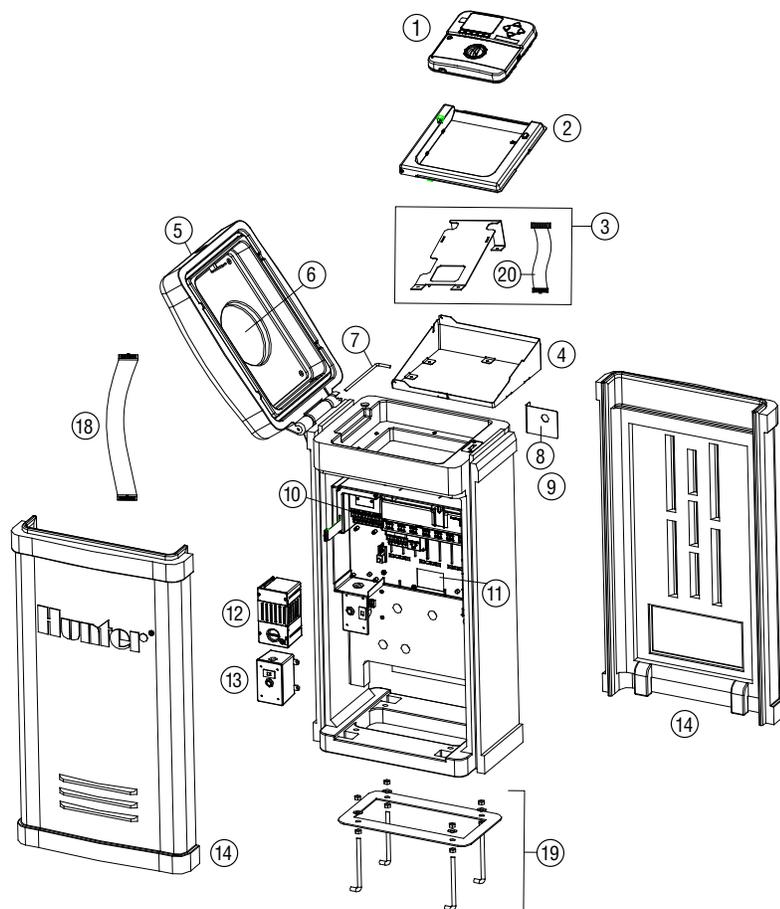
COMMUNICATION MODULES AND PARTS

Item	Description	Catalog No.
⑯	Com module for dial-up <i>(POTS)</i>	ACC-COM-POTS
⑯	Com module for GSM cell <i>(USA)</i>	ACC-COM-GSM
⑯	Com module for GSM, International	ACC-COM-GSM-E
⑯	Com module for radio and hardwire only	ACC-COM-HWR
⑰	Hardwire Interface Module	ACC-HWIM
⑱	UHF radio <i>(No antenna)</i>	RAD3
⑲	Antenna Isolation Module	AIM-BNC



PEDESTAL CONTROLLERS (ACC1200PP, AGC1200PP, ACC99DPP, AGC99DPP)

Item	Description	Catalog No.
①	Front Faceplate Face Pack (ACC)	571500
	Front Face Pack (AGC)	571505
②	Front Face Pack Door only	620000
③	Plastic Ped Com and Radio Bracket, including Ribbon Cable	APPBRKT
④	Frame Adapter	145500
⑤	Lid including Lock	553305
⑥	Lid Antenna for Ped, UHF	IMMSANT2
⑦	Lid Hinge Pin	558400
⑧	SmartPort® Bracket	576000
⑨	SmartPort® Wiring Harness	112210
⑩	Master Module	572000
⑪	Decoder Output Module	ADM99
⑫	Transformer Assembly	587000
⑬	J Box	145410
⑭	Pedestal Door with Screen	553205
⑮	Lock & Key Set <i>(Not shown)</i>	558000
⑯	Key Set (2) <i>(Not shown)</i>	122516
⑰	ACC Ped Inner Panel Cabinet with Transformer	621230
⑱	Ribbon, Inner Controller to Facepack Door	585105
⑲	Mounting Template Kit, includes Template #558600, and Hardware #420200	581700
⑳	Ribbon, Extension for Com Modules in Pedestals	619900
	Station Module(s) ACM-Module (Standard) AGM-Module (Extreme Service)	ACM600 AGM600



ACC/AGC CENTRAL SYSTEM COMPONENTS (ACC1200, ACC99D, ACC1200PP, AGC1200PP, ACC99DPP, AGC99DPP)

①	Hardwire/Radio Communication Module	ACC-COM-HWR
②	Telephone Communication Module	ACC-COM-POTS
③	Cellular Communication Module	ACC-COM-GSM
④	Cellular Communication Module outside US	ACC-COM-GSM-E
⑤	Radio Communication Module	RAD3
⑥	Hardwire Interface Module	ACC-HWIM
⑦	ET Sensor for IMMS ET	ETSENSOR

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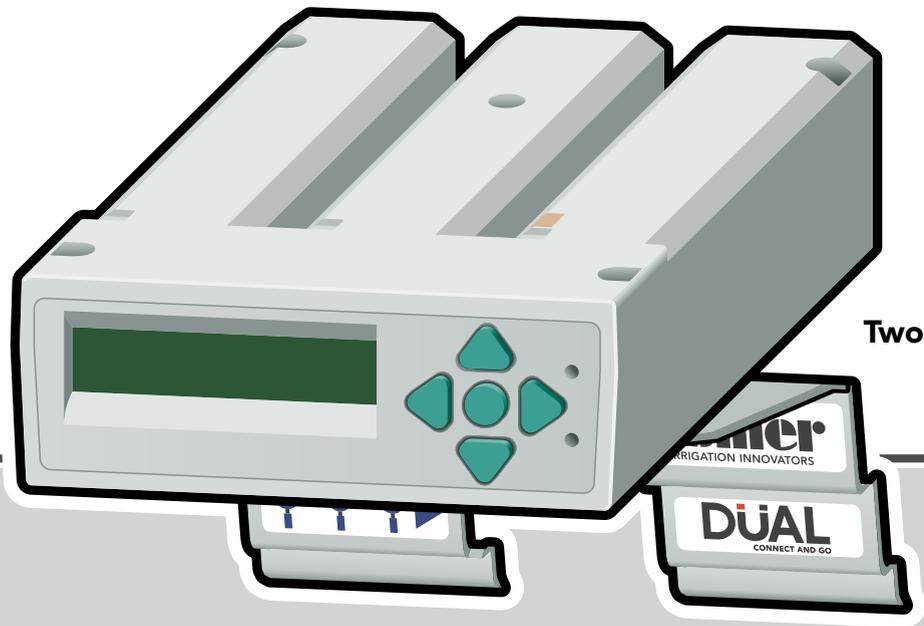
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DUAL

CONNECT AND GO

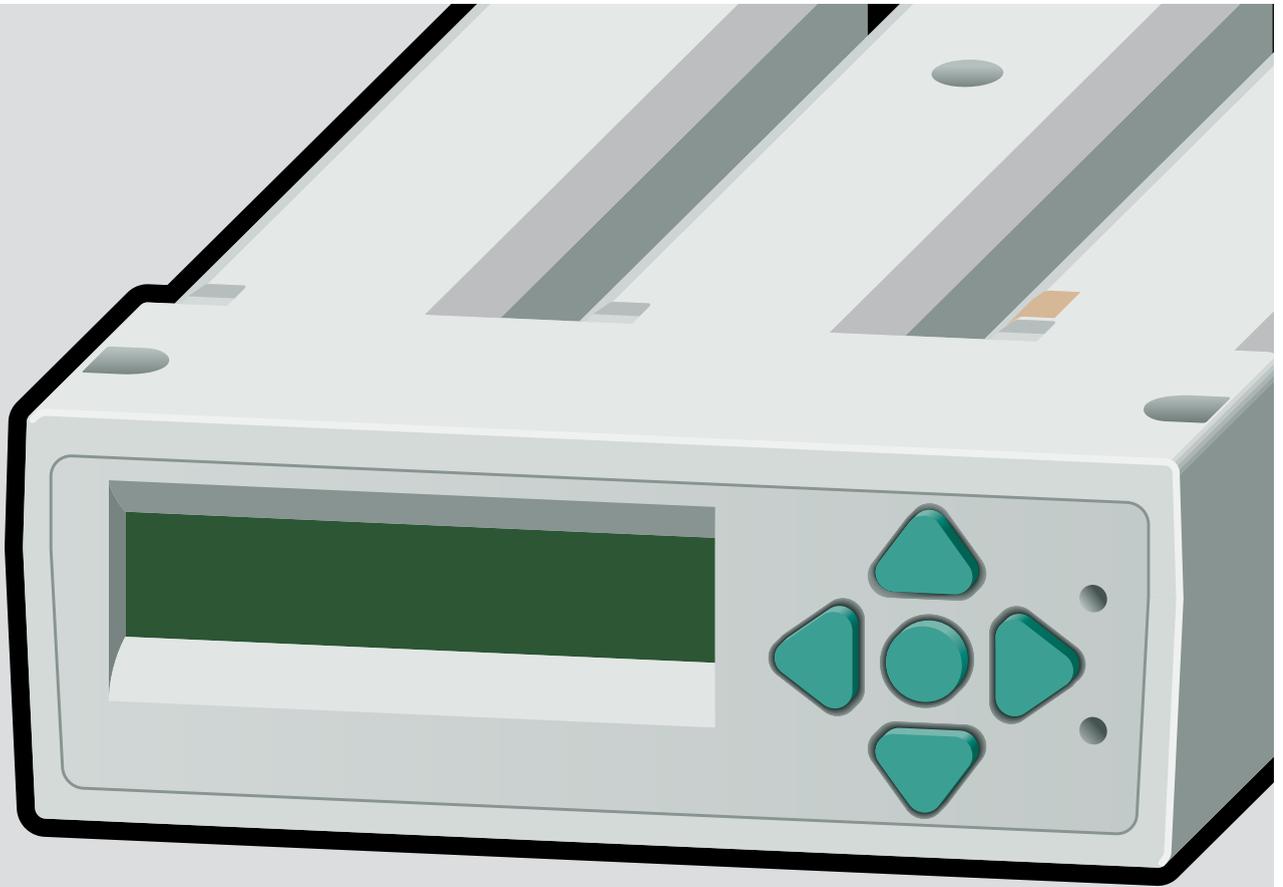


DUAL™ 48M
Two-Wire/Decoder Module

NEW

Owner's Manual and Programming Instructions
For use with I-CORE controller

Hunter®



For use with
I-CORE

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SYSTEM COMPONENTS



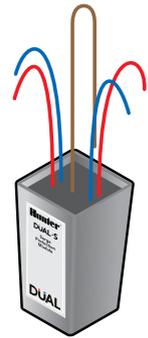
DUAL 48M



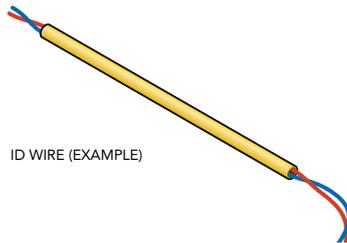
DUAL 1



DUAL 2



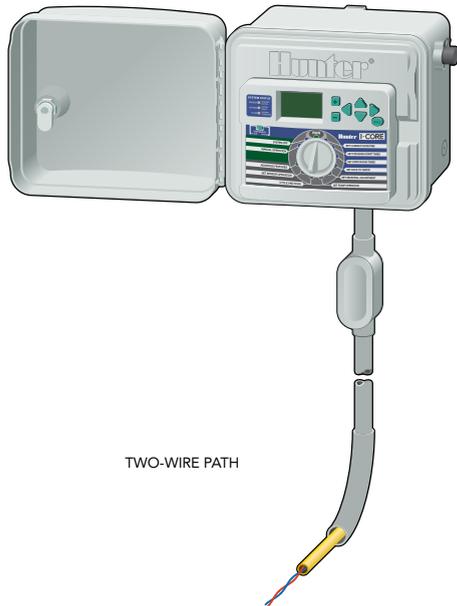
DUAL 5



ID WIRE (EXAMPLE)

OVERVIEW OF DUAL™ DECODER OPERATION

DUAL™ two-wire decoder technology permits control of irrigation systems over relatively long distances by attaching waterproof decoders as needed in a low voltage, direct burial two-wire path. The wire is cut wherever station control is needed, and the decoder wires are spliced into the path. The decoders are then connected to local standard 24 VAC solenoids for individual operation of valves and similar devices. Each decoder is uniquely addressed, and both the signal for their address and the power required for solenoid operation are sent over the single pair of wires. Up to 48 decoders can be individually operated by the I-CORE controller over a single pair of wires in this manner.



Decoder Benefits

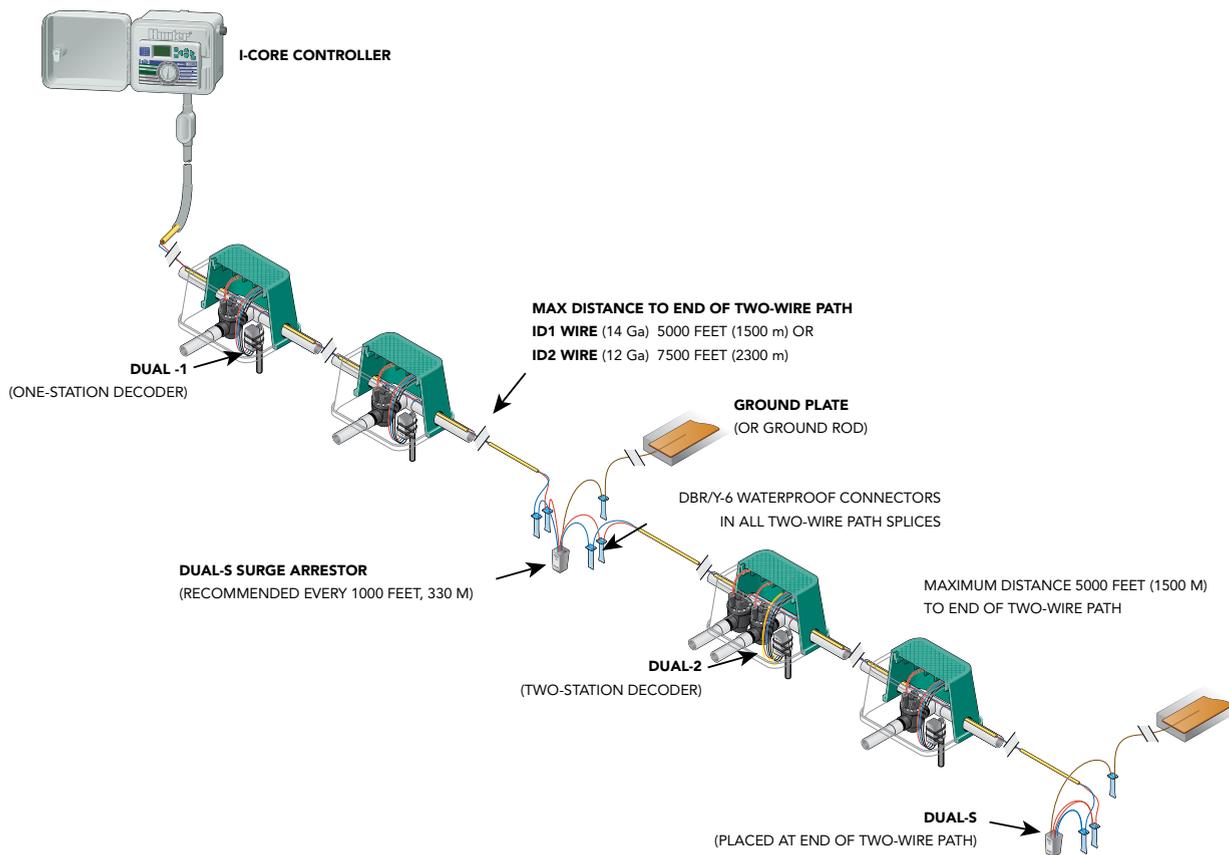
Decoder systems save wire. A significant benefit is the ability to operate up to 48 stations with only two wires, instead of approximately 50 wires for conventional installations. This can also save labor associated with large numbers of individual wire runs.

Decoder systems are flexible. As long as the two-wire path is accessible throughout an irrigation system, stations can be added later by inserting additional decoders into the path at any point, with minimum disruption of turf and landscape. Decoder wire runs can even be spliced and tee'd to follow pipe trenches, minimizing wasted wire.

Decoder systems are lightning resistant. While no irrigation system is immune to lightning, decoder systems have less wire in the ground and, when properly installed, have excellent grounding and surge suppression. They are popular in regions with high lightning exposure.

Decoder systems are relatively easy to program and troubleshoot. There are only two wires per path and a single DUAL-M output module for the decoder functions, equipped with diagnostics. The controller operating system is the same as a conventional I-CORE, which makes programming easy for those already familiar with the I-CORE controller.

SYSTEM OVERVIEW



INSTALLATION OF DUAL DECODER MODULE

The DUAL48M decoder output module is designed for use in all Hunter I-CORE series controllers and provides two-wire decoder outputs for the Hunter DUAL family of field decoders.



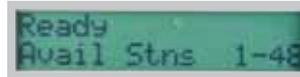
NOTE: This module is not compatible with any other controller or any other type of decoder.

The decoder output module installs in the first three expansion slots of the controller. The station size of this module is 48 maximum.

1. Turn the dial to the Run position.
2. Open the facepack door, and locate the module slide lock. Slide the module lock to the unlocked "Power Off" position.
3. Remove any previously installed ICM-600 station output modules. Install the DUAL48M in the first 3 slots to the right of the Power Module. Do not attempt to force the module into any other position.
4. Install the module by aligning it in the first three expansion slots, and slide it in, pushing until the module is seated flush with the Power Module to the left.



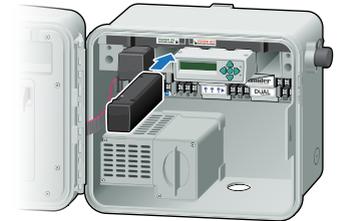
5. Slide the module lock to the locked "Power On" position. The I-CORE will apply power to the module and recognize it for decoder use (controller maximum station size is now 48 stations).



NOTE: The DUAL48M will display a line open message if the module is installed and no two-wire paths and decoders are wired to the controller.

Installation for Combined Decoder and ICM-600 Module

The I-CORE will accept both the DUAL48M decoder module and standard ICM-600 expansion modules (up to 2 additional ICMs in the plastic cabinet and up to 3 in the metal and plastic pedestal controllers), providing the ability to attach decoders and conventionally wired stations to the controller. The ICM-600 module(s) must be installed to the left of the DUAL Decoder Module with no gaps. The 48 station maximum does not change. The decoder module will automatically recognize the number of conventional stations (six per ICM-600). The "Avail Station" display will change to show the range of available decoder stations (for example, 7-48, 13-48, etc).



WIRE SPECIFICATIONS AND INSTALLATION

Wire and wire installation is a key factor in successful decoder installations. Substitution of recommended wire and wire splices is at the installer's own risk and is a major cause of start-up service troubles. Hunter provides two types of wire for use with I-CORE DUAL™ decoder systems.

ID1 WIRE: Two-conductor, solid-core, twisted, color-coded red and blue, direct burial PE jacket 14AWG/1.6 mm dia. copper wires. Suitable up to 5000 feet/1500 m.

ID2 WIRE: Two-conductor, solid-core, twisted, color-coded red and blue, direct burial PE jacket 12AWG/2.05 mm dia. copper wires. Suitable up to 7500 feet/2300 m.

The twisted pairs are not shielded or armored. Conduit is not necessary unless local regulations require it (the two-wire path is low voltage).

- Each two-wire output run of wire is called a "path". The DUAL48M provides up to three output paths to the field, and decoders may be installed on any or all of them in any combination.
- It is not necessary to connect the paths to one another. Each path runs from the controller to the last decoder in the path, and simply stops there.
- Never connect a wire path from one controller to the wire paths from another controller.

Hunter requires twisted wire meeting the listed specifications on all paths. The twist in the wire is an essential part of surge suppression. As lightning damage is never covered by warranty, it is in the installer's best interest to share what Hunter has learned in nearly two decades of decoder installations, by using twisted wire that meets all the above specifications. Wire may be substituted provided it meets or exceeds these specifications. The red/blue coding is a convenience for matching the wires to Hunter decoders. Color coding the two different conductors is mandatory.

Using Pre-Existing Wire

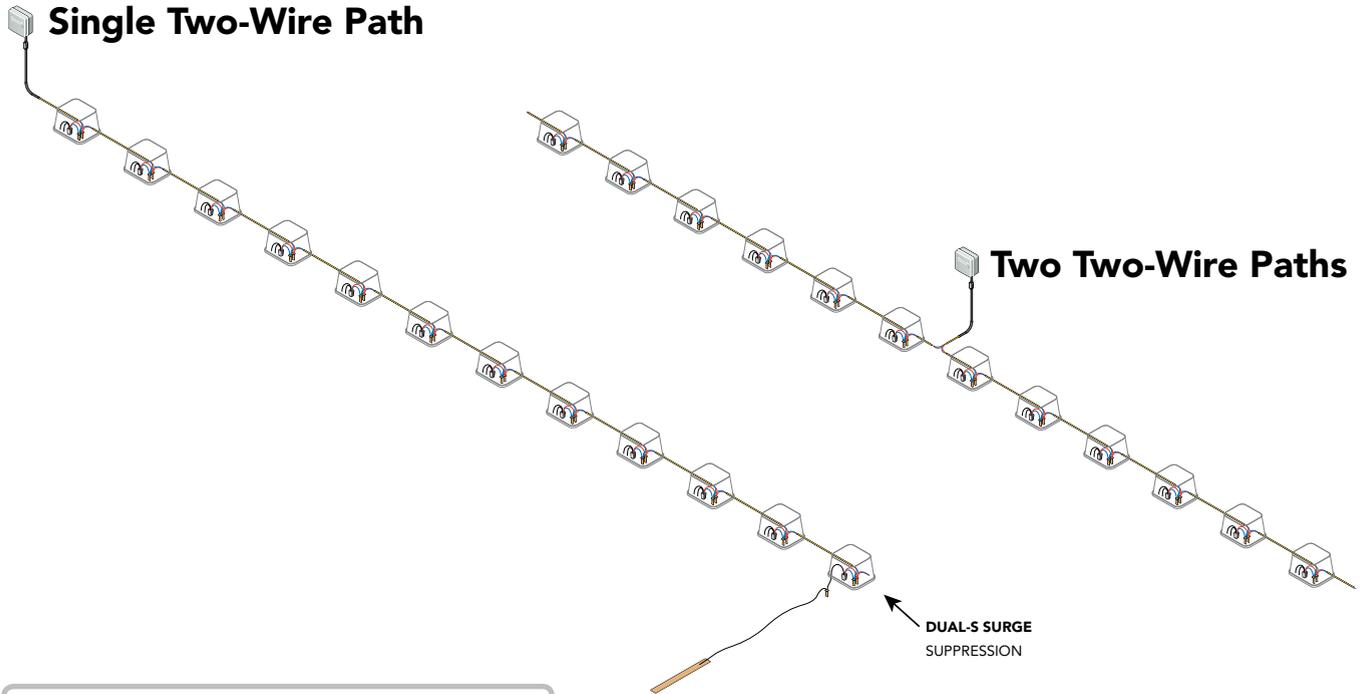
This is strongly discouraged by Hunter for the following reasons:

- It is unlikely that the pre-existing wire meets the specifications for gauge, twist, and solid copper.
- Pre-existing wire will not be color-coded correctly for the decoder wires.
- Pre-existing wire may have invisible problems (shorts, breaks, increased resistance, or damaged insulation) that will be inherited by the new installation.

ID WIRE TABLES

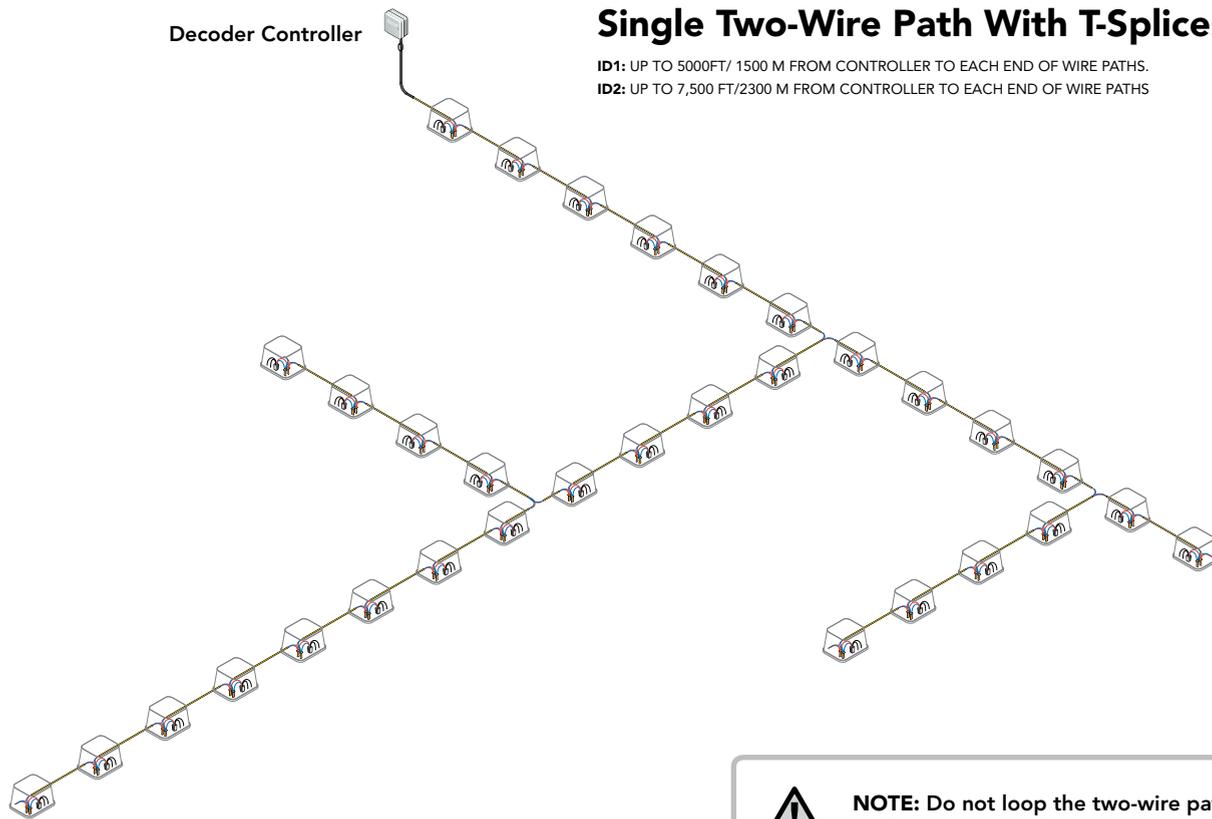
14 AWG/2 MM ² STANDARD DECODER CABLE (UP TO 5,000 FT./1,500 M)		12 AWG/3.3 MM ² LONG RANGE, HEAVY-DUTY DECODER CABLE	
ID1GRY	Gray jacket	ID2GRY	Gray jacket
ID1PUR	Purple jacket	ID2PUR	Purple jacket
ID1YLW	Yellow jacket	ID2YLW	Yellow jacket
ID1ORG	Orange jacket	ID2ORG	Orange jacket
ID1BLU	Blue jacket	ID2BLU	Blue jacket
ID1TAN	Tan jacket	ID2TAN	Tan jacket

TYPICAL WIRE LAYOUT



 **NOTE:** Do not loop the two-wire path back to the controller.

TYPICAL WIRE LAYOUT



Single Two-Wire Path With T-Splices

ID1: UP TO 5000FT/ 1500 M FROM CONTROLLER TO EACH END OF WIRE PATHS.

ID2: UP TO 7,500 FT/2300 M FROM CONTROLLER TO EACH END OF WIRE PATHS

 **NOTE:** Do not loop the two-wire path back to the controller.

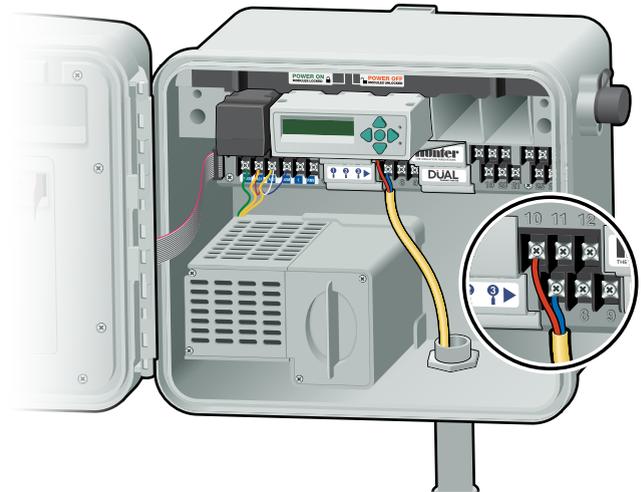
WIRE SPECIFICATION AND INSTALLATION

Connecting the Two-Wire Paths

1. Turn Controller power OFF.
2. Route the red and blue wire paths from the field up through the wire openings or conduit into the controller wiring compartment.
3. Connect the red and blue two-wire paths to the decoder output screw terminals below the decoder module.
4. There are two rows of screw terminals in the controller that are accessed through an opening in the decoder module cover, one red and one blue, labeled 1-2-3. Each numbered pair represents a possible two-wire path to the field (some systems only use one pair, others may use all three).
5. Connect the red wire from a twisted pair to a numbered red terminal, and connect the blue wire to the blue terminal with the same number. Do not connect more than one wire to any of the terminals. Do not mix red from one pair with the blue from another pair. Keep each pair separate, red to red and blue to blue, until all pairs are connected to their numbered terminals.
6. Turn controller power back ON and test. The decoder output module display should show that it is ready for programming or operation.



NOTE: If decoder(s) have not been installed on the two-wire path(s), the decoder output module will display "Line Open".



OVERVIEW OF DECODER PROGRAMMING

It is recommended that each decoder be programmed with station address(es) at the controller before installing it in the two-wire path. Decoders can also be programmed in the field with the Hunter ICD-HP Handheld Programmer, if available. Program the station number(s) into the decoders, and then write the station number assignments on the label on the decoders.

The decoder output module has two holes to the right of the programming buttons.

Before programming any stations, you should have an exact plan on paper for the location of each decoder and station in the system. DUAL decoders are available in one- and two-station sizes, and they may be mixed in the same system. The numbered station assignments for each decoder can be programmed for any station by the decoder module depending on the size of the decoder.



NOTE: Do not program the same station number into two different decoders!

Programing Decoder Stations

1. Turn controller power ON.
2. Insert the stripped end of the red wire from a DUAL decoder into one of the two Programming Ports to the right of the programming buttons on the decoder output module.



3. Insert the blue wire from the decoder into the other Programming Port hole.



NOTE: Do not let the wires touch each other.

4. Press the mode button (center button) ● once. An arrow will be displayed next to "Prog Decoder". The decoder is now ready to be programmed.
5. Press the ● button again. The display will show "Reading" as the decoder module checks for the presence of a decoder.



OVERVIEW OF DECODER PROGRAMMING

- The display will briefly show "Reading DONE" when the module has completed identification of the decoder.
- If the decoder red/blue wires are not fully inserted into the module, or if the decoder is defective, a "Reading ERROR" message will be displayed.



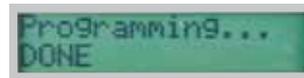
- Once the module has recognized the decoder, it is now ready to be programmed. Brackets [] indicate the station number for the decoder output. There will be two sets of brackets for a two-station decoder. (There may already be a number within the brackets indicating that the decoder has been previously programmed.)

A new decoder out of the box will be set to station 00, and new DUAL-2 decoders will have both stations set to 00.



- Use the ▲▼ buttons to select or change the station number you would like to program into the decoder.
- Press the ● button to begin the automatic programming procedure.

- The display will indicate when programming has been completed by showing "Programming DONE". If the decoder has been accidentally disconnected or malfunctions, the display will show "Programming ERROR". This means the decoder was not programmed (check connection, and try again).



- If a two-station decoder is being programmed, use the ► button to navigate to the second set of brackets [] which indicate the station number for the #2 decoder output. Use the ▲▼ buttons to select the station number you would like to program.

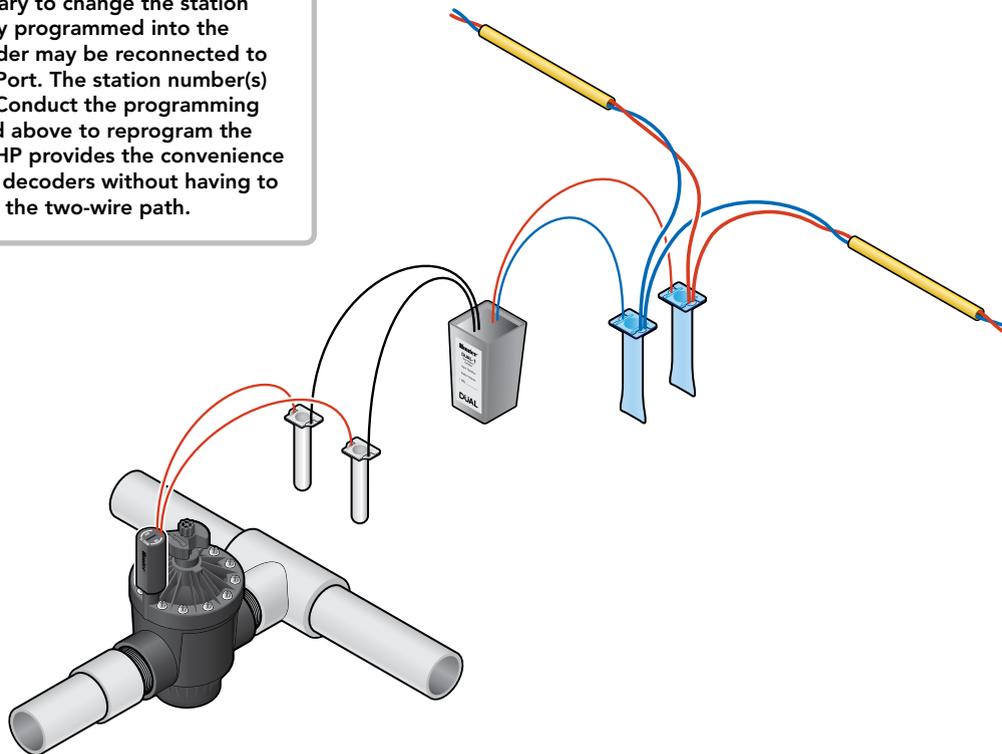


- Press the ● button once and the module will conduct the automatic programming procedure for the #2 decoder output.
- Again, if the programming (of the decoder) is successful, the display will show "Programming DONE".
- When the decoder and stations have been programmed, the module display will return to the ready mode. It is recommended that you write the station numbers for each decoder output on the label provided on each decoder.

OVERVIEW OF DECODER PROGRAMMING



NOTE: Decoders may be reprogrammed at any time. If it is necessary to change the station numbers previously programmed into the decoder, the decoder may be reconnected to the Programming Port. The station number(s) will be displayed. Conduct the programming procedure outlined above to reprogram the decoder. The ICD-HP provides the convenience of reprogramming decoders without having to remove them from the two-wire path.



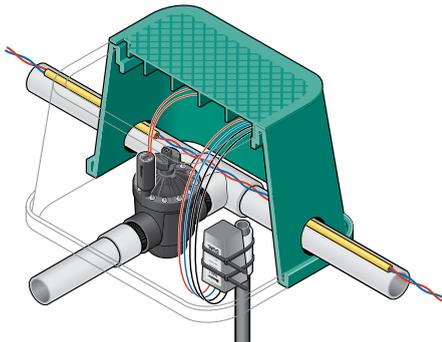
INSTALLING THE DECODERS

1. Controller power must be OFF when installing decoders in the two-wire path.

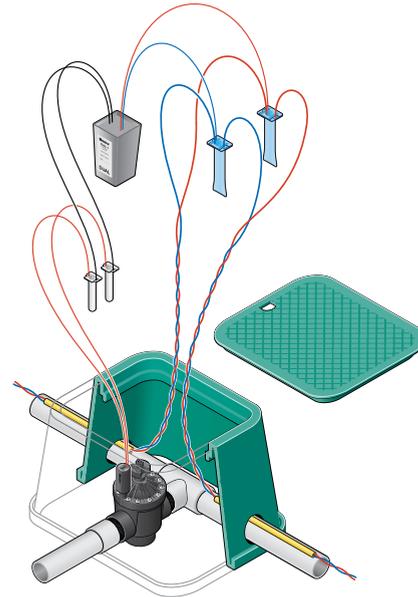


NOTE: Decoder wire runs and connections must be completely waterproof. Decoder wiring is more critical than "conventional" 24 VAC solenoid wiring. Follow instructions closely!

2. Select the decoder location (unless you are replacing an existing decoder). Decoders should be within 100 feet/33 m of the solenoids they will operate. Decoders are waterproof, but should be installed in a valve box to facilitate future service and increase longevity.
3. Locate the two-wire path. These are the red and blue wires coming from the controller. The wire path must be cut to insert decoder wiring, unless you are replacing an existing decoder.

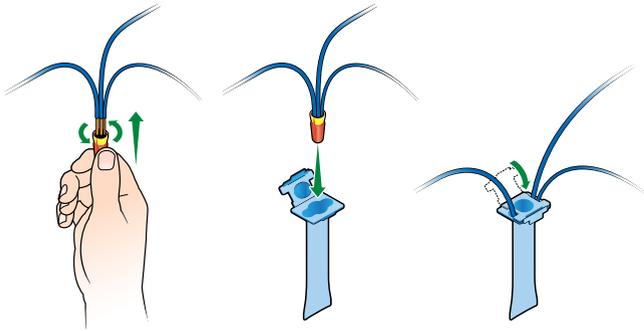


NOTE: Be sure to leave enough slack in the wire path to allow easy connection of the decoder and to allow for contraction of wiring due to temperature changes. Hunter recommends at least 5 feet/1.5 m slack for each decoder to allow it to be removed from the valve box completely for installation, service, and inspection.



INSTALLING THE DECODERS

4. Identify the color-coded wires on the decoder. The red and blue wires connect to the red and blue wire path from the controller.
5. Strip the cut red and blue wire ends back approximately $\frac{3}{4}$ inch (2 cm).



6. Twist the stripped red wire ends (the ends from the two-wire path and the decoder) together, and thread securely into the wire nut supplied with the decoder. Seal the connection by inserting the wire nut into the connector's waterproof grease until it snaps into place, and snap cap securely over wires.
7. Repeat with the blue wires: Connect the blue end(s) from the two-wire path with the blue wire from the decoder, and secure in a separate waterproof connector supplied with the decoder.

8. Each pair color-coded decoder output wires operates one or two solenoids up to 100 feet/33 m away (greater distances are possible, but increase susceptibility to lightning damage).
9. Strip the insulation and connect the two black wires from the decoder to the solenoid leads for the first station output. If a two-station decoder is being installed, strip back and connect the two yellow wires to the solenoid leads for the second station output. Insert and seal connections with DBY or equivalent waterproof connectors.
10. Always terminate each wire path with a DUAL-S surge suppression module. Do not leave unconnected stubs of the two-wire path beyond the last decoder. These may affect the current readings and cause incorrect fault messages.



NOTE: Each DUAL decoder output may operate two solenoids simultaneously. The solenoids must be connected in parallel, rather than in series. Each decoder output wire should make a three-way connection, with one wire from each of the two solenoids. Decoder outputs never use a "common" wire.

LIGHTNING PROTECTION AND GROUNDING

Proper grounding of decoder systems is part of the installation that requires consideration. Properly grounded decoder systems perform very well even in high-lightning regions. Poor grounding often results in unnecessary equipment losses and irrigation down time.

Earth grounding rules for the I-CORE decoder controllers are the same as for conventional I-CORE controllers. A large ground lug is provided for connection of bare copper wire to earth grounding hardware.

Hunter DUAL-S surge arrestors must be used on all DUAL two-wire systems. The DUAL-S surge arrestor attaches directly to the two-wire path to minimize the damage from lightning strikes. The amount of surge protection needed depends on how exposed the area is to lightning and on how well the installation needs to be protected. In addition to grounding the controller, the minimum recommended level of protection is one DUAL-S grounded at the end of each two-wire path and one DUAL-S grounded every 1000 feet/300 m or twelfth decoder. For higher levels of protection, attach surge arrestors more often.

Similar to the DUAL decoders, the DUAL-S is sealed from moisture and should be placed in its own valve box. It is important that both the controller and the surge arrestors are grounded to ground rods or plates with less than 10 ohms resistance. Use grounding electrodes that are UL listed or meet the minimum requirements of the National Electrical Code (NEC) as well as local codes. At minimum, the grounding circuit for controllers will include a copper clad steel ground rod, or copper ground plate.

Copper ground rods should have a minimum diameter of $\frac{3}{8}$ "/1.5 cm and a minimum length of 8 feet/2.5 m. These are to be driven into the ground at a location 8 to 10 feet/2.4 to 3 m from the equipment or wires connected to it, at right angles to the two-wire path.. Install all grounding circuit components in straight lines. When it is necessary to make bends, do not make sharp turns.

Copper grounding plate assemblies intended for grounding applications have minimum dimensions of 4" x 36" x 0.0625" (100 mm x 2.4 m x 1.58 mm). A 25-foot (8 m) continuous length (no splices allowed unless using exothermic welding process) of 6 AWG solid bare copper wire is to be attached to the plate using an approved welding process.

The earth-to-ground resistance measured should be no more than 10 ohms. If the resistance is more than 10 ohms, then additional ground plates and PowerSet® can be installed. It is required that the soil surrounding copper electrodes be kept at a minimum moisture level of 15 percent at all times by dedicating an irrigation station at each controller location.

DUAL-S Installation

DUAL-S surge arrestors should be installed at the end of every two-wire path and at intervals of 1000 feet/300 m or every twelfth decoder.

LIGHTNING PROTECTION AND GROUNDING

In-Line Surge Arrestor Installation

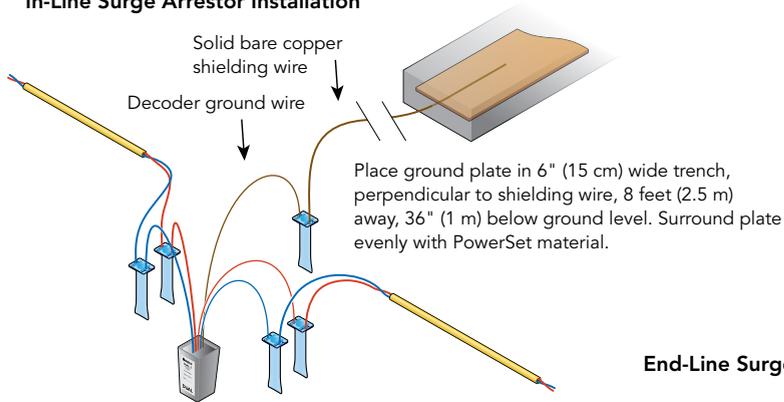
1. Controller power must be OFF when installing surge protection on the two-wire path.
2. Select the location for the DUAL-S surge arrestor.
3. Locate the two-wire path from the controller (typically red and blue wires). The wire path must be cut to insert the surge arrestor, unless you are replacing an existing arrestor.
4. Identify a pair of red/blue wires from the DUAL-S and connect one red wire to one red from one side of the two-wire path. Twist the red wires together and seal the connection with the waterproof connectors supplied. Repeat for the blue wire.
5. Connect the second pair of red/blue wires from the DUAL-S to the other side of the two-wire path. Seal the connections with the waterproof connectors supplied.
6. Attach grounding device to the copper wire from DUAL-S using manufacturer's installation recommendations. Wire to ground hardware must be run at right angles to the two-wire path, a minimum of 8 feet/2.5 m away from the wire path. The ground hardware should not be in the same valve box as the surge suppressor.

End of Line Surge Arrestor Installation

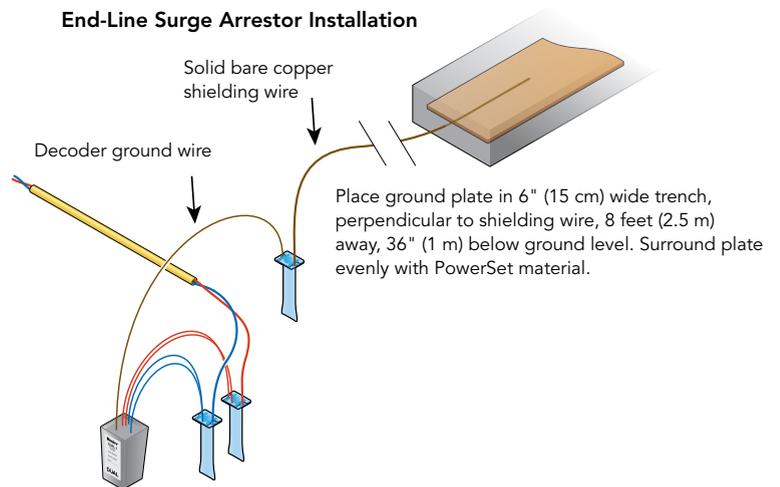
1. Controller power must be OFF when installing surge protection in the two-wire path.
2. Locate the end of the two-wire path from the controller (typically red and blue wires).
3. Identify the two pair of red/blue wires from the DUAL-S surge arrestor. Twist the three red wires together and thread them securely into the wire nut supplied. Seal the connection by inserting the wire nut into the connector's waterproof grease, and snap the cap over the wires.
4. Repeat the procedure for the blue wires.
5. Attach ground plate or ground rod to the bare copper wire from the DUAL-S per manufacturer's installation recommendation.

LIGHTNING PROTECTION AND GROUNDING

In-Line Surge Arrestor Installation



End-Line Surge Arrestor Installation



DIAGNOSTICS

The DUAL decoder module has features and diagnostics to help you troubleshoot installation issues and check the status of solenoid operation. Basically, two functions are available to the user in the Diagnostic mode:

Read Current Function

Allows for real time current readings of solenoids operating on the two-wire path.

1. Use the ▲▼ buttons to select the "Read Current" function. Press the ● button once and the display will show the current draw on the two-wire path.



2. The display will show current in milliamps (mA). The display shows typical current draw for a single solenoid.



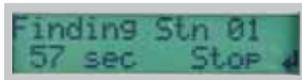
Find Solenoid Function

The "Find Solenoid" function allows the users to activate the solenoid of a single station in a mode that produces a "chattering" sound. This function allows for quick identification of valves on the site.

1. Use the ▲▼ buttons to select the station you would like to operate in the "Find Solenoid" mode.



2. Press the ● button once to initiate. The module will "chatter" the solenoid for 60 seconds. Use the ● button at any time to stop the "Find Solenoid" function.



Operating Stations

The I-CORE controller can operate two programs simultaneously or up to five solenoids in the manual station operation model. At any time the controller is operating stations, the station numbers will be displayed.



TROUBLESHOOTING

Important tools

#2 Phillips screwdriver,

Calculator

ICD-HP Handheld Programmer

Known-good solenoid

Known-good decoder

Digital Multimeter

ICD-HP Handheld Wireless Programmer



This Hunter product allows wireless connection with DUAL decoders, even when they are wired into field installations. The ICD-HP allows direct diagnostics, operation, and programming of any DUAL decoder installed in a valve box. ICD-HP can also verify status of solenoids, read voltage, and test sensors. The ICD-HP is highly recommended for field troubleshooting and will pay for itself in greatly reduced setup, programming, and diagnostic time.



Faults and Fault Messages

Faults: Controller display shows "Fault". This may be followed by a station number.

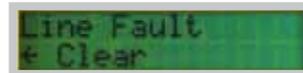
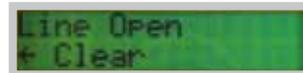
The Station Status light on the ICore System Status dashboard will also show a red LED when there has been a decoder fault.



NOTE: Fault light and message are only visible when stations are not running. During active irrigation, the Fault will not be visible.

If one or more station numbers are listed on the display, troubleshoot those stations. If there is no station number, troubleshoot the two-wire path connections.

1. Open the controller inner door to see additional diagnostic information on the DUAL48M display. The display may show Line Open or Line Fault.



The message may alternate with other screens. Allow a few seconds to see all displays.

TROUBLESHOOTING

2. Press the Mode (center) button on the DUAL48M control panel. Select "Diagnostics" with the ▲▼ arrows, and press Mode to select.
3. Press the Mode button to select "Read Current". This will show the current draw in milliamps (ma). In standby (no stations running), the total should be approximately 3-4mA multiplied by the number of decoders in the system. The number of decoders on the two-wire paths determines the correct current for the system.



When a station is turned on, the milliamps should increase by approximately 40mA, per solenoid attached to the active station.

- If a station is turned on, and the milliamps don't increase enough, the controller will show a Station Fault followed by the station number.
- If a station is turned on, and the milliamps increase by more than the controller will allow, the controller will show a Station Fault followed by the station number.
- If the milliamps increase too much when no stations are supposed to be running, the controller will show a Fault with no station number.

4. Observe the current draw with no stations running. Divide the current draw by the number of decoder modules connected to the controller. It should be approximately 3-4 mA per decoder.
 - Do not include DUAL-S surge suppression devices in current draw calculations- they do not increase the current.
5. If no problem is observed with the current draw reading in standby (no stations running), turn on a station listed in the Fault message with the Manual Single Station feature, or a wireless remote control.
6. Observe the Current Draw display. The current should increase by approximately 40 milliamps per solenoid connected to the decoder. Wait at least 30 seconds for the controller to complete its retry attempts and for the current to stabilize.

TROUBLESHOOTING

Line Fault: If the DUAL48M says “Line Fault” when no stations are running, the most likely cause is a direct short between the two wires in the two wire path (red and blue). If the Line Fault message only appears when a station is turned on, the problem is most likely a short in the decoder-to-solenoid wiring for the affected stations.

ICore Display	DUAL48M display in Standby	Cause	Corrective Action
Fault, no station	Line Open: Current draw too low on standby	Two-wire path disconnected	Check connections to two wire path
	Line Fault: Current draw too high on standby	Short in two-wire path Too many decoders (more than 48) in two-wire path	Check two-wire path (red and blue must not touch) Verify number of decoders in two-wire path
Fault with station numbers	DUAL48M display with Active Station	Cause	Corrective Action
	Current Draw for station too low (station number will blink slowly) *	Decoder not programmed Decoder missing, damaged, or disconnected Solenoid missing, damaged, or disconnected	Program decoder address Repair/replace decoder or connections Repair or replace solenoid or decoder-to-solenoid wiring
	Current Draw for station too high (Line Fault will appear when station is running)	Shorted solenoid or solenoid wiring Multiple decoders with same address Too many solenoids connected	Repair/replace solenoid or decoder-to-solenoid wiring Remove duplicate addresses Remove excess solenoids

TROUBLESHOOTING

*** Current Draw Too Low:** In a low current situation, the controller will retry the command to the station up to 3 times.

The DUAL48M display will show the station number when it is sending the command to the decoder.

If the current does not increase, the station number will disappear for a few seconds. This indicates that the draw did not increase as expected.

After 4-5 more seconds, the station number will re-appear, during the retry attempt.

If low current draw continues, the number will disappear again.

After 3 unsuccessful attempts, the station number will disappear, and the Fault message will appear on the ICore controller facepack display.

The slow blink of the station number is an indication that either the specified decoder, or its solenoids, are not connected or operational.

When a healthy decoder and solenoid are activated, there is no need for the retry attempts, and the station number will not appear to blink.

If No Stations Will Activate:

1. Verify that slide lock is in the Power On position and that power is on to the DUAL48M module (display appears).
2. Check DUAL48M for "Line Open" message. This means the two-wire path is disconnected from the controller.
3. Check between the controller and the first decoder to verify that the two-wire path is connected.

If No Stations Will Activate Beyond a Certain Station Number (followed by multiple station faults): Likely break in two-wire path beyond station 1.

1. Identify failing stations from Fault messages.
2. Identify decoder locations and layout on plan or in wiring path.
3. Begin with last working station, and look for break beyond that point.
4. If multiple two-wire paths are in use, disconnect other paths, and troubleshoot one path at a time.

TROUBLESHOOTING

Clear Fault Alarms:

Press the – button on the ICore facepack to clear the Fault message and/or Alarm light.

Special Notes:

ICore Decoders are not compatible with mechanical relays.

When combining DUAL48M with conventional ICore station output modules, not all stations will be available for decoder addressing. The station numbers for slots with ICM-600 modules will not be available for decoder station programming.

Voltage measurement between an active decoder and the solenoid is not a reliable indicator of the output from a decoder.

- Decoder electrical power is not the same as 50/60 Hz power and normal voltmeters may show very low readings to active stations (may range from 5 to 14 Volts).
- It is more reliable to keep a known-good decoder, and a known-good solenoid, for troubleshooting purposes.

Controller may temporarily fault Open if only one decoder is connected to the two-wire path, since standby current may fluctuate below the minimum. Correct by either waiting 5 minutes for line to stabilize, or connecting a second decoder.

Stations turned on in the field with ICD-HP may shut down prematurely, because the controller is unaware of the decoder activation. To prevent this, start another station via the controller or remote control anywhere in the system.

NOTES

NOTES

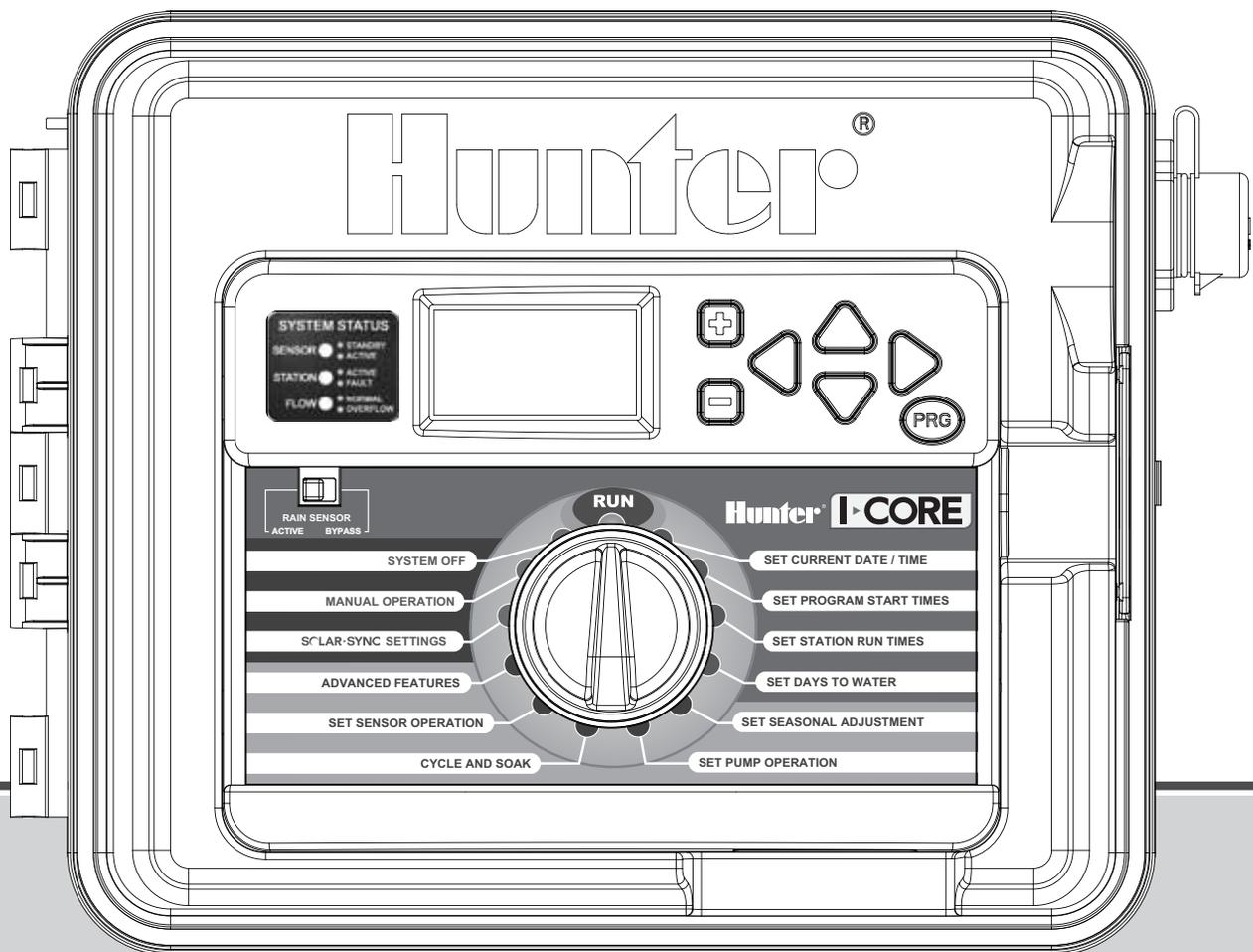
Hunter®

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www.hunterindustries.com

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LIT-533 9/10

I-CORE

Commercial Irrigation Controller



Owner's Manual and Installation Instructions

- IC-600PL 6-station Controller expandable to 30 stations, Plastic Cabinet
- IC-600M 6-station Controller expandable to 42 stations, Metal Cabinet
- IC-600PP 6-station Controller expandable to 42 stations, Plastic Pedestal
- IC-600SS 6-station Controller expandable to 42 stations, Stainless Steel

Hunter[®]

Hunter®



RUN

Hunter® I-CORE

SET CURRENT DATE / TIME

SET PROGRAM START TIMES

SET STATION RUN TIMES

SET DAYS TO WATER

SET SEASONAL ADJUSTMENT

SET PUMP OPERATION

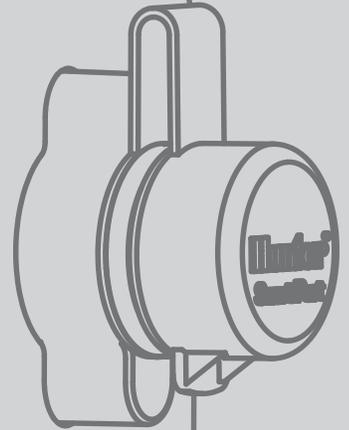


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INTRODUCTION

The Hunter I-Core controller is a full-featured controller for demanding commercial and high-end residential applications. Versatility is what makes the I-Core one of Hunter's highest performing irrigation controllers.

I-Core features include:

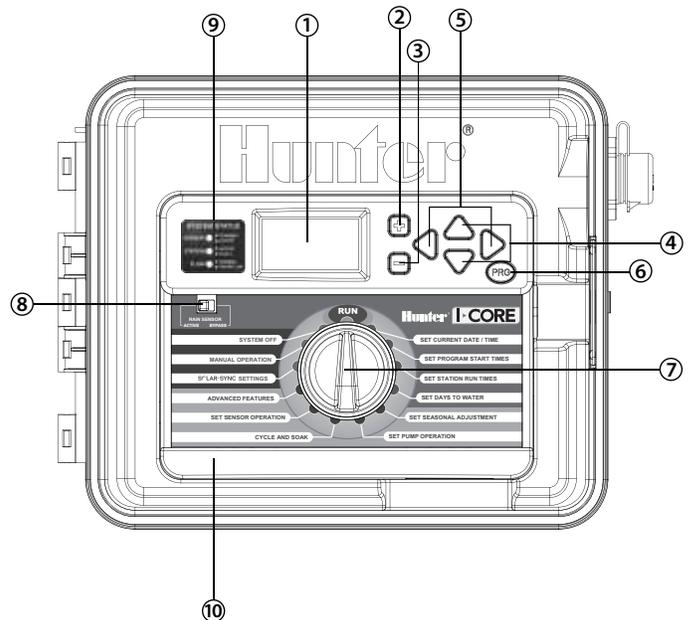
- Modular design expandable from 6 to 30 stations (plastic cabinet) and 6 to 42 stations (metal/stainless cabinet)
- 4 fully independent programs
- Diagnostic Dashboard™ monitors system operation and provides real-time sensor and controller status
- Real-time flow monitoring
- Remote control ready with factory installed SmartPort®
- Seasonal adjustment independent by program: Can be set globally, monthly, or through Solar Sync
- Water Window Manager™: User defined hours when watering is allowed
- Easy Retrieve™ Memory: Saves preferred program in memory
- Large, backlit display for easy programming
- Multi-language programming capability
- Automatic short circuit protection
- Built in Solar Sync capability

Note:

- This product should not be used for anything other than what is described in this document.
- This product should only be serviced by trained and authorized personnel.
- This product is designed for continuous outdoor use from 0° F/-18 ° C to 140° F/60° C.
- These units have an IP44 rating.
- This controller is not intended for use by young children or infirm persons without supervision; young children should be supervised to ensure that they do not play with the appliance.

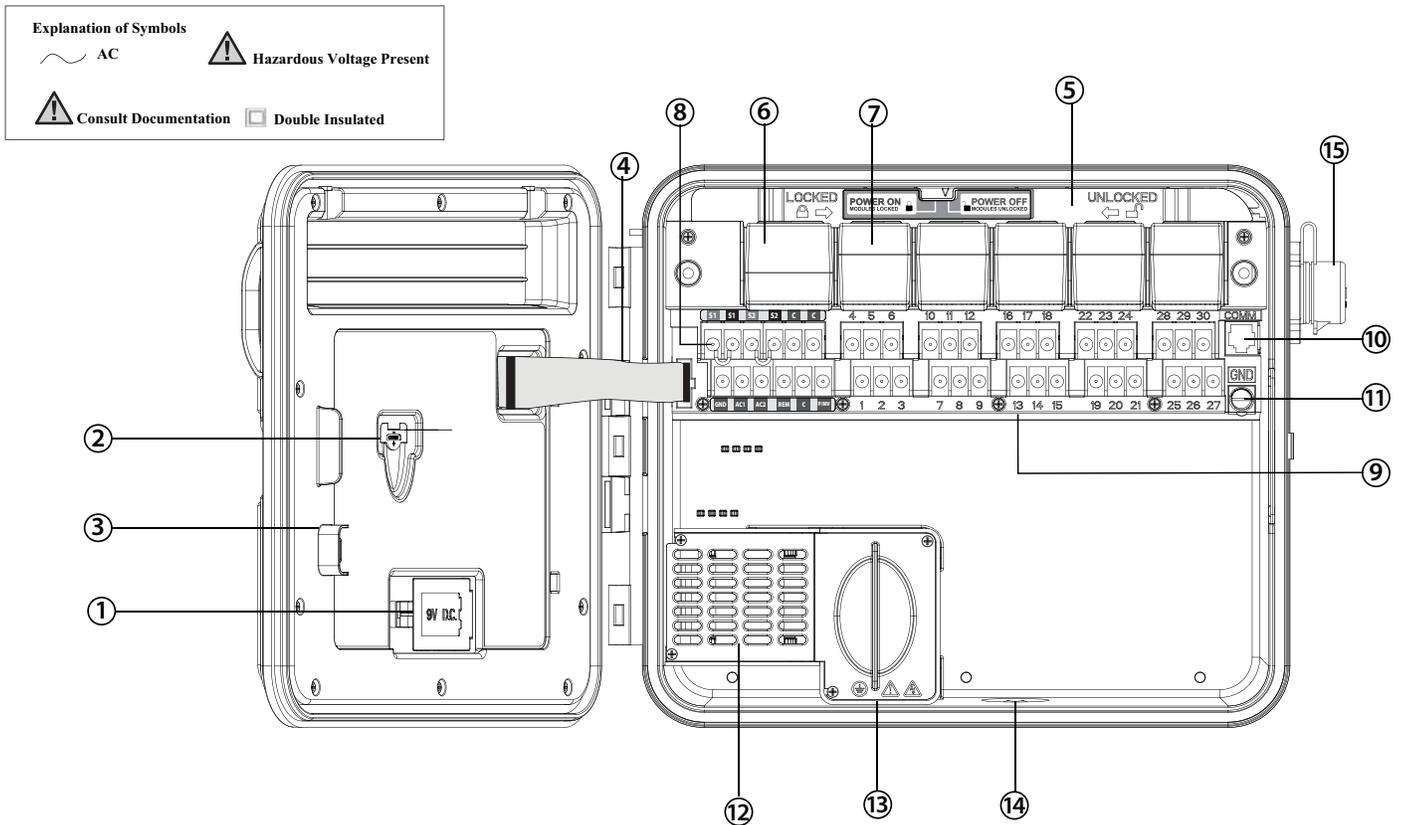
I-CORE INTERFACE AND KEY COMPONENTS

1. **LCD Display** – Backlit, adjustable contrast display
2. **+ Button** – Increases flashing value depending on function
3. **- Button** – Decreases flashing value depending on function
4. **▲ ▼ (Up and Down Arrow Buttons)** – Used to move up and down through adjustable functions in various screens, and change selections in certain screens
5. **◀ ▶ (Left and Right Arrow Buttons)** – Used to move left and right in various screens, and change important selections such as Stations, Start Times, and Water Days
6. **PRG (Program Button)** – Selects one of the automatic Programs (A–D), and also starts the test program
7. **Programming Dial** – Used to access all of the programming functions of the I-Core. The most basic automatic watering is set up in the first 4 dial positions
8. **Rain Sensor Bypass Switch** – Allows user to bypass weather sensor if one is installed
9. **System Status Dashboard** – LED lights provide system status information regarding sensor status, valve operation, and flow monitoring
10. **Removable Facepack** – I-Core facepack can be removed from controller for remote programming



I-CORE WIRING COMPARTMENT AND INTERIOR

1. **Battery Compartment** (9-volt alkaline battery) – The alkaline battery (not included) keeps time during power outages. The user may also program the controller without AC power.
2. **Battery Compartment** (CR2032 3-volt lithium) – The lithium battery provides backup timekeeping during power outages and when the 9-volt is not installed (location is on the back of the facepack).
3. **Release for Facepack** – Pull on the release tab and the facepack can be removed from the facepack frame.
4. **Ribbon Cable** – Cable that transmits information between the facepack and the inner controller assembly.
5. **Slide Lock Bar for Output Modules** – Sliding the Slide Lock Bar turns the controller's power on or off. Permits the addition or removal of output modules and locks the modules into place in the Power On position.
6. **Power Module** – This module provides power to the controller. This module must be in place for the controller to operate.
7. **Station Module(s)** – The addition of 6 station modules allows the ability to expand your I-Core from 6 to 30 stations (plastic cabinet) and 6 to 42 stations (metal cabinet and plastic pedestal). Each station module corresponds to six station screw terminals.
8. **Power and Accessory Terminals** – Connections for Power, Sensors, Pump/Master Valve, and other accessory connections.
9. **Station Terminals** – Connections for station wires; only terminals with corresponding Station Output Modules will be active and recognized by the controller.
10. **Communication Port** – Connection for future use with Central Control Communications.
11. **Earth Ground Lug** – For connection of earth ground copper wire (for surge protection only). Do not connect valve commons or the incoming service ground wire.
12. **Transformer** – A transformer is installed in the controller to supply 24VAC power to the controller. Transformer allows for either 120VAC or 230VAC connections.
13. **AC Wiring Compartment** (Junction Box) – For connection of 120/230VAC power.
14. **Conduit Opening** – 1 to 1 1/2" (25 mm to 38 mm) for field wiring into controller.
15. **SmartPort®** – Integrated connector for ICR/SRR/ROAM receiver (on side of cabinet).



MOUNTING THE CONTROLLER TO WALL

Wall Mount for Plastic and Metal Cabinet

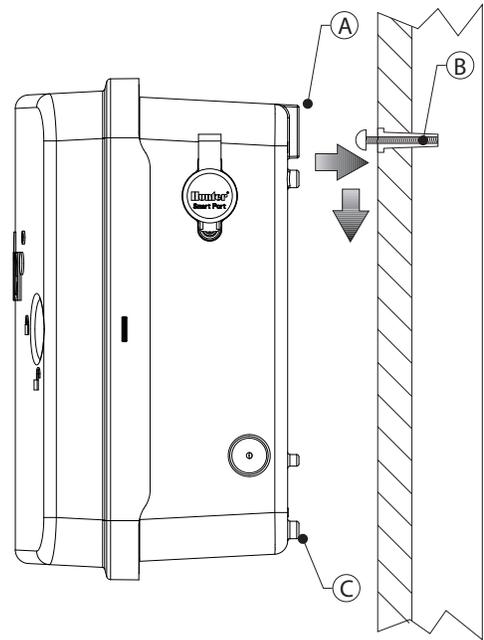
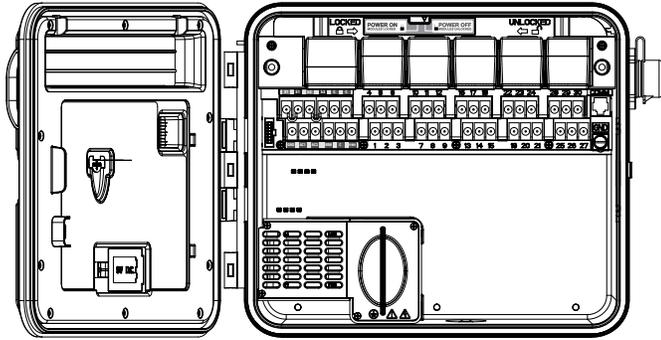
All necessary mounting hardware is included with your controller and should be suitable for most installations.

Tools required:

- Long drill bit and extension Philips screwdriver or bit (for use with long extension) – magnetic recommended Wire strippers



NOTE: This controller must be installed in compliance with local electrical codes.



Location Requirement: A) A switch or circuit-breaker shall be included in building installations; B) the switch or breaker shall be in close proximity to the controller and within easy reach of the operator; C) the switch or breaker shall be marked as the disconnecting device for the controller; D) the switch or circuit breaker used must comply with IEC 60947-1 and IEC 60947-3.

Select a location for your controller that can be easily accessible, has a flat wall surface, and is within close proximity to a 120VAC(10A) or 230/240VAC(5A) power source.

In outdoor installations, avoid direct exposure to sprinkler spray. Shaded or partially shaded areas are preferable to prolonged direct sunlight.

1. Using the enclosed mounting template, mark the mounting hole locations on the wall. It should be mounted at eye level if possible.
2. Drill a 1/4" (6 mm) hole at each mark.
3. Install screw anchors into holes if attaching the controller to drywall, masonry, or plaster walls.
4. Open the controller and inner door. The inner door will swing out of the way to provide full access to the controller mounting holes.
5. Holding the controller cabinet, line up the holes in the cabinet with the wall anchors or pilot holes.
6. Drive a screw through each hole and secure snugly but do not over tighten.
7. **OPTIONAL:** Locate the positioning hanger in the upper center of the controller (A). Install one screw (B) in this hanger position and hang the controller from the keyhole slot. Place a level on the top of the controller cabinet and level. Locate and drive a screw in each of the remaining screw holes (C), and secure snugly but do not over tighten the screws.

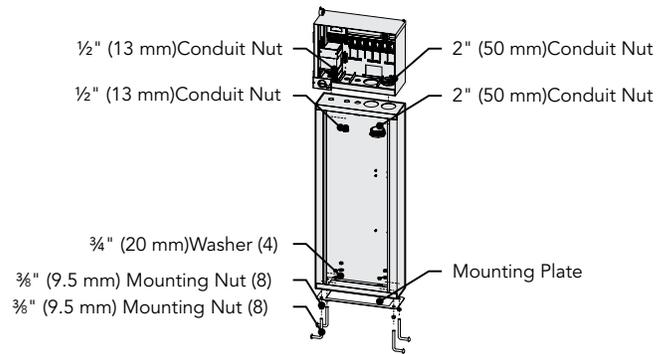
MOUNTING THE CONTROLLER (METAL PEDESTAL)

Pedestal Mount for Metal/Stainless Cabinet

Location Requirement: A) A switch or circuit-breaker shall be included in building installations; B) the switch or breaker shall be in close proximity to the controller, and within easy reach of the operator; C) the switch or breaker shall be marked as the disconnecting device for the controller; D) the switch or circuit breaker used must comply with IEC 60947-1 and IEC 60947-3.

Select a location for your controller that can be easily accessible, and is within close proximity to a 120VAC(10A) or 230/240VAC(5A) power source.

1. Set concrete forms using the installation instructions provided with the controller. Allow 2" (50 mm) of the conduit sweep above the surface of the concrete pad.
2. Assemble the mounting template. Twist one nut on each of the four J-bolts and slide each bolt through the template. Put a washer and nut on each J-bolt to secure it to the template (allow 2 1/2" [64 mm] of thread protruding above each nut).
3. Level the mounting template before the concrete sets. Uneven surfaces may cause the pedestal to distort, preventing proper sealing of the doors.
4. Allow the concrete to cure for at least 24 hours. After the concrete sets, remove the nuts and washers from the four J-bolts, and slide the pedestal over the bolts. Secure the pedestal to the bolts using the enclosed washers and nuts.



5. Remove the door and faceplate of the I-Core and attach the metal cabinet of the I-Core to the top of the pedestal using the enclosed hardware in the pedestal.
6. Replace the pedestal door first and then replace the faceplate and the cabinet door. The pedestal door cannot be removed or replaced when the cabinet door is closed.

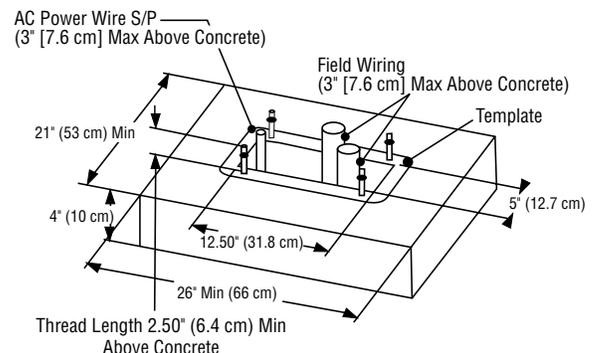
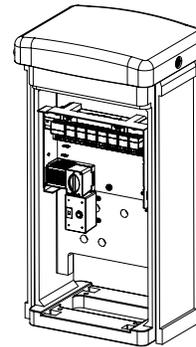
MOUNTING THE CONTROLLER (PLASTIC PEDESTAL)

Plastic Pedestal Mounting

Location Requirement: A) A switch or circuit-breaker shall be included in building installations; B) the switch or breaker shall be in close proximity to the controller, and within easy reach of the operator; C) the switch or breaker shall be marked as the disconnecting device for the controller; D) the switch or circuit breaker used must comply with IEC 60947-1 and IEC 60947-3.

Select a location for your controller that can be easily accessible, and is within close proximity to a 120VAC(10A) or 230/240VAC(5A) power source.

1. Set concrete forms using the installation instructions provided with the controller. Allow 2" (50 mm) of the conduit sweep above the surface of the concrete pad.
2. Assemble the mounting template. Twist one nut on each of the four J-bolts and slide each bolt through the template. Put a washer and nut on each J-bolt to secure it to the template (allow 2 1/2" [64 mm] of thread protruding above each nut).
3. Level the mounting template before the concrete sets. It is important with plastic pedestals to ensure a smooth mounting surface. Uneven surfaces may cause the pedestal to distort, preventing proper sealing of the doors.
4. Allow the concrete to cure for at least 24 hours. After the concrete sets, remove the nuts and washers from the four J-bolts, and slide the pedestal over the bolts. Secure the pedestal to the bolts using the enclosed washers and nuts.



CONNECTING AC POWER



NOTE: It is recommended that a licensed electrician perform the following power installation.

The I-Core can operate with either 120VAC or 230VAC power. Supply wires must be 14AWG or larger.

1. Turn AC power off at the source, and verify that it is off.
2. Remove the cover from the junction box.
3. Strip approximately ½" (13 mm) of insulation from the end of each of the AC power wires.
4. Route the wires through the conduit opening inside the junction box.

Do NOT connect the primary AC 120/230V electrical ground wire to the earth ground lug.

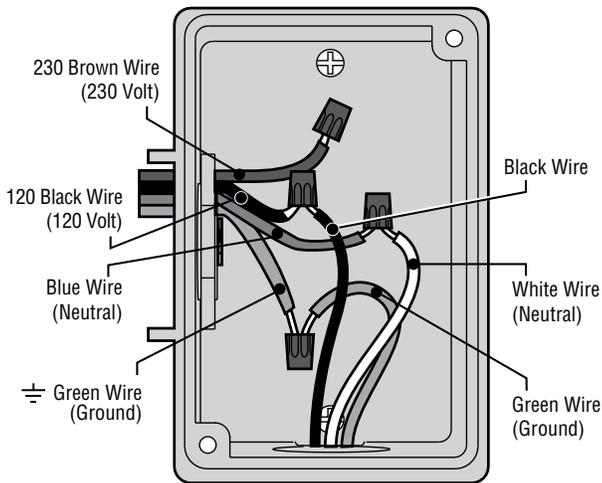
For 120V Operation

1. Connect the incoming black power wire (HOT) with the black wire lead from the transformer.
2. Connect the incoming white wire (NEUTRAL) with the blue lead from the transformer.
3. Connect the incoming green wire (GROUND) with the green and yellow wire from the transformer.
4. Cap the unused brown wire coming from the transformer. Replace cover of the junction box and screw into place.

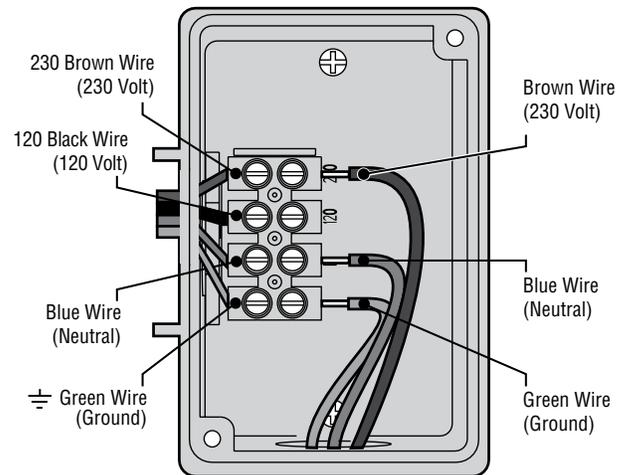
For 230V Operation

1. Connect the incoming brown power wire (HOT) with the brown wire lead from the transformer.
2. Connect the incoming blue wire (NEUTRAL) with the blue lead from the transformer.
3. Connect the incoming green wire (GROUND) with the green and yellow wire from the transformer.
4. Cap the unused black wire coming from the transformer. Replace cover of the junction box and screw into place.

Junction Box without Terminal Strip (120 Volt)



Junction Box with Terminal Strip (230 Volt)



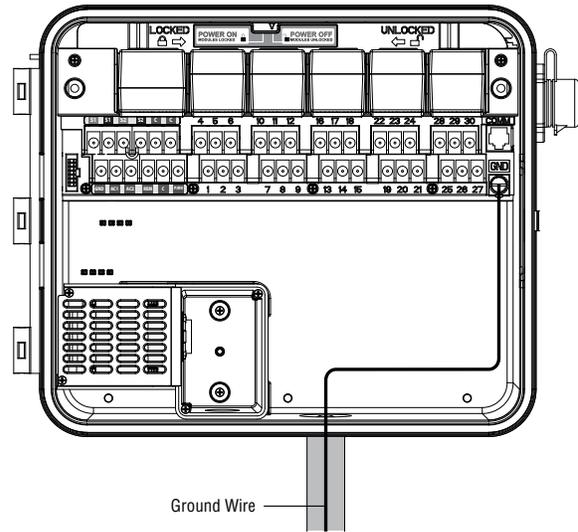
CONNECTING EARTH GROUND

The I-Core features a ground lug, which is isolated from the primary AC power, and is used to ground incoming surges from the communications and output valve wires.

Do NOT connect the primary AC 120/230V electrical ground wire to the earth ground lug.

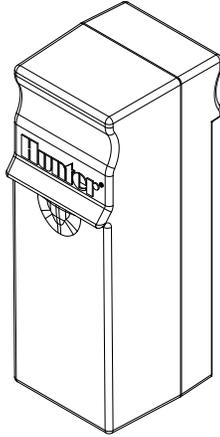
1. Use #10 (6 mm) or #8 (10 mm) bare wire to connect the controller to the ground rod. Route the earth ground wire into the wiring compartment through the 1 ½" conduit opening at the bottom of the cabinet. Do not route the ground wire through the same conduit as the incoming primary AC power.
2. Loosen the ground lug screw; insert the ground wire into the ground lug and tighten the screw to secure the ground wire. Do not over tighten.

Acceptable grounding consists of an 8' (2.5 m) copper-clad rod or stake, or a 4" x 96" (100 mm x 240 cm) copper plate, or both, placed in the earth at least 8' (2.5m) away from the controller, and with the ground wire at right angles to the communications and valve wires, if possible. Ideal grounding resistance would be 10 Ohms or less as measured with a "megger" or similar device. Please consult the ASIC reference for more detailed information on proper grounding techniques.



CONNECTING THE POWER AND STATION MODULES

The I-Core controller is supplied with one factory installed power module and one station module for six stations. Additional station modules may be added in six station increments to expand the controller's station capability. The plastic cabinet I-Core can be expanded to a size of 30 stations, and the metal cabinet and plastic pedestal I-Core can expand to 42 stations.



STATION MODULE

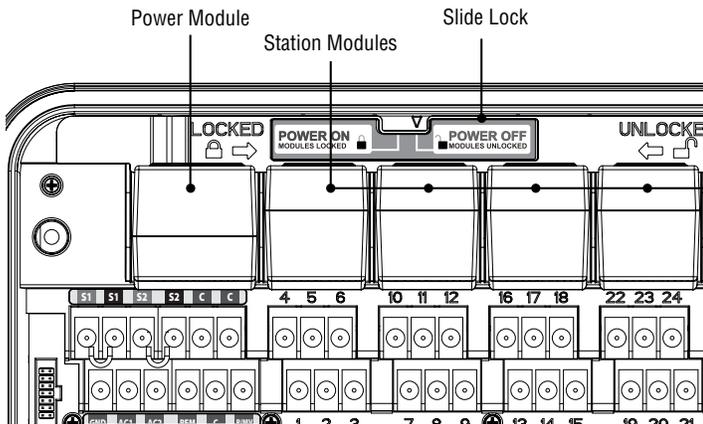
Station Module Installation

1. Open the inner facepack door and locate the Slide Lock. Move the Slide Lock bar to the **POWER OFF** position.
2. The module needs to be inserted into the first open module slot position from the left or next available position in the back of the controller. Do not skip slots by leaving them empty.
3. Insert the module with the gold tab on the top of the module facing up. Slide the module straight in until it clicks into place.
4. Slide the Slide Lock into the **POWER ON** position.
5. The controller will automatically identify any new modules that have been added. You can turn the dial to **SET STATION RUN TIMES** to confirm the correct number of stations have been acknowledged.

Power Module Installation

The I-Core power module supplies power to the facepack and accessory terminals. It typically does not need to be removed, however can be replaced for servicing.

1. To install the Power Module, open the inner facepack door, and locate the module lock bar. Move the Slide Lock bar to the **POWER OFF** position.
2. Insert the power module into the first slot position from the left, with the gold tab on the top of the module facing up. Slide the module straight in until it clicks into place.
3. Move the Slide Lock to the **POWER ON** position.
4. The Power Module must be in place in order for the controller to operate and function.



CONNECTING VALVE WIRES

Connecting Station Valve Wires

Each station module that has been inserted has a grouping of six station screw terminals corresponding to that particular expansion slot. Once a station module is installed in a module slot, the station screw terminals assigned to that module, which are located directly below the station module, become active.

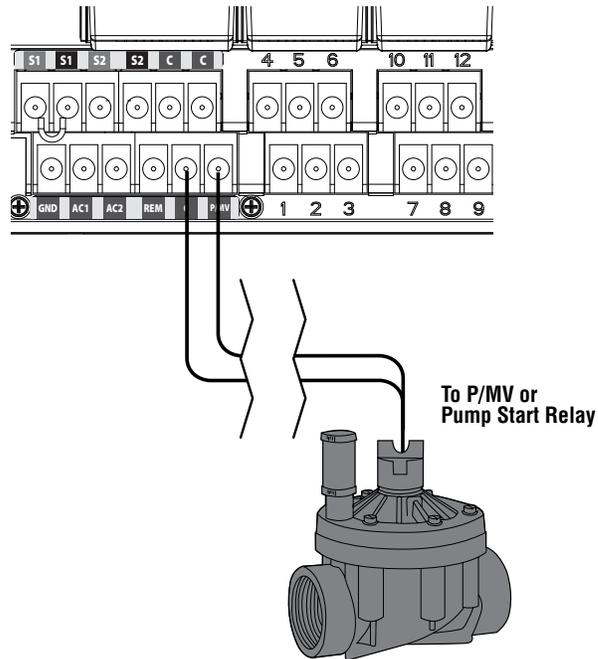
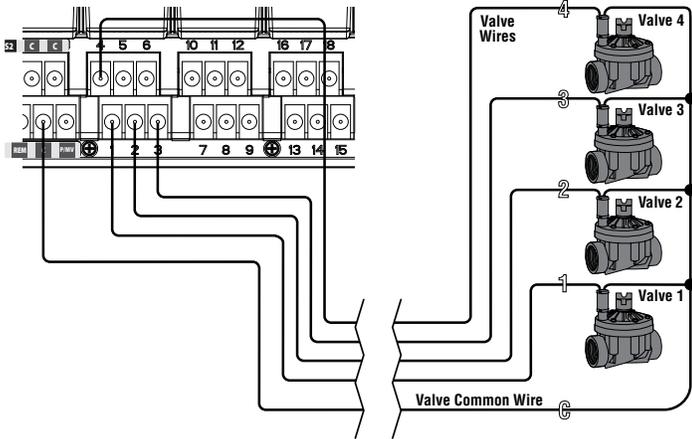
Each station output is rated for 0.56A max, or enough to operate two Hunter AC solenoids simultaneously.

1. Route valve wires between control valve location and the controller.
2. At the valves, attach a common wire to either solenoid wire of all the valves. This is most commonly a white colored wire. Attach a separate control wire to the remaining wire of each valve. All valve wire splice connections should be done using waterproof connectors.
3. Open the faceplate at the controller to expose the numbered station terminals.
4. Route valve wires through the conduit and attach the conduit to the controller at the 1 1/2" (37.5 mm) opening at the bottom of the cabinet.
5. Strip 1/2" (13 mm) of insulation from the ends of all the wires. Secure the valve common wire to one of three C (Common) terminals located of the Power and Accessory terminals. All three common terminals are active, so the valve common wire may be connected to either one. Attach all the individual valve control wires to the appropriate station terminals.

The Master Valve or Pump Start Relay connection is located on the bottom row of the Power and Accessory Terminals, and is labeled P/MV. This terminal will supply 24 VAC, 0.32A max, for a single Master Valve solenoid. For a Pump Start Relay, the relay holding current draw must not exceed 0.28 amps. If using a Pump Start Relay, it is recommended that the controller be mounted at least 15' (4.5 m) away from both the pump start relay and the pump. When a pump is to be operated by the controller, a pump start relay must be used. Do not connect the controller directly to the pump — damage to controller will result.

1. Route valve wires between Master Valve or Pump Start Relay location and the controller.
2. At the Master Valve, attach a common wire to either solenoid wire of the valve. Attach a separate control wire to the remaining solenoid wire. At the Pump Start Relay, attach either wire to one of the yellow wires coming from the Pump Start Relay. Attach the remaining wire to the other yellow wire at the Relay. All wire splice connections should be done using waterproof connectors.
3. Open the inner facepack door at the controller.
4. Route the valve wires into the controller via the field wire conduit.
5. Connect either wire from the Master Valve or Pump start Relay to the P/MV terminal located on the bottom row of the Power and Accessory terminals. Connect the remaining wire to the C (Common) terminal that is located directly to the left of the P/MV terminal.

The Master Valve or Pump Start Relay can be activated according to a particular station. The configuration of assigning the Master Valve or Pump Start Relay according to a particular station will be covered in the Set Pump Operation (pg. 18).



Connecting a Master Valve or Pump Start Relay

Complete this section only if you have a Master Valve or Pump Start Relay installed. The I-Core controller works with a normally closed master valve that is typically installed at the supply point of the main line that opens only when the automatic system is activated. A pump start relay is an electrical device that uses the irrigation controller to activate a pump to provide water to your system.

CONNECTING A WEATHER SENSOR (OPTIONAL AND NOT INCLUDED)

The I-Core controller has the ability of connecting two Hunter Sensors (three with I-Core Metal) including:

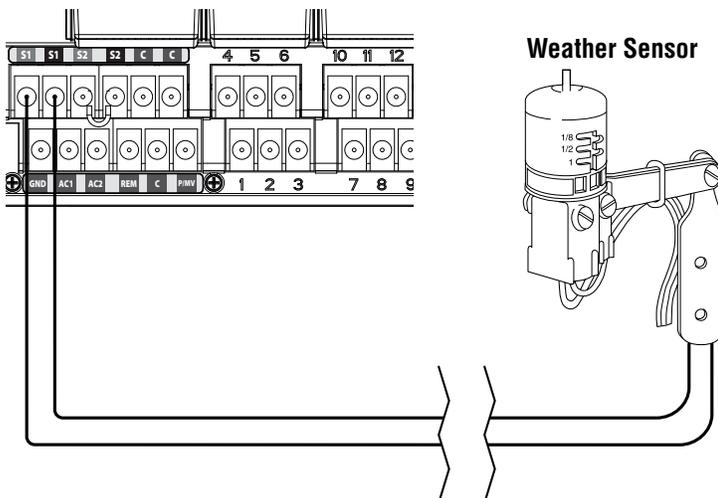
- Mini-Clik®
- Rain Clik™ (including Wireless Rain Clik, Wireless Rain Freeze-Clik)
- Freeze-Clik®
- Wind-Clik®
- Mini-Weather Station (MWS)
- Solar Sync and Wireless Solar Sync ET Sensor

With the I-Core controller, Clik sensors can be programmed to shut down individual stations, not necessarily the entire controller. Each sensor can be given its own response instructions according to each station. Hunter Clik sensors are usually normally closed, and open on alarm. This signals the controller to suspend watering when precipitation, freeze or wind events occur. The sensor connects directly to the sensor terminals, which also allows you to override the sensor by using the Rain Sensor bypass switch on the face of the controller.

1. To connect Clik sensors, locate the 2 pairs of sensor terminals in the Power and Accessory Terminal section, labeled S1, S1 and S2, S2 (S3 available on I-Core Metal).
2. Route the wires from the Clik sensor through any of the available knockouts into the controller cabinet.
3. The sensor connections are made in dedicated pairs. Remove the sensor jumper wire from one pair of S1 or S2 terminals. Attach one sensor wire to each of the two S1 or S2 terminals.
4. To connect the Wireless Rain Clik or Wireless Rain Freeze Clik, the blue and white wires will be connected to the corresponding sensor terminal as stated above: One into the first S1 terminal and the other into the second S1 terminal. Connect one of the yellow wires to the AC1 terminal and the other yellow wire to the AC2 terminal.

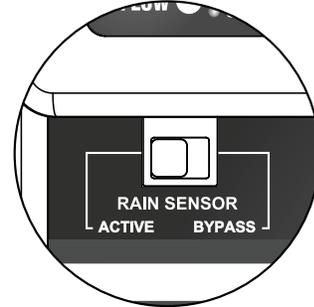
Bypassing the Sensor(s)

If the rain sensor is ACTIVE and automatic or manual operation is required, simply move the Bypass switch to Bypass.



If the rain sensor switch is left in the ACTIVE position but no sensor is connected and the jumper wire has been removed, the display on the I-Core will indicate that the sensor is ACTIVE. This will also be indicated in the System Status dashboard to the left of the display. The sensor light will be illuminated RED for ACTIVE, thus having an open circuit. As long as the sensor is in the ACTIVE mode, any station that has been programmed to the ACTIVE sensor will not be allowed to water, and will be put into Suspend mode. If you do not have a sensor and want to eliminate this possible problem, simply keep the rain sensor switch in the bypass mode, or install the jumper wire between the sensor terminals if it has been removed.

Programming of the sensors will be discussed in the Set Sensor Operation section of Programming and Operation (pg. 18).



Sensor Bypass Switch

This switch will either enable or disable a Rain or Freeze sensor that has been connected to the controller. When the switch is in the Active position, the controller will adhere to the state of the sensor and shut down irrigation if the sensor is in an open state. If the sensor is in a closed state, the controller will operate as normal. If the sensor is in an open state, but you would like your automatic irrigation to operate as normal, simply move the switch to the Bypass position. The sensor will now be overridden and the controller will operate as programmed.

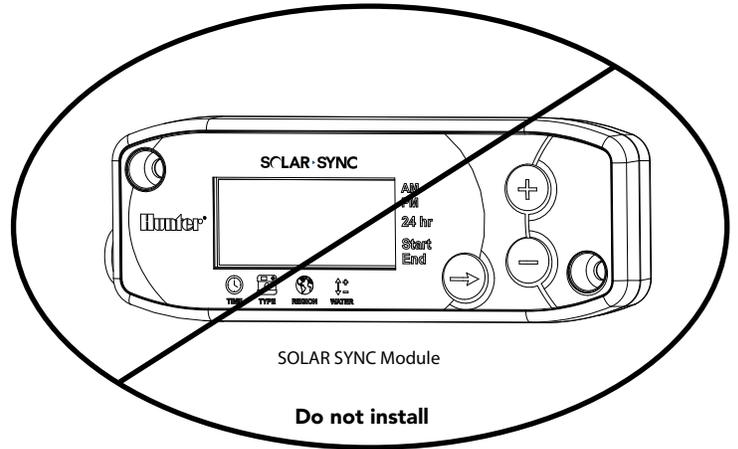
Once the Sensor Bypass Switch is in the Active position the System Status Dashboard will acknowledge the switch is in the Active position, and the Sensor Status light will light up. If the sensor is in an open state, the System Status Sensor light will be Red. If the sensor is in a closed state, the System Status Sensor light will be Green.

If you do not have a sensor installed, the position of the Rain Sensor switch can be in either the Active or the Bypass mode. This is true as long as the jumper wire connecting the two sensor terminals remain in place. If a jumper wire has been removed, it will be necessary to keep the Rain Sensor switch in the Bypass mode, otherwise no automatic irrigation will occur.

CONNECTING A HUNTER SOLAR SYNC

The Solar Sync is a “smart” control system that, when connected to the I-Core, will automatically adjust your controller’s station run times based upon changes in local climate conditions. The Solar Sync incorporates a solar and temperature sensor to determine evapotranspiration, also known as ET. It also utilizes a Rain Klik and Freeze-Klik to shut down your irrigation when conditions arise.

The I-Core now has the Solar Sync software built into the controller. New I-Core controllers with built in Solar Sync are easily identified by the new **SOLAR SYNC SETTINGS** dial position on the facepack. Because the new I-Core has built in Solar Sync software, the Solar Sync Sensor is the only item to be connected to the controller. **The Solar Sync module will not be used and is not compatible with I-Core controllers that have Solar Sync software built in.**



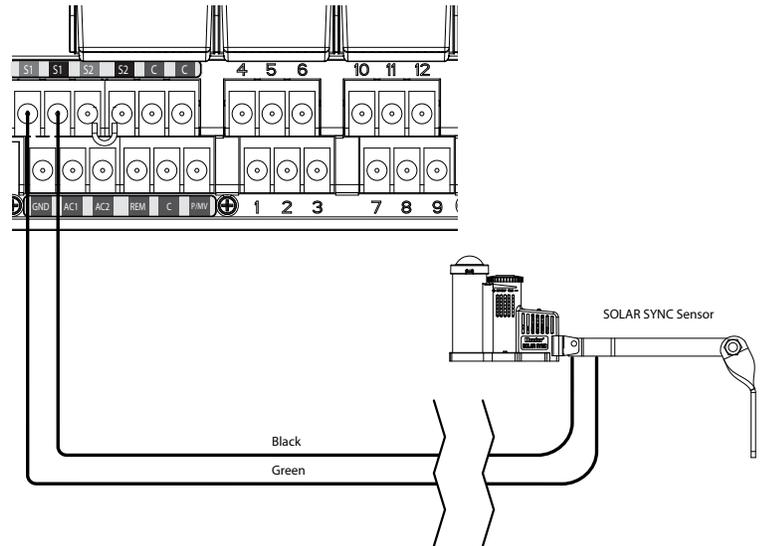
1. To connect the Solar Sync Sensor route the black and green sensor wires into the controller and connect them to the two S1 terminal positions. It does not matter which wire goes to which S1 terminal, but **the S1 terminal must be used when connecting a Solar Sync sensor.**
2. Mount the Solar Sync sensor in a location that receives as much sunlight as possible for best results. (see Solar Sync owner’s manual for more details on sensor location)
3. **The Solar Sync Sensor must now be assigned to the SEN1 location in the controller.** Turn the dial to the **ADVANCED FEATURES** position.
4. Use the ▼ button to scroll to **Sensor Configuration** and press the + button.
5. In the SEN1 position use the + button to scroll through the options until **Solar Sync** is shown. The I-Core now recognizes that a Solar Sync sensor has been connected.

If connecting a **Wireless Solar Sync** to the I-Core, steps 1-5 are the same except in step 1, you will be connecting the green and black wires from the Wireless Solar Sync Receiver to the S1 terminal positions. The Wireless Solar Sync Receiver then communicates with the Wireless Sensor.

The Solar Sync can be programmed to adjust station run times by program. To set the I-Core to Solar Sync Adjust mode:

1. Turn the dial to Set Seasonal Adjustment. Use the PRG Button to select the desired program.
2. Press the +/- button to select By Solar Sync Seasonal Adjust mode. Repeat for other programs if needed (See Sensor Configuration on page 22).

Once a Solar Sync is connected and programmed the station run times will be adjusted according to the findings of the Solar Sync. The Solar Sync will automatically adjust station run times and can be programmed independently for each of the four I-Core programs. The Rain Klik and Freeze-Klik sensor incorporated in the Solar Sync can be programmed by station which is discussed in the Set Sensor Operation section.



CONNECTING A FLOW SENSOR (OPTIONAL)

The I-Core is designed to operate primarily with the Hunter HFS Flow Sensors. However, some non-Hunter flow sensors can be used.

1. To connect a Hunter HFS Flow Sensor, route the pair of 18 AWG (1 mm) wires from the sensor into the cabinet (max distance of 1,000 ft.).
2. Locate a pair of S1 or S2 (S3 available on I-Core Metal) sensor red and black terminals on the Power and Accessories Terminals. Remove the jumper wire from one pair or S1 or S2 terminals. You may use either pair of S1 or S2 sensor terminals for a flow sensor. Connect the red wire from the HFS to the red terminal, and the black wire from the HFS to the black terminal.
3. I-Core allows you to connect two flow sensors at one time. In that case, one of the flow sensors would connect to the red S1 terminal and the black S1 terminal, while the second flow sensor would connect to the red S2 terminal and the black S2 terminal.

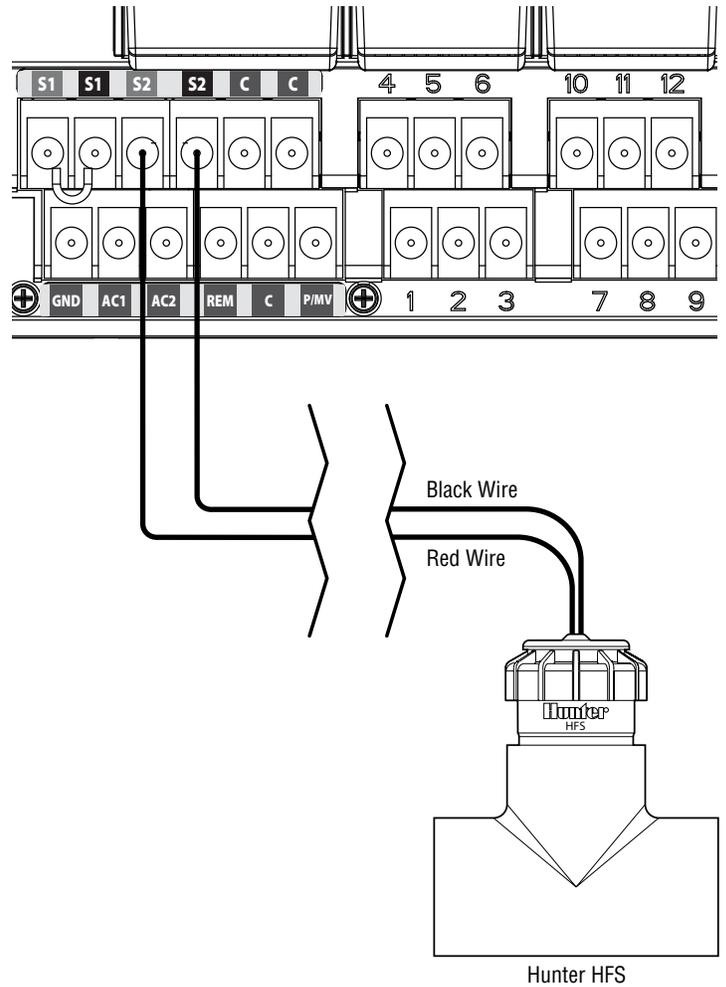


NOTE: I-Core has only one Pump/Master Valve output. If 2 flow sensors are used on 2 different points of connection, only one of them will have a master valve available for alarm shutdowns unless the single PMV is configured to operate 2 master valves simultaneously.

Flow setup, learning, and configuration will be described later in the manual under Advanced Features (pg. 22). A complete step by step Flow Monitoring procedure is also available in the Hidden Features section (pg. 29).



NOTE: If a flow sensor is going to be connected to the controller and flow will be monitored, there is critical information that needs to be read in the Controller Diagnostics and Troubleshooting section under System Status Dashboard Flow. It is very important to understand how the controller will monitor flow under certain circumstances and what diagnostic testing will be performed in alarm situations.



CONNECTING A REMOTE CONTROL (OPTIONAL)

The I-Core controller has factory installed SmartPort®. This provides a remote ready connection for Hunter ICR, ROAM, and SRR remotes.

To connect a remote, remove the weather resistant rubber cover on the SmartPort, align the remote receiver's pins with the connector, and push firmly until the receiver is fully seated. Refer to the remote control owner's manual for further information on how to operate your Hunter remote.

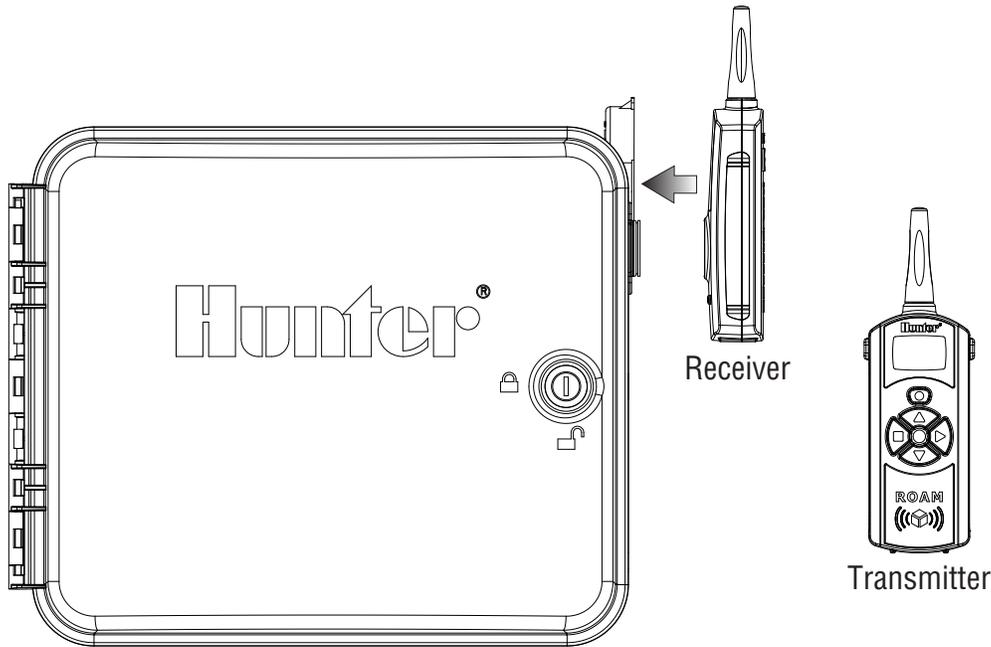
The I-Core can overlap remote commands allowing up to five valves to run simultaneously. Therefore, if a station is being operated and a remote command is sent to activate another station, that station will not turn off the existing station, but run both stations simultaneously.

If five valves are running and a new remote command is received to start another event, the command will be ignored. No new remote commands will be accepted until one of the five events completes watering. I-Core can run automatic programs and manual stations simultaneously. Each command will be displayed on the screen, indicating the event is watering, in the order the event took place.

Remote commands will also be allowed if the controller is in the OFF position. With the dial in the OFF position, the controller will respond to single station or program manual commands. In the OFF position, the display will not indicate that a station is watering; you will only see the System Status Dashboard Light turn green next to Station, indicating that there is a station running. When the controller receives a Manual Program remote command, the controller will only activate the stations within the

Program. If a station within the Program is programmed to a sensor that is Active, that particular station will not operate and will be put into suspend mode. The controller will count down that station's programmed run time without actually running the station.

If there are stations within the program that follow this station numerically and are NOT programmed to the sensor, these stations will run and the controller will observe the remote command and follow through the rest of the program. The programming of stations to a sensor will be discussed in the Set Sensor Operation section of the manual (pg. 18).



POWER FAILURES

Due to the possibility of power failures, the I-Core has nonvolatile memory to preserve programming data indefinitely. The 9-volt battery is required for programming of the controller in the absence of AC power. Both the 9-volt battery and lithium battery (if a 9-volt battery is not installed), will maintain the current time and day during power outages. If the power goes out, the display will acknowledge there is No A/C Power. No stations will water if the display reads No A/C Power, until AC power is restored to the controller.

QUICK START

The I-Core controller offers maximum scheduling flexibility including four programs, each with up to eight daily start times, permitting plants with different watering requirements to be separated on different day schedules. Multiple start times permit morning, afternoon, and evening watering, perfect for the establishment of new lawns and thirsty annual flowers. A built-in 365-day calendar clock accommodates odd/even watering restrictions without requiring monthly reprogramming. You may simply designate days of the week you want to water for ease or use the convenient interval day watering. All of this and more will be explained in detail throughout the programming and operation section. You will begin to notice just how easy the I-Core programming can be and the capabilities of advanced features the I-Core offers to set this controller apart from its competition.

The following are basic programming instructions to initially program your I-Core controller. If more complex programming is required, please reference the I-Core Programming following this page.

1. **Set Current Date/Time:** Use the ◀ and ▶ buttons to navigate, and the + / - buttons to change the flashing selection to the correct Date and Time.
2. **Set Program Start Times:** Each automatic program has 8 start times available. Use the ◀ and ▶ buttons to navigate through the different start times, and the + / - buttons to change the time. The time changes in 15 minute increments, and by holding down the + / - buttons the time will scroll faster. Use the PRG button to select individual programs.



NOTE: The number shown on the screen does not indicate a station number, but indicates an individual start time for that particular Program.

3. **Set Station Run Times:** This dial position allows you to assign a station's run time with a particular program. If you need to change the program, you are assigning a station run time, simply press the PRG button. Use ◀ and ▶ buttons to navigate through the station numbers, and the + / - buttons to change the length of run time in hours: minutes.
4. **Set Days to Water:** Use the PRG button to select the Program. Use the ▲ or ▼ buttons to move the ▶ cursor next to a day, and then use the + / - buttons to indicate a water day or a non water day. When using Days of the Week scheduling, a ✓ will indicate a water day, and a _ will indicate a No-Water Day. The ◀ and ▶ arrow buttons will change the schedule type, including Days of the Week, Odd/Even Days, and Interval Watering.



NOTE: For Days of the Week scheduling, a check mark indicates a water day, and no check mark indicates a non water day. When programming Odd/Even and Interval watering schedules, the X that appears next to the day will indicate a non water day for that schedule, and all other days with no X will be available water days depending on the schedule programmed.

5. **Set Pump Operation (optional):** The Pump/Master Valve output may be set by station. If a Pump/Master Valve is in use you need to make sure the stations are set to **On**. If no Pump/Master Valve is in use, this is not required. The ◀ and ▶ buttons scroll through the stations and the + / - buttons set the stations to **On** or **Off**.
6. **Return the Dial to the Run Position:** This is all that is required for the most basic operations. The I-Core will water automatically in any dial position except **OFF**, with the previous steps discussed being programmed.
7. **Test Program:** The test program will start every station in the controller sequentially, in numerical order, for the specified time. Turn the dial to the **RUN** position. Hold down the PRG button for three seconds. The screen will change automatically and display station number 1 and a flashing run time of 0:00. Enter the desired run time in hours: minutes by using the + / - buttons. Within five seconds the test program will begin. Test program will operate stations in sequential order.
8. **Manual Start:** With the dial in the **RUN** position, there is a shortcut to manually start a program. Press and hold the ▶ button. The screen will change and indicate station 1 and the programmed run time for Program A. If you would like to change the Program you want to manually run, release the ▶ button and press the PRG button to change the Program selection. The manual program will start in a few seconds.

CONTROLLER PROGRAMMING

Setting Current Date and Time

The **SET CURRENT DATE AND TIME** dial position allows you to set the current date and time in your I-Core controller.

1. Turn the dial to the **SET CURRENT DATE/TIME** position.
2. The year will be flashing in the display. Use the + / - button to change the year. Press the ► button to proceed.
3. The month will be flashing. Use the + / - button to change the month. Press the ► button to proceed.
4. The day will be flashing. Use the + / - button to change the day. Press the ► button to proceed and set the time.
5. Use the + / - button to select AM, PM, or 24 HR. Press the ► button.
6. Use the + / - button to set the hour. Press the ► to set the minutes. Use the + / - button to change the minutes until they are correct. The correct date and time have now been set. Always return the dial to the RUN position when you are finished programming the controller.



Setting Program Start Times

The SET PROGRAM START TIMES mode allows you to program start times for each of the four programs (A, B, C, or D) independently. Up to eight start times per day can be set for each program.



NOTE: Two programs are allowed to run at the same time if there Start Times coincide or overlap. This is an important element to consider when programming the Start Times if the hydraulics of your system do not allow for more than one station to run at the same time.

1. Turn the dial to the **SET PROGRAM START TIMES** position.
2. Program A and start time 1 will be displayed. If necessary, you can select Program B, C, or D by pressing the PRG button.
3. The program start time will be flashing. Use the + / - button to change the start time. The time will change in 15 minute increments. Press the ► button to select an additional start time if you would like more than one watering cycle per day to occur for that program. Programs A, B, C have eight start times per day, while program D has 16 start times. Press the PRG button to change between programs A, B, C, and D to assign a start time to the particular program.
4. To eliminate a program start time turn the dial to the **SET PROGRAM START TIMES** position, use the PRG button to select the program and the ► button to select the start time you would like to eliminate. Press the + / - button until you reach 12:00 AM. Press the - button once more and the display will show dashed lines --:--, indicating no start time.



If a program start time is skipped (for example, a start time is set for 1 and 3), the start time will be accepted, but when returning to this dial position, the start times will be moved to sequential order (the Start Time 3 will be moved to 2).

If an earlier start time is set for a higher-numbered start (for example, start time 1 is set to 4:00 AM, and start time 2 is set to 3:00 AM), when returning to this dial position the start times will have been reorganized in chronological order. The lowest numbered start time will always have the earliest time of day (in the example, the start time 1 will be at 3:00 AM and start time 2 at 4:00 AM).



NOTE: One start time will activate all stations sequentially that are assigned to a program. Multiple start times are typically used when separate morning, afternoon, or evening watering cycles are required. You cannot enter a start time for each station. If you only want to water your stations once a day within a particular program, you would only program start time 1. The rest of the start times 2 through 8 would be left blank --:--.

The I-Core controller has the ability to operate five Hunter valves at one time, and, therefore, allows for more than one program to run at the same time. Only two programs can be allowed to run concurrently. If you set two programs to have the same start time, or their start times overlap, both programs will run concurrently. This is a great feature if you have a short water window and the available water to feed multiple stations; however, it could become an issue if the flow of your irrigation system cannot support operating multiple stations at the same time.

If you do not have the available water to operate multiple stations at one time, you will need to consider and calculate when each program will finish, or review the Total Watering Time for each program within the **ADVANCED FEATURES** dial position. Each Program's Start Time must be programmed to start after the previous Program finishes in order to eliminate the possibility of multiple Programs watering at once.

Setting Station Run Times (Length of Watering for Each Station)

The SET STATION RUN TIMES mode allows you to enter a length of run time for each station assigned to a particular program. Each station that has a run time associated with a program will be activated and operate one after another sequentially with each start time for that program.

1. Turn the dial to the **SET STATION RUN TIMES** position.
2. The display will show the station number and program. Use the PRG button to select a program.
3. Use the + / - button to change the station run time on the display.
4. Use the ► button to advance to the next station for which you would like to enter a run time.
5. When finished entering run times, rotate the dial to the RUN position.



By pressing the PRG button, you can move between programs while staying on the same station. However, it is recommended that one program is completed before going on to the next program.

CONTROLLER PROGRAMMING (CONTINUED)



NOTE: When entering run times the Seasonal Adjusted run time will be displayed in the lower right corner of the display. The default Seasonal Adjustment setting is 100%. If the ACTUAL value is different from the PROGRAMMED value, the Seasonal Adjustment has been changed from the default of 100% to a new value.

The ACTUAL run time is the duration the station will water based upon the seasonal adjustment value. Detailed information on Seasonal Adjustment can be found in the Set Seasonal Adjustment section (pg. 17).



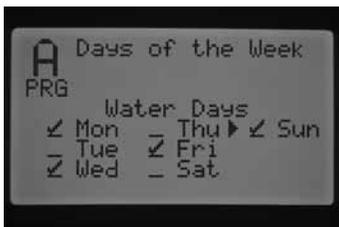
Setting Days to Water

SET DAYS TO WATER mode allows you to select days you would like to water for each program independently.

1. Turn the dial to **SET DAYS TO WATER** position.
2. Program A water days will be displayed. Use the PRG button to select your desired program (A, B, C, or D).
3. Use the ◀ and ▶ button to change from 1) Specific Days of the Week; 2) Odd Day Watering; 3) Even Day Watering; or 4) Interval Day Watering. Each program can only be assigned one type of water day option at a time.

Selecting Specific Days of the Week to Water

1. Turn the dial to **SET DAYS TO WATER** position.
2. Use the PRG button to select your desired program (A, B, C, or D).
3. Use the ◀ and ▶ button to select Days of The Week watering mode. Water Days will be displayed at the bottom of the screen. With the cursor on Monday, press the + button to activate the day or the - button to cancel watering for that day. A ✓ indicates a water day, and a _ indicates a non-water day. After pressing the + / - button on a specific day the cursor will automatically move to the next day. Press the ▲ or ▼ buttons to move quickly to a specific day without making a water or non water selection.



This is program specific so you will need to repeat these steps for each required program.

Selecting Odd or Even Days to Water

This feature uses numbered days of the month for watering instead of specific days of the week. (For example, Odd Days 1st, 3rd, 5th, etc. and Even Days 2nd, 4th, 6th, etc.)

1. Turn the dial to **SET DAYS TO WATER** position.
2. Use the PRG button to select your desired program (A, B, C, or D).
3. Press the ◀ and ▶ button until **Odd Days** watering or **Even Days** watering is shown on the display.



4. In either the Odd or Even Days mode, there will be a ****NO WATER DAYS**** description flashing on the display. Within the Odd or Even mode you can select days that watering will NOT take place. This is a feature that is frequently used to omit watering on a specific day, for example, a mowing day. Press the ▲ or ▼ buttons to move through the days of the week and press the + button for the days that you DO NOT want to water. By pressing the + button on a specific day, an X will appear indicating that the day is a Non-Water Day.



5. To change a Non-Water Day, use the ▲ or ▼ buttons to go to that day and press the - button. The X will disappear, and the day will be available for Odd or Even watering again.



NOTE: The 31st of any month and February 29th are always "OFF" days when Odd watering is selected.

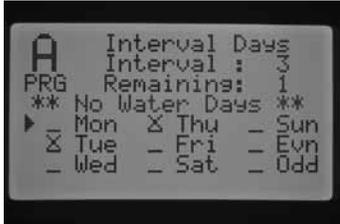
Selecting Interval Watering

This feature is convenient if you want to have a more consistent watering schedule without having to worry about the day of the week or the date. The interval number you select is the actual interval of days on which watering will occur. For example, if you have an interval of 3 days watering every third day. The days remaining (Remaining) indicates how many days until the next watering occurs. For example, if you select interval 3 with 1 days remaining, watering will begin tomorrow at the scheduled time. At midnight the days remaining will change from 1 to 0, indicating that the controller will water that day.

1. Turn the dial to the **SET DAYS TO WATER** position.
2. Use the PRG button to select your desired program (A, B, C, or D).
3. Press the ◀ and ▶ button until **Interval Days** is displayed. The Interval will be flashing. Use the + / - button to select the interval of days on which watering will occur.
4. Press the ▼ button once to program days remaining, if required. One day remaining means it will begin watering the next day.

CONTROLLER PROGRAMMING (CONTINUED)

- In the Interval Watering mode, there will be a No Water Days description on the display. Within the Interval Watering mode you can select days that watering will not take place. This is a feature that is frequently used to omit watering on a specific day, for example, a mowing day. Press the ▼ button until the cursor points to Monday. Once the cursor points to Monday the **No Water Days** description will start flashing. Press the ▲ or ▼ buttons to move through the days of the week and press the + button for the days that you DO NOT want to water. By pressing the + button on a specific day, an X will appear indicating that the day is a Non-Water day.



- To change a No Water Day, use the ▲ or ▼ buttons to go to that day and press the - button. The X will disappear, and the day will be available for Interval watering again.
- After programming water days, rotate the dial back to the **RUN** position.

Set Seasonal Adjustment

Seasonal Adjustment is used to make run time changes without having to reprogram all of the individual station run times. This feature is perfect for making small changes that are necessary as weather conditions change due to seasonality. For example, during hotter times of the year, your landscape may require a bit more water. Seasonal adjust can be increased so that stations will run longer than the programmed time. Conversely, as fall approaches, the seasonal adjust can be reduced to allow for shorter station watering durations.

There are three separate seasonal adjust modes that can be used independently for each Program. Again, the selections are by program, and the steps need to be taken for each program:

Global Seasonal Adjust (PRG Global) – This selection is a program global seasonal adjustment, which increases or decreases station run times by a fixed %. All stations that have a run time within the Program will be adjusted according to the Global Seasonal Adjust value.



- Turn the dial to **SET SEASONAL ADJUSTMENT**. Use the PRG button to select the desired program.
- Press the + / - button to select the PRG Global seasonal adjust mode.
- While in the PRG Global mode, press the ▼ button and the percentage will start flashing.
- Press the + / - button to increase or decrease the global seasonal adjust value between 0 and 300%, which will affect all the stations within the program you have selected.



Monthly Seasonal Adjust (By Month) – All of the seasonal adjustment values for the full year can be programmed into the controller at one time. Each month, the controller will switch to the new seasonal adjust value.



- Turn the dial to **SET SEASONAL ADJUSTMENT**. Use the PRG button to select the desired program.
- Press the + / - button to select By Month seasonal adjust mode.
- While in the By Month mode, press the ▼ button and the seasonal adjust valve for January will start flashing, and the ▶ cursor will indicate January.
- Press the + / - button to increase or decrease the seasonal adjust value between 0 and 300% for the month selected, which will affect all the stations for the Program you have selected.
- By pressing the ▲ or ▼ buttons, you may scroll through the months to select the specific month you want to adjust.



Solar Sync Adjust (By Solar Sync) – This mode allows seasonal adjustment to occur on a daily basis when a Hunter Solar Sync is connected to the controller. This provides for the maximum amount of water saving while promoting healthy plant material. Solar Sync will change the seasonal adjust % daily based upon weather conditions.



- Turn the dial to **SET SEASONAL ADJUSTMENT**. Use the PRG button to select the desired program.
- Press the + / - button to select By Solar Sync seasonal adjust mode.

CONTROLLER PROGRAMMING (CONTINUED)

The Solar Sync will take over and the percentage will change according to the findings of the Solar Sync sensor. If you set seasonal adjust mode to Solar Sync and you DO NOT have a Solar Sync connected, the controller will automatically keep the seasonal adjust percentage at 100%.

There are also further steps in programming of the I-Core to assign the Solar Sync, Rain, and Freeze sensor to shut down specific stations. This will be detailed in this manual under Advanced Features, Sensor Configuration, and Set Sensor Operation.

Set Pump Operation

The default is for all stations is Pump/Master Valve circuit ON. The Pump/Master Valve circuit can be set ON or OFF by station, regardless of which program the station is assigned. This feature may be utilized on systems where it is desirable for a booster pump to operate with certain zones. It could also be used for systems that have two points of connection and some valves need a master valve/pump start to turn on and other valves operate on a different water source that do not need the master valve/pump start.



To Set Pump Operation:

1. Turn the dial to **SET PUMP OPERATION** position.
2. Press the ◀ and ▶ buttons to select a particular station.
3. Use the + / - button to turn the Pump/Master Valve circuit ON or OFF for a specific station.
4. When finished, turn the dial back to the **RUN** position.

Cycle and Soak

The Cycle and Soak feature allows you to split a station's run time into more usable, shorter watering durations. This feature is useful when applying water to slopes and tight soils because it automatically applies water more slowly, helping to prevent run off from occurring. You should enter the Cycle time as a fraction of the station's watering time, and the Soak time as the minimum number of minutes required before watering can occur again for the next Cycle. The total number of cycles is determined by taking the total programmed station run time and dividing it by the Cycle time.

Example: Station 1 requires 20 minutes of watering, but after 5 minutes, runoff occurs. However, after 10 minutes all the water is absorbed. The solution would be to program 20 minutes for the station run time, 5 minutes for the Cycle time, and 10 minutes for the Soak time.



1. Turn the dial to **CYCLE AND SOAK** position
2. Use the ◀ and ▶ buttons to select the station that you would like to program Cycle and Soak.

3. Cycle will flash OFF. Use the + / - button to set the Cycle time. You may select a maximum Cycle time of up to 60 minutes.
4. Press the ▼ button to set the Soak time. Use the + / - button to set the Soak time. You may select a maximum Soak time of up to 120 minutes.
5. Rotate the dial to the **RUN** position when finished programming all Cycle and Soak times for your desired stations.

It may be beneficial to understand how the cycle and soak application process works. For example, Station 1 has been programmed to have a 5 minute cycle time and a 10 minute soak time. Station 1 may not exactly come back on for its second cycle immediately after 10 minutes of soaking. If there are other stations within the program that have run time after Station 1, the program in numerical order will continue to run each station that has a run time in the Program before it goes back to Station 1 for another cycle. The Program will water each station for its programmed run time or first cycle time, before it looks back at station 1 to complete its cycle and soak. If no other stations in the Program have a cycle and soak programmed, then Station 1 will continue with its second cycle after all stations have completed and then go into cycle and soak one after another until the total run time has completed.

Set Sensor Operation

The **SET SENSOR OPERATION** dial position is specifically used to set a response for a sensor to a station. The I-Core controller is capable of monitoring two individual Klik-type sensors, including the Solar Sync rain/freeze sensor. You may have a combination of two Klik sensors, one Klik sensor and one flow sensor, one Klik sensor and a Solar Sync rain/freeze sensor, or two flow sensors. The I-Core Metal version controller has an additional sensor terminal, allowing up to 3 sensors to be installed and programmed. Additional programming assignment of the sensor(s) to stations **MUST** be done in order for the sensors to shutdown irrigation. The programming of the two available sensor inputs is described in the Advanced Features section under Sensor Configuration (see pg. 22) and must be completed prior to setting sensor operation.



NOTE: If using a Solar Sync it will show as a Klik sensor. There is not a special distinction or selection for the Solar Sync, and will be described as a Klik sensor for the remainder of this section.

If two Klik sensors are installed, the display in the **SET SENSOR OPERATION** dial position will allow you to program a response for each sensor according to a particular station. A Sensor Response will either show a ✓, indicating that the sensor will shut down irrigation, or _ , indicating that the station will ignore the state of the sensor and continue in its normal operation.



NOTE: If using a Solar Sync, the Solar Sync sensor terminal will automatically be used for both Rain and Freeze inputs as well as weather adjustment information. The display will show which sensor has caused a shutdown.

CONTROLLER PROGRAMMING (CONTINUED)



Both sensors programmed for Station 1



Sensor 1 only programmed for Station 1



Sensor 2 only programmed for Station 1



No sensor programmed for Station 1

Rotate the dial to the **SET SENSOR OPERATION** position.

1. Use the ◀ and ▶ buttons to select the station that you would like to program a sensor response.
2. The default is to have the sensor input active for each station, therefore indicating a ✓. The ▶ cursor will be flashing on SEN1. Use the + button to enable sensor operation or the – button to disable the sensor.
3. Once SEN1 has been programmed the ▶ cursor will move to SEN2. Use the + / – button to enable or disable SEN2 for the station.
4. Rotate the dial to the **RUN** position when finished programming sensor operation for the desired stations.

If one Klik sensor and one Flow sensor are installed, the screen in Set Sensor Operation will show only one option of selecting a sensor response for the one Klik Sensor. The Klik sensor will either appear as SEN1 or SEN2, depending on which sensor terminals that Klik sensor was connected. You will give the sensor a ✓ if you want the sensor to shut down irrigation, or a _ if you do not want the irrigation to shut down in the case of a sensor state change. The flow sensor configuration will not appear as an option to change in the Set Sensor Operation screen. The programming of the Flow sensor will be done in the **ADVANCED FEATURES** dial position and will be discussed further in that section.



SEN 2 is configured for a Flow Sensor



SEN 1 is configured for a Flow Sensor



Rotate the dial to the **SET SENSOR OPERATION** position.

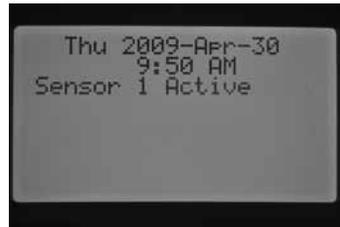
1. Use the ◀ and ▶ buttons to select the station that you would like to program a sensor response.
2. The default is to have the sensor input active for each station, therefore indicating a ✓. The cursor will be flashing on either SEN1 or SEN 2. Use the + button to enable sensor operation or the – button to disable the sensor.
3. Rotate the dial to the **RUN** position when finished programming sensor operation for the desired stations.

If you have two flow sensors configured to each one of the sensor terminals, you will not be given the option to select a response for a weather sensor. When you turn the dial to **SET SENSOR OPERATION**, the screen will display **No Klik or WRC**. The configuration of the Flow sensors will be discussed in the **ADVANCED FEATURES** dial position.



SEN 1 and SEN 2 are configured for Flow Sensors

Once you have installed and programmed a sensor and set a response to your desired stations, the controller will acknowledge the state of the sensor. When the sensor is inactive or in a closed state, the System Status Dashboard will have a green light next to Sensor, indicating that irrigation will occur as normal. If the sensor is in the Active mode or open state, the controller will display a red light in the System Status Dashboard next to Sensor. This indicates that the sensor is active and certain automatic irrigation will not occur. When a sensor becomes active the controller will also indicate the status of the sensor on the display in the RUN position.



Once a sensor becomes active, the controller will put irrigation in a suspend mode. The controller will acknowledge a program's start time and the display will indicate where the program would be watering. However, whether or not the station is set to respond to the sensor will determine if the station turns on or not. If the station is set to respond to the sensor, the display will count down the stations run time and indicate that the station is Suspended. If the sensor state changes and becomes inactivate, the station will resume watering at the given run time on the screen. If a station is not set to respond to a sensor, the station will water as normal and ignore the state of the sensor.

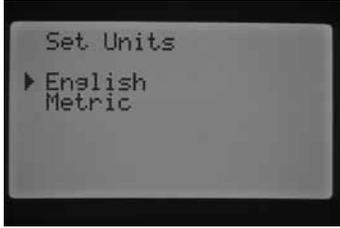


A remote single station command will override the sensor state, whether the station is set to respond or not, and that station will water for the desired run time. When you activate a manual program command by

CONTROLLER PROGRAMMING (CONTINUED)

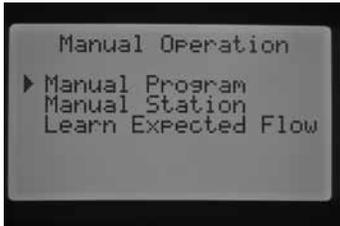
a remote, the controller will acknowledge the stations that have been programmed to respond to a sensor and those stations will not water and be in Suspend Mode.

The same rules apply for activating a station or program manually by turning the dial to the manual position. A manual single station will override an active sensor; however, a manual program will adhere to the rules of shutting down irrigation if the station within the program is set to respond to the sensor.



Manual Operation

This dial position enables immediate operation of either a single station or an automatic program. It also is used to Learn Expected Flow, which is a key element in flow monitoring. You may run more than one manual program or station at the same time, because the I-Core has the ability to run up to five stations or events at once. To initiate multiple events, you will need to turn the dial from **MANUAL OPERATION** to **RUN** and then return to the **MANUAL OPERATION** dial position to begin the initiation of another event. Use the ▲ or ▼ buttons to navigate through the manual feature selections. When the ► cursor is pointing to the selection you want, simply press the + button to select the feature.



Manual Program

This will allow an entire program to be run immediately to be started at any station. It is important to know that if a particular station is selected as the starting point it will run from that that point, to the end. The manual will not go back and run the stations that were initially skipped in the program.



1. Press the PRG button to select the program you would like to run.
2. Turn the dial to **RUN** to start the program at the beginning. Each station will run for its automatic programmed time (including cycle and soak) settings, and the stations with no run time in the selected program will be skipped. You may increase the run time for the first station in the manual sequence, however, each station following will run for its automatic program time.
3. To start later in the program at a higher numbered station, use the ◀ or ▶ buttons to select the station you want the manual to start on.
4. Turn the dial to **RUN** and the manual program will begin from the desired station. The manual will continue until the last station in the Program and then stop.

5. After the manual program begins, you may also use the ▶ button to scroll to a particular station or advance to a station more quickly. It is important to know that once you advance to the next station by using the ▶ button you will not be able to return to the previous station.

Manual Station

Manual Station allows any individual station to be started immediately.

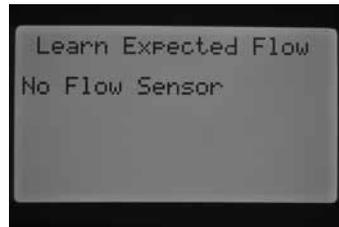


1. Use the ◀ or ▶ buttons to select a particular station.
2. Use the + button to increase the flashing run time on the screen until the desired run time is achieved. You can assign a run time from 1 minute to 12 hours.
3. Turn the dial to **RUN**, and the station will begin irrigating.

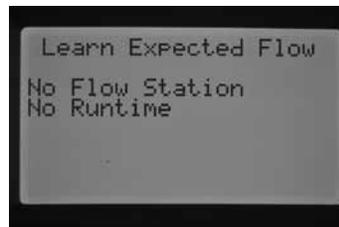
Up to five Hunter valves can be operated simultaneously.

Learn Expected Flow

This feature is used to learn station flows and is the final element that needs to be programmed in the controller in order for flow monitoring to occur. You may learn expected flows by particular stations, or you may learn all the stations at once. It is important that the following programming steps must be completed before you are able to learn flow: (1) You must select a flow sensor in the Sensor Configuration screen in Advanced Features; (2) You must program the station flow to be monitored, which is found in the Flow Operation screen in Advanced Features; and (3) The station must have a programmed run time in the **SET STATION RUN TIMES** dial position. A complete Flow Monitoring procedure will be discussed in the Flow Monitoring section in the manual (pg. 29).

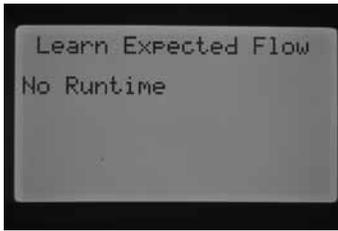


If a sensor is not selected in the Sensor Configuration screen, a station's flow is not set to be monitored or stations do not have programmed run times, the controller will not allow you to learn expected flow. If the user has not selected a flow sensor in the Sensor Configuration screen, the controller will display **No Flow Sensor** while in the Learn Expected Flow screen.

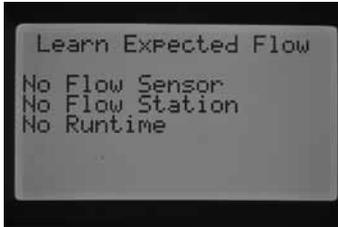


CONTROLLER PROGRAMMING (CONTINUED)

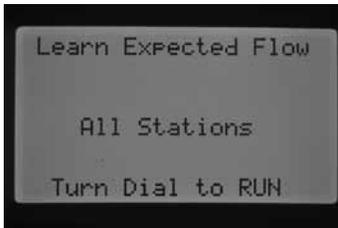
If the user has not selected a station's flow to be monitored the controller will display **No Flow Station**, as well as **No Runtime** even if there is a run time associated with the stations.



If the user has not programmed station run times in the SET STATION RUN TIMES screen, the display will read **No Runtime**.

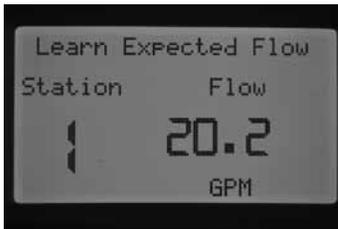


If each one of these key aspects have NOT been programmed, the display will indicate each missing link of the Learn Expected Flow process.



Once these settings have been entered, the controller will allow for Learn Expected Flow.

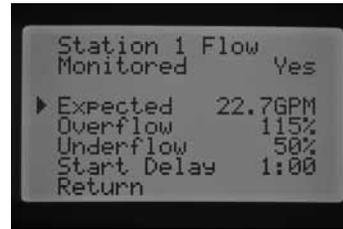
If you want to Learn Expected Flow for All Stations, simply turn the dial to Run. The controller will go into diagnostic testing of the actual flow for each station that has been previously programmed to have its flow monitored. This may take approximately one minute for each station's flow to be learned. It is important to know that during the learning process the station will actually turn on and water in the field.



If you want to learn the flow of a specific station, use the ◀ or ▶ buttons to select the station that you would like to learn the flow for.



Once the correct station number is displayed, turn the dial to Run. Again, the controller will go into its diagnostic flow testing for that particular station. The controller will activate the station and the learning process may take up to a minute. Once the controller has Learned Expected Flow the controller will shut the stations down and the controller will go back to the main current date/time screen.



After completing the learning process, you can review the Expected Flow for each station. Rotate the dial to Advanced Features and use the button to select flow operation. The expected flow will now be displayed. The Expected Flow may be changed manually in this screen, or you may relearn any of the stations flow by repeating the process just discussed. This will be necessary if additional heads have been added, heads have been removed, or nozzles have been changed to a station, which will all adjust the flow.

System Off

To completely stop all irrigation, including any stations which are already running, turn the dial to the System OFF position. Within a few seconds a large OFF will appear in the display and any stations which were running will be shut down, and no new automatic irrigation will be allowed to start.

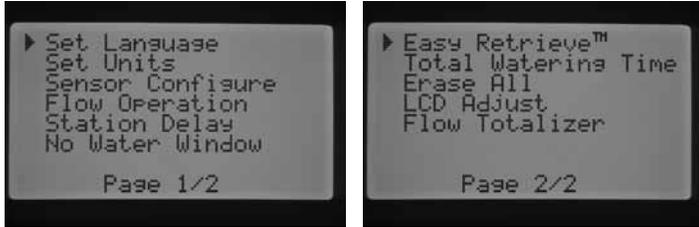


It is also possible to set a programmable period that the controller will remain off in the System Off dial position. This is known as the Programmable Rain Off feature, which will be discussed in the Programmable Rain Off section.

A command to operate the controller from a hand-held remote (SRR, ICR, ROAM) will activate the controller while the dial is the System Off position. This is true for a remote single station command or a remote Program command. The display will continue to show OFF, however the command will be accepted and the controller will begin watering the station or Program.

ADVANCED FEATURES

Advanced features can be accessed by turning the dial to the **ADVANCED FEATURES** dial position. Use the ▲ or ▼ buttons to navigate through the Advanced Feature selections. When the ► cursor is pointing to the selection you want, simply press the + button to select the feature. Use the ◀ button to go back to the previous menu. A detailed description of each selection within the Advanced Features are provided below.



Advanced Features

Set Language

This feature allows you to customize the displayed language to English, Spanish, French, German, Portuguese, or Italian.

1. Turn the dial to the Advanced Features position. Use the ▲ and ▼ to select **Set Language** and use the + button to enter.
2. Use the ▲ or ▼ buttons to navigate through the language selections.
3. Press the + button when the ► cursor is next to the language you want.



Set Units

This function allows you to set the unit of measure to either English or Metric.

1. Turn the dial to the **ADVANCED FEATURES** position. Use the ▲ and ▼ to Set Units and use the + button to enter.
2. Use the ▲ or ▼ buttons to select English (GPM) or Metric (LPM).
3. Press the + button when the ► cursor is next to the unit of measure you prefer.

Sensor Configuration

It is important to complete this step in Advanced Features if you are going to be connecting a sensor to the controller. If you are not going to be connecting a sensor to the controller this section may be skipped. The Sensor Configure feature allows you to program the SEN1 or SEN2 terminals to accept a Hunter Klik-type sensor, a Solar Sync sensor, an HFS flow sensor, or a non-Hunter flow sensor. It is important to program the correct flow sensor size. HFS sensors are always installed in a Hunter FCT fitting, and selecting the correct fitting size automatically sets calibration for the sensor.

Turn the dial to the **ADVANCED FEATURES** position. Use the ▲ and ▼ to select Sensor Configuration and use the + button to enter.

Sensor Options

Flow Sensors

Clik sensor	With the ► button pointing to SEN1, press the + / – button to scroll through the possible choices. When you find the selection or sensor that correlates with the sensor you have wired into SEN1 terminals, simply leave it on that choice.
HFS 100 (1" Schedule 40 Sensor Body)	
HFS 150 (1 ½" Schedule 40 Sensor Body)	
HFS 158 (1 ½" Schedule 480 Sensor Body)	
HFS 200 (2" Schedule 40 Sensor Body)	
HFS 208 (2" Schedule 80 Sensor Body)	
HFS 300 (3" Schedule 40 Sensor Body)	
HFS 308 (3" Schedule 80 Sensor Body)	
HFS 400 (4" Schedule 40 Sensor Body)	
Custom 1, Custom 2, and Custom 3	

By selecting a Clik sensor as an option for SEN1 or SEN2 within the Sensor Configuration screen, you will now be allowed to select by station one or both of the Clik Sensor selections to shut down irrigation in the Set Sensor Operation screen, which was previously discussed.

The factory presets for SEN1 and SEN2 will be programmed as Clik sensors. If you do not have a sensor wired into the controller the settings under Sensor Configuration may be ignored. As long as the jumper wires connect the two sensor terminals together inside the controller, the circuit will remain closed, and the sensor will not false alarm or cause the irrigation to shutdown.



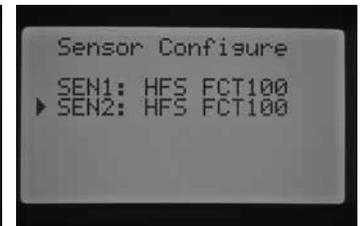
SEN 1 & 2 - CLIK-TYPE SENSORS



SEN 1 - FLOW SENSOR (HFS FCT100)
SEN 2 - CLIK-TYPE SENSOR



SEN 1 - CLIK-TYPE
SEN 2 - FLOW SENSOR (HFS FCT100)



SEN 1 & 2 - FLOW SENSORS (HFS FCT100)

Configure a non-Hunter Flow Sensor

Custom 1, Custom 2, or Custom 3 can be selected to program a non-Hunter flow sensor. Press the ► button when you have the Custom choice selected. The controller will allow the ability to program the K-Factor and Offset specified by the flow sensor manufacturer (please consult Hunter for compatible flow sensors).

ADVANCED FEATURES (CONTINUED)



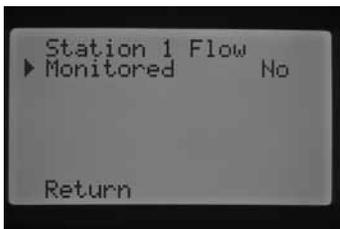
Use the ▲ or ▼ buttons and the ◀ and ▶ buttons to navigate through the Custom, K-Factor, and Offset screen. Once you navigate to a number, it will flash. The number may be changed by pressing the + / - button to either increase or decrease the value. Once you have completed entering the K-Factor and Offset specified by the manufacturer of the flow sensor, use the ▼ button to return to the main Sensor Configuration screen.



If an HFS sensor has been selected and programmed in the Sensor Configuration screen, the main RUN screen will indicate a flashing flow rate anytime a station is irrigating. If the station's flow has not been learned or the station has not been enabled for flow monitoring, which will be discussed in the Flow Operation and Manual Operation section, the screen will still indicate a total flow of 0.0 GPM because the HFS has been selected.

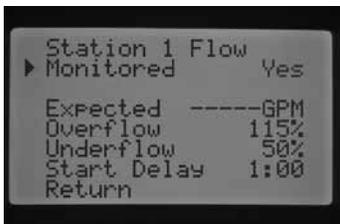
Flow Operation

The Flow Operation feature allows you to program flow monitoring functions for each station. You can program the controller to either monitor flow for a station or not monitor flow for a station.



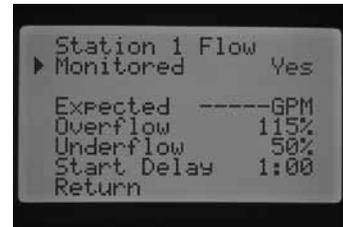
1. Turn the dial to the **ADVANCED FEATURES** position. Use the ▲ and ▼ to select **Flow Operation** and use the + button to enter.
2. Use the ◀ and ▶ buttons to navigate to the station you would like to program.
3. The cursor will be displayed next to Monitored. Use the + / - button to enable or disable flow monitoring for that station.

If flow monitoring is enabled (Yes), you will be given the ability to change certain characteristics of each station's monitored flow. As soon as the station is enabled the new screen will appear with the following selections:



- **Expected Flow** – the amount of flow expected for that station in Gallons Per Minute (GPM) or Liters Per Minute (LPM)
- **Overflow** – Can be set from 110% to 300% of Expected Flow. During system operation, if the station flow exceeds the Overflow limit, the controller will shut the system down and begin diagnostic testing. For example, if the expected flow is 20 GPM and the overflow is set to 115%, the actual flow would need to exceed 15% (3 gallons) of the expected flow. Therefore, the station would need to exceed 23 GPM before the controller would go into overflow alarm.
- **Underflow** – Can be set from 10% to 100% of Expected Flow. During system operation, if the actual station flow falls below the Underflow limit, the controller will shut the system down. For example, if the expected flow is 20 GPM and the underflow is set to 50%, the actual flow would need to underflow by 50% (10 gallons) of the expected flow. Therefore, the station would need to flow at a minimum of 10 GPM before the controller would go into an underflow alarm.
- **Start Delay** – Can be set from 5 seconds to 10 minutes. The Start Delay prevents premature system shutdown due to erratic flow within the mainline by providing a delay before the system shutdown occurs. It allows the system to stabilize prior to shutting the system down during Overflow and Underflow conditions.

After the station has been enabled, press the ▼ button to select any of the features mentioned above. With the ▶ cursor pointing to the flow characteristic, press the + / - button to increase or decrease the value until the desired number is reached.



If flow monitoring is enabled for a specific station, the factory preset values will be displayed. The expected flow will be blank, because the actual learning process has not taken place. The learning process will be discussed in the Manual Operation, Learn Expected Flow section. Overflow will be 115%, underflow will be 50%, and the preset Start Delay will be set to 1 minute.

Flow Operation is necessary to program in order for the controller to know which stations to monitor. Important additional steps that need to be taken to complete the flow monitoring setup. A flow sensor needs to be assigned in the Sensor Configuration screen, and the stations set to be monitored need their flows to be learned. These steps are required in order for flow monitoring to occur.

If a station has been enabled for flow monitoring, it is important to know that the System Status Dashboard flow light will become active for that station. If the other components to complete the flow monitoring process have not been programmed, but the station's flow has been enabled, the System Status Flow light will light Green indicating a normal flow.

A detailed description of what happens in the case of an overflow or underflow is discussed in the controller Diagnostics and Troubleshooting section under System Status Dashboard, Flow. It is very important to read and understand this description before flow monitoring occurs.

ADVANCED FEATURES (CONTINUED)

Station Delay

This feature allows the user to insert a delay time between when one station turns off and the next station turns on. This is very helpful on systems with slow closing valves, or on pump systems that are operating near maximum flow or have slow well recovery. Different time delays between stations can be set according to each Program (from 1 second to 9 hours).



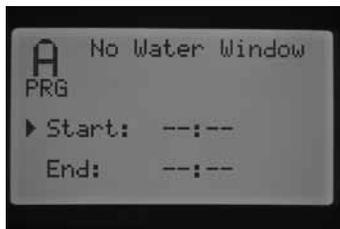
EXP: STATION DELAY FOR PROGRAM A 2 MINUTES

Turn the dial to the **ADVANCED FEATURES** position. Use the ▲ and ▼ buttons select Station Delay and press the + button to enter the Station Delay screen. While in the Station Delay screen press the + / - button to increase or decrease the delay time between stations according to a Program. Use the PRG button to change between Programs A, B, C, or D.

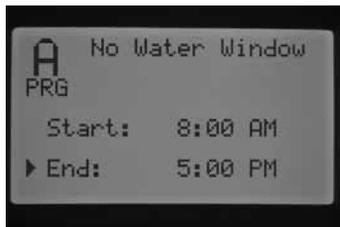
No Water Window

This feature provides the user the ability to disable automatic watering during certain times of the day specific to a Program.

1. Turn the dial to the **ADVANCED FEATURES** position. Use the ▲ and ▼ to select **No Water Window** and use the + button to enter.
2. With the ► cursor next to Start, use the + / - button to set the start of the No Water Window.



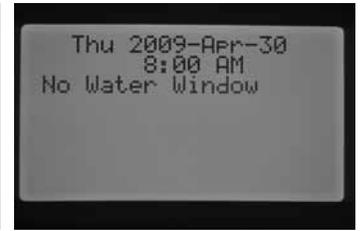
3. Use the ▼ button to select the End time.



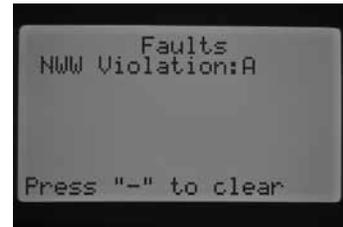
4. With the ► cursor next to End, use the + or - button to set the end of the No Water Window.

For example: if the No Water Window Start is set at 8:00 AM and the No Water Window End is set at 5:00 PM, the controller will not irrigate during the period of the day between 8:00 AM to 5:00 PM. Press the PRG button to change Programs to set a different No Water Window period for each program.

If an automatic Program or Manual Program overlaps and runs into a No Water Window period, the controller will Suspend the watering of the Program being run.



The program will continue to count down the run times associated with the program. If the No Water Window expires and the program is still counting down a run time, the controller will begin watering at that point in time. Once the program finishes and the display returns to the current date and time screen, a fault message will be displayed indicating irrigation has violated the No Water Window and which program was in violation.



This message is displayed to make you aware that irrigation has been missed or Suspended and supplemental watering may be necessary to make up the missed irrigation that has occurred during the No Water Window. A manual single station that is activated remotely or at the controller will override the No Water Window and be allowed to water.

Firmware Info

This feature shows the revision of firmware loaded into the I-Core controller.



Easy Retrieve™ Memory

The Easy Retrieve feature allows you to save your preferred watering program and settings into memory for retrieval at a later time. This feature allows for a quick way of resetting the controller to the original programmed watering schedule if for some reason the programming was tampered with.

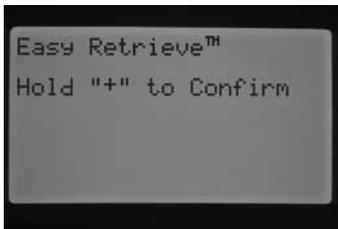
ADVANCED FEATURES (CONTINUED)

To save your watering program into memory:

1. Turn the dial to the **ADVANCED FEATURES** position. Use the ▲ and ▼ to select **Easy Retrieve Memory** and use the + button to enter.
2. Use the ▲ or ▼ buttons to place the ► cursor next to Save.



3. Press the + button once, then press and hold the + button to confirm that you want to save the current programming as the Easy Retrieve program. The display will ask you to please wait, and when the Easy Retrieve program has successfully been saved the display will indicate it is done.

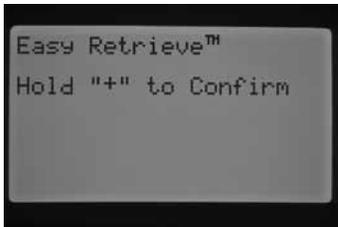


To restore the saved program:

1. Use the ▲ or ▼ buttons to place the ► cursor next to Restore.



2. Press the + button once, then press and hold the + button to confirm that you want to retrieve the restored Easy Retrieve programming. The display will ask you to please wait, and when the Easy Retrieve program has successfully been restored, the display will indicate it is done.



If you erase the controller's memory by using the Erase All feature found in Advanced Features, which will be discussed in a few sections, the controller will revert back to factory presets, and you will NOT be able to retrieve the Easy Retrieved saved programming. The Easy Retrieve program that was saved will be overwritten and lost.

Total Watering Time

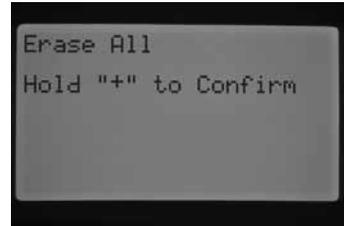
The Total Watering Time feature displays the total run time of all stations in a particular Program. The total time shown is only a representation for each Start Time within the Program and not an accumulation of all the Start Times added together. The controller acknowledges which stations have a run time associated with each program, and adds all the station's run times together to equal the total run time or watering duration for that Program. Total Watering Time does not take into consideration any Cycle and Soak and Station Delay times that will occur during irrigation.



1. Turn the dial to the **ADVANCED FEATURES** position. Use the ▲ and ▼ to select **Total Watering Time** and use the + button to enter.
2. The total watering time will be displayed for the current program shown. Press the PRG button to display total watering time for other programs.

Erase All

The Erase All feature will erase all of the controller's memory and set everything back to factory presets. Once you perform an Erase All, all programming will be erased, including the Easy Retrieve saved programming. Erase All is usually performed when you would like to reprogram the controller from the beginning.



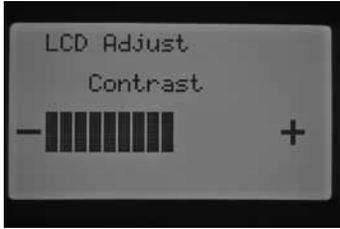
1. Turn the dial to the **ADVANCED FEATURES** position. Use the ▲ and ▼ to select **Erase All** and use the + button to enter.
2. Press and hold the + button to erase all memory from the controller.

The display will briefly inform you to please wait and then indicate when the reset is done.

ADVANCED FEATURES (CONTINUED)

LCD Adjust

The LCD Adjust feature allows you to increase or decrease the contrast of the display. This is helpful to make the display more visible in varying light conditions. You may adjust the contrast of the screen until you are able to read it effectively.



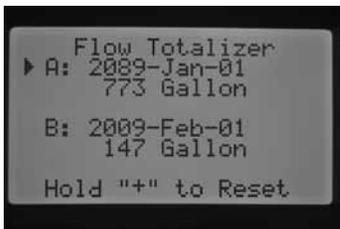
1. Turn the dial to the **ADVANCED FEATURES** position. Use the ▲ and ▼ buttons to select **LCD Adjust** and use the + button to enter.
2. Press the + button to increase the contrast or press the – button to decrease the contrast until your desired contrast level is achieved.

Flow Totalizer

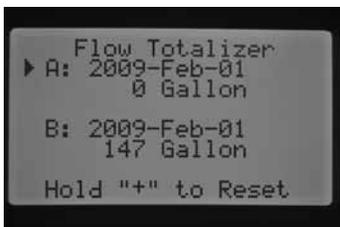
The Flow Totalizer feature provides a running total of all the gallons or liters of water used. This is an accumulation of automatic programs, manuals, remote starts, and any other water that triggers the flow meter, including leaks in the system. Within the Flow Totalizer screen, you will be given two start points or references from which the flow calculations will be recorded. These reference points will be indicated as point A and point B. You may reset either reference point at any time. This is helpful if you would like to keep track of the gallons for the year and also for the month. At the beginning of the year you may reset point A, and the controller will start recording from that point in time. At the end of each month, record the total gallons used for point B and simply reset the reference point on B to start recording the gallons for a new month.

Turn the dial to the **ADVANCED FEATURES** position. Use the ▲ and ▼ buttons to select **Flow Totalizer** and use the + button to enter.

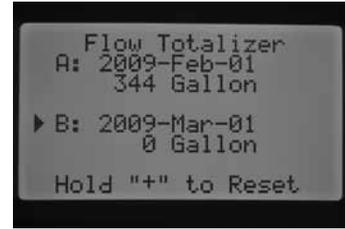
The ► cursor will be pointing to A when you initialize the Flow Totalizing screen. It will show the date of when the point of reference was started and also the running total of the gallons of water.



If you would like to reset this reference point, press and hold the + button while the ► cursor is pointing to A. The date will change to the current date, and the gallons will be set back to 0.



Use the ▼ button to select point B. The ► cursor will be displayed next to point B. To reset reference point B, press and hold the + button, the date will change to the current date and the gallons will be set back to 0.



NOTE: The Flow Totalizer feature will not be reset if an Erase All is performed. This ensures that the flow data will not be lost during a reset of the controller.

Solar Sync Delay

I-Core with built in Solar Sync has the ability to delay the automatic, daily update of the seasonal adjustment value from Solar Sync for up to 99 days. This option may be an advantage to users who do not want the program run times to be adjusted by Solar Sync until after a set seeding or over watering period. The Solar Sync Delay function allows the controller to operate with a manually set seasonal adjustment value during the delay period so that programs assigned to the Solar Sync Seasonal Adjustment (see Seasonal Adjustment setting on pg. 17) will use this seasonal adjustment value until the delay period is over. Once the delay period is over, the programs assigned to Solar Sync will be adjusted based on the daily update from the Solar Sync weather data.

1. Turn the dial to the **ADVANCED FEATURES** dial position.
2. Use the ▲ and ▼ buttons to scroll to the **Solar Sync Delay** position. Press the + button to enter.
3. Use the + and – buttons to set number of days of delay. The default setting is 0 (no delay)
4. Use the ▲ and ▼ buttons to scroll to the **Seasonal Adjust During Delay** position. Use the + and – buttons to modify the Seasonal Adjust during delay (if desired) from the default setting of 100%.

PROGRAMMING SOLAR SYNC SETTINGS

The table will assist you in identifying the type of region you live in. There are four basic ET regions, each with descriptions of the region, along with typical ET and temperature characteristics. It is recommended that, if possible, the region be chosen based upon average July ET or peak summer ET (inches/mm per day).

Use the following table for choosing your region (reference below). You can use **A**, **B** or **C** to help you choose which region is best for your area:

A: Based upon the ET of your region using the **average** July ET or peak summer ET (inches/mm per day). This is the preferred option when selecting your region.

B: Based upon the temperature for your region using the **average** July or the driest month high temperature (not the highest temperature for July).

C: Based upon the general description of your region.

Programming Region & +/- Water Adjustment Setting

After the Solar Sync sensor is connected and assigned to the controller, the Region setting will need to be programmed.

1. Turn the dial to the **SOLAR SYNC SETTINGS** position. The number on the left of the screen is the **Region** setting, and the number on the right is the **+/- Water Adjustment settings**.



2. Set the Region (1, 2, 3, or 4) by using the **+** or **-** buttons. For accurate Solar Sync measurements, the **Region** needs to be programmed for the typical peak ET for your area. Use the table to determine your Region. (see the Solar Sync owner's manual for more details on Region)
3. Set the +/- Water Adjustment by using the **▶** button to move to the number on the right side of the screen. Use the **+** or **-** button to set the value any number between 1-10. The default setting is 5. It is recommended to leave the +/- Water Adjustment setting at the default 5 setting after install. Adjustments to this value can be made to alter the Solar Sync seasonal adjustment value if more/less is desired. (see the Solar Sync owner's manual for more details on using the +/- Water Adjustment)

IF ANY OF THE CHOICES IN THE ROWS APPLY TO YOUR SITUATION, THEN THAT IS YOUR REGION SETTING CHOICE.			
	A	B	C
Region 1	If the average July ET is < 0.17" (4.3 mm) per day	If the average temperature for July is 65°–75° (18°C – 24°C)	<ul style="list-style-type: none"> • U.S. Northern States • Coastal Regions
Region 2	If the average July ET is 0.18" – 0.23" (4.6 mm – 5.8 mm) per day	If the average temperature for July is 75°– 85° (24°C – 29°C)	<ul style="list-style-type: none"> • Mountains • U.S. Northern Inland States
Region 3	If the average July ET is 0.24" – 0.29" (6.1 mm – 7.4 mm) per day	If the average temperature for July is 85°– 95° (29°C – 35°C)	<ul style="list-style-type: none"> • U.S. Southern States • Inland/High Desert
Region 4	If the average July ET is > 0.30" (7.6 mm) per day	If the average temperature for July is 95°– 105° (35°C – 41°C)	<ul style="list-style-type: none"> • Deserts

* For Southern hemisphere locations, use the month of January.

PROGRAMMING SOLAR SYNC SETTINGS (CONTINUED)

Clearing ET memory

1. Once the Solar Sync Sensor is installed the controller will begin collecting ET data. This ET data can be erased/cleared if desired.
2. Turn the dial to the **SOLAR SYNC SETTINGS** dial position.
3. Use the ▲ and ▼ buttons until the cursor is at **Clear ET History**.
4. Press the + button to. The following will be shown on the display, clear ET History and Press + to confirm.
5. Press and hold the + button to clear the ET history saved in the controller.

Check Sensor

This will allow the user to perform a communications check with the Solar Sync Sensor.

1. Turn the dial to the **SOLAR SYNC SETTINGS** dial position.
2. Use the ▲ or ▼ buttons until the cursor is at **Check Sensor**.
3. Press the + button. The controller will perform the communications check with the Sensor and show one of the following responses:
 - a. Upgrade power module – the controller is using a power module that is not compatible with the built-in Solar Sync. Replace the Power module with one that is version 2.1 or later.
 - b. Sensor OK – Solar Sync Sensor has been installed and is operating correctly
 - c. Sensor failed – Solar Sync Sensor is not installed, not enabled, or is not operating correctly.



NOTE: The Solar Sync Sensor must be enabled for this function to work. If the Solar Sync Sensor has not been enabled, "Sensor Failed" will show on the display. To enable the Solar Sync Sensor, follow instructions in section "Sensor Configuration" for Solar Sync.

Assigning Solar Sync to programs

Once Solar Sync is installed it must be assigned to a program in order for that program's run times to be modified using the Solar Sync seasonal adjustment value. Even if no programs are assigned to Solar Sync seasonal adjustment, the controller will continue to collect the Solar Sync ET data. (See Set Seasonal Adjustment section under Solar Sync Adjust for details.)

Programming Solar Sync Delay

I-Core with built in Solar Sync has the ability to delay the automatic, daily update of the seasonal adjustment value from Solar Sync for up to 99 days. This option may be an advantage to users who do not want the program run times to be adjusted by Solar Sync until after a set seeding or over watering period. The Solar Sync Delay function allows the controller to operate with a manually set seasonal adjustment value during the delay period so that programs assigned to the Solar Sync Seasonal Adjustment (See Set Seasonal Adjustment on page 17) will use this seasonal adjustment value until the delay period is over. Once the delay period is over, the programs assigned to Solar Sync will be adjusted based on the daily update from the Solar Sync weather data.

1. Turn the dial to the **ADVANCED FEATURES** dial position.
2. Use the ▲ and ▼ buttons to scroll to the **Solar Sync Delay** position. Press the + button to enter.
3. Use the + and – buttons to set number of days of delay. The default setting is 0 (no delay)
4. Use the ▲ and ▼ buttons to scroll to the **Seasonal Adjust During Delay** position. Use the + and – buttons to modify the Seasonal Adjust during delay (if desired) from the default setting of 100%.

HIDDEN FEATURES

Programmable Rain Off

The Programmable Rain Off allows the user to set period of time in which the controller will be turned off, after which the system will automatically return to automatic irrigation. This is useful for halting irrigation when weather fronts or conditions are expected to persist for several days.

To set a Programmable Rain Off duration:

1. Turn the dial to the **OFF** position.



2. While the controller is in the **SYSTEM OFF** dial position, press the + / - button. The controller will immediately go into the Remaining Days mode. Continue using the + / - button until you reach the desired number of days you want the irrigation to be off before automatic irrigation will resume. You may select a Programmable Rain Off from 1 to 180 days.



3. Turn the dial back to the **RUN** position. The display at the RUN position will then show the number of days for the Programmable Rain Off setting. This will count down each day at midnight, showing the remaining days until automatic irrigation will resume.

Remote commands will act the same in the Programmable Rain Off setting, as they do in the **SYSTEM OFF** dial position. Manual single station and manual program remote commands will activate the controller and run.

As soon as you turn the dial back to the **SYSTEM OFF** position the Programmable Rain Off will be erased, and you will have to reprogram the Remaining Days. It is important to leave the dial in the Run position to maintain the Programmable Rain Off setting.

One Touch Manual Start and Advance

This feature allows the user to start a manual program, similar to activating a Manual Program at the **MANUAL OPERATION** dial position, but without having to turn the dial. It will activate all the stations within the Program for the given programmed run time they were assigned.

With the dial in the **RUN** position, press and hold the ► button.

The controller will default to Program A. You can select Program B, C, or D by pressing the PRG button.



The stations run time will be flashing. Use the ◀ or ▶ buttons to select the station within the program you would like the manual to begin with, and use the + / - button to select a different run time for the particular station number you have on the screen. Any stations following the first station activated will run for their automatic programmed run times.

After no more buttons are pressed, the controller will automatically begin watering. After the manual program begins, you may also use the ▶ button to scroll to a particular station or advance to a station more quickly.

Test Program Operation

The I-Core has a quick test program that will run all stations for a selectable period of time, in numerical order. The test is an easy way to walk through every station in the system to verify proper operation, or perform diagnostics. It also features a quick advance for stepping through stations with the ◀ or ▶ button.

1. With the dial in the **RUN** position, press and hold the PRG button for approximately three seconds.
2. The Test Program screen will appear with Station 1 and a flashing run time of 0:00.



3. Use the + button to increase the flashing test run time from 1 minute to 15 minutes. Each station will run for this selected run time.
4. Press the ▶ button to select which station the Test program will begin with.
5. The Test program will begin running in 3 seconds if no further buttons are pressed.
6. Once the Test program is running, the stations can be advanced or reversed without waiting for the run times to complete. Press the ▶ button to step up one station immediately. Press the ◀ button to back up one station and this will restart the previous station with a new Test run time.

Complete Flow Monitoring Procedure

This is a complete step by step procedure to set up and initialize flow monitoring for the I-Core controller. There are multiple programming steps that need to be completed in order for the monitoring of station's flows to occur. It is important to complete all of the steps for accurate flow monitoring.

1. Before any flow programming takes place, you must have programmed automatic station run times under **Set Station Run times** for the stations you would like to learn flow. The learning process will not occur until station run times are programmed, as the controller does not recognize the station until it has a programmed runtime.
2. Turn the dial to **ADVANCED FEATURES**. Use the ▼ button to move the ► cursor next to Sensor Configuration, press the + button.
3. Use the + / - button until the correct HFS FCT size is displayed. A list of sizes and descriptions can be found in the Set Configuration section in Advanced Features. Enter the HFS FCT size for SEN1 or SEN2 according to which sensor terminals you have the flow sensor wired. If you are installing two flow sensors, both SEN1 and SEN2 will have to be programmed for each flow sensor.

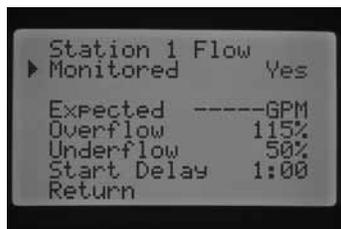
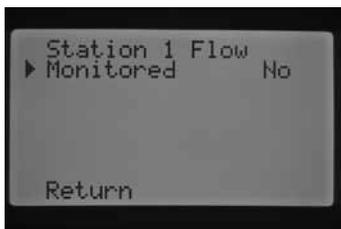
HIDDEN FEATURES (CONTINUED)



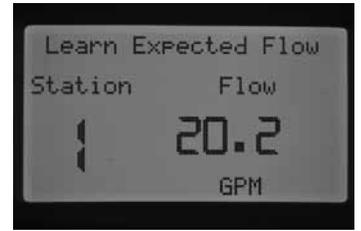
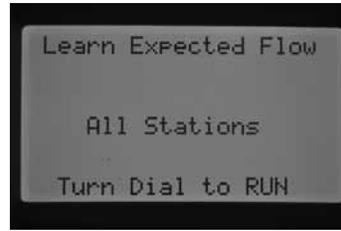
4. For non-Hunter flow sensors, Custom 1, Custom 2, or Custom 3 (Metal Version I-Core) can be selected as a flow sensor type. With custom selected, press the ► button to program the K-Factor and Offset that is specific to that sensor, specified by the flow sensor manufacturer.



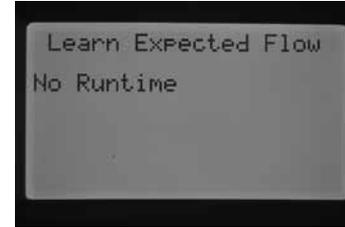
5. Use the ▲ or ▼ buttons and the ◀ or ▶ buttons to navigate through the Custom, K-Factor, and Offset screen. Once you navigate to a particular number and it starts flashing, the number may be changed, press the + / - button to either increase or decrease the value. Once you have completed entering the K-Factor and Offset specified by the manufacturer of the flow sensor, use the ▼ button to return to the main Sensor Configuration screen.
6. Use the ◀ button to return to the **Advanced Features** main screen, or move the dial from **ADVANCED FEATURES** and simply return the dial back to Advanced Features. Use the ▼ button to move the ► cursor next to Flow Operation, press the + button.
7. The display will show Station 1 Flow Monitored and a flashing NO. A selection of NO will indicate that this station's flow will NOT be monitored. Press the + button, and the value will change to YES. This selection will allow for this station's flow to be monitored. If flow monitoring is enabled (Yes), a new screen will appear with important characteristics of each stations monitored flow. Use the ◀ or ▶ buttons to scroll through the station numbers and assign YES or NO for the stations flow monitoring.



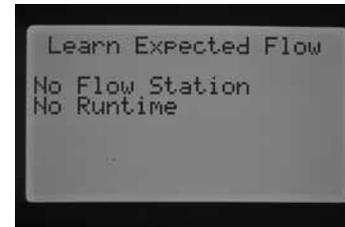
8. Turn the dial to **MANUAL OPERATION**. Use the ▼ button to move the ► cursor next to **Learn Expected Flow**, press the + button.
9. If you would like to learn the flow for All Stations, simply turn the dial to RUN. The controller will learn all the stations that have been programmed for their flows to be monitored, and have programmed run times. The learning process will actually activate each station automatically, operating each station approximately one minute to learn the flow rate. Once all the stations have been learned, the controller will return to its automatic programming and flow monitoring will be active.



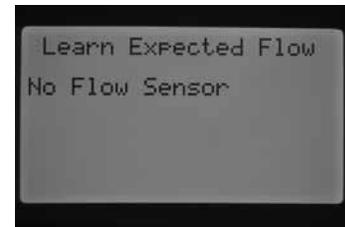
The Learn Expected Flow display will also indicate if there is a problem with any programming. If station run times were not programmed in the **Set Station Run Times** screen, the controller will display **No Runtime** in the **Learn Expected Flow** screen.



If no stations were set to have their flows monitored in the Flow Operation section of Advanced Features, the controller will display **No Flow Station** as well as **No Runtime** in the **Learn Expected Flow** screen.



If no HFS FCT size was programmed in the Sensor Configuration section of Advanced Features, the controller will display **No Flow Sensor** in the **Learn Expected Flow** screen.

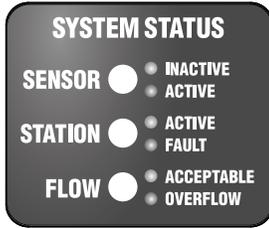


Once flow monitoring has been established, the rules that apply to an overflow or underflow condition are very important to understand. There is a diagnostic testing procedure the controller will activate to determine if there is an overflow or underflow condition. A complete description of the process is explained in the Controller Diagnostics and Troubleshooting section under System Status Dashboard, Flow. It is important to read this section in order to understand the flow monitoring process.

CONTROLLER DIAGNOSTICS AND TROUBLESHOOTING

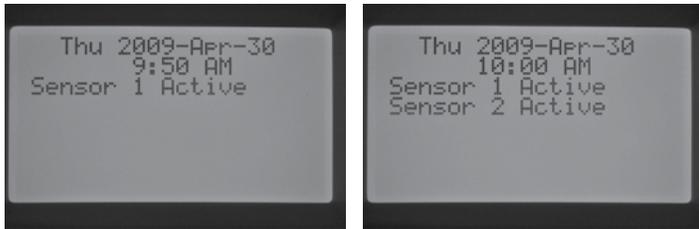
System Status Dashboard

The System Status Dashboard is a quick reference indicator that uses LED lights to provide system status information regarding sensor status, valve operation, and flow monitoring.



Sensor Status

The Sensor System Status lights indicate if a sensor is Inactivate (closed state) or Active (open state). If the controller senses on either the SEN1 or SEN2 terminals an Active condition, a RED light will be displayed. A message will also be displayed indicating which sensor is Active.



If a station has been programmed to acknowledge the sensor in the **SET SENSOR OPERATION** dial position, the controller will suspend the watering of those stations.



If the controller senses closed circuits across the sensor terminals, the Sensor status light will be GREEN, indicating an Inactive sensor. All programmable watering schedules will proceed as normal.

If no sensors are connected to the controller, as long as the jumper wires remain connected to their respective sensor terminals, the Sensor Status light will always be green.

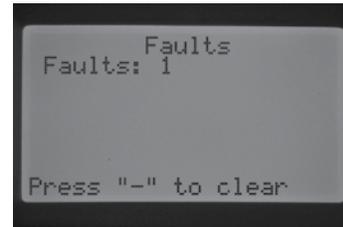
If the Rain Sensor Bypass switch is moved to the Bypass position, the controller will no longer light up the Sensor Status Dashboard light. Any Klik type sensor that is connected to the controller will be ignored, and watering will resume as normal.

Station Status

The Station System Status light monitors and indicates whether a station is operating normally or if an overcurrent condition for a particular station has occurred. The overcurrent condition indicates that either too many solenoids are connected or the field wiring or solenoid has a problem, causing an unacceptably high level of current.

Any time a station is activated and is operating satisfactorily the Station Status Light will be GREEN. If the controller senses an overcurrent for a particular station, the Station Status Light will begin to flash RED. If you observe the Station Status Light flashing RED, the display will provide a fault message.

The number displayed next to the word Fault is the actual station number that the overcurrent condition occurred. Simply press the – button to dismiss the Fault message, and reset the Station Status light. Further troubleshooting will be required to correct the issue causing the station fault(s).



Flow Status

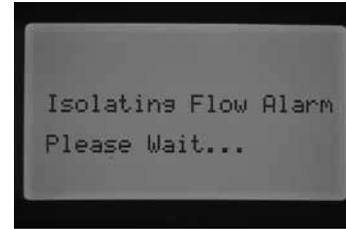
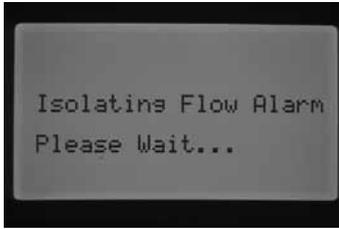
The Flow System Status light identifies whether a station has an acceptable flow or whether overflow condition is occurring. A station's flow monitoring **MUST** be set to YES in the Flow Operation section of Advanced Features before the Flow System Status light will acknowledge acceptable flow of the station. Once this has been established, the Sensor light will light GREEN for an acceptable flow, or a flashing RED for an overflow or underflow condition.

If the I-Core senses an overflow or underflow condition after the Start Delay has elapsed, the Sensor Status Light will turn solid RED, and the controller will go into diagnostic testing to determine if the station has an overflow or underflow condition.



The controller will shut down the station and put it into pause mode for approximately one minute to allow for erratic flow to settle.

CONTROLLER DIAGNOSTICS AND TROUBLESHOOTING (CONTINUED)

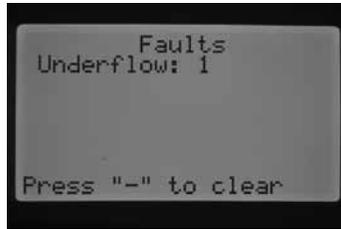
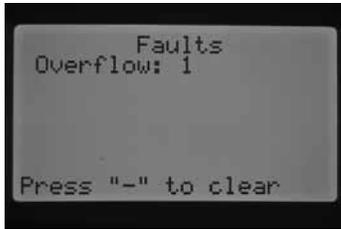


Once a minute has passed, the controller will again activate the station (the display will still indicate that it is Isolating the Flow Alarm). After the Start Up delay has elapsed, if the station flow resembles the learned flow, the controller will continue to run the station for the given programmed run time, and the Sensor Status Light will change to GREEN. If the station flow does not correct itself and an overflow or underflow condition persists after running the station for a second time for the programmed Start Delay, the controller will shutdown the station and the station will not restart. The Flow Status light will then flash RED, and the controller will display an overflow message and indicate which station number.

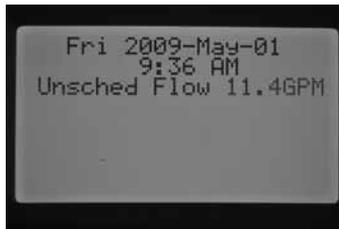
The I-Core can activate stations simultaneously. After the Start Delay elapses for the flow monitored station, if the controller detects overflow, it will initiate a diagnostic testing procedure. The display will read **Isolating Flow Alarm, Please Wait...**

The I-Core will shut down all stations for one minute and allow the water to settle in the irrigation lines. After the one minute passes the controller will reactivate a station whose flow is being monitored for the programmed Start Delay time. The controller will acknowledge the flow and determine if it is acceptable or not. If the flow is acceptable for the monitored station, the controller will again activate the station whose flow is NOT monitored after the Start Delay has elapsed. Once this second station whose flow is NOT monitored activates, the controller will again sense an overflow and begin the diagnostic testing again. This will be a repeating process until the station run time's elapse or do not coincide with each other due to different run times.

If during the diagnostic testing the controller determines that the station's flow, which should be monitored, is in an overflow or underflow condition, the controller will shut down the station and not allow it to restart. The station, whose flow is NOT monitored, will continue to run for its programmed run time.



If a flow sensor is selected, stations are set to be monitored, and their flow has been learned, the controller will light the Flow Status light GREEN anytime an acceptable flow is monitored. A flashing RED light indicates an unacceptable flow is occurring.



Stations that are set to NOT monitored will be displayed by the Flow Status Light differently. A station set to be NOT monitored will NOT activate the Flow Status light and turn it GREEN when the station starts running. However, after five minutes of the station running, the controller will acknowledge that there is flow, and the Flow Status light will light solid RED, indicating an unscheduled flow.

A station not monitored will not be shut down. The controller will detect the flow and determine it as a unscheduled flow.

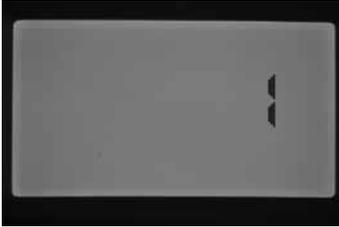


NOTE: The I-Core controller has the ability to run two programs at the same time, which may allow for the possibility of one station to run whose flow is set to be monitored and a second station to run concurrently whose flow is set to be NOT monitored. In the rare instance that this occurs, the controller will not be able to differentiate which stations flow the sensor should be monitoring, and will cause the controller to detect an overflow condition.

HUNTER QUICK CHECK™

The Hunter Quick Check is an efficient and effective way to diagnose problems in the field. Instead of having to physically check each field wiring circuit for potential problems, the user can run the Hunter Quick Check circuit test procedure. This circuit diagnostic procedure is very beneficial to quickly identify "shorts" commonly caused by faulty solenoids or when a bare common wire touches a bare station control wire.

To initiate Hunter Quick Check: With the dial in the **RUN** position, press and hold the +, -, ◀ or ▶ buttons for approximately two seconds and then release.

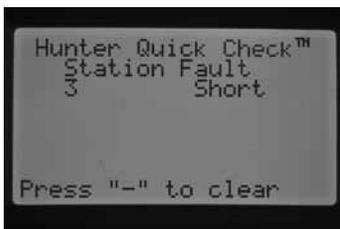


After a few seconds, the display will show a number 1. Press the + button.

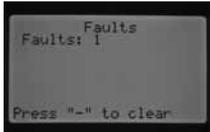
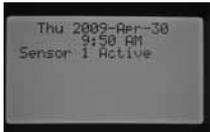
The screen will initially show a number 20 and within one second, the Hunter Quick check will begin.



The controller will begin searching all stations in an effort to detect a high current path through the station terminals. If a field wiring short is detected on a station, the controller will display a fault message for each faulty station.



TROUBLESHOOTING

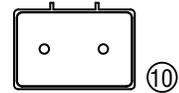
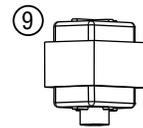
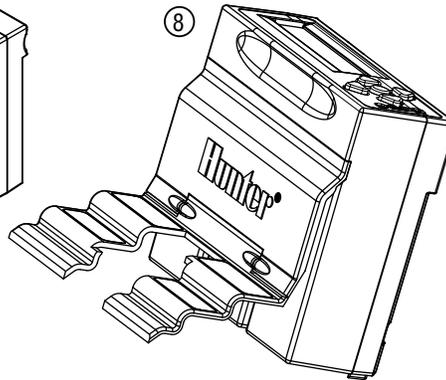
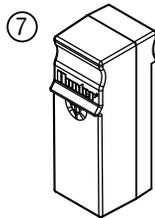
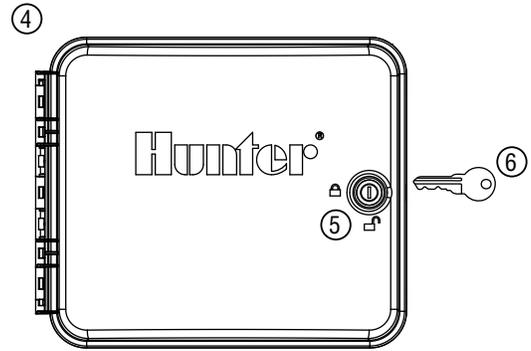
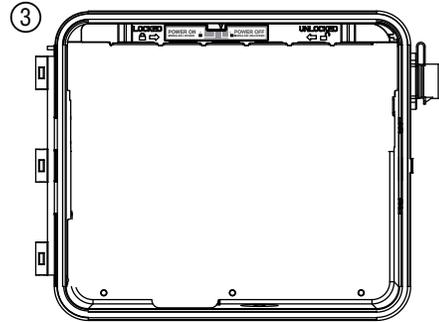
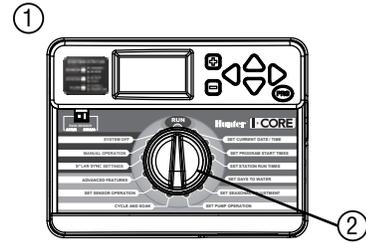
Problem	Causes	Solutions
No display.	<p>Check AC power to controller.</p> <p>14-Pin connector is not fully connected.</p> <p>Module locking bar is in the Power Off position.</p>	<p>Fix power supply.</p> <p>Connect ribbon cable on back of facepack door.</p> <p>Slide the module locking bar into the Power On position.</p>
<p>The display reads NO A/C Power.</p> 	No AC power present to operate controller/valves.	Check to see if the transformer is properly installed or power is coming out of it.
<p>Display reads Fault (OVERFLOW OR UNDERFLOW).</p> 	Overflow/Underflow alarm has occurred.	Check system for problems.
<p>Possible station short.</p> 		Check solenoid and field wiring.
<p>Display reads sensor is active.</p> 	The rain sensor is interrupting irrigation or not installed.	<p>Slide the Rain Sensor switch on front panel to the bypass position to bypass rain sensor.</p> <p>Check to make sure the jumper wire is connecting the sensor terminals if no rain sensor is being used.</p>
Station does not irrigate.	Field wiring or solenoid problem.	<p>Perform Manual Single-Station start and observe display and Station Status light.</p> <p>If Station Status light is RED, check solenoid and field wiring, including COM wires. Station outputs must not exceed 0.56A Max.</p>
The controller does not irrigate automatically.	<p>Possible programming errors.</p> <p>Sensor shutdown.</p> <p>Programmable Off in effect.</p> <p>Time/Date errors.</p>	<p>Verify all programs Days to water, start Times, and Station Run Times.</p> <p>Check display for fault indication.</p> <p>Check display for OFF days.</p> <p>Verify controller time and date, including AM/PM/24 settings.</p>

TROUBLESHOOTING

Problem	Causes	Solutions
Rain or other Clik sensor does not shut down system.	<p>Incorrect sensor type or connection (Jumper installed).</p> <p>Incorrect sensor settings for stations.</p>	<p>Use one normally-closed Clik-type sensor per sensor ports. Verify that one wire from each sensor is to each SEN1 or SEN2 terminals. Remove Jumper wire.</p> <p>Turn dial to SET SENSOR OPERATION and verify correct response for each station to the sensor.</p>
The controller repeats a program or continuously waters even when it should not be on / controller cycles over and over.	Too many start times (user programming error).	Only one start time per active Program is required. Refer to "Set Program Start Time" instructions.
Controller does not recognize output module (station size shown is incorrect).	<p>Module seated incorrectly.</p> <p>Module slot skipped.</p> <p>Station output module overloaded.</p>	<p>Verify that modules are seated all the way back in the wiring compartment and module lock is ON.</p> <p>Verify that no module slots have been skipped from left to right.</p> <p>Swap with known good module in the same position. If new module works in the position, replace the old module. If new known good module also fails to be recognized, check gold contacts for dirt, corrosion, or pests.</p>
Solar Sync Adjusting too low	Solar Sync Setting need to be adjusted	<p>Make sure controller dial is in the RUN position. Increase the value on the Water Adjustment scale (10 is max). Once the setting is changed, the controller will immediately be updated with the new Seasonal Adjust %. Increase the Water Adjustment setting until the desired Seasonal Adjust % is shown. If you max out the Water Adjustment scale at 10 and still require more Seasonal Adjust, move down to the next lower Region (from Region 4 to 3, for example).</p>
Solar Sync Adjusting too high	Solar Sync Setting need to be adjusted	<p>Make sure controller dial is in the RUN position. Decrease the value on the Water Adjustment scale (default setting is 5). Once the setting is changed, the controller will immediately be updated with the new Seasonal Adjust %. Decrease the Water Adjustment setting until the desired Seasonal Adjust % is shown. If you minimize the Water Adjustment scale down to 1 and still require a reduction in Seasonal Adjust, move up the next Region (from Region 2 to 3, for example).</p>

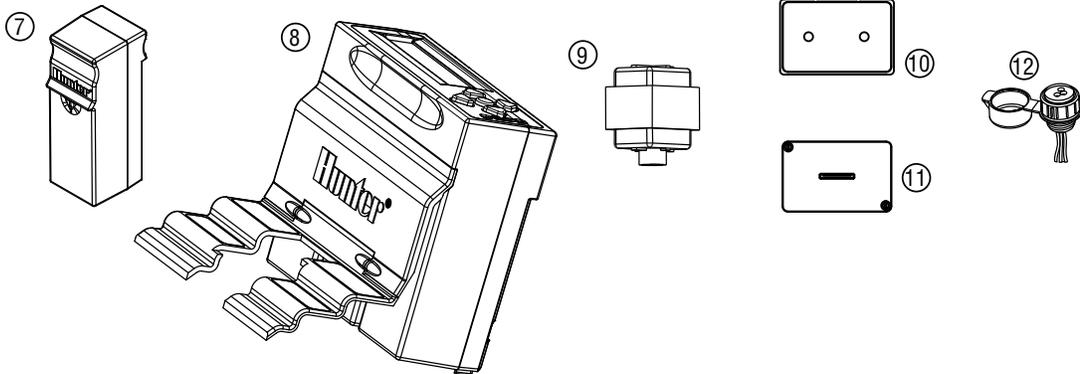
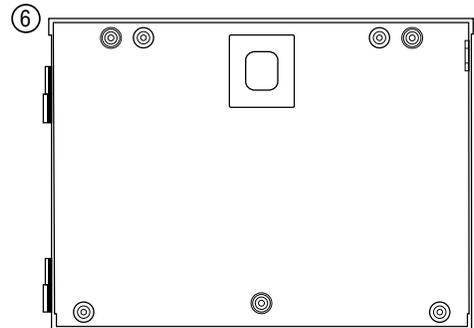
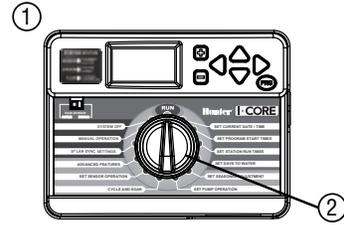
I-CORE: INSTITUTIONAL/COMMERCIAL CONTROLLER (IC-600PL & IC601PL) – PLASTIC CABINET

Item	Description	Catalog No.	
①	Front Panel	124705	
②	Knob	129300	
③	Rear Cabinet	117805	
④	Door Without Lock, Plastic I-Core	131305	
⑤	Lock & Key Set	387300	
⑥	Key Set (2)	122516	
⑦	6-Station Expansion Module	ICM600	
⑧	48 Station DUAL Module	DUAL48M	
⑨	Transformer	154628	
⑩	Junction Box	123800	
⑪	Junction Box Cover	124000	
⑫	Smart Port Wiring Harness 25' Shielded Cable	SRR-SCWH	
	Power Module	121405	
	Ribbon Cable, Plastic I-Core	130800	
	I-Core Mounting Template	LIT-548	
	Hanging Door Card	English	LIT-506
	Owners Manual	English	LIT-502
		Spanish	INT-895
		French	INT-894
		Italian	INT-896
		German	INT-898
		Portuguese	INT-897



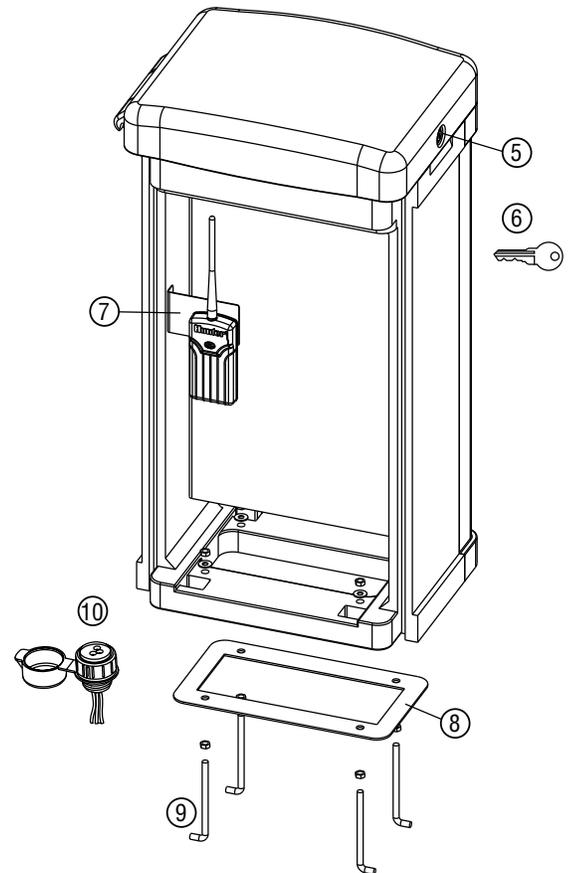
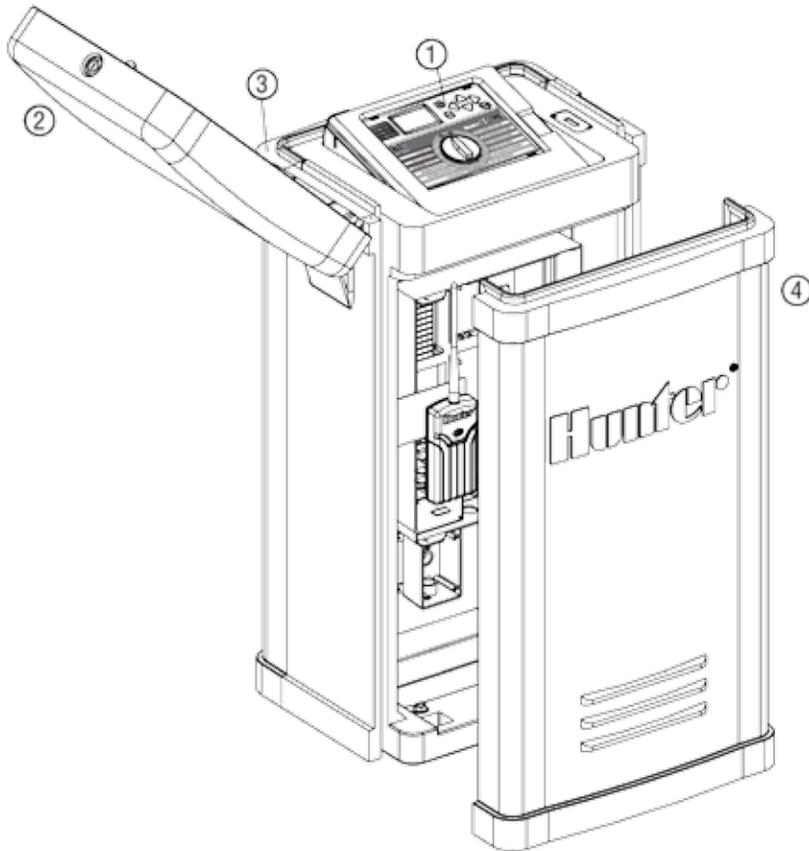
I-CORE: INSTITUTIONAL/COMMERCIAL CONTROLLER (IC-800M & IC-800SS) – METAL CABINET

Item	Description	Catalog No.	
①	Front Panel	124705	
②	Knob	129300	
③	Door Without Lock, Metal I-Core	125500	
④	Lock & Key set	387300	
⑤	Key Set (2)	122516	
⑥	Rear Cabinet	118700	
⑦	6 Station Expansion Module	ICM600	
⑧	48 Station DUAL Module	DUAL48M	
⑨	Transformer	154628	
⑩	Junction Box	123800	
⑪	Junction Box Cover	124000	
⑫	Smart Port Wiring Harness 25' Shielded Cable	SRR-SCWH	
	Power Module	121405	
	Ribbon Cable, Metal/Stainless I-Core	130810	
	I-Core Mounting Template	LIT-548	
	Hanging Door Card	English	LIT-506
	Owners Manual	English	LIT-502
	International Kit (Includes Owners Manual)	Spanish	INT-895
		French	INT-894
		Italian	INT-896
		German	INT-898
		Portuguese	INT-897



I-CORE PLASTIC PEDESTAL

Item	Description	Catalog No.
①	I-Core Front Panel	12475
②	Lid	552200
③	Hinge Pin	558400
④	Access Door	553200
⑤	Lock & Key Set	558800
⑥	Key Set (2)	122516
⑦	SmartPort Bracket	576000
⑧	Mounting Template	558600
⑨	Mounting Hardware	420200
⑩	Smart Port Wiring Harness 25' Shielded Cable	SRR-SCWH
	Ribbon Cable - Plastic Ped I-Core	130815
	Mounting Kit	581700
Owners Manual	English	LIT-502
	Spanish	INT-895
International Kit (Includes Owners Manual)	French	INT-894
	Italian	INT-896
	German	INT-898
	Portuguese	INT-897



SPECIFICATIONS

Operating Specifications

- Station Run Time: 1 minute to 12 hours (in 1-minute increments) on programs A, B, C, D.
- Start Times: 8 per day, per program (A, B, C), 16 per day (D), for up to 40 daily starts.
- Watering Schedule: 7-day calendar, interval watering up to a 31-day interval or true odd or even day programming, made possible by the 365-day clock/calendar.

Electrical Specifications

- Transformer Input: 120 VAC, 60Hz (230 VAC, 50/60 Hz International Use)
- Transformer Output: 25 VAC, 1.5 amp
- Station Output: 24VAC, 0.56 amps per station
- Maximum Output: 24VAC, 1.4 amps (includes Master Valve Circuit)
- Battery Backup: 9-volt alkaline battery (not included) used only for time keeping during power outages, the nonvolatile memory maintains program information.

Dimensions

- **Plastic Cabinet**
Height: 11" (28 cm)
Width: 12" (30.5 cm)
Depth: 3¾" (9.5 cm)
- **Metal/Stainless Cabinet**
Height: 15¾" (40 cm)
Width: 11¾" (29 cm)
Depth: 4½" (11.4 cm)
- **Plastic Pedestal**
Height: 38" (96 cm)
Width: 20 ½" (52 cm)
Depth: 15" (38 cm)

Default Settings

All stations are set to zero run time. This controller has a non-volatile memory that retains all entered program data even during power outages, without need for a battery.

FCC NOTICE

This controller generates radio frequency energy and may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Move the controller away from the receiver.
- Plug the controller into a different outlet so that controller and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington, D.C., Stock No. 004-000-00345-4 (price – \$2.00 postpaid).

Hunter®

Hunter Industries Incorporated • The Irrigation Innovators
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www.hunterindustries.com

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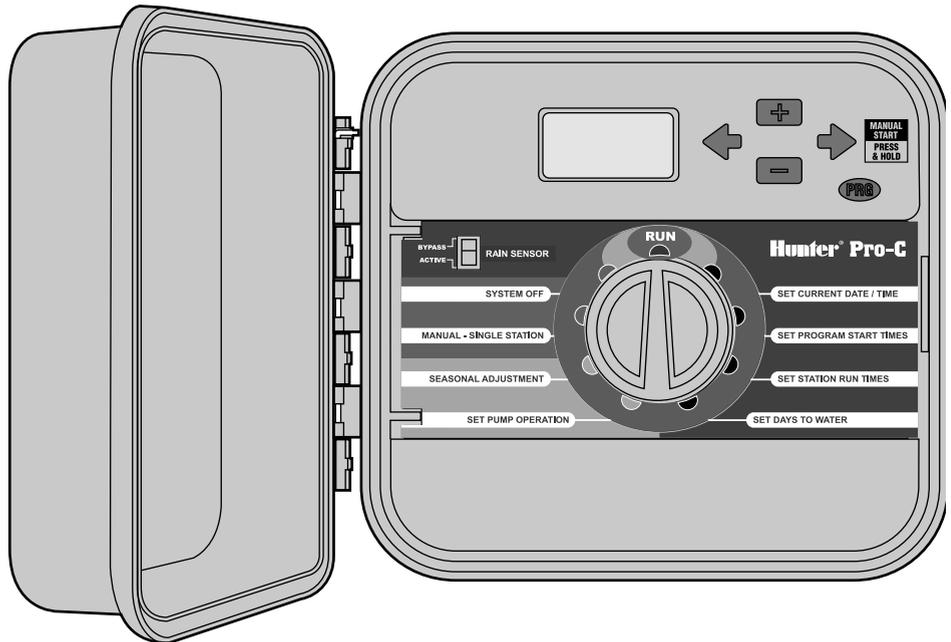
Pro-C

Residential and Light Commercial Irrigation Controllers

**PC Series
Modular Controller
Indoor/Outdoor Models**

**Owner's Manual and
Installation Instructions**

Please leave with property owner



Hunter®

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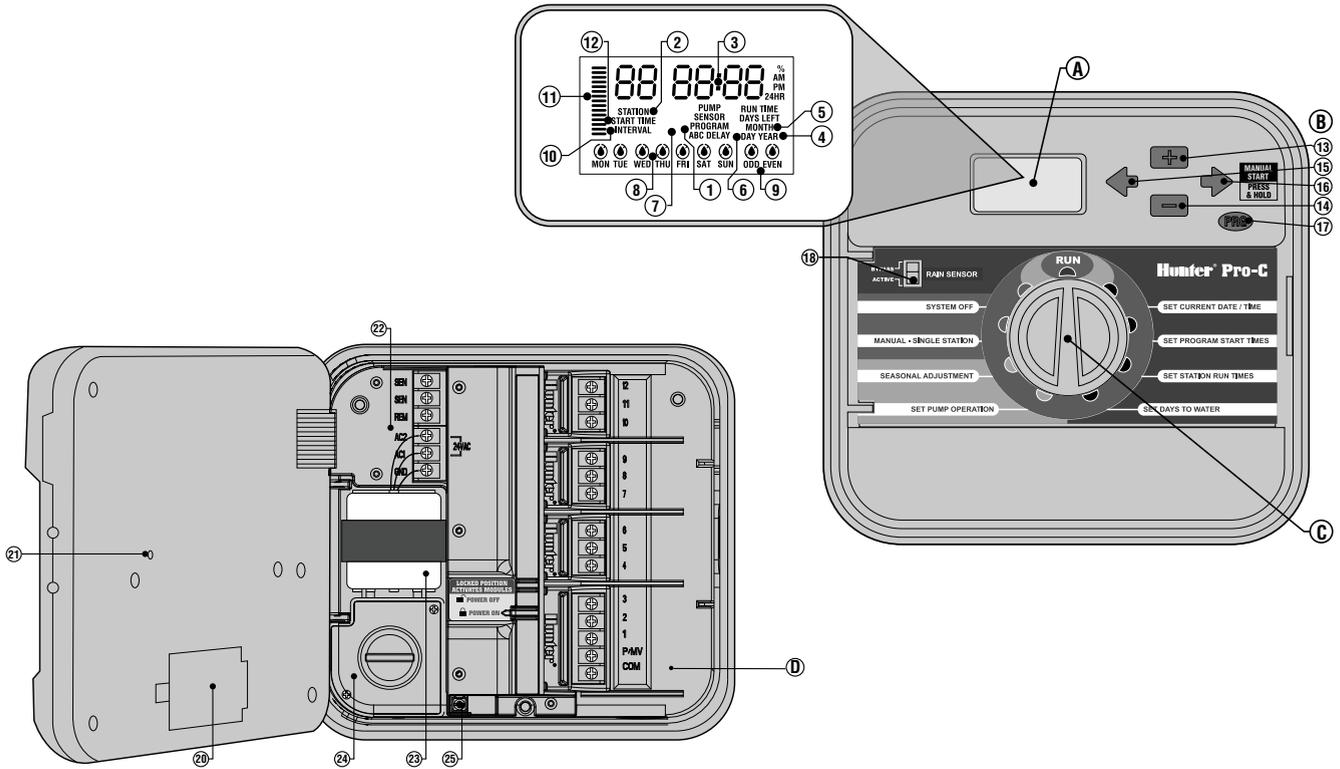
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PRO-C



A. – LCD Display

1. **Program Selector** – Identifies the program in use A, B, or C.
2. **Station Number** – Identifies currently selected station number.
3. **Main Display** – Indicates various times, values, and programmed information.
4. **Year** – Identifies current calendar year.
5. **Month** – Identifies current calendar month.
6. **Day** – Identifies current calendar day.
7. **Running** – Sprinkler icon indicates when watering is occurring.
8. **Days of the Week** – Identifies days of the week to water or not water.
9. **Odd/Even Watering** – Identifies if odd or even watering is selected.
10. **Interval** – Identifies if interval watering has been selected.
11. **Seasonal Adjust** – Displays in increments of 5%, the percentage of seasonal adjust that has been selected.
12. **Start Time** – Identifies selected program start time.

B. – Control Buttons and Switches

13. **+ Button** – Increases the selected flashing display.
14. **- Button** – Decreases the selected flashing display.
15. **← Button** – Returns selected flashing display to the previous item.
16. **→ Button** – Advances the selected flashing display to the next item. Also to start a manual cycle.
17. **PRG Button** – Selects programs A, B, and C. Also to start a test program.
18. **Rain Sensor Bypass Switch** – Use to bypass weather sensor, if one is installed.

C. – Control Dial

- Run** – Normal dial position for automatic operation.
- Set Current Date/Time** – Set current date time.
- Set Program Start Times** – Set 1 to 4 start times in each program.
- Set Station Run Times** – Set each station run time.
- Set Days to Water** – Select individual days to water, odd, even, or interval watering schedule.
- Set Pump Operation** – Turn pump or master valve on or off for each station.
- Manual – Single Station** – Activates a one time watering of a single station.
- Seasonal Adjustment** – Make global run time changes without reprogramming the controller (from 5% to 300%).
- System Off** – Used to discontinue all programs and stop all watering until the dial is returned to the **RUN** position, or to set the programmable rain off feature.

D. – Wiring Compartment

20. **9-Volt Battery** – An alkaline battery (not included) allows you to program the controller without AC power.
21. **Reset Button** – This button will reset the controller. All programmed data will remain intact.
22. **Power Area** – Used to attach transformer, sensor wires, and other systems to the controller.
23. **Transformer** – A transformer is installed (Outdoor models only, indoor models are supplied with a plug-in transformer.)
24. **Junction Box** – This box provides an area for connecting primary AC power. (Outdoor models only.)
25. **Ground Lug.**

MOUNTING THE CONTROLLER TO A WALL.....

All necessary hardware is included for most installations.



NOTE: The indoor Pro-C is not weather or water resistant, and must be installed indoors or in a protected area. This device is not intended for use by young children. Never let children play with this device.

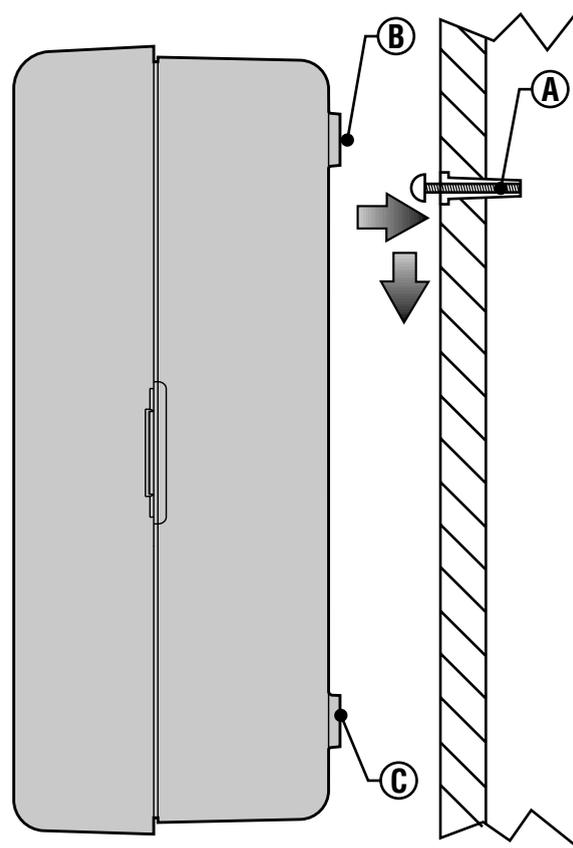
1. Select a location close to an electrical outlet or power supply that is not controlled by a light switch.
2. Remove the front panel from the Pro-C by first removing the ribbon connector and then pulling down the hinge release. Removing the front panel will ease installation of the controller cabinet.
3. Use the hole at the top of the controller as a reference and secure a 1" (25 mm) screw (A) into the wall. **Note: Install screw anchors if attaching to drywall or masonry wall.**
4. Align controller with the screw and slide the keyhole (B) on top of the controller over the screw.
5. Secure controller in place by installing screws in the holes (C).



NOTE: Outdoor model is water and weather resistant. Connecting the outdoor Pro-C to the primary power should be done by a licensed electrician following all local codes. Improper installation could result in shock or fire hazard. This device is not intended for use by young children. Never let children play with this device.

For PC-301-A:

If the supply cord is damaged, it must be replaced by the manufacturer or service agent or a similarly qualified person in order to avoid hazard.

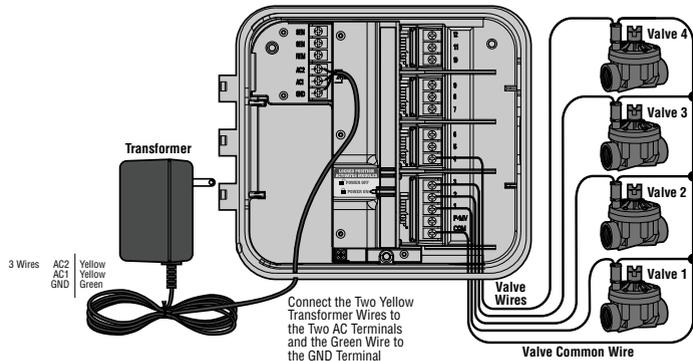


CONNECTING VALVES AND AC POWER

1. Route valve wires between control valve location and controller.
2. At valves, attach a common wire to either solenoid wire of all valves. This is most commonly a white colored wire. Attach a separate control wire to the remaining wire of each valve. All wire splice connections should be done using waterproof connectors.
3. Route valve wires through the conduit and attach conduit to one of the openings on the bottom of the cabinet.
4. Strip ½" (13 mm) of insulation from ends of all wires. Secure valve common wire to "COM" (Common) terminal. Attach all individual valve control wires to appropriate station terminals.

Indoor Cabinet

Route transformer cable through the hole on the bottom left side of the controller and connect one Yellow Wire to each of the screws marked **AC** and the Green Wire to **GND**.



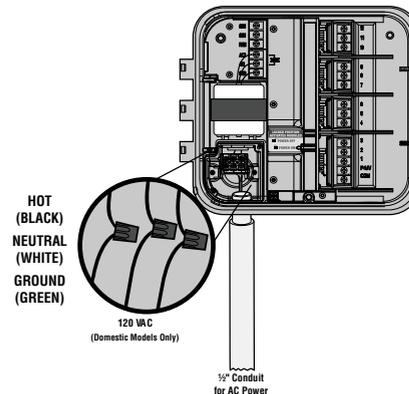
NOTE: It is recommended that a licensed electrician perform the following power installation.



NOTE: Pro-C/PCC controllers are intended to be supplied AC power with a 15A rated over current protective device.

Outdoor Cabinet

Route **AC** power cable and conduit through the ½" (13 mm) conduit opening on the left side of the bottom of the cabinet. Connect the wires to the transformer wires located inside the junction box. International units are supplied with a built in terminal strip. Always use a UL listed conduit ½" (13 mm) male adapter when installing the **AC** wiring. Insert the adapter into the ½" (13 mm) hole at the bottom of the controller. Attach a nut to the adapter inside the enclosure.



INSTALLING STATION MODULES

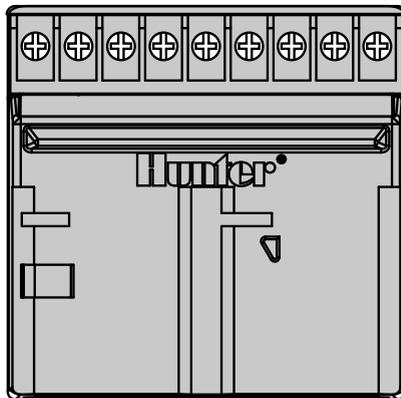
The Pro-C controller is supplied with a factory-installed base module for up to 3 stations. Additional modules may be added in increments of 3 stations (PCM-300) or a single 9-station (PCM-900) to expand the controller's station capability to 15 stations. Additional modules are sold separately.

Note: The use of a PCM-900 to expand your controller to 15 stations requires that one PCM-300 be installed in the first expansion slot (**stations 4-6**) and the PCM-900 in the upper two expansion slots.

The Pro-C utilizes automatic module recognition firmware to identify when PCM modules are installed or removed from the controller. This feature will recognize the correct number of stations without having to reset or cycle power to the controller.



PCM-300



PCM-900 (Must be installed in the 9-12 station module slots and used along with one PCM-300 Module)

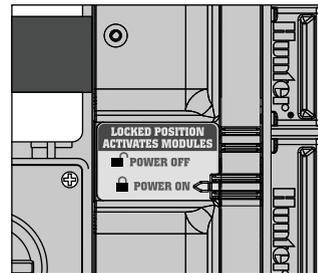
Installing PCM Modules

The Pro-C controller is designed with a simple to use Power Lock feature that assures that the modules are energized and firmly secured into the controller. The Power Lock can unlock or lock all modules at one time by simply pushing the Power Lock slide.

1. Slide the Power Lock into the Power Off (unlocked) position. Insert the PCM modules into the appropriate sequential position in the controller cabinet.

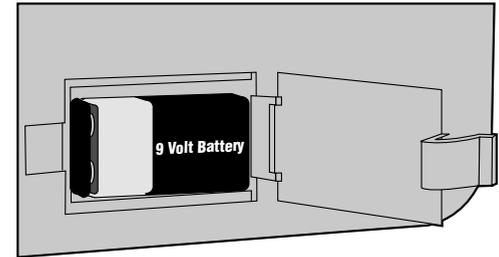
Note: Your Pro-C controller is designed to work only in conjunction with **BLACK PCM** expansion modules.

2. Once all of the modules are in place, slide the Power Lock into the Power On (locked) position to energize and secure the modules into the controller.
3. The Pro-C will automatically recognize the correct number of stations. It is not necessary to press the reset button or cycle power to the controller.



CONNECTING THE BATTERY (optional)

Connect a 9-volt **alkaline** battery (not included) to the battery terminals and place in the battery compartment in the front panel. The battery allows the user to program the controller without AC power. **Watering will not occur without AC power.** Since this controller has non-volatile memory, the program clock and calendar will be retained during a power outage even if no battery is installed.

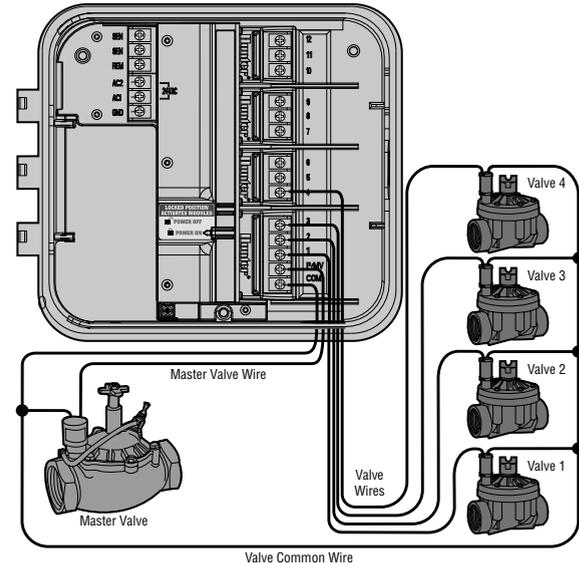


CONNECTING A MASTER VALVE.....



NOTE: Complete this section only if you have a master valve installed. A master valve is a normally closed valve installed at the supply point of the main line that opens only when the automatic system is activated.

1. At the Master Valve, attach the common wire to either solenoid wire of the valve. Attach a separate control wire to the remaining solenoid wire.
2. Route the wires into the controller.
3. Connect either wire from Master Valve to the **P/MV** terminal. Connect remaining wire to the "**COM**" (Common) terminal.



CONNECTING A PUMP START RELAY.....



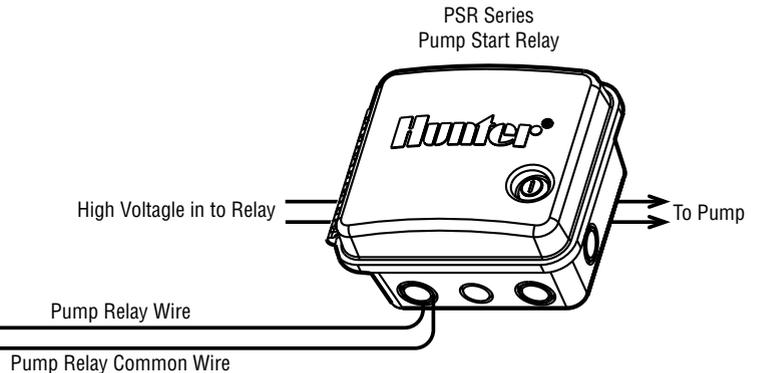
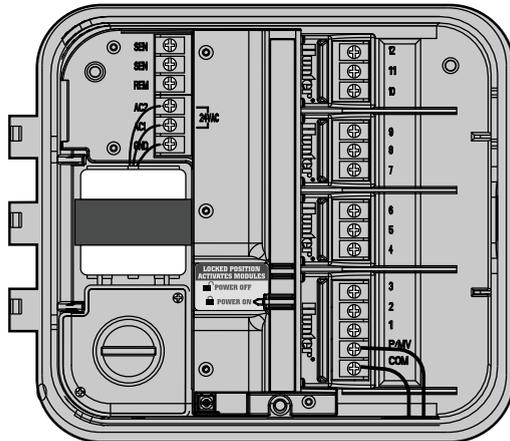
NOTE: Complete this section only if you have a pump and pump start relay installed. A pump start relay is an electronic device that uses a signal current from the irrigation controller to activate a pump to provide water to your system.

When a pump is to be operated by the controller, a pump start relay is typically used. Hunter offers a full range a pump start relays for most applications.

1. Route a wire pair from the pump relay into the controller housing.
2. Connect the pump common wire to the terminal slot “COM” (Common) and the remaining wire from the pump relay to the P/MV screw slot.

Relay holding current draw must not exceed .28 amps (24 VAC).

Do not connect the controller directly to the pump – damage to controller will result.



CONNECTING A WEATHER SENSOR (not included).....

A Hunter Mini-Clik® rain sensor or other type of micro-switch weather sensor may be connected to the Pro-C. The purpose of a rain sensor is to stop watering when precipitation is sufficient.

1. Route the wires from the rain sensor up through the same conduit used for valve wiring.
2. **Remove the metal jumper plate** from the two **SEN** terminals.
3. Connect one wire to the **SEN** terminal and one to the other **SEN** terminal.
4. When the weather sensor has deactivated automatic watering, OFF and sensor will appear on the display.



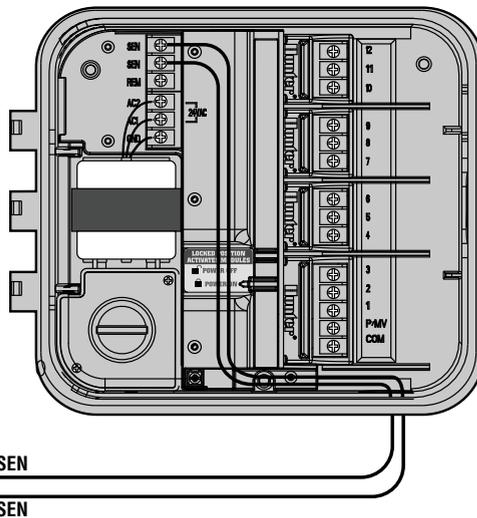
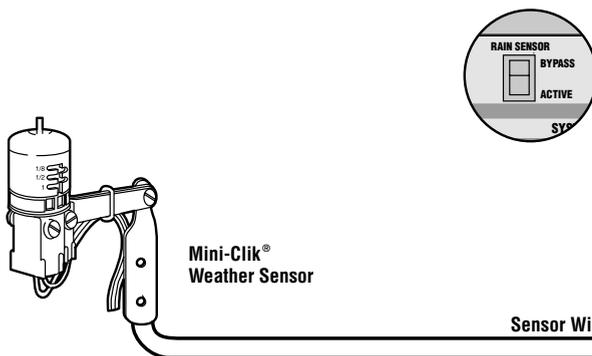
SENSOR BYPASS position to disable the rain sensor from the system to allow for the controller operation. You can also bypass the weather sensor for manual operation by using the **MANUAL - SINGLE STATION** function.



NOTE: If the rain sensor switch is left in the **ACTIVE** position and no sensor is connected and the jumper has been removed, the display will read **SEN OFF** and no irrigation will occur. To eliminate this problem when no sensor is connected, leave the switch in the **BYPASS** position or install a short jumper wire between the sensor terminals.

Manually Bypassing the Weather Sensor

If the rain sensor is interrupting irrigation you can bypass it by using the bypass switch on the front of the controller. Slide the switch to the



Sensor Wire to SEN
Sensor Wire to SEN

CONNECTING A WEATHER SENSOR (continued)

Testing the Weather Sensor

The Pro-C provides simplified testing of a rain sensor when the sensor is wired into the sensor circuit. You can manually test proper operation of the rain sensor by running a **MANUAL ALL STATIONS** cycle by activating the system using the **ONE TOUCH MANUAL START** (see page 20). During the Manual Cycle, pressing the test button on the Mini-Click will interrupt watering.



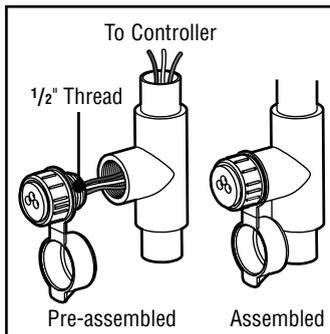
NOTE: A manual single station cycle will override the sensor to allow manual operation when the sensor is active.

CONNECTING A HUNTER REMOTE CONTROL (not included)

The Hunter remotes make it possible for you to operate the system without having to walk back and forth to the controller. The SmartPort connector creates a simple interface for quick and easy connection of a Hunter remote to a Hunter controller. (SmartPort connectors are included with Hunter remotes)

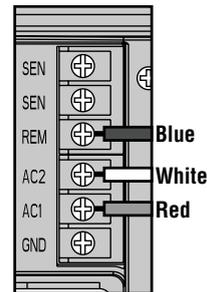
To install the SmartPort connector

1. Install a 1/2" female threaded "Tee" in the field wiring conduit approximately 12 feet (3.7 meters) below the Pro-C.
2. Feed the red, white, and blue wires of the harness through the base of the "Tee" and into the wiring compartment as shown.



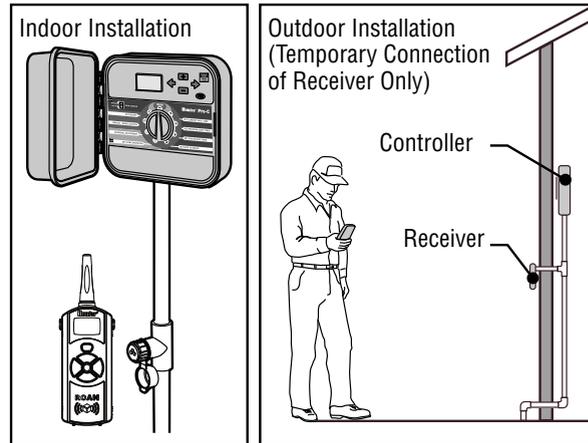
3. Screw the SmartPort harness housing into the "Tee" as shown.
4. Attach the red wire to the bottom most **AC1** screw slot, attach the white wire to the upper **AC2** screw slot and attach the blue wire to the screw slot marked **REM**.

The SmartPort is now ready for remote control use. Please refer to the Hunter remote control owner's manual for further information or contact your local Hunter distributor for ordering information.





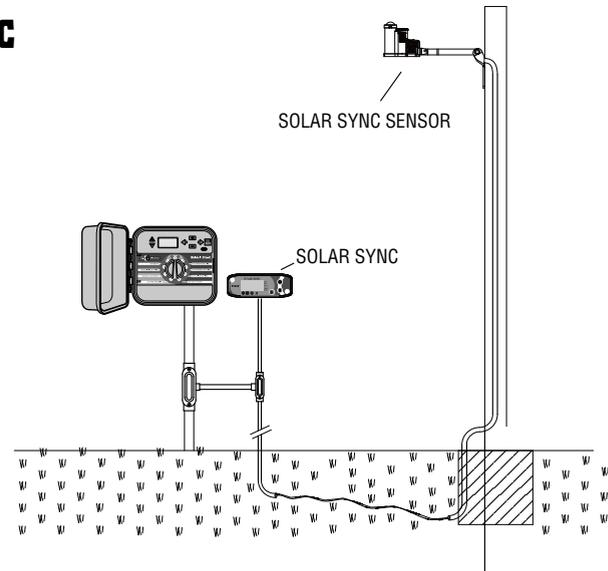
NOTE: Any extension of the wiring on the SmartPort® may result in an error message in the controller display and possible malfunction of the remote unit due to radio interference. In some situations, lengthening of the harness may work fine, in others it may not work at all (it is site specific). In either case, extending the wiring harness should be done using shielded cable to minimize the possible effects of electrical noise. For easiest installation, order a new Hunter SmartPort shielded cable wiring harness (part #SRR-SCWH) with a full 25 feet (7.6 meters) of shielded cable.



CONNECTING TO THE HUNTER SOLAR SYNC

The Solar Sync is a sensor system that, when connected to Hunter Pro-C, will automatically adjust your controller watering based upon changes in local climate conditions. The Solar Sync utilizes a solar and temperature sensor to measure on-site weather conditions used to determine evapotranspiration (ET), or the rate at which plants and turf use water. In addition, the Solar Sync sensor includes a Hunter Rain-Clik™ and Freeze-Clik™ sensor that will shut down your irrigation system when it rains and/or during freezing conditions.

A small module connects the sensor to the controller and will automatically increase or decrease watering run times based on changes in weather. The result is a new water-efficient irrigation product that promotes water conservation and healthier plants. You simply program your controller like you normally would, and the Solar Sync takes over from there, eliminating the need to manually adjust your watering schedule.



POWER FAILURES

Due to the possibility of power failures, the controller has non-volatile memory to preserve the program indefinitely. There is no default program.

The Pro-C is also capable of keeping the current time and date for an extended period of time during power outage conditions.

SPRINKLER SYSTEM FUNDAMENTALS.....

There are three main components that are involved with all automatic sprinkler systems that are made today. They are the **controller**, **valves**, and the **sprinklers**.

The **controller** is what makes the whole system operate efficiently. It is technically the brain of the entire system, instructing the valves when to supply water to the sprinklers and for how long to do so. The sprinklers, in turn, will direct the water towards the surrounding plants and lawn.

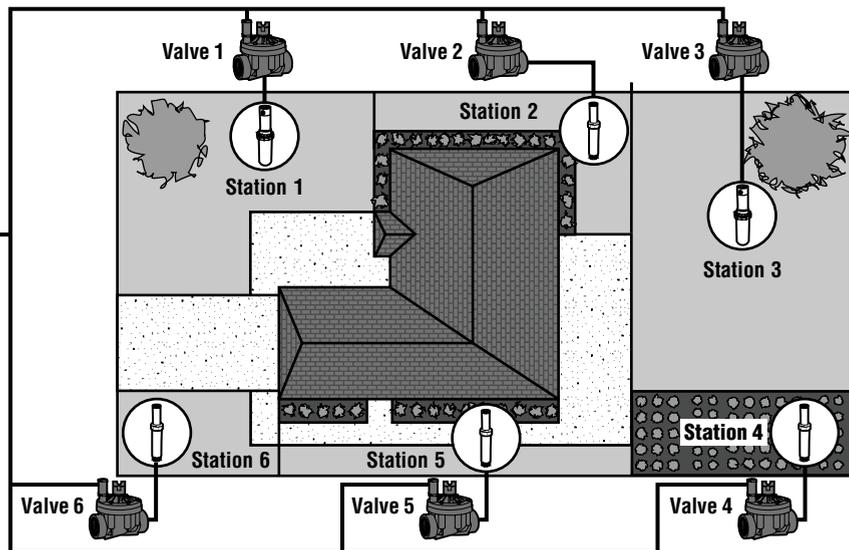
A **valve** controls a group of sprinklers called a watering **station**. These stations are laid out in a fashion according to the type of plant, the locations of the plants, and the maximum amount of water that

can be pumped to the location. Each valve is connected via wire to the controller. Here the wire is connected to a number that corresponds to the valve's station number.

The controller will operate the valves in numerical sequence, only one at a time. When a valve has completed its watering; it will switch to the next station that has been programmed. This process is called the watering cycle. The information pertaining to the watering times of the individual stations and the duration of them is called a **program**.



- Valve 1** – Activates Station 1 – Rotors water front yard lawn
- Valve 2** – Activates Station 2 – Sprays water side lawn and bubblers water flowers
- Valve 3** – Activates Station 3 – Rotors water back yard lawn
- Valve 4** – Activates Station 4 – Bubblers water garden
- Valve 5** – Activates Station 5 – Sprays water side lawn and bubblers water flowers
- Valve 6** – Activates Station 6 – Sprays water front corner lawn



CREATING A WATERING SCHEDULE.....

There are some guidelines that should be followed when determining when and how long to water. These factors are the soil type, the part of the landscape being watered, weather conditions, and the types of sprinklers being used. A watering schedule form is included with your Pro-C that can be used as a handy reference.

Station Number and Location – Identify the station number, location and the type of plant that is being watered.

Watering Day – Identify whether you want to use a calendar day, interval, or an odd or even day schedule. For a calendar day schedule circle the day of the week in which watering is desired. For an interval schedule, indicate the desired interval number.

Program Start Times – Indicate the time of day that the program will begin. Each program can have 1-4 start times. However, one start time will run an entire program. Write “OFF” for any Pump Start Time not used.

Station Run Time – Indicate the run time (1 minute – 6 hours) for each station. Write “0:00” for any station that you do not want to operate in the program.

Keep this schedule in a safe place for quick reference later.



NOTE: It is usually good to water one or two hours before sunrise. Water pressure will be at optimum levels during the early morning and the water can soak into the roots of the plants while evaporation is minimal. For most plants, watering during mid-day or in the evening may cause plant damage or possibly mildew.



NOTE: Keep an eye out for evidence of under- or over-watering. Over-watering is most commonly indicated by pools of water that take a long time to soak in or evaporate, while under-watered landscapes will show signs of discoloring and dryness. Make programming changes immediately when evidence is present.

WATERING SCHEDULE FORM EXAMPLE

HUNTER PRO-C		PROGRAM A						PROGRAM B						PROGRAM C								
DAY OF THE WEEK		M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S
ODD/ EVEN or INTERVAL								Every 3 days						Every 20 days								
PROGRAM START TIMES		1	7:00 AM						9:00 AM						1:00 PM							
		2	OFF						OFF						OFF							
		3	OFF						OFF						OFF							
		4	OFF						OFF						OFF							
STATION	LOCATION	STATION RUN TIME						STATION RUN TIME						STATION RUN TIME								
1	Front Lawn	0:20						0:00						0:00								
2	Side Lawn	0:10						0:00						0:00								
3	Back Lawn	0:20						0:00						0:00								
4	Annuals	0:05						0:00						0:00								
5	Front Shrubs	0:00						0:15						0:00								
6	Back Shrubs	0:00						0:15						0:00								
7	Trees	0:00						0:00						3:00								
8																						
9																						
10																						
11																						
12																						
NOTES:																						

PROGRAMMING FUNDAMENTALS.....

A watering program can be created to operate valves in numerical sequence one at a time. To create a watering program:

1. Select a program (**A, B, or C**) by pressing the **PROG** button on the controller (it is recommended to start with **Program A**).
2. Set a program start time (only one program start time is required to activate a watering program).
3. Set the run time for each valve assigned to the program, and
4. Set the days that you would like the watering program to run.

We have included an example that will better illustrate the operation of a program:

Let's say you have a program start time set for 6:00 a.m. Stations 1 and 2 are going to have a run time of 15 minutes and station 3 is set for 20 minutes. Please note that stations 4, 5, etc. have not been included in this program, we will water them on separate programs.

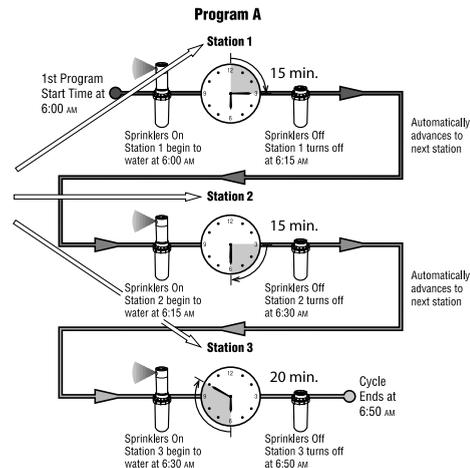
At 6:00 a.m. the controller will activate the watering cycle. The sprinklers on station 1 will run for 15 minutes and then shut off. The controller will automatically advance to station 2 sprinklers. These sprinklers will also run for 15 minutes and then shut off. Then, watering on station 3 will begin. The sprinklers will turn on for 20 minutes and shut off. Since no times were programmed for stations 4, 5, etc. the controller skips them. This will conclude the program and end the water cycle at 6:50 a.m.

As shown in the above example, only **one** program start time was required to run the three different stations. The controller automatically moves to the next station without the need for additional start times.

We realize that many consumers will have variations in their plant watering needs, so at Hunter we equipped the Pro-C with three different programs A, B, and C. These programs are independent of each other. However, no two programs can run at the same time. The Pro-C will automatically stack any programs that overlap.

PROGRAMMING FUNDAMENTALS EXAMPLE

HUNTER PRO-C		PROGRAM A						
DAY OF THE WEEK		M	T	W	T	F	S	S
ODD/ EVEN or INTERVAL								
PROGRAM START TIMES	1							
	2							
	3							
	4							
STATION	LOCATION	STATION RUN TIME						
1	Front Lawn	15 minutes						
2	Shrub	15 minutes						
3	Side Yard	20 minutes						
4								
5								
6								
7								
8								
9								
10								
11								
12								
NOTES:								
Total Cycle of Program A = 50 minutes								



PROGRAMMING THE CONTROLLER

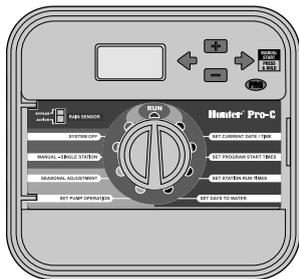
The display changes when the dial is rotated to indicate the specific programming information to enter. When programming, the flashing portion of the display can be changed by pressing the **+** or **-** buttons. To change something that is not flashing, press **←** or **→** until desired field is flashing.

To activate a program in your controller, you must enter the following information:

1. Set current day and time – turn dial to **SET CURRENT DATE/TIME**.
2. Set what time of day you would like the program to start – turn dial to **SET PROGRAM START TIMES**.
3. Set how long each valve will water – turn dial to **SET STATION RUN TIMES**.
4. Set the day(s) you would like the program to water – turn dial to **SET DAYS TO WATER**.

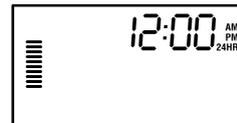
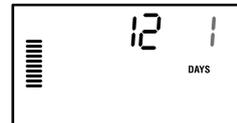
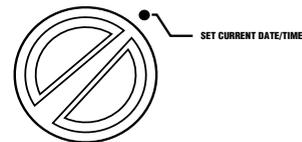


NOTE: All stations operate in numerical order. Only one program start time is required to activate a watering program.



Setting the Current Date and Time

1. Turn the dial to the **SET CURRENT DATE/TIME** position.
2. The current year will be flashing in the display. Use the **+** and **-** buttons to change the year. Push the **→** button to proceed to setting the month.
3. The month will be flashing. Use the **+** and **-** buttons to change the month. Press the **→** button to proceed to setting the day.
4. The day will be flashing. Use the **+** and **-** buttons to change the day of the month. Press the **→** button to proceed to setting the time.
5. The time will be displayed: Use the **+** and **-** buttons to select AM, PM, or 24 hr. Press the **→** button to move to hours. Use the **+** and **-** buttons to change the hour shown on the display. Press the **→** button to move onto the minutes. Use the **+** and **-** buttons to change the minutes shown in the display.

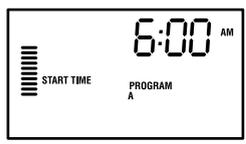
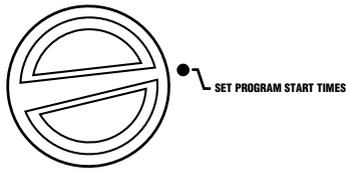


The date, day, and time have now been set.

PROGRAMMING THE CONTROLLER (continued)

Setting Program Start Times

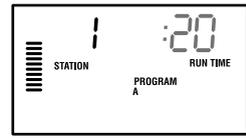
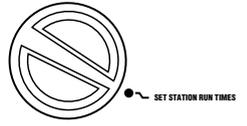
1. Turn the dial to the **SET PROGRAM START TIMES** position.
2. The factory preset is set on program **A**. If necessary you can select program **B** or **C** by pressing the **PRG** button.
3. Use the **+** and **-** buttons to change the start time. (Advances in 15-minute increments.) **One start time will activate all stations sequentially in that program.** This eliminates the need to enter a start time for each station.
4. Press the **➡** button to add an additional start time, or **PRG** button for the next program.



NOTE: If a program has all four start times turned off, then that program is off (all other program details are retained). Because there are no start times, there will be no watering with that program.

Setting Station Run Times

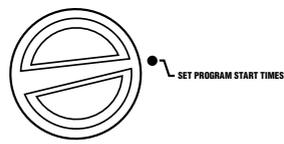
1. Turn the dial to the **SET STATION RUN TIMES** position.
2. The display will show the last program selected (**A, B, or C**) the station number selected, and the run time for that station will be flashing. You can switch to another program by pressing the **PRG** button.
3. Use the **+** and **-** buttons to change the station run time on the display. You may set station run times from 1 minute to 6 hours.
4. Press the **➡** button to advance to the next station.
5. Repeat steps 2 and 3 for each station.



NOTE: Regardless of the order in which the start times are entered, the Pro-C will always arrange the start times in chronological order when the dial is moved off the **SET PROGRAM START TIMES** position.

Eliminating a Program Start Time

With the dial set to the **SET PROGRAM START TIMES** position, push the **+** and **-** buttons until you reach 12:00 AM (Midnight). From this position push the **➡** button once to reach the **OFF** position.



Setting Days to Water

1. Turn the dial to the **SET DAYS TO WATER** position.
2. The display will show the last program selected (**A, B, or C**). You can switch to another program by pressing the **PRG** button.
3. The controller displays currently programmed active day schedule information. You can choose to water on specific days of the week, or you can choose interval watering, or choose to water on odd days or even days. Each program can only operate using one type of water day option.



PROGRAMMING THE CONTROLLER (continued)

Selecting Specific Days of the Week to Water

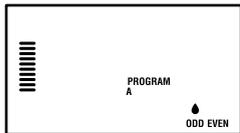
1. Press the **+** button to activate a particular day of the week to water (the display always starts with Monday). Press the **-** button to cancel watering for that day. After pressing a button the display automatically advances to the next day. A **◆** icon indicates a water day. A blank space indicates a no water day.

After programming, set dial to **RUN** to enable automatic execution of all selected programs and start times.

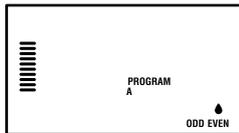
Selecting Odd or Even Days to Water

This feature uses numbered day(s) of the month for watering instead of specific days of the week (odd days: 1st, 3rd, 5th, etc.; even days: 2nd, 4th, 6th, etc.)

1. With the **◆** cursor on SU press the **➡** button once. The **◆** icon will flash over **ODD**.
2. If is desired, turn the dial back to the run position.
3. If even day watering is desired, press the **➡** button once. The **◆** icon will flash over **EVEN**. You can move back and forth from **ODD** to **EVEN** by pressing the **⬅** and **➡** buttons.



Odd Day Watering

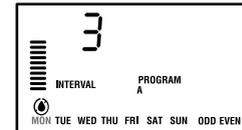
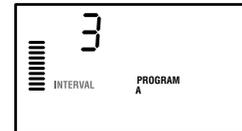
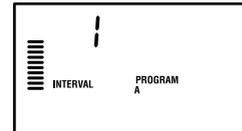


Even Day Watering

Selecting Interval Watering

This feature is convenient if you want to have a more consistent watering schedule without having to worry about the day of the week or the date. The interval you select is the amount of days between watering including the watering day.

1. Turn the dial to **SET DAYS TO WATER**. The water drop above Monday should be flashing.
2. Press the **➡** button until the drop over **EVEN** is flashing, then press the **➡** button one more time. The display will change to the interval mode and the Interval Day number will be flashing.
3. Press the **+** or **-** button to select the Interval Day(s) you desire.
4. Push the **➡** button once to advance to NO WATER DAYS to select any days you do not want the Pro-C to water (see page 20).





NOTE: If any days are selected as non-water days **⊙** at the bottom of the display, the Interval Day watering will exclude those days. For example, if the Interval Days are set at 5 and Monday is a non-water day, the controller will water every 5th day, but never on a Monday. If the interval water day falls on a Monday and Monday is a non-water day. The program would not water for 5 more days resulting in no irrigation for 10 days total.

PROGRAMMING THE CONTROLLER (continued)

Run

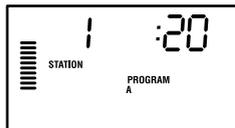
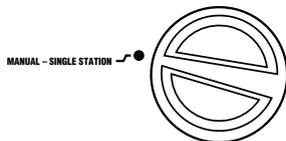
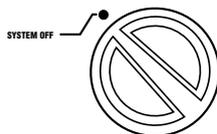
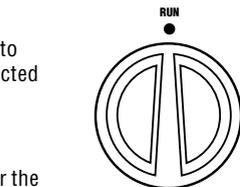
After programming is complete, turn the dial to **RUN** to enable automatic execution of all selected programs and start times.

System Off

Valves currently watering will be shut off after the dial is turned to the **SYSTEM OFF** position for two seconds. All active programs are discontinued and watering is stopped. To return controller to normal automatic operation, simply return dial to **RUN** position.

Manually Run a Single Station

1. Turn the dial to the **MANUAL-SINGLE STATION** position.
2. Station run time will flash in the display. Use the **➡** button to move to the desired station. You may then use the **+** and **-** buttons to select the amount of time for a station to water.
3. Turn the dial to the **RUN** position to run the station (only the designated station will water, then controller will return to automatic mode with no change in the previously set program).



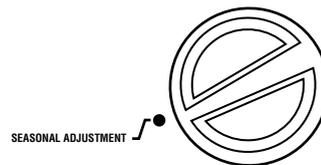
Seasonal Adjustment

Seasonal Adjust is used to make global run time changes without re-programming the entire controller. This feature is perfect for making small changes that are necessary as the weather changes.

For instance, hotter times of the year may require a bit more water. Seasonal adjust can be increased so that the stations will run longer than the programmed time. Conversely, as Fall approaches, the seasonal adjust can be reduced to allow for short watering durations.

1. Turn the dial to the **SEASONAL ADJUSTMENT** position.
2. Press the **+** or **-** buttons to set the percentage desired from 5% to 300%

To view the new adjusted run time, turn the dial to set run time's position. The displayed run times will be updated accordingly as the seasonal adjustment is made.



NOTE: The controller should always be initially programmed in the 100% position.



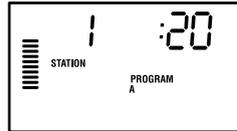
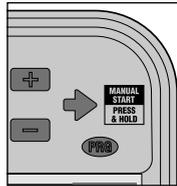
NOTE: The manual single station function will override the sensor.

PROGRAMMING THE CONTROLLER (continued)

One Touch Manual Start and Advance

You can also activate a program to water without using the dial.

1. Hold down the ➡ button for 2 seconds.
2. This feature automatically defaults to program **A**. You can select program **B**, or **C** by pressing the **PRG** program.
3. The station number will be flashing. Press the ⬅ or ➡ button to scroll through the stations and use the **+** and **-** buttons to adjust the station run times. (If no buttons are pressed during step 2 or 3, the controller will automatically begin program **A**.)
4. Press the ➡ button to scroll to the station you wish to begin with. After a 2 second pause, the program will begin.



This feature is great for a quick cycle when extra watering is needed or if you would like to scroll through the stations to inspect your system.

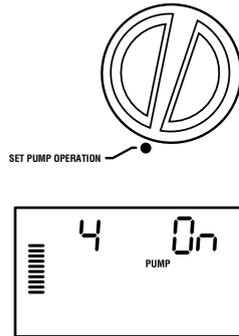
ADVANCED FEATURES

Set Pump/Master Valve Operation

The default is for all stations to have the master valve/pump start circuit **ON**. The master valve/pump start can be set **ON** or **OFF** by station, regardless of which program the station is assigned.

To program pump operation:

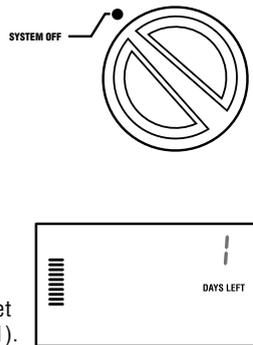
1. Turn the dial to **SET PUMP OPERATION** position.
2. Press the **+** or **-** buttons to toggle the master valve/pump start **ON** or **OFF** for the specific station.
3. Press the **➡** button to advance to the next station.
4. Repeat steps 2 and 3 for all necessary stations.



Programmable Rain Off

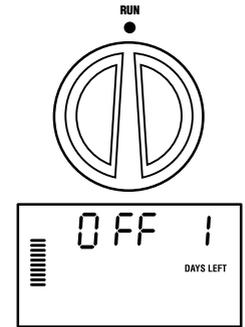
This feature permits the user to stop all programmed waterings for a designated period from 1 to 31 days. At the end of the programmable rain off period, the controller will resume normal automatic operation.

1. Turn the dial to the **SYSTEM OFF** position.
2. Press the **+** button and a 1 will be displayed and the **DAYS LEFT** icon will illuminate.
3. Press **+** as many times as needed to set the number of days off desired (up to 31).



4. Turn the dial back to the **RUN** position at which time, **OFF**, a **number** and the **DAYS** icon all remain on.
5. Leave the dial in the **RUN** position.

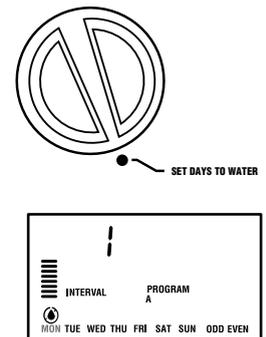
The days off remaining will decrease at midnight of each day. When it goes to zero, the display will show the normal time of day and normal irrigation will resume at the next scheduled start time.



Setting Specific Day(s) Off

Programming a No Water Day(s) is useful to inhibit watering on mowing days, etc. For instance, if you always mow the lawn on Saturdays you would designate Saturday as a **No Water Day** so you are not mowing wet grass.

1. Turn the dial to the **DAYS TO WATER** position.
2. Enter an interval watering schedule as described on page 21.
3. Press the **➡** button once. **MON** will be flashing.
4. Use the **➡** button until the cursor is at the day of the week you wish to set as a **No Water Day**.
5. Press the **-** button to set this day as a no water day. The **☉** will illuminate over this day.
6. Repeat steps 4 and 5 until all desired event day(s) are off.



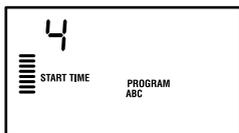
HIDDEN FEATURES

Program Customization

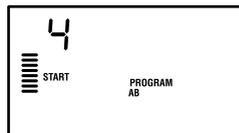
The Pro-C comes factory configured with 3 independent programs (A, B, C with four start times each) for different plant type requirements. The Pro-C can be customized to display only the required programs. You can hide those programs that are not required to ease programming.

To customize Pro-C programs:

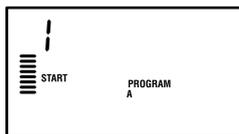
1. Press and hold the  button. Turn the dial to set days to water.
2. Release the  buttons.
3. Use the  and  button to change program modes.



Advanced Mode
(3 programs / 4 start times)



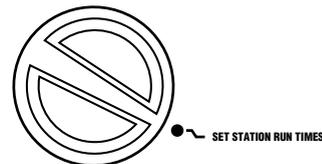
Normal Mode
(2 programs / 4 start times)



Limited Mode
(1 program / 1 start time)

Programmable Delay Between Stations

This feature allows the user to insert a delay between when one station turns off and the next station turns on. This is very helpful on systems with slow closing valves or on pump systems that are operating near maximum flow or have slow well recovery.



1. Start with the dial in the **RUN** position.
2. Press and hold the  button down while turning the dial to the **SET STATION RUN TIMES** position.
3. Release the  button. The display will show a delay time for all stations in seconds. The **DELAY** icon shall also be lit at this time.
4. Press the  and  buttons to increase or decrease the delay time between 0 and 59 seconds in 1 second increments and then in one minute increments up to four hours. **Hr** will be displayed when the delay changes from seconds to minutes and hours. Maximum delay is 4 hours.
5. Return the dial to the **RUN** position.



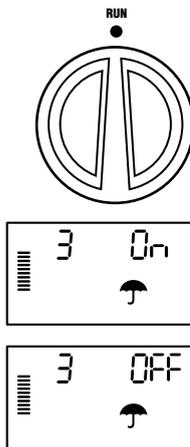
NOTE: The Master Valve/Pump Start circuit will operate during the first 15 seconds of any programmed delay to aid in the closing of the valve and to avoid unnecessary cycling of the pump.

HIDDEN FEATURES (continued)

Programable Sensor Override

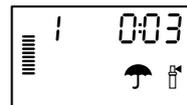
The Pro-C allows the user to program the controller so that the sensor disables watering on only desired stations. For example, patio gardens that have pots under overhangs and roofs may not receive water when it rains and will continue to need to be watered during periods of rain. To program sensor override:

1. Turn the dial to the **RUN** position.
2. Press and hold the  button down while turning the dial to **START TIMES** position.
3. Release the  button. The display will show the station number, ON, and the  icon, will be flashing.
4. Press the  or  button to enable or disable the sensor for the station shown.
ON = Sensor enabled (will suspend irrigation)
OFF = Sensor disabled (will allow watering)
5. Use the  or  buttons to scroll to the next station that you would like to program the sensor override.



NOTE: The controller default is for the sensor to disable watering on all zones when rain occurs.

When the Pro-C receives an input from the sensor to disable watering, the display will indicate those stations that have been programmed to override the sensor. A station that is running in the sensor override mode will flash  the and  icons alternately.



Total Run Time Calculator

The Pro-C keeps a running total of each program's station run times. This feature provides a quick way to determine how long each program will water.

1. While in the Set Station **Run** Time mode use the  button to advance to the highest station position.
2. Press the  button once to review the total of all run times programmed.
3. Use the  button to review additional programs.

Test Program

The Pro-C allows the user a simplified method for running a test program. This feature operates each station in numerical sequence, from the lowest to the highest. You can start with any station. This is a great feature to check the operation of your irrigation system.

To initiate the test program:

1. Press and hold the  button. The station number will be flashing.
2. Press the  or  button to scroll to the station you would like the test program to start with. Use the  and  button to set a run time of up to 15 minutes. The run time needs to be entered only once.
3. After a 2 second pause, the test program will begin.

HIDDEN FEATURES (continued).....

Easy Retrieve™ Program Memory

The Pro-C is capable of saving the preferred watering program into memory for retrieval at a later time. This feature allows for a quick way of resetting the controller to the original programmed watering schedule.

To save the program into memory.

1. With the dial in the **RUN** position, press and hold the **+** and **PRO** buttons for 5 seconds. The display will scroll **≡** from left to right across the display indicating the program is being saved into memory.
2. Release the **+** and **PRO** buttons.

To retrieve a program that was previously saved into memory.

1. With the dial in the **RUN** position, press and hold the **-** and **PRO** buttons for 5 seconds. The display will scroll **≡** from right to left across the display indicating the program is being saved into memory.
2. Release the **-** and **PRO** buttons

Hunter Quick Check™

This circuit diagnostic procedure is can quickly identify “shorts” commonly caused by faulty solenoids or when a bare common wire touches a bare station control wire.

To initiate the Hunter Quick Check test procedure:

1. Press the **+**, **-**, **←** and **→** buttons simultaneously. In the standby mode, the LCD will display all segments (helpful when troubleshooting display problems).
2. Press the **+** button to begin the Quick Check test procedure. The system will search all stations to detect a high current path through the station terminals. When a field wiring short is detected, an ERR symbol preceded by the station number will momentarily flash on the controller LCD display. After the Hunter Quick Check completes running this circuit diagnostic procedure, the controller returns to the automatic watering mode.

Clearing Controller’s Memory/Resetting Controller

If you feel that you have misprogrammed the controller, there is a process that will reset the memory to factory defaults and erase all programs and data that have been entered into the controller. Press and hold the **PRO** button. Press and release the **RESET** button on the back of the front panel. Wait until the display shows 12:00am. Release the **PRO** button. All the memory has been cleared and the controller may now be reprogrammed.

WINTERIZING YOUR SYSTEM

In regions within the country where the frost level falls below the depth of the installed piping, it is common for these systems to be “winterized”. Several methods can be used to drain the water from the system. If the blow out method is used it is recommended that a qualified licensed contract perform this type of winterization.

WARNING! WEAR ANSI APPROVED SAFETY EYE PROTECTION!

Extreme care must always be taken when blowing out the system with compressed air. Compressed air can cause serious injury, including serious eye injury from flying debris. Always wear ANSI approved safety eye protection and do not stand over any irrigation components (pipes, sprinklers, and valves) during blow out. **SERIOUS PERSONAL INJURY MAY RESULT IF YOU DO NOT PROCEED AS RECOMMENDED.**

TROUBLESHOOTING GUIDE

PROBLEM	CAUSES	SOLUTIONS
The controller repeats itself or continuously waters, even when it should not be on (cycling repeatedly).	Too many start times (user error).	Only one start time per active program is required. Refer to “Setting Program Start Times” on page 16.
There is no display.	Check AC power wiring.	Correct any errors.
The display reads “ERR”.	Electrical noise is entering the system.	Check the SmartPort® wiring harness. If the wires were extended then they will need to be replaced with shielded cable. Contact your local distributor for information on shielded cable.
The display reads “P ERR”.	There is a fault in the wire to the pump start or master valve.	Check the master valve or pump start wire for continuity. Replace or repair the shorted wire. Check that all wire connections are good and water tight.
The display reads a station number and ERR, such as “2 ERR”.	There has been a fault with the wire leading to that station.	Check the station wire for continuity. Replace or repair shorted wire. Check that all wire connections are good and water tight.
The display reads “NO AC”.	There is no AC power present (the controller is not receiving power).	Check to see if the transformer is properly installed.

TROUBLESHOOTING GUIDE (continued)

PROBLEM	CAUSES	SOLUTIONS
The display reads “ SENSOR OFF ”.	The rain sensor is interrupting irrigation or the sensor jumper is not installed.	Slide the Rain Sensor switch on front panel to the BYPASS position to bypass rain sensor circuit, or install the sensor jumper.
Rain sensor will not shut off system.	<p>Incompatible rain sensor or the jumper was not removed when sensor was installed.</p> <p>Manual Single Station Mode Used.</p>	<p>Make sure sensor is micro-switch type such as Mini-Clik®. Check that the the jumper has been removed from the the SEN terminals. Confirm proper operation (see “Testing a Weather Sensor” on page 9).</p> <p>Manual Single Station Mode will override the sensor. Use Manual All Station Mode to test sensor.</p>
The controller does not have a start time for each station.	Programming error, dial in incorrect position.	Be sure the dial is in correct position. Total number of stations can be easily checked by placing dial in SET STATION RUN TIMES position and pressing the back arrow.
Valve will not turn on.	<p>Short in wiring connections.</p> <p>Bad solenoid.</p>	<p>Check field wiring.</p> <p>Replace solenoid.</p>

SPECIFICATIONS

Operating Specifications

- Station Run Time: 1 minute to 6 hours on programs A, B, and C.
- Start Times: 4 per day, per program, for up to 12 daily starts.
- Watering Schedule: 7-day calendar, interval watering up to a 31-day interval or true odd or even day programming, made possible by the 365-day clock/calendar.

Electrical Specifications

- Transformer Input: 120 VAC, 60 hz
(230 VAC, 50/60 hz International Use)
- Transformer Output: 25 VAC, 1.0 amp
- Station Output: 24 VAC, 0.56 amps per station
- Maximum Output: 24 VAC, 0.84 amps (includes Master Valve Circuit)
- Battery: 9-volt alkaline battery (not included) used only for non-AC programming, the non-volatile memory maintains program information
- Battery, Front Panel, Internal CR2032 Lithium for real time clock.

Dimensions

Indoor Cabinet

Height: 8.25"

Width: 9.5"

Depth: 3.75"

Outdoor cabinet is NEMA 3R, IP44 rated.

Outdoor Cabinet

Height: 9"

Width: 10"

Depth: 4.5"

Default Settings

All stations are set to zero run time. This controller has a non-volatile memory that retains all entered program data even during power outages, without need for a battery.

Cleaning

Clean only with cloth dampened with mild soapy water.

FCC NOTICE.....

This controller generates radio frequency energy and may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna
- Move the controller away from the receiver
- Plug the controller into a different outlet so that controller and receiver are on different branch circuits

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington, D.C., Stock No. 004-000-00345-4 (price – \$2.00)

CERTIFICATE OF CONFORMITY TO EUROPEAN DIRECTIVES

Hunter Industries declares that the irrigation controller Model Pro-C complies with the standards of the European Directives of "electromagnetic compatibility" 87/336/EEC and "low voltage" 73/23/EEC.



Project Engineer



This product should not be used for anything other than what is described in this document. This product should only be serviced by trained and authorized personnel.

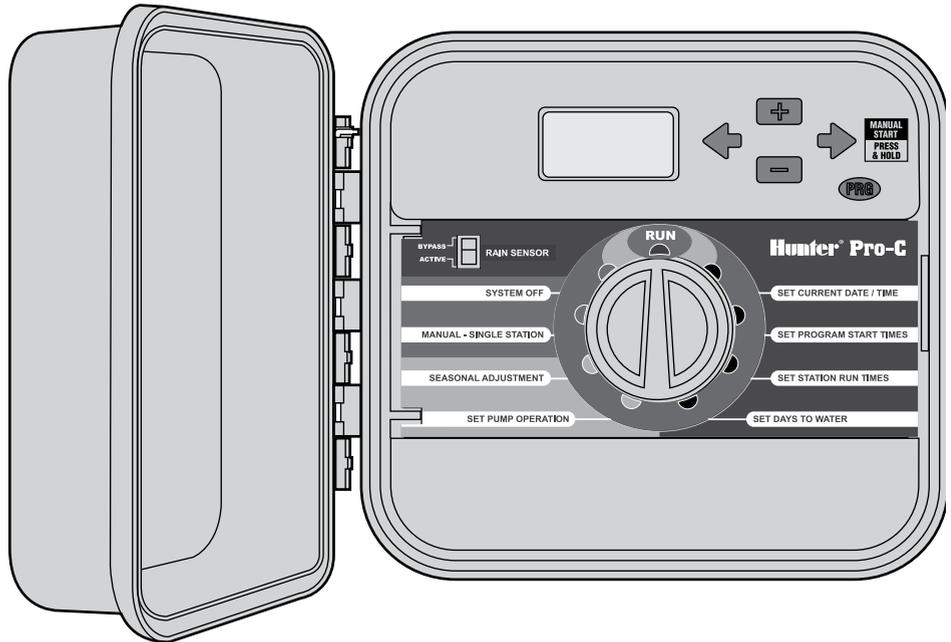
Pro-C

Residential and Light Commercial Irrigation Controllers

PCC Series Controller
6, 9, 12 & 15 Station
Indoor/Outdoor Models

**Owner's Manual and
Installation Instructions**

Please leave with property owner



Hunter[®]

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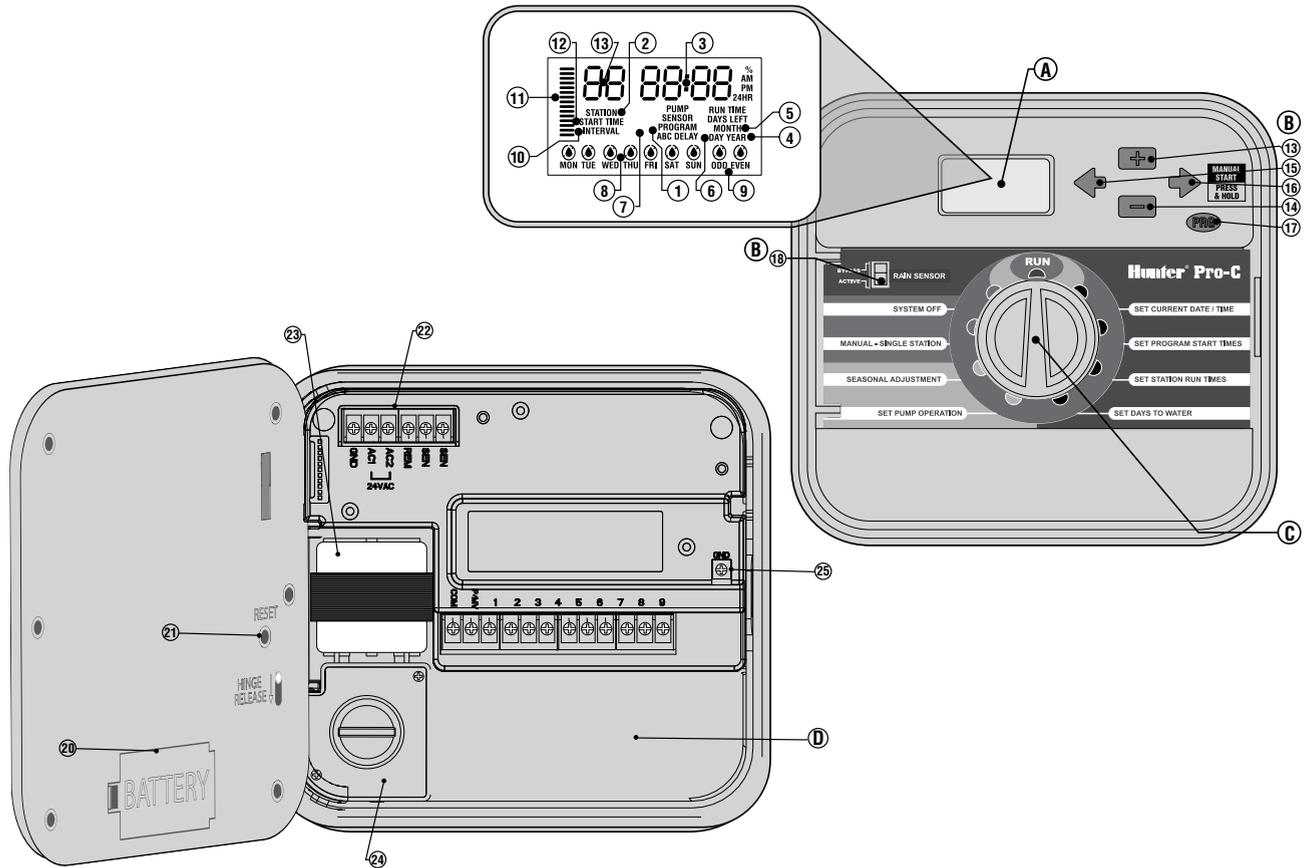
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PRO-C



A. – LCD Display

1. **Program Selector** – Identifies the program in use A, B, or C.
2. **Station Number** – Identifies currently selected station number.
3. **Main Display** – Indicates various times, values, and programmed information.
4. **Year** – Identifies current calendar year.
5. **Month** – Identifies current calendar month.
6. **Day** – Identifies current calendar day.
7. **Running** – Sprinkler icon indicates when watering is occurring.
8. **Days of the week** – Identifies days of the week to water or not water.
9. **Odd/Even Watering** – Identifies if odd or even watering is selected.
10. **Interval** – Identifies if interval watering has been selected.
11. **Seasonal Adjust** – Displays in increments of 5%, the percentage of seasonal adjust that has been selected.
12. **Start Time** – Identifies selected program start time.

B. – Control Buttons and Switches

13. **+ Button** – Increases the selected flashing display.
14. **- Button** – Decreases the selected flashing display.
15. **← Button** – Returns selected flashing display to the previous item.
16. **→ Button** – Advances the selected flashing display to the next item. Also to start a manual cycle.
17. **PRG Button** – Selects programs A, B, and C. Also to start a test program.
18. **Rain Sensor Bypass Switch** – Use to bypass weather sensor, if one is installed.

C. – Control Dial

- Run** – Normal dial position for automatic operation.
- Set Current Date/Time** – Set current date time.
- Set Program Start Times** – Set 1 to 4 start times in each program.
- Set Station Run Times** – Set each station run time.
- Set Days to Water** – Select individual days to water, odd, even, or interval watering schedule.
- Set Pump Operation** – Turn pump or master valve on or off for each station.
- Manual – Single Station** – Activates a one time watering of a single station.
- Seasonal Adjustment** – Make global run time changes without reprogramming the controller (from 5% to 300%).
- System Off** – Used to discontinue all programs and stop all watering until the dial is returned to the **RUN** position, or to set the programmable rain off feature.

D. – Wiring Compartment

20. **9-Volt Battery** – An alkaline battery (not included) allows you to program the controller without AC power.
21. **Reset Button** – This button will reset the controller. All programmed data will remain intact.
22. **Power Area** – Used to attach transformer, sensor wires, and other systems to the controller.
23. **Transformer** – A transformer is installed (Outdoor models only, indoor models are supplied with a plug-in transformer.)
24. **Junction Box** – This box provides an area for connecting primary AC power. (Outdoor models only.)
25. **Ground Lug.**

MOUNTING THE CONTROLLER TO A WALL.....

All necessary hardware is included for most installations.



NOTE: The indoor Pro-C is not weather or water resistant, and must be installed indoors or in a protected area. This device is not intended for use by young children. Never let children play with this device.

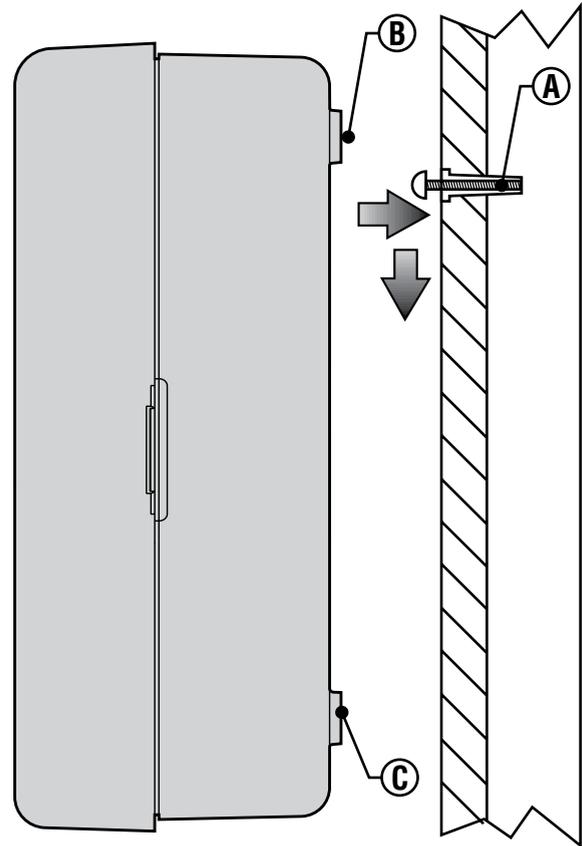
1. Select a location close to an electrical outlet or power supply that is not controlled by a light switch.
2. Remove the front panel from the Pro-C by first removing the ribbon connector and then pulling down the hinge release. Removing the front panel will ease installation of the controller cabinet.
3. Use the hole at the top of the controller as a reference and secure one 25mm screw (A) into the wall. **Note: Install screw anchors if attaching to drywall or masonry wall.**
4. Align controller with the screw and slide the keyhole (B) on top of the controller over the screw.
5. Secure controller in place by installing screws in the holes (C).



NOTE: Outdoor model is water and weather resistant. Connecting the outdoor Pro-C to the primary power should be done by a licensed electrician following all local codes. Improper installation could result in shock or fire hazard. This device is not intended for use by young children. Never let children play with this device.

For PC-301-A:

If the supply cord is damaged, it must be replaced by the manufacturer or service agent or a similarly qualified person in order to avoid hazard.

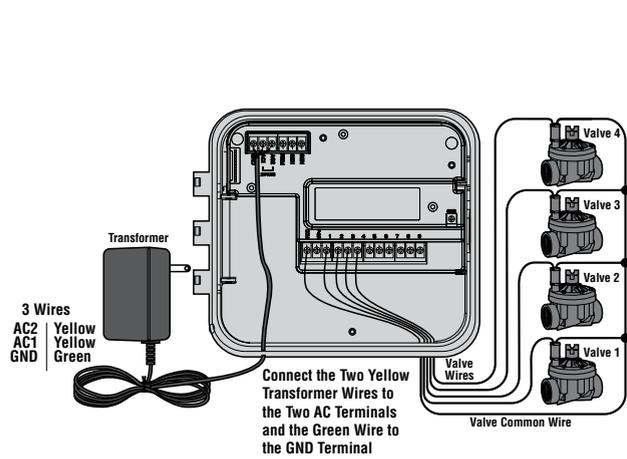


CONNECTING VALVES AND AC POWER

1. Route valve wires between control valve location and controller.
2. At valves, attach a common wire to either solenoid wire of all valves. This is most commonly a white colored wire. Attach a separate control wire to the remaining wire of each valve. All wire splice connections should be done using waterproof connectors.
3. Route valve wires through the conduit and attach conduit to one of the openings on the bottom of the cabinet.
4. Strip ½" (13 mm) of insulation from ends of all wires. Secure valve common wire to "COM" (Common) terminal. Attach all individual valve control wires to appropriate station terminals.

Indoor Cabinet

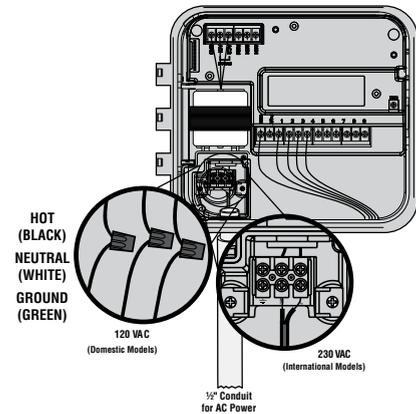
Route transformer cable through the hole on the bottom left side of the controller and connect one Yellow Wire to each of the screws marked **AC** and the Green Wire to **GND**.



NOTE: It is recommended that a licensed electrician perform the following power installation.

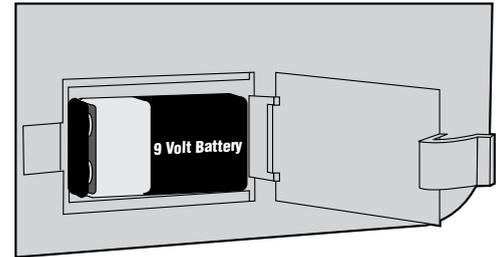
Outdoor Cabinet

Route **AC** power cable and conduit through the ½" (13 mm) conduit opening on the left side of the bottom of the cabinet. Connect the wires to the transformer wires located inside the junction box. International units are supplied with a built in terminal strip. Always use a UL listed conduit ½" (13 mm) male adapter when installing the **AC** wiring. Insert the adapter into the ½" hole at the bottom of the controller. Attach a nut to the adapter inside the enclosure.



CONNECTING THE BATTERY (optional)

Connect a 9-volt **alkaline** battery (not included) to the battery terminals and place in the battery compartment in the front panel. The battery allows the user to program the controller without AC power. **Watering will not occur without AC power.** Since this controller has non-volatile memory, the program clock and calendar will be retained during a power outage even if no battery is installed.

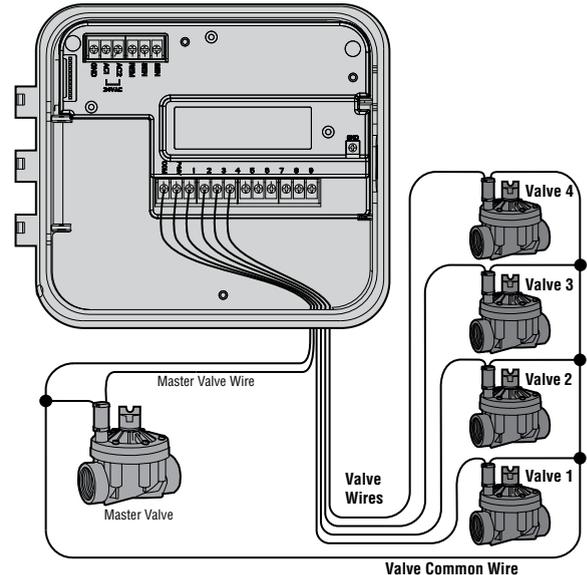


CONNECTING A MASTER VALVE.....



NOTE: Complete this section only if you have a master valve installed. A master valve is a normally closed valve installed at the supply point of the main line that opens only when the automatic system is activated.

1. At the Master Valve, attach the common wire to either solenoid wire of the valve. Attach a separate control wire to the remaining solenoid wire.
2. Route the wires into the controller.
3. Connect either wire from Master Valve to the **P/MV** terminal. Connect remaining wire to the "**COM**" (Common) terminal.



CONNECTING A PUMP START RELAY.....

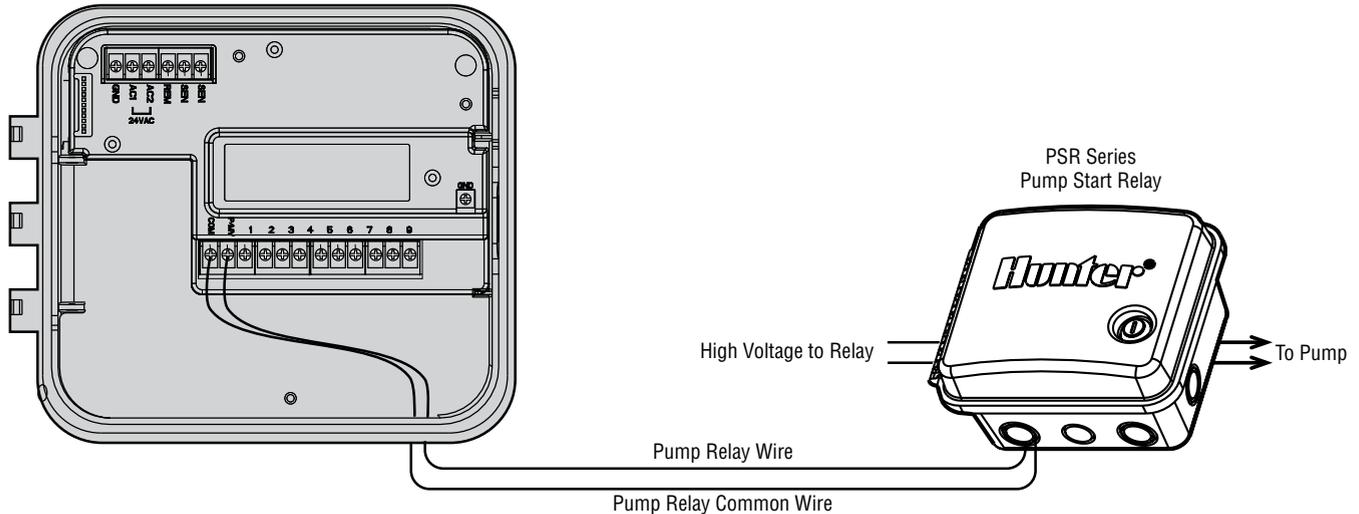


NOTE: Complete this section only if you have a pump and pump start relay installed. A pump start relay is an electronic device that uses a signal current from the irrigation controller to activate a pump to provide water to your system.

When a pump is to be operated by the controller, a pump start relay is typically used. Hunter offers a full range a pump start relays for most applications.

1. Route a wire pair from the pump relay into the controller housing.
2. Connect the pump common wire to the terminal slot “COM” (Common) and the remaining wire from the pump relay to the P/MV screw slot.

Relay holding current draw must not exceed .28 amps (24 VAC).
Do not connect the controller directly to the pump – damage to controller will result.



CONNECTING A WEATHER SENSOR (not included).....

A Hunter Mini-Clik® rain sensor or other type of micro-switch weather sensor may be connected to the Pro-C. The purpose of a rain sensor is to stop watering when precipitation is sufficient.

1. Route the wires from the rain sensor up through the same conduit used for valve wiring.
2. **Remove the metal jumper plate** from the two **SEN** terminals.
3. Connect one wire to the **SEN** terminal and one to the other **SEN** terminal.
4. When the weather sensor has deactivated automatic watering, OFF and sensor will appear on the display



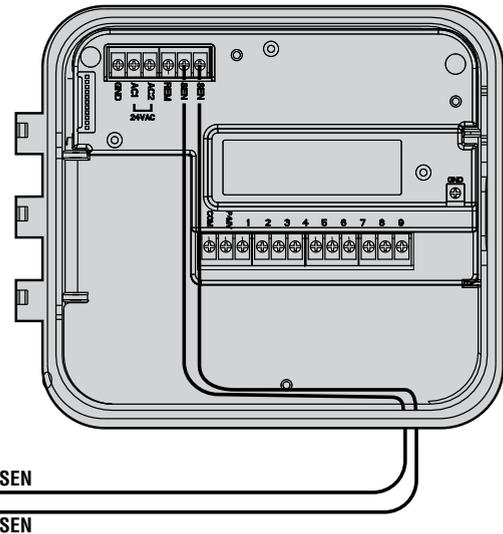
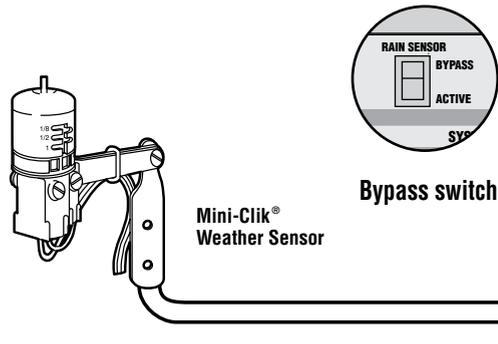
SENSOR BYPASS position to disable the rain sensor from the system to allow for the controller operation. You can also bypass the weather sensor for manual operation by using the **MANUAL - SINGLE STATION** function.



NOTE: If the rain sensor switch is left in the **ACTIVE** position and no sensor is connected and the jumper has been removed, the display will read **SEN OFF** and no irrigation will occur. To eliminate this problem when no sensor is connected, leave the switch in the **BYPASS** position or install a short jumper wire between the sensor terminals.

Manually Bypassing the Weather Sensor

If the rain sensor is interrupting irrigation you can bypass it by using the bypass switch on the front of the controller. Slide the switch to the



CONNECTING A WEATHER SENSOR (continued)

Testing the Weather Sensor

The Pro-C provides simplified testing of a rain sensor when the sensor is wired into the sensor circuit. You can manually test proper operation of the rain sensor by running a **MANUAL ALL STATIONS** cycle by activating the system using the **ONE TOUCH MANUAL START** (see page 19). During the Manual Cycle, pressing the test button on the Mini-Click will interrupt watering.



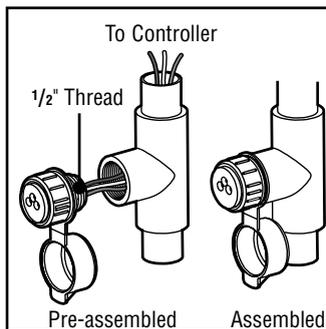
NOTE: A manual single station cycle will override the sensor to allow manual operation when the sensor is active.

CONNECTING AN SRR OR ICR REMOTE CONTROL (not included)

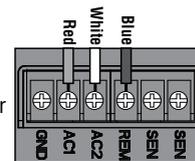
The Pro-C controller is shipped with a SmartPort® wiring harness, allowing for fast and easy use of the Hunter SRR, or Long Range ICR remote controls. The SRR and ICR make it possible for you to operate the system without having to walk back and forth to the controller.

To install the SmartPort connector

1. Install a 1/2" female threaded "Tee" in the field wiring conduit approximately 12" below the Pro-C.
2. Feed the red, white, and blue wires of the harness through the base of the "Tee" and into the wiring compartment as shown.



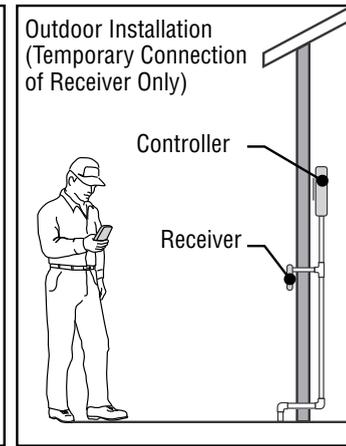
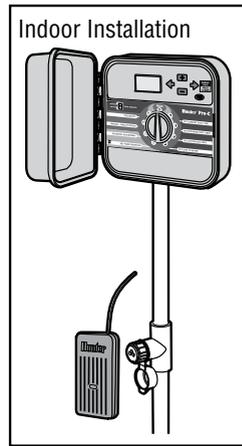
3. Screw the SmartPort harness housing into the "Tee" as shown.
4. Attach the red wire to the bottom most **AC1** screw slot, attach the white wire to the upper **AC2** screw slot and attach the blue wire to the screw slot marked **REM**.



The SmartPort is now ready for remote control use. Please refer to either the SRR or ICR owner's manual for further information or contact your local Hunter distributor for ordering information.

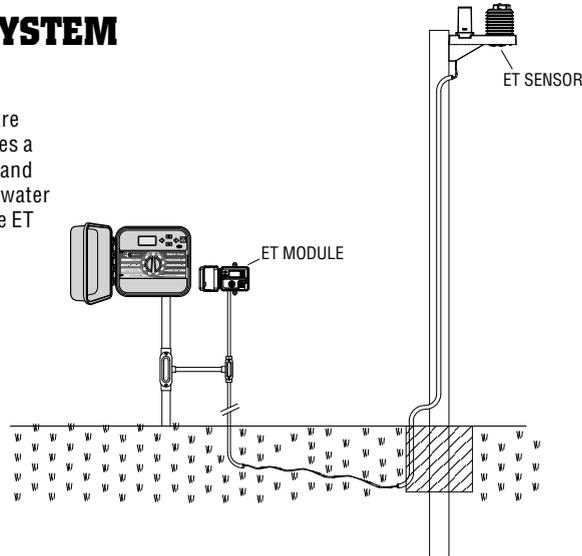


NOTE: Any extension of the wiring on the SmartPort® may result in an error message in the controller display and possible malfunction of the remote unit due to radio interference. In some situations, lengthening of the harness may work fine, in others it may not work at all (it is site specific). In either case, extending the wiring harness should be done using shielded cable to minimize the possible effects of electrical noise. For easiest installation, order a new Hunter SmartPort shielded cable wiring harness (part #SRR-SCWH) with a full 25 feet of shielded cable.



CONNECTING TO THE HUNTER ET SYSTEM

The Hunter ET System allows irrigation programs to be created automatically, based on local climate conditions. These programs are then loaded into the controller and run automatically. ET System uses a sensor to determine the local “evapotranspiration” (ET) rate of turf and plants. The result is a new, water-efficient irrigation program every water day, based on local weather conditions. For more information on the ET System, contact your local Hunter dealer.



CONNECTING TO THE HUNTER IRRIGATION MANAGEMENT AND MONITORING SYSTEM™

With the Irrigation Management and Monitoring System™ (IMMS™), automatic irrigation systems at multiple sites or multiple controllers on a single site can be programmed for functions that would typically be handled directly at each site's controller. Scheduling of days to water, run times, start times, cycle and soak operations, and more can now be done from a single computer at a desk miles away from the actual installation.

In addition, scheduled operation of non-irrigation components also in use at these sites – e.g., lighting systems at athletic fields, fountains at shopping centers – as well as pumps and sensors can also be programmed and monitored from a single central location.

A key function of the IMMS is its ability to monitor changing conditions. With the aid of such options as flow sensors, rain sensors, and other weather-sensing devices, the IMMS can receive reports on the current condition at every site it is linked with and then respond with the necessary adjustments should any of those conditions go beyond the limits that have been defined.

No system available today is more cost-effective than the Hunter IMMS. It's inexpensively priced and contains the most essential features needed for water management. It's able to team with any or all of the standard automatic controllers in the Hunter line-up, from the SRC to the Pro-C to the ICC. Plus, it's a system that's easy and affordable to upgrade, making it possible to accommodate an expanding network of controllers.

For more information on the IMMS, contact your local Hunter dealer.

POWER FAILURES

Due to the possibility of power failures, the controller has non-volatile memory to preserve the program indefinitely. There is no default program.

The Pro-C is also capable of keeping the current time and date for an extended period of time during power outage conditions.

SPRINKLER SYSTEM FUNDAMENTALS.....

There are three main components that are involved with all automatic sprinkler systems that are made today. They are the **controller**, **valves**, and the **sprinklers**.

The **controller** is what makes the whole system operate efficiently. It is technically the brain of the entire system, instructing the valves when to supply water to the sprinklers and for how long to do so. The sprinklers, in turn, will direct the water towards the surrounding plants and lawn.

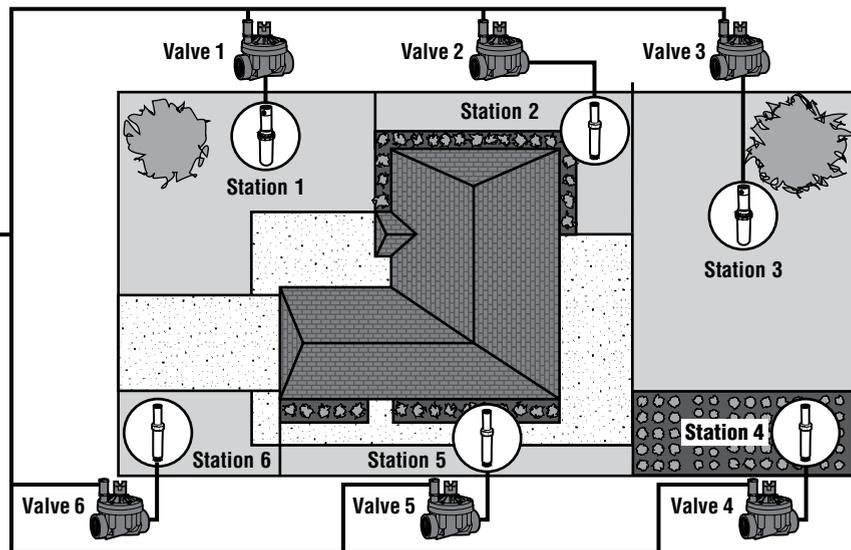
A **valve** controls a group of sprinklers called a watering **station**. These stations are laid out in a fashion according to the type of plant, the locations of the plants, and the maximum amount of water that

can be pumped to the location. Each valve is connected via wire to the controller. Here the wire is connected to a number that corresponds to the valve's station number.

The controller will operate the valves in numerical sequence, only one at a time. When a valve has completed its watering; it will switch to the next station that has been programmed. This process is called the watering cycle. The information pertaining to the watering times of the individual stations and the duration of them is called a **program**.



- Valve 1** – Activates Station 1 – Rotors water front yard lawn
- Valve 2** – Activates Station 2 – Sprays water side lawn and bubblers water flowers
- Valve 3** – Activates Station 3 – Rotors water back yard lawn
- Valve 4** – Activates Station 4 – Bubblers water garden
- Valve 5** – Activates Station 5 – Sprays water side lawn and bubblers water flowers
- Valve 6** – Activates Station 6 – Sprays water front corner lawn



CREATING A WATERING SCHEDULE.....

There are some guidelines that should be followed when determining when and how long to water. These factors are the soil type, the part of the landscape being watered, weather conditions, and the types of sprinklers being used. A watering schedule form is included with your Pro-C that can be used as a handy reference.

Station Number and Location – Identify the station number, location and the type of plant that is being watered.

Watering Day – Identify whether you want to use a calendar day, interval, or an odd or even day schedule. For a calendar day schedule circle the day of the week in which watering is desired. For an interval schedule, indicate the desired interval number.

Program Start Times – Indicate the time of day that the program will begin. Each program can have 1-4 start times. However, one start time will run an entire program. Write “OFF” for any Pump Start Time not used.

Station Run Time – Indicate the run time (1 minute – 6 hours) for each station. Write “0:00” for any station that you do not want to operate in the program.

Keep this schedule in a safe place for quick reference later.



NOTE: It is usually good to water one or two hours before sunrise. Water pressure will be at optimum levels during the early morning and the water can soak into the roots of the plants while evaporation is minimal. For most plants, watering during mid-day or in the evening may cause plant damage or possibly mildew.



NOTE: Keep an eye out for evidence of under- or over-watering. Over-watering is most commonly indicated by pools of water that take a long time to soak in or evaporate, while under-watered landscapes will show signs of discoloring and dryness. Make programming changes immediately when evidence is present.

WATERING SCHEDULE FORM EXAMPLE

HUNTER PRO-C		PROGRAM A						PROGRAM B						PROGRAM C								
DAY OF THE WEEK		M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S
ODD/ EVEN or INTERVAL		Every 1 day						Every 3 days						Every 20 days								
PROGRAM START TIMES	1	7:00 AM						9:00 AM						1:00 PM								
	2	OFF						OFF						OFF								
	3	OFF						OFF						OFF								
	4	OFF						OFF						OFF								
STATION	LOCATION	STATION RUN TIME						STATION RUN TIME						STATION RUN TIME								
1	Front Lawn	0:20						0:00						0:00								
2	Side Lawn	0:10						0:00						0:00								
3	Back Lawn	0:20						0:00						0:00								
4	Annuals	0:05						0:00						0:00								
5	Front Shrubs	0:00						0:15						0:00								
6	Back Shrubs	0:00						0:15						0:00								
7	Trees	0:00						0:00						3:00								
8																						
9																						
10																						
11																						
12																						
NOTES:																						

PROGRAMMING FUNDAMENTALS.....

A watering program can be created to operate valves in numerical sequence one at a time. To create a watering program:

1. Select a program (**A, B, or C**) by pressing the **PROG** button on the controller (it is recommended to start with **Program A**).
2. Set a program start time (only one program start time is required to activate a watering program).
3. Set the run time for each valve assigned to the program, and
4. Set the days that you would like the watering program to run.

We have included an example that will better illustrate the operation of a program:

Let's say you have a program start time set for 6:00 a.m. Stations 1 and 2 are going to have a run time of 15 minutes and station 3 is set for 20 minutes. Please note that stations 4, 5, etc. have not been included in this program, we will water them on separate programs.

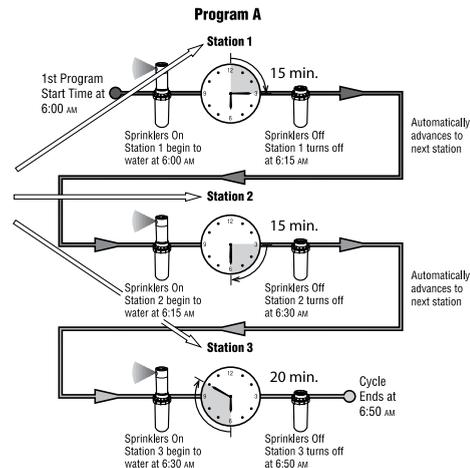
At 6:00 a.m. the controller will activate the watering cycle. The sprinklers on station 1 will run for 15 minutes and then shut off. The controller will automatically advance to station 2 sprinklers. These sprinklers will also run for 15 minutes and then shut off. Then, watering on station 3 will begin. The sprinklers will turn on for 20 minutes and shut off. Since no times were programmed for stations 4, 5, etc. the controller skips them. This will conclude the program and end the water cycle at 6:50 a.m.

As shown in the above example, only **one** program start time was required to run the three different stations. The controller automatically moves to the next station without the need for additional start times.

We realize that many consumers will have variations in their plant watering needs, so at Hunter we equipped the Pro-C with three different programs A, B, and C. These programs are independent of each other. However, no two programs can run at the same time. The Pro-C will automatically stack any programs that overlap.

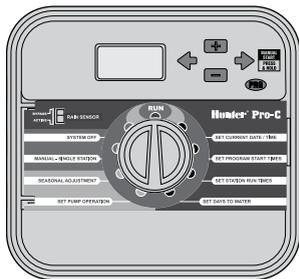
PROGRAMMING FUNDAMENTALS EXAMPLE

HUNTER PRO-C		PROGRAM A						
DAY OF THE WEEK		M	T	W	T	F	S	S
ODD/ EVEN or INTERVAL								
PROGRAM START TIMES	1							
	2							
	3							
	4							
STATION	LOCATION	STATION RUN TIME						
1	Front Lawn	15 minutes						
2	Shrub	15 minutes						
3	Side Yard	20 minutes						
4								
5								
6								
7								
8								
9								
10								
11								
12								
NOTES:								
Total Cycle of Program A = 50 minutes								



PROGRAMMING THE CONTROLLER

The display changes when the dial is rotated to indicate the specific programming information to enter. When programming, the flashing portion of the display can be changed by pressing the **+** or **-** buttons. To change something that is not flashing, press **←** or **→** until desired field is flashing.



To activate a program in your controller, you must enter the following information:

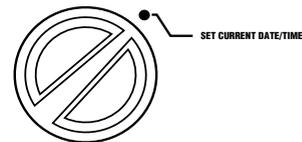
1. Set current day and time – turn dial to **SET CURRENT DATE/TIME**.
2. Set what time of day you would like the program to start – turn dial to **SET PROGRAM START TIMES**.
3. Set how long each valve will water – turn dial to **SET STATION RUN TIMES**.
4. Set the day(s) you would like the program to water – turn dial to **SET DAYS TO WATER**.



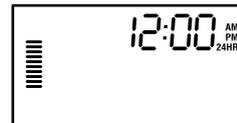
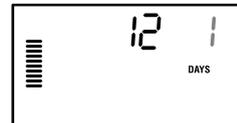
NOTE: All stations operate in numerical order. Only one program start time is required to activate a watering program.

Setting the Current Date and Time

1. Turn the dial to the **SET CURRENT DATE/TIME** position.
2. The current year will be flashing in the display. Use the **+** and **-** buttons to change the year. Push the **→** button to proceed to setting the month.



3. The month will be flashing. Use the **+** and **-** buttons to change the month. Press the **→** button to proceed to setting the day.
4. The day will be flashing. Use the **+** and **-** buttons to change the day of the month. Press the **→** button to proceed to setting the time.
5. The time will be displayed: Use the **+** and **-** buttons to select AM, PM, or 24 hr. Press the **→** button to move to hours. Use the **+** and **-** buttons to change the hour shown on the display. Press the **→** button to move onto the minutes. Use the **+** and **-** buttons to change the minutes shown in the display.

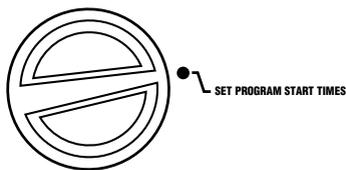


The date, day, and time have now been set.

PROGRAMMING THE CONTROLLER (continued)

Setting Program Start Times

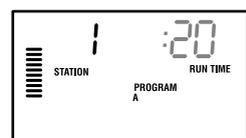
1. Turn the dial to the **SET PROGRAM START TIMES** position.
2. The factory preset is set on program **A**. If necessary you can select program **B** or **C** by pressing the **PRG** button.
3. Use the **+** and **-** buttons to change the start time. (Advances in 15-minute increments.) **One start time will activate all stations sequentially in that program.** This eliminates the need to enter a start time for each station.
4. Press the **➡** button to add an additional start time, or **PRG** button for the next program.



NOTE: If a program has all four start times turned off, then that program is off (all other program details are retained). Because there are no start times, there will be no watering with that program.

Setting Station Run Times

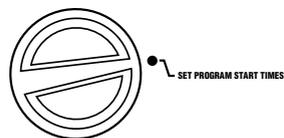
1. Turn the dial to the **SET STATION RUN TIMES** position.
2. The display will show the last program selected (**A**, **B**, or **C**) the station number selected, and the run time for that station will be flashing. You can switch to another program by pressing the **PRG** button.
3. Use the **+** and **-** buttons to change the station run time on the display. You may set station run times from 1 minute to 6 hours.
4. Press the **➡** button to advance to the next station.
5. Repeat steps 2 and 3 for each station.



NOTE: Regardless of the order in which the start times are entered, the Pro-C will always arrange the start times in chronological order when the dial is moved off the **SET PROGRAM START TIMES** position.

Eliminating a Program Start Time

With the dial set to the **SET PROGRAM START TIMES** position, push the **+** and **-** buttons until you reach 12:00 AM (Midnight). From this position push the **-** button once to reach the **OFF** position.



Setting Days to Water

1. Turn the dial to the **SET DAYS TO WATER** position.
2. The display will show the last program selected (**A**, **B**, or **C**). You can switch to another program by pressing the **PRG** button.
3. The controller displays currently programmed active day schedule information. You can choose to water on specific days of the week, or you can choose interval watering, or choose to water on odd days or even days. Each program can only operate using one type of water day option.



PROGRAMMING THE CONTROLLER (continued)

Selecting Specific Days of the Week to Water

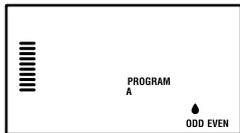
1. Press the **+** button to activate a particular day of the week to water (the display always starts with Monday). Press the **-** button to cancel watering for that day. After pressing a button the display automatically advances to the next day. A **●** icon indicates a water day. A blank space indicates a no water day.

After programming, set dial to **RUN** to enable automatic execution of all selected programs and start times.

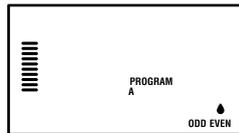
Selecting Odd or Even Days to Water

This feature uses numbered day(s) of the month for watering instead of specific days of the week (odd days: 1st, 3rd, 5th, etc.; even days: 2nd, 4th, 6th, etc.)

1. With the **▲** cursor on SU press the **➡** button once. The **●** icon will flash over **ODD**.
2. If is desired, turn the dial back to the run position.
3. If even day watering is desired, press the **➡** button once. The **●** icon will flash over **EVEN**. You can move back and forth from **ODD** to **EVEN** by pressing the **⬅** and **➡** buttons.



Odd Day Watering

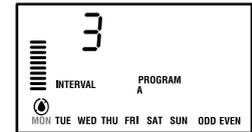
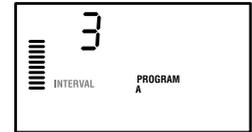
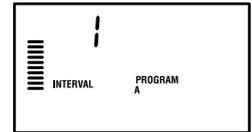


Even Day Watering

Selecting Interval Watering

This feature is convenient if you want to have a more consistent watering schedule without having to worry about the day of the week or the date. The interval you select is the amount of days between watering including the watering day.

1. Turn the dial to **SET DAYS TO WATER**. The water drop above Monday should be flashing.
2. Press the **➡** button until the drop over **EVEN** is flashing, then press the **➡** button one more time. The display will change to the interval mode and the Interval Day number will be flashing.
3. Press the **+** or **-** button to select the Interval Day(s) you desire.
4. Push the **➡** button once to advance to NO WATER DAYS to select any days you do not want the Pro-C to water (see page 20).



NOTE: If any days are selected as non-water days **⊙** at the bottom of the display, the Interval Day watering will exclude those days. For example, if the Interval Days are set at 5 and Monday is a non-water day, the controller will water every 5th day, but never on a Monday. If the interval water day falls on a Monday and Monday is a non-water day. The program would not water for 5 more days resulting in no irrigation for 10 days total.

PROGRAMMING THE CONTROLLER (continued)

Run

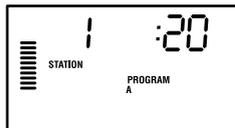
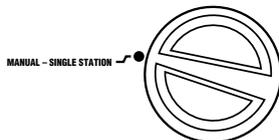
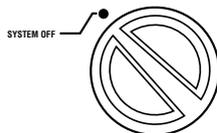
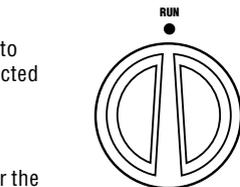
After programming is complete, turn the dial to **RUN** to enable automatic execution of all selected programs and start times.

System Off

Valves currently watering will be shut off after the dial is turned to the **SYSTEM OFF** position for two seconds. All active programs are discontinued and watering is stopped. To return controller to normal automatic operation, simply return dial to **RUN** position.

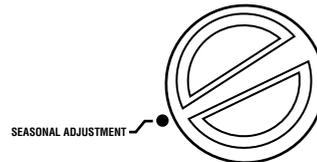
Manually Run a Single Station

1. Turn the dial to the **MANUAL-SINGLE STATION** position.
2. Station run time will flash in the display. Use the **➡** button to move to the desired station. You may then use the **+** and **-** buttons to select the amount of time for a station to water.
3. Turn the dial to the **RUN** position to run the station (only the designated station will water, then controller will return to automatic mode with no change in the previously set program).



Seasonal Adjustment

Seasonal Adjust is used to make global run time changes without re-programming the entire controller. This feature is perfect for making small changes that are necessary as the weather changes. For instance, hotter times of the year may require a bit more water. Seasonal adjust can be increased so that the stations will run longer than the programmed time. Conversely, as Fall approaches, the seasonal adjust can be reduced to allow for short watering durations.



1. Turn the dial to the **SEASONAL ADJUSTMENT** position.
2. Press the **+** or **-** buttons to set the percentage desired from 5% to 300%

To view the new adjusted run time, turn the dial to set run time's position. The displayed run times will be updated accordingly as the seasonal adjustment is made.



NOTE: The controller should always be initially programmed in the 100% position.



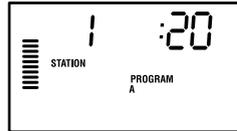
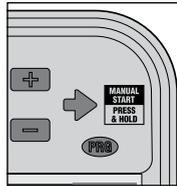
NOTE: The manual single station function will override the sensor.

PROGRAMMING THE CONTROLLER (continued)

One Touch Manual Start and Advance

You can also activate a program to water without using the dial.

1. Hold down the ➡ button for 2 seconds.
2. This feature automatically defaults to program **A**. You can select program **B**, or **C** by pressing the **PRG** program.
3. The station number will be flashing. Press the ⬅ or ➡ button to scroll through the stations and use the **+** and **-** buttons to adjust the station run times. (If no buttons are pressed during step 2 or 3, the controller will automatically begin program **A**.)
4. Press the ➡ button to scroll to the station you wish to begin with. After a 2 second pause, the program will begin.



This feature is great for a quick cycle when extra watering is needed or if you would like to scroll through the stations to inspect your system.

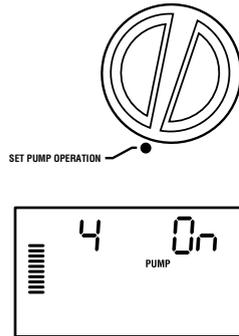
ADVANCED FEATURES

Set Pump/Master Valve Operation

The default is for all stations to have the master valve/pump start circuit **ON**. The master valve/pump start can be set **ON** or **OFF** by station, regardless of which program the station is assigned.

To program pump operation:

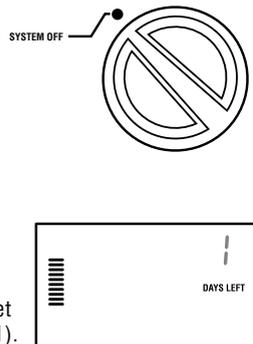
1. Turn the dial to **SET PUMP OPERATION** position.
2. Press the **+** or **-** buttons to toggle the master valve/pump start **ON** or **OFF** for the specific station.
3. Press the **➡** button to advance to the next station.
4. Repeat steps 2 and 3 for all necessary stations.



Programmable Rain Off

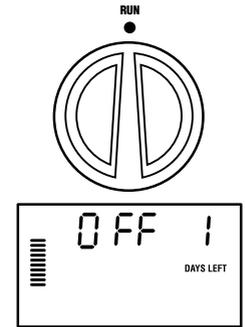
This feature permits the user to stop all programmed waterings for a designated period from 1 to 31 days. At the end of the programmable rain off period, the controller will resume normal automatic operation.

1. Turn the dial to the **SYSTEM OFF** position.
2. Press the **+** button and a 1 will be displayed and the **DAYS LEFT** icon will illuminate.
3. Press **+** as many times as needed to set the number of days off desired (up to 31).



4. Turn the dial back to the **RUN** position at which time, **OFF**, a **number** and the **DAYS** icon all remain on.
5. Leave the dial in the **RUN** position.

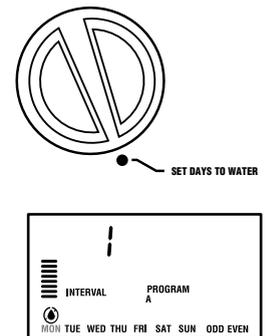
The days off remaining will decrease at midnight of each day. When it goes to zero, the display will show the normal time of day and normal irrigation will resume at the next scheduled start time.



Setting Specific Day(s) Off

Programming a No Water Day(s) is useful to inhibit watering on mowing days, etc. For instance, if you always mow the lawn on Saturdays you would designate Saturday as a **No Water Day** so you are not mowing wet grass.

1. Turn the dial to the **DAYS TO WATER** position.
2. Enter an interval watering schedule as described on page 21.
3. Press the **➡** button once. **MON** will be flashing.
4. Use the **➡** button until the cursor is at the day of the week you wish to set as a **No Water Day**.
5. Press the **-** button to set this day as a no water day. The **☉** will illuminate over this day.
6. Repeat steps 4 and 5 until all desired event day(s) are off.



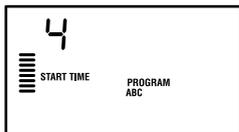
HIDDEN FEATURES

Program Customization

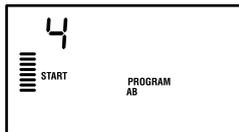
The Pro-C comes factory configured with 3 independent programs (A, B, C with four start times each) for different plant type requirements. The Pro-C can be customized to display only the required programs. You can hide those programs that are not required to ease programming.

To customize Pro-C programs:

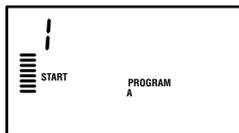
1. Press and hold the  button. Turn the dial to set days to water.
2. Release the  buttons.
3. Use the  and  button to change program modes.



Advanced Mode
(3 programs / 4 start times)



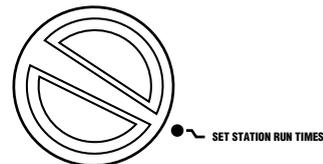
Normal Mode
(2 programs / 4 start times)



Limited Mode
(1 program / 1 start time)

Programmable Delay Between Stations

This feature allows the user to insert a delay between when one station turns off and the next station turns on. This is very helpful on systems with slow closing valves or on pump systems that are operating near maximum flow or have slow well recovery.



1. Start with the dial in the **RUN** position.
2. Press and hold the  button down while turning the dial to the **SET STATION RUN TIMES** position.
3. Release the  button. The display will show a delay time for all stations in seconds. The **DELAY** icon shall also be lit at this time.
4. Press the  and  buttons to increase or decrease the delay time between 0 and 59 seconds in 1 second increments and then in one minute increments up to four hours. **Hr** will be displayed when the delay changes from seconds to minutes and hours. Maximum delay is 4 hours.
5. Return the dial to the **RUN** position.



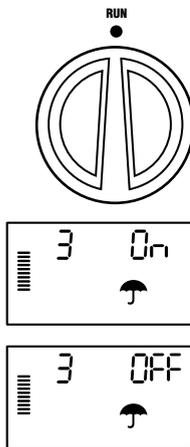
NOTE: The Master Valve/Pump Start circuit will operate during the first 15 seconds of any programmed delay to aid in the closing of the valve and to avoid unnecessary cycling of the pump.

HIDDEN FEATURES (continued)

Programable Sensor Override

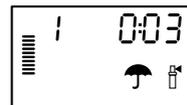
The Pro-C allows the user to program the controller so that the sensor disables watering on only desired stations. For example, patio gardens that have pots under overhangs and roofs may not receive water when it rains and will continue to need to be watered during periods of rain. To program sensor override:

1. Turn the dial to the **RUN** position.
2. Press and hold the  button down while turning the dial to **START TIMES** position.
3. Release the  button. The display will show the station number, ON, and the  icon, will be flashing.
4. Press the  or  button to enable or disable the sensor for the station shown.
ON = Sensor enabled (will suspend irrigation)
OFF = Sensor disabled (will allow watering)
5. Use the  or  buttons to scroll to the next station that you would like to program the sensor override.



NOTE: The controller default is for the sensor to disable watering on all zones when rain occurs.

When the Pro-C receives an input from the sensor to disable watering, the display will indicate those stations that have been programmed to override the sensor. A station that is running in the sensor override mode will flash  the and  icons alternately.



Total Run Time Calculator

The Pro-C keeps a running total of each program's station run times. This feature provides a quick way to determine how long each program will water.

1. While in the Set Station **Run** Time mode use the  button to advance to the highest station position.
2. Press the  button once to review the total of all run times programmed.
3. Use the  button to review additional programs.

Test Program

The Pro-C allows the user a simplified method for running a test program. This feature operates each station in numerical sequence, from the lowest to the highest. You can start with any station. This is a great feature to check the operation of your irrigation system.

To initiate the test program:

1. Press and hold the  button. The station number will be flashing.
2. Press the  or  button to scroll to the station you would like the test program to start with. Use the  and  button to set a run time of up to 15 minutes. The run time needs to be entered only once.
3. After a 2 second pause, the test program will begin.

HIDDEN FEATURES (continued).....

Easy Retrive™ Program Memory

The Pro-C is capable of saving the preferred watering program into memory for retrieval at a later time. This feature allows for a quick way of resetting the controller to the original programmed watering schedule.

To save the program into memory.

1. With the dial in the **RUN** position, press and hold the **+** and **PRO** buttons for 5 seconds. The display will scroll **≡** from left to right across the display indicating the program is being saved into memory.
2. Release the **+** and **PRO** buttons.

To retrieve a program that was previously saved into memory.

1. With the dial in the **RUN** position, press and hold the **-** and **PRO** buttons for 5 seconds. The display will scroll **≡** from right to left across the display indicating the program is being saved into memory.
2. Release the **-** and **PRO** buttons

Hunter Quick Check™

This circuit diagnostic procedure is can quickly identify “shorts” commonly caused by faulty solenoids or when a bare common wire touches a bare station control wire.

To initiate the Hunter Quick Check test procedure:

1. Press the **+**, **-**, **←** and **→** buttons simultaneously. In the standby mode, the LCD will display all segments (helpful when troubleshooting display problems).
2. Press the **+** button to begin the Quick Check test procedure. The system will search all stations to detect a high current path through the station terminals. When a field wiring short is detected, an ERR symbol preceded by the station number will momentarily flash on the controller LCD display. After the Hunter Quick Check completes running this circuit diagnostic procedure, the controller returns to the automatic watering mode.

Clearing Controller’s Memory/Resetting Controller

If you feel that you have misprogrammed the controller, there is a process that will reset the memory to factory defaults and erase all programs and data that have been entered into the controller. Press and hold the **PRO** button. Press and release the **RESET** button on the back of the front panel. Wait until the display shows 12:00am. Release the **PRO** button. All the memory has been cleared and the controller may now be reprogrammed.

WINTERIZING YOUR SYSTEM

In regions within the country where the frost level falls below the depth of the installed piping, it is common for these systems to be “winterized”. Several methods can be used to drain the water from the system. If the blow out method is used it is recommended that a qualified licensed contract perform this type of winterization.

WARNING! WEAR ANSI APPROVED SAFETY EYE PROTECTION!

Extreme care must always be taken when blowing out the system with compressed air. Compressed air can cause serious injury, including serious eye injury from flying debris. Always wear ANSI approved safety eye protection and do not stand over any irrigation components (pipes, sprinklers, and valves) during blow out. **SERIOUS PERSONAL INJURY MAY RESULT IF YOU DO NOT PROCEED AS RECOMMENDED.**

TROUBLESHOOTING GUIDE

PROBLEM	CAUSES	SOLUTIONS
The controller repeats itself or continuously waters, even when it should not be on (cycling repeatedly).	Too many start times (user error).	Only one start time per active program is required. Refer to “Setting Program Start Times” on page 19.
There is no display.	Check AC power wiring.	Correct any errors.
The display reads “ERR”.	Electrical noise is entering the system.	Check the SmartPort® wiring harness. If the wires were extended then they will need to be replaced with shielded cable. Contact your local distributor for information on shielded cable
The display reads “P ERR”.	There is a fault in the wire to the pump start or master valve.	Check the master valve or pump start wire for continuity. Replace or repair the shorted wire. Check that all wire connections are good and water tight.
The display reads a station number and ERR, such as “2 ERR”.	There has been a fault with the wire leading to that station.	Check the station wire for continuity. Replace or repair shorted wire. Check that all wire connections are good and water tight.
The display reads “NO AC”.	There is no AC power present (the controller is not receiving power).	Check to see if the transformer is properly installed.

TROUBLESHOOTING GUIDE (continued)

PROBLEM	CAUSES	SOLUTIONS
The display reads “SENSOR OFF”.	The rain sensor is interrupting irrigation or the sensor jumper is not installed.	Slide the Rain Sensor switch on front panel to the BYPASS position to bypass rain sensor circuit, or install the sensor jumper.
Rain sensor will not shut off system.	<p>Incompatible rain sensor or the jumper was not removed when sensor was installed.</p> <p>Manual Single Station Mode Used.</p>	<p>Make sure sensor is micro-switch type such as Mini-Clik®. Check that the the jumper has been removed from the the SEN terminals. Confirm proper operation (see "Testing a Weather Sensor" on page 9).</p> <p>Manual Single Station Mode will override the sensor. Use Manual All Station Mode to test sensor.</p>
The controller does not have a start time for each station.	Programming error, dial in incorrect position.	Be sure the dial is in correct position. Total number of stations can be easily checked by placing dial in SET STATION RUN TIMES position and pressing the back arrow.
Valve will not turn on	<p>Short in wiring connections.</p> <p>Bad solenoid.</p>	<p>Check field wiring.</p> <p>Replace solenoid.</p>

SPECIFICATIONS

Operating Specifications

- Station Run Time: 1 minute to 6 hours on programs A, B, and C.
- Start Times: 4 per day, per program, for up to 12 daily starts.
- Watering Schedule: 7-day calendar, interval watering up to a 31-day interval or true odd or even day programming, made possible by the 365-day clock/calendar.

Electrical Specifications

- Transformer Input: 120VAC, 60Hz
(230VAC, 50/60 Hz International Use)
- Transformer Output: 25VAC, 1.0 amp
- Station Output: 24VAC, .56 amps per station
- Maximum Output: 24VAC, .84 amps (includes Master Valve Circuit)
- Battery: 9-volt alkaline battery (not included) used only for non-AC programming, the non-volatile memory maintains program information
- Battery, Front Panel, Internal CR2032 Lithium for real time clock.

Dimensions

Indoor Cabinet

Height: 8.25"

Width: 9.5"

Depth: 3.75"

Outdoor cabinet is NEMA 3R, IP44 rated.

Outdoor Cabinet

Height: 9"

Width: 10"

Depth: 4.5"

Default Settings

All stations are set to zero run time. This controller has a non-volatile memory that retains all entered program data even during power outages, without need for a battery.

Cleaning

Clean only with cloth dampened with mild soapy water.

FCC NOTICE.....

This controller generates radio frequency energy and may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna
- Move the controller away from the receiver
- Plug the controller into a different outlet so that controller and receiver are on different branch circuits

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington, D.C., Stock No. 004-000-00345-4 (price – \$2.00)

CERTIFICATE OF CONFORMITY TO EUROPEAN DIRECTIVES

Hunter Industries declares that the irrigation controller Model Pro-C complies with the standards of the European Directives of "electromagnetic compatibility" 87/336/EEC and "low voltage" 73/23/EEC.



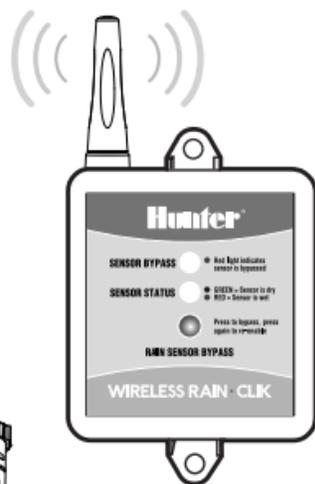
Project Engineer



This product should not be used for anything other than what is described in this document. This product should only be serviced by trained and authorized personnel.

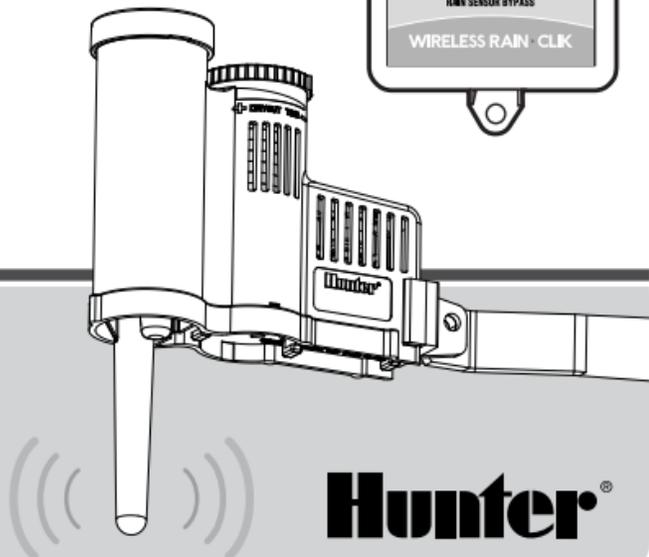
Wireless RAIN-CLIK™ Sensor

Rain Sensor Shutoff for Automatic Irrigation Systems



Owner's Manual and Installation Instructions

WR-CLIK Wireless Rain-Clik
WRF-CLIK Wireless Rain/Freeze-Clik



Hunter®

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FEATURES

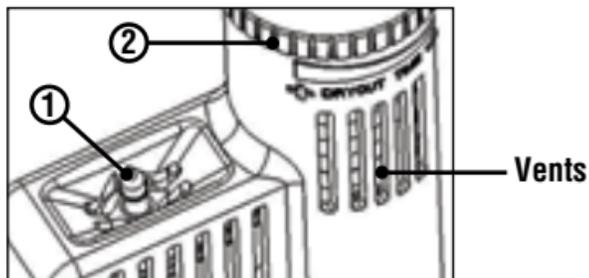
Wireless Rain-Clik™ sensors attach quickly and easily to your controller. Wireless Rain-Clik™ features include:

1. **Quick Response™** – Unique technology that turns off the irrigation system immediately rather than after it has accumulated a fixed amount of rain. No calibration is required.
2. **Maintenance-Free Design** – Provides trouble-free operation for up to ten years. There are no batteries to replace.
3. **Wireless operation up to 800 ft. (275 m)** – No wires are required between the rain sensor and controller.
4. **Two models available:**
 - Wireless Rain-Clik™ (WR-CLIK)** – Acts as a switch to deactivate automatic watering of your irrigation controller when it rains. Once rain has stopped and the sensor has dried out, automatic irrigation will resume.
 - Wireless Rain/Freeze-Clik (WRF-CLIK)** – The Wireless Rain/Freeze-Clik includes a freeze sensor that is designed to keep the irrigation system from operating when temperatures drop to 37°F or below. When temperatures rise above 37°F, the sensor will enable automatic watering.
5. **Automatic Synchronization** – The Wireless Rain-Clik™ transmitter will send wireless signals every hour to the receiver to assure that the sensor and receiver are continuously synchronized.
6. **Lost Communication/Battery Status Indication** – The Sensor Bypass LED will flash RED if the receiver has not received a signal from the transmitter. This can indicate a low or dead battery.

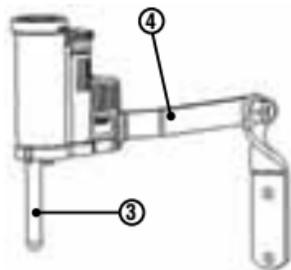
WIRELESS RAIN-CLIK™ COMPONENTS

Wireless Rain-Clik™ Transmitter

1. **Manual Test Spindle** – Press and hold the manual test spindle to confirm proper operation of your transmitter.
2. **Vent Ring** – Used to adjust the reset rate or dry out time for the sensors. Opening the vents will decrease the reset rate, while closing the vents will increase the time it takes for the discs to dry out.

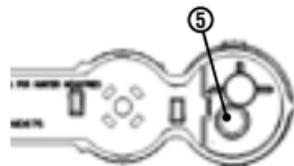


3. **Radio Antenna** – Transmits a wireless signal to the receiver up to 800 ft. (275m). It is recommended that the antenna be oriented vertically.



4. **Mounting Arm** – Metal extension arm for mounting the sensor.

5. **Battery Status LED** – Used to determine the status of the sealed battery. Pushing the manual test spindle will flash the LED light indicating that the battery is good.



WIRELESS RAIN-CLIK™ COMPONENTS

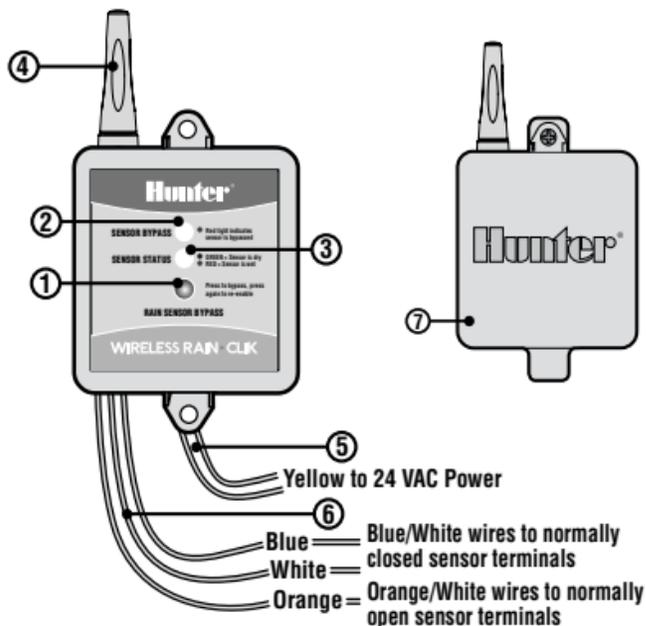
Wireless Rain-Clik™ Receiver

1. **Bypass Button** – Allows automatic or manual watering when the sensor is active.
2. **Sensor Bypass LED** – Indicates when sensor has been bypassed.
3. **Sensor Status LED** – Used to indicate the status of the sensor.
4. **Radio Antenna** – Receives a wireless signal from the transmitter up to 800 ft. (275m) It is recommend that the antenna be oriented vertically.
5. **AC Power Wires** – The two yellow wires are attached to a 24 VAC source from the controller.
6. **Sensor Wires** – The sensor wires are attached to either the sensor terminals in the controller or in-line with the valve common wire.

Blue/White Wires (used for normally closed sensor applications)

Blue/Orange Wires (used for normally open sensor applications)

7. **Rubber Cover** – Used to protect the receiver when mounted in outdoor locations.



MOUNTING THE RECEIVER

Wiring the Receiver to Your Controller

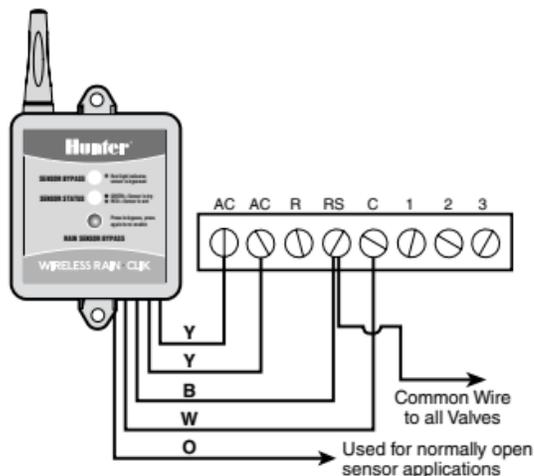
Using the hardware supplied, mount the receiver to the wall next to the irrigation controller. It is recommended that the receiver be installed away from sources of electrical interference and metal objects to maximize communication range. Make sure to attach the rubber cover under the receiver when installing the receiver in an outdoor location.



Warning: This unit is designed to be installed in conjunction with 24 VAC circuits only. Do not use with 110 or 220 VAC circuits.

Wiring the Receiver to a Hunter SRC

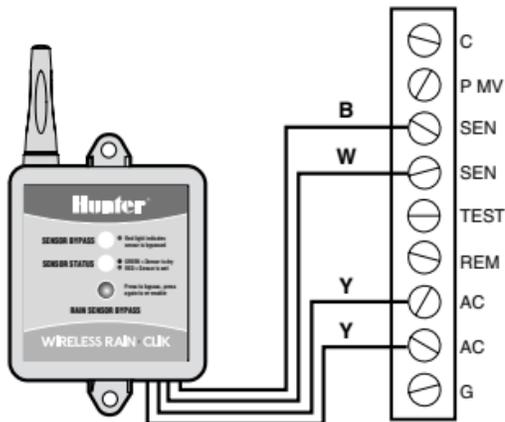
1. Attach the two yellow wires to the AC terminals.
2. Attach the blue wire to the RS terminal.
3. Attach the white wire to the C terminal.
4. Attach the valve common wire to the RS terminal.



MOUNTING THE RECEIVER

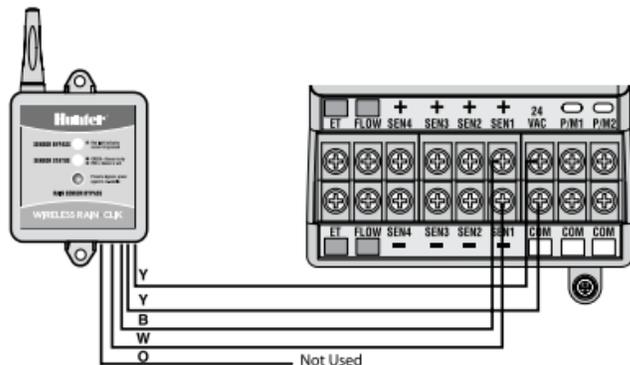
Wiring the Receiver to a Hunter X-Core, Pro-C, ICC and I-CORE

1. Remove the sensor jumper across the two SEN terminals in the controller.
2. Attach the two yellow wires to the 24 VAC terminals.
3. Attach the blue wire to one SEN terminal and the white wire to the other SEN terminal.



Wiring the Receiver to a Hunter ACC

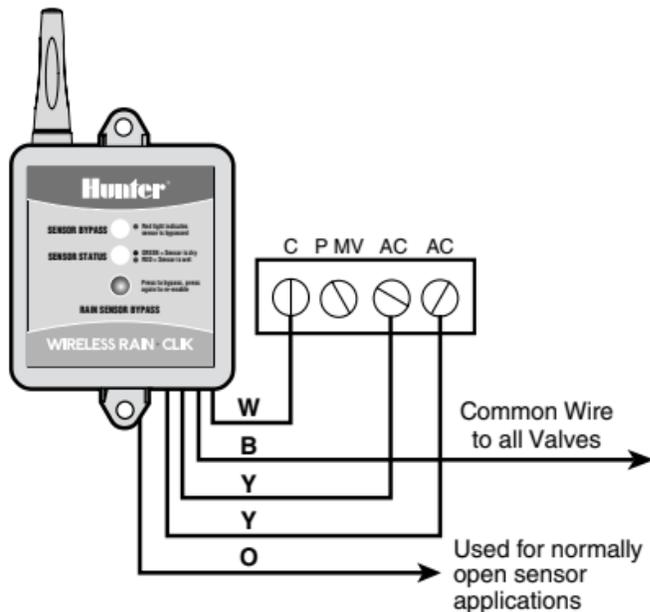
1. Connect the blue and white wire to any of the four Sensor Terminal pairs (Sen 1 shown).
2. Attach yellow wires to 24VAC and COM terminals.
3. Use features at the "Set Sensor Operation" dial position on ACC to complete setup.
4. See ACC owner's manual for further details.



MOUNTING THE RECEIVER

Wiring the Receiver to Other Controllers: Normally Closed Sensor Applications

1. Attach the two yellow wires to the 24 VAC terminals.
2. Attach the blue and white wire to the sensor terminals (if available) or in-line with the valve common wire.



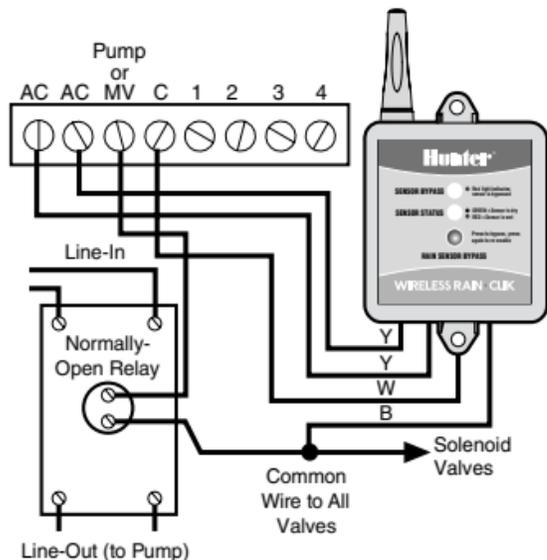
MOUNTING THE RECEIVER

Normally Open Sensor Applications

A few controllers on the market require normally open rain sensors. To attach the receiver to this type of controller, attach the blue and orange wire to the sensor input.

Controllers with 24 VAC Solenoids and a Booster Pump

1. Locate the common wire to the solenoid valves and the common wire to the pump relay. If these two wires are connected to the "common" terminal on the controller, disconnect both of them.
2. Twist together these wires along with one of the wires from the Wireless Rain-Clik™ and secure with a wire nut.
3. Attach the other wire from the Wireless Rain-Clik™ receiver to the "common" terminal on the controller.

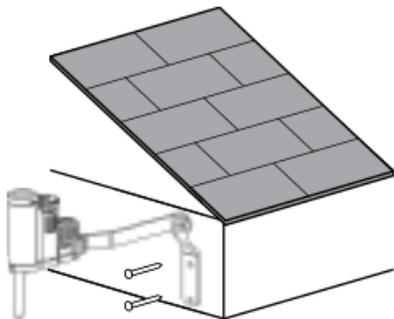


Note: The pump circuit output must be 24 VAC. Do not proceed if 115 VAC.

MOUNTING THE TRANSMITTER

Standard Mounting

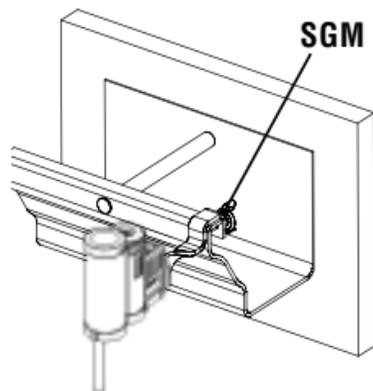
Using the screws provided with your sensor, mount the transmitter on any surface where it will be exposed to unobstructed rainfall, but not in the path of sprinkler spray. The sensor should be oriented upright (as pictured), but the swivel bracket can be moved for mounting on any angled surface. Loosen the locknut and screw before swiveling the bracket, and then re-tighten.



Standard Mount

Gutter Mounting (Optional)

The sensor gutter mount can be purchased as an optional accessory for your Wireless Rain-Clik™ (order p/n SGM). The SGM allows the transmitter to be mounted directly to the edge of a gutter. Install the SGM on the transmitter by removing the metal extension arm supplied with your sensor and reinstalling the SGM. Position the gutter mount on the edge of the gutter and twist the thumbscrew to secure it in place.



Gutter Mount

ADJUSTMENTS AND OPERATION

Hints for mounting the transmitter

- Choose a location such as the side of a building or post. The closer the transmitter is to the receiver, the better the reception. Do not exceed 800 ft (275 m).
- To assure maximum range in communication, mount the receiver and transmitter away from sources of electrical interference (i.e. control panels, transformers, etc.) or metal objects. Best performance is obtained when no physical obstruction is between the transmitter and receiver.
- Correct placement of the Wireless Rain/ Freeze-Clik model is important for accurate temperature sensing. The best location would be out of direct sunlight.
- The reset rate refers to the amount of time it takes for the sensor to dry out sufficiently for the sprinkler system to be allowed to come back on. The mounting location will affect this rate. For example, mounting the transmitter in a very sunny location may cause the sensor to dry out sooner than desired. Similarly, mounting the sensor in constant shade may keep the sensor from drying out sooner.

ADJUSTMENTS AND OPERATION

Transmitter Operation

There is nothing to set up with the Wireless Rain-Clík™.

Receiver Operation

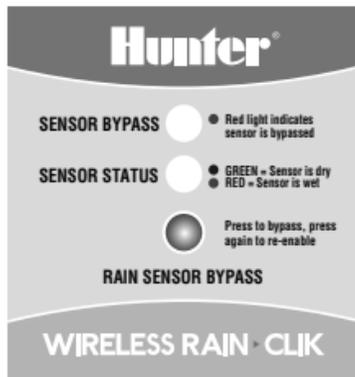
The receiver has two LED lights that indicate the state of the system.

1. SENSOR STATUS LED:

RED – Sensor is wet (watering disabled)

GREEN – Sensor dry (watering enabled)

YELLOW – Sensor is in addressing mode



2. SENSOR BYPASS LED:

RED – Rain sensor is bypassed (even though the sensor is bypassed, the STATUS LED will continue to alert you of the state of the sensor (wet or dry).

OFF – Rain sensor is enabled.

FLASHING RED – Indicates that communication between the transmitter and receiver was lost.

Note: When you first apply power to the receiver, the SENSOR STATUS LED will be RED. Press the manual test spindle on the transmitter for 5 seconds and release the spindle. The SENSOR STATUS LED will turn GREEN indicating proper operation.

ADJUSTMENTS AND OPERATION

Bypassing the Sensor

The sensor may be bypassed by using the built in bypass feature on the receiver. To bypass the sensor, press the SENSOR BYPASS button on the receiver. The bypass status light will turn red when the sensor is bypassed. Pressing the SENSOR BYPASS button again will re-enable the sensor and the sensor bypass light will go out.

Setting the Transmitter Address at the Receiver

Each transmitter is produced with a unique address. A receiver must learn this address to work with that transmitter. This step is only necessary if transmitters and receivers are purchased separately.

Note: Units purchased as a kit will already have their communication address preset. No addressing is necessary, however, if the receiver or transmitter is replaced you need to reset the address.

ADJUSTMENTS AND OPERATION

1. Prior to applying power (yellow wires) to the receiver, press and hold the bypass button on the receiver.
2. While the bypass button is depressed, apply power to the receiver. The sensor status indicator light should light up yellow indicating that the receiver is ready to learn a new address.
3. Press and hold the quick response button on the transmitter.
4. Within 4 seconds, the receiver's sensor status indicator light should turn red. The receiver has now learned the address and it will be retained even in the event of a power outage.
5. Release the button on the transmitter. The sensor status indicator light should turn green.

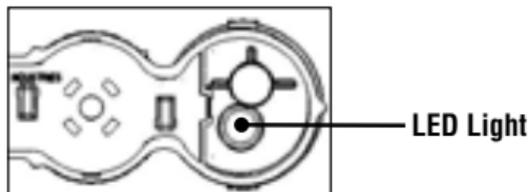
Battery Life

The Wireless Rain-Clik™ transmitter is designed to operate up to ten years with its sealed, maintenance-free battery. The transmitter is available as a replacement part. (WRCLIK-TR) Should you need to change the transmitter, the receiver will have to learn the new transmitter address.

ADJUSTMENTS AND OPERATION

To check the status of the battery in the transmitter:

1. Press and hold the quick response spindle at the top of the sensor.
2. Within a few seconds the LED light on the bottom of the sensor will briefly flash.
3. Release the spindle and the LED light will flash again. If the LED flashes, the battery in the transmitter is good.



If you are experiencing problems with your Wireless Rain-Clik™ sensor, follow these simple checks first before assuming the unit is defective and replacing it.

System will not come on at all:

- Check to make sure that the sensor discs are dry and the switch “clicks” on and off freely by pressing the top of the spindle.
- Look for breaks in the wire leading to the receiver and check all connections.
- Verify outside air temperature (for Rain/Freeze-Clik installations).

ADJUSTMENTS AND OPERATION

System will not shut off even after heavy rainfall:

- Remove the sensor jumper across the two SEN terminals.
- Check to make sure that rainfall is hitting the sensor.
- Look for breaks in the wire leading to the receiver and check all connections.
- Check the battery in the transmitter (See page 15).

Sensor Bypass LED is flashing red:

- Check that the battery in the transmitter is good (See page 15).
- Check for obstructions around the transmitter or receiver antenna.

FCC NOTICE

Sensor FCC ID:M3UWRCE

This device complies with FCC rules Part 15. Operation is subject to the following two conditions:

1. This device may not cause harmful interference and
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for class B digital devices, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

The user is cautioned that changes and modifications made to the equipment without the approval of the manufacturer could void the user's authority to operate this equipment.

FCC DECLARATION OF CONFORMITY

TRADE NAME	Wireless Rain/Freeze-Clik
MODEL NUMBER	WR-Clik-R
COMPLIANCE TEST REPORT NUMBER	B00217D3
COMPLIANCE TEST REPORT DATE	Jan. 29, 2010
RESPONSIBLE PARTY	Hunter Industries Incorporated
ADDRESS	1940 Diamond St. San Marcos, CA 92078
TELEPHONE	760-744-5240

This equipment has been tested and found to comply with the limits for class B digital devices, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

FCC DECLARATION OF CONFORMITY

If this equipment does cause harmful interference to radio or television reception, please refer to you user's manual for instructions on correcting the problem. The undersigned, hereby declare that the equipment specified above conforms to the above requirements.

Signature: 	
Place: San Marcos, CA	Full Name: Peter Woytowitz
Date: March 18, 2010	Position: Engineering Manager

INDUSTRY OF CANADA NOTICE

Sensor - IC:2772A-WRCE

Receiver - IC:2772A-WRCER

Operation is subject to the following two conditions:

1. This device may not cause harmful interference and
2. This device must accept any interference received, including interference that may cause undesired operation.

CE & AUSTRALIA NOTICE



Hunter Industries hereby declares that this remote control device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/CE.

Declaration of Conformity: We, Hunter Industries Incorporated, 1940 Diamond Street, San Marcos, CA 92078, declare under our own responsibility that the Wireless Rain/Freeze-Clik, model numbers WR-Clik-TR, WRF-Clik-TR and WR-Clik-R, to which this declaration refers, conforms with the relevant standards:

Emissions: ETSI EN 300 220-1 V2.1.1
ETSI EN 300 220-2 V2.1.1
ETSI EN 301 489-1 (per EN55022)
EN 61000-3-2
EN61000-3-3

Immunity: ETSI EN 301 489-1 V1.4.1
(per IEC61000-4-2 through IEC61000-4-6, and IEC61000-4-11)

Signature: 	
Place: San Marcos, CA	Full Name: Peter Woytowitz
Date: March 18, 2010	Position: Engineering Manager

NOTES

NOTES

Hunter®

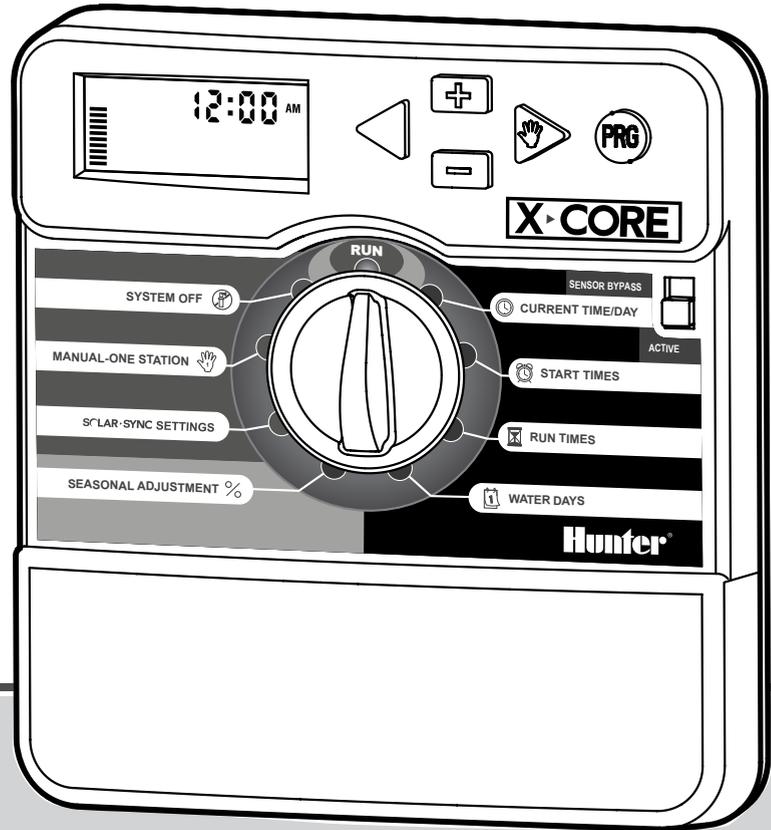
Hunter Industries Incorporated • The Irrigation Innovators
1940 Diamond Street • San Marcos, California 92078 USA
www.hunterindustries.com

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P/N 715182 23-594 C 02/11

X-CORE

Residential Irrigation Controller



NEW

Owner's Manual and Programming Instructions
Compatible with Hunter Remotes and Solar Sync

Hunter[®]

12:00 AM



X-CORE

RUN

SYSTEM OFF

SENSOR BYPASS

CURRENT TIME/DAY

MANUAL-ONE STATION

ACTIVE

START TIMES

SOLAR-SYNC SETTINGS

RUN TIMES

SEASONAL ADJUSTMENT %

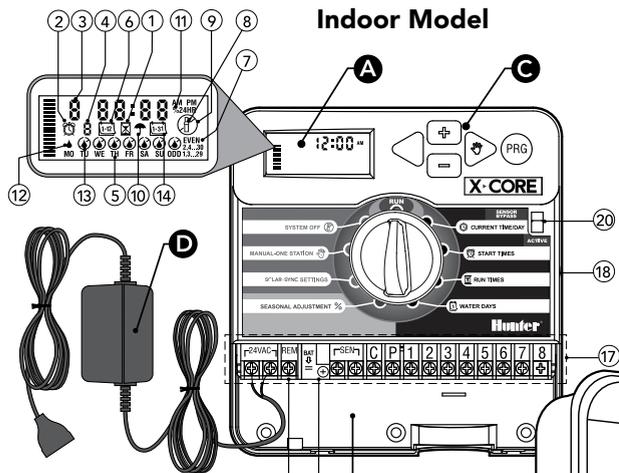
WATER DAYS

Hunter®

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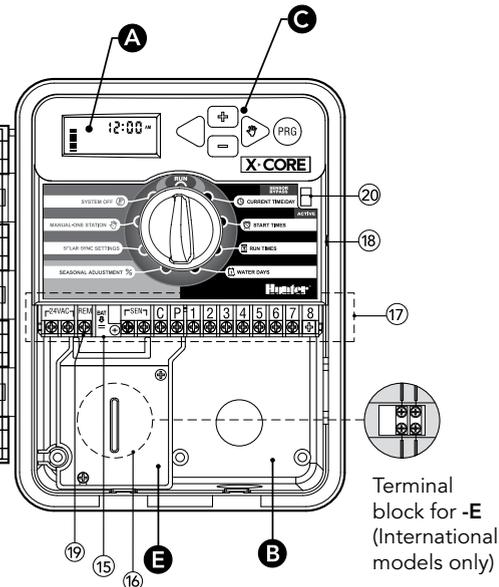
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X-CORE COMPONENTS



Note: Plug may look different from illustration

Outdoor Model (Internal Transformer Included)



X-CORE COMPONENTS

A LCD Display		
1	 Run Times	Allows user to set each valve station run time from 1 minute to 4 hours
2	 Start Times	Allows 1 to 4 start times to be set in each program
3	Station Number	Indicates currently selected station number
4	Program Designator	Identifies program (A, B, or C) in use
5	Day of the Week	Identifies day of the week
6	Interval Watering	Identifies month when programming current date
7	Odd/Even Watering	Identifies if Odd or Even watering has been selected
8	Flashing Sprinkler	Indicates that watering is taking place
9	 System Off	Allows user to discontinue all programs and watering. Also allows the user to set the programmable "rain off," which stops watering for a period from 1 to 7 days.
10	 Umbrella	Indicates that the rain sensor is active
11	% Seasonal Adjustment	Allows the user to make run time changes according to the seasons without reprogramming the controller. Bars on the left allow quick visual reference to the seasonal adjustment percentage. When using Solar Sync ET Sensor, will display seasonal adjust updated daily by sensor.
12	 Rain Drop	Indicates watering will occur on the selected day
13	 Crossed Rain Drop	Indicates the watering will NOT occur on the selected day
14	 Calendar	Indicates interval watering schedule has been programmed. Icon also appears when programming the current day

X-CORE COMPONENTS

B Wiring Compartment

15	Lithium Battery	The replaceable lithium battery (included) allows the controller to be programmed in the absence of AC power. In addition, the battery will provide power for backup timekeeping in the event of a power outage.	
16	Internal Junction Box	Junction box in outdoor models for making AC power connections	
17	Terminal Strip	Use to attach transformer, sensor, and valve wires from their source to the controller	
NEW	18	Reset Button	Use to reset the controller (located on side of controller)
NEW	19	REM	Allows for connection of Hunter SmartPort® and Hunter Remote Controls
20	Sensor Bypass Switch	Ignores “Clik” weather sensor input when in Bypass position	

C Control Buttons

	+ Button	Increases the selected item flashing in the display
	- Button	Decreases the selected item flashing in the display
	◀ Button	Returns selected flashing display to previous item
	▶ Button	Advances the selected flashing display to the next item
	PRO Button	Selects program A, B, or C for different watering zone requirements

X-CORE COMPONENTS

Dial Settings		
	Run	Normal dial position for all controller automatic and manual operation
	 Current Time/Day	Allows current day and clock time to be set
	 Start Times	Allows 1 to 4 start times to be set in each program
	 Run Times	Allows user to set each valve station run time from 1 minute to 4 hours
	 Water Days	Allows the user to select interval days to water
	% Seasonal Adjustment	Allows user to make run time changes according to the seasons without reprogramming the controller. Bars on the left allow quick visual reference to the seasonal adjustment percentage.
	 Manual-One Station	Allows user to activate a one-time watering of a single valve
	 System Off	Allows user to discontinue all programs and watering. Also allows the user to set the programmable "rain off," which stops watering for a period from 1 to 7 days
NEW	SOLAR·SYNC Settings	Allows user to program settings when using Solar Sync ET Sensor
D External Transformer (Indoor Model Only)		
		A plug in transformer is provided to supply AC power to the controller

MOUNTING THE CONTROLLER TO WALL



Note: The indoor version of the X-Core is not waterproof or weather resistant, and must be installed indoors or in a protected area.

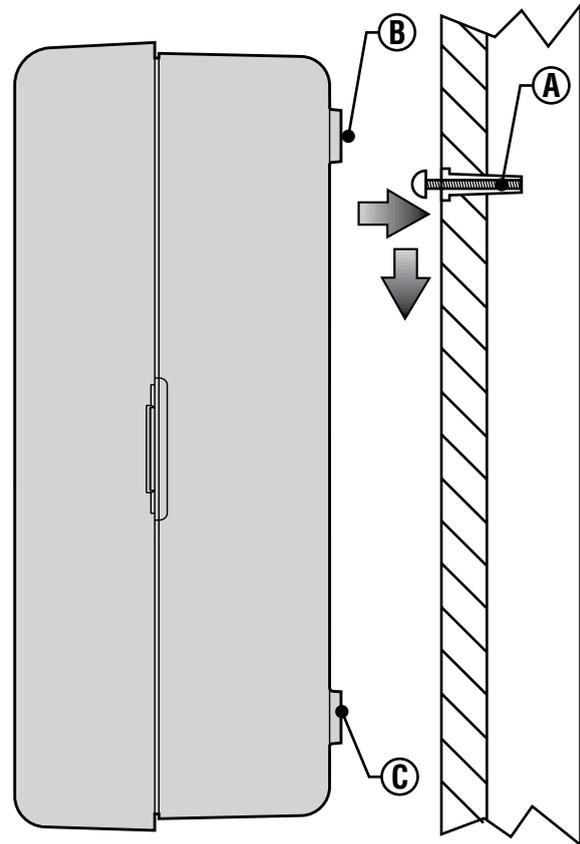
1. Secure one screw into the wall. Install screw anchors if attaching to drywall or masonry wall.
2. Slide the keyhole on top of the controller over the screw.
3. Secure the controller in place by installing screws in the holes below the terminal strip.



Do not plug transformer into power source until controller is mounted and all valve wiring has been connected.

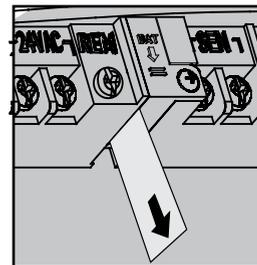


For XC - x01 - A: If the supply cord is damaged, it must be replaced by the manufacturer or service agent, or a similarly qualified person in order to avoid hazard.



ACTIVATING THE BATTERY

After installing your X-Core, make sure to remove the battery contact insulator to allow the X-Core to keep time in the event of a power outage.



CAUTION:
RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

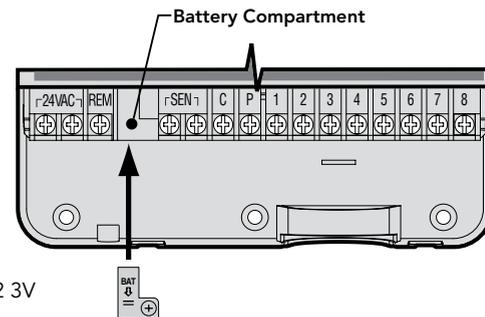
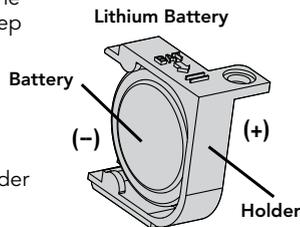
REPLACING THE BATTERY

A high-energy lithium battery is included with your X-Core controller. The battery allows the user to remotely program the controller without connecting AC power. It is also used to keep the current time and day during power outage conditions. To replace the battery:

1. Remove the screw from the battery holder.
2. Slide the battery holder down to access the battery.
3. Remove and replace the new battery into the battery holder and reinstall the battery holder.



NOTE: This positive(+) side of the battery should face the inside of the battery holder.

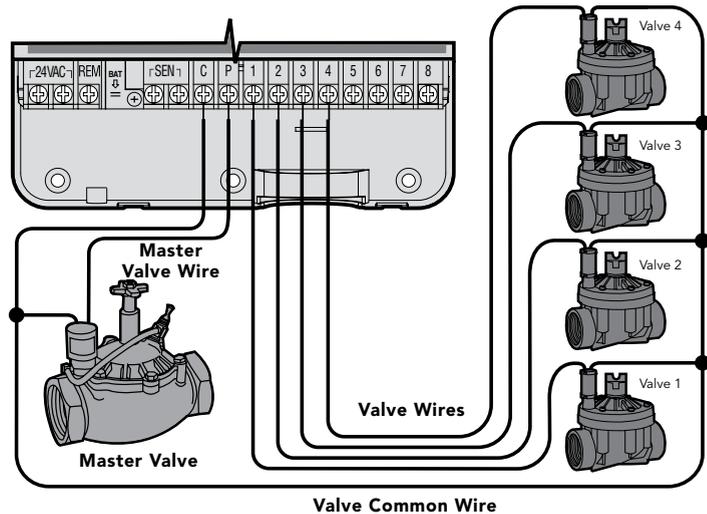


CONNECTING A MASTER VALVE



NOTE: Complete this section only if you have a master valve installed in your irrigation system. A master valve is a “normally closed” valve installed at the supply point of the main line that opens only when the controller initiates a watering program.

1. At the Master Valve, attach the common wire to either solenoid wire of the valve. Attach a separate control wire to the remaining solenoid wire.
2. The common wire should be attached to the **C** terminal inside the controller. The other wire coming from the master valve should be attached to the **P** terminal inside the controller. Tighten each terminal screw.



CONNECTING A PUMP START RELAY

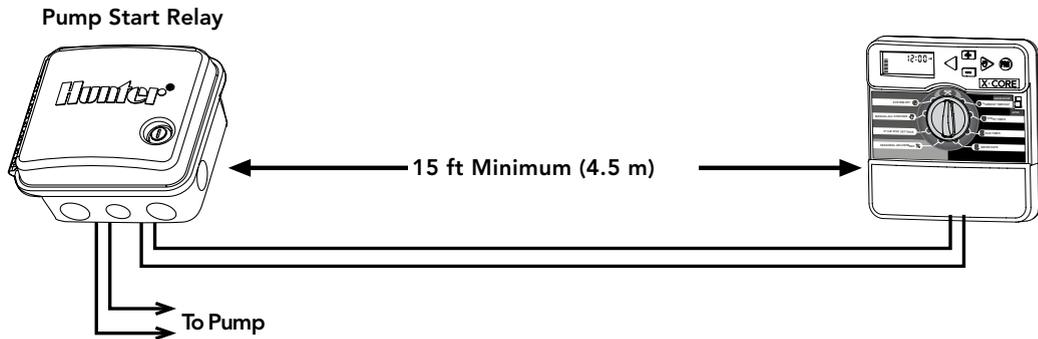


NOTE: Complete this section only if you have a pump start relay installed. A pump start relay is a device that uses a signal from the controller to actuate a separate electrical circuit to energize a pump to provide water to your system.

The controller should be mounted at least a 15 ft (4.5 m) away from both the pump start relay and pump to minimize any potential electrical interference.

1. Route a pair of wires from the pump relay into the controller.
2. Connect a common wire to the **C** (Common) terminal inside the controller and connect the remaining wire from the pump start relay to the **P** (Pump) terminal.

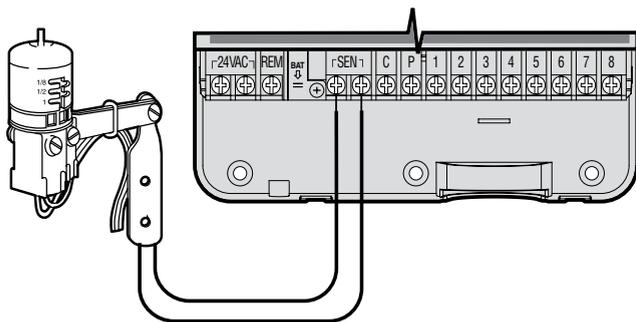
Relay holding current draw must not exceed 0.3 A. Do not connect the controller directly to the pump or damage to the controller will result.



CONNECTING A HUNTER "CLIK" WEATHER SENSOR

A Hunter weather sensor or other micro-switch type weather sensors can be connected to the X-Core. The purpose of this sensor is to stop automatic watering when weather conditions dictate.

1. **Remove the metal jumper** plate that is attached across the two SEN terminals inside the controller.
2. Connect one wire to one SEN terminal and the other wire to the other SEN terminal.



When the weather sensor has deactivated automatic watering, the OFF, and ☂ icon will appear on the display.



Testing the Weather Sensor

The X-Core provides simplified testing of a rain sensor when the sensor is wired into the sensor circuit. You can manually test proper operation of the rain sensor by running a **MANUAL CYCLE** or by activating the system using the **One Touch MANUAL START** (see page 22). During the Manual cycle, pressing the test button on the Mini-Click® will interrupt watering.

Manually Bypassing the Weather Sensor

If the rain sensor is interrupting irrigation, you can bypass it by using the bypass switch on the front of the controller. Slide the switch to the **SENSOR BYPASS** position to disable the rain sensor from the system to allow for controller operation. You can also bypass the weather sensor for manual operation by using the **MANUAL – ONE STATION** function.

The Bypass switch does not affect the Seasonal Adjust update when using Solar Sync sensor.



CONNECTING A HUNTER SOLAR SYNC ET SENSOR

The X-Core is compatible with the Solar Sync and Wireless Solar Sync systems. Solar Sync is a sensor system that will automatically adjust the X-Core controller's watering schedule (based on changes in local climate condition) by using the Seasonal Adjust function. The Solar Sync uses a solar and temperature sensor to determine evapotranspiration (ET), or the rate at which plants and turf use water, and also includes Hunter Rain Klik and Freeze Klik technology that will shut down irrigation when it rains and/or during freezing conditions.



NOTE: Solar Sync will apply a default seasonal adjust value of 100% until the first full day (24 hour period) of weather measurements have been received from the sensor.



NOTE: Enabling the Sensor Bypass switch has no effect on the seasonal adjust updates from the Solar Sync sensor. It will, however, bypass the Rain Klik and Freeze Klik functionality of the sensor.

Installing Solar Sync Sensor

Connect the Green and Black wire from the Solar Sync Sensor to the "SEN" wiring terminals on the X-Core controller, similar to picture on page 11. It does not matter which wire connects to which terminal. Turn the dial to the "Solar Sync Settings" position. The display will initially show dashed lines and then will show the default Region setting (3) on the left and the default Water Adjustment setting (5) on the right. Adjust the Region as needed



by using the ▲ and ▼ buttons (refer to page 13 for explanation of Solar Sync Region setting). Use the ► button to advance to the right to adjust the Water Adjust setting as needed (see page 14 for explanation of Water Adjust setting).

Installing the Wireless Solar Sync

Connect the Green and Black wire from the Wireless Solar Sync Receiver to the "SEN" wiring terminals on the X-Core controller. It does not matter which wire connects to which terminal. Turn the dial to the "Solar Sync Settings" position. The display will initially show dashed lines and then will show the default Region setting (3) on the left and the default Water Adjustment setting (5) on the right. Adjust the region as needed by using the ▲ and ▼ buttons (refer to page 13 for explanation of Solar Sync Region setting). Use the ► button to advance to the right to adjust the Water Adjust setting as needed (see page 14 for explanation of Water Adjust setting).



Solar Sync Settings

Once the Solar Sync sensor is connected to the X-Core controller, two numbers will appear in the display when the dial is turned to the Solar Sync Settings position. The number on the left of the screen is the Region setting, and the number on the right on the screen is the Water Adjustment setting (as shown above).

CONNECTING A HUNTER SOLAR SYNC ET SENSOR

Region

For accurate Solar Sync measurements, the controller needs to be programmed for the average peak season ET for your region. Use the table below to determine your region.

The table will assist you in identifying the type of region you live in. There are four basic ET regions, each with descriptions of the region, along with typical ET and temperature characteristics. It is recommended that, if possible, the region be chosen based upon average July ET or peak summer ET (inches/mm per day).

Use the following table for choosing your region (reference below). You can use methods **A**, **B** or **C** to help you choose which region is best for your area:

A: Based upon the ET of your region using the **average** July ET or peak summer ET (inches/mm per day). This is the preferred option when selecting your region.

B: Based upon the temperature for your region using the **average** July or the driest month high temperature (not the highest temperature for July).

C: Based upon the general description of your region.

IF ANY OF THE CHOICES IN THE ROWS APPLY TO YOUR SITUATION, THEN THAT IS YOUR REGION SETTING CHOICE.			
	A	B	C
Region 1	If the average July ET is < 0.17" (4.3 mm) per day	If the average temperature for July is 65°–75° (18°C – 24°C)	<ul style="list-style-type: none"> • U.S. Northern States • Coastal Regions
Region 2	If the average July ET is 0.18" – 0.23" (4.6 mm – 5.8 mm) per day	If the average temperature for July is 75°– 85° (24°C – 29°C)	<ul style="list-style-type: none"> • Mountains • U.S. Northern Inland States
Region 3	If the average July ET is 0.24" – 0.29" (6.1 mm – 7.4 mm) per day	If the average temperature for July is 85° – 95° (29°C – 35°C)	<ul style="list-style-type: none"> • U.S. Southern States • Inland/High Desert
Region 4	If the average July ET is > 0.30" (7.6 mm) per day	If the average temperature for July is 95° – 105° (35°C – 41°C)	<ul style="list-style-type: none"> • Deserts

* For Southern hemisphere locations, use the month of January.

CONNECTING A HUNTER SOLAR SYNC ET SENSOR

Water Adjustment \updownarrow

The Water Adjustment is a 1 to 10 scale that allows for easy adjustment of the Seasonal Adjust value from the Solar Sync ET Sensor. Upon installation of the Solar Sync ET Sensor, it is recommended that the Water Adjustment setting stay at the default value of 5. However, after installation, if you find that the seasonal adjust value is lower or higher than expected, the Water Adjustment value can be modified to modify the Seasonal Adjust output value. See Calibration/Setup on page 15 for explanation of how to use Water Adjustment scale to fine tune seasonal adjust output value.



NOTE: If an individual zone is “wetter” or “drier” than the rest of the system, simply increase or decrease the amount of run time on the controller.

Uninstalling a Solar Sync Sensor

If a Solar Sync sensor has been installed on the X-Core controller then the seasonal adjust value used by the controller will be calculated from the weather data supplied by the Solar Sync sensor. If it is decided that the Solar Sync sensor will no longer be used with the X-Core controller, it must be uninstalled. **If the Solar Sync sensor is not uninstalled, the controller will not allow the seasonal adjust value to be manually changed.** For example, if the seasonal adjust value shown on the controller was 50% when the Solar Sync sensor was removed, it will remain 50% until the Solar Sync sensor is uninstalled.

To uninstall the Solar Sync sensor, simply disconnect the green and black wires from the controller terminal and then turn the dial to the “Solar Sync Settings” position. The display should show dashes, indicating that the controller no longer recognizes the Solar Sync sensor for calculation of seasonal adjustment. Now the seasonal adjust value can be changed manually by turning the knob to the “Seasonal Adjust” position and using the \oplus or \ominus button to adjust the value.

CONNECTING A HUNTER SOLAR SYNC ET SENSOR

Calibration/Setup

After Solar Sync has been installed and programmed, it is recommended to allow the system to run for a few days at the initial setting. Because of the variety in site conditions (including sensor location, amount of direct sunlight available to the sensor, reflective heat from surrounding structures, etc), **the initial setting may require adjustment in order to arrive at the desired performance.** The calibration of the Solar Sync to a particular site can easily be accomplished by adjusting the Region and/or Water Adjustment settings. The instructions below outline this process:

1. Install Solar Sync sensor
2. Program Region and allow system to operate at initial setting for a minimum of 3 days (see page 13 for instructions on how to determine proper Region setting).
3. Observe the Seasonal Adjust on the controller. If the Seasonal Adjust amount appears to be lower or higher than expected for that time of year, the Solar Sync settings need to be adjusted.
 - a. **Seasonal Adjust too low:** Turn the dial to the Solar Sync settings position. Increase the value on the Water Adjustment scale (10 is max). Once the setting is changed, the controller will immediately be updated with the new Seasonal Adjust %. Increase the Water Adjustment setting until the desired Seasonal Adjust % is shown. **If you max out the Water Adjustment scale at 10 and still require more Seasonal Adjust, move down to the next lower Region (from Region 4 to 3, for example).**
 - b. **Seasonal Adjust too high:** Turn the dial to the Solar Sync settings position. Decrease the value on the Water Adjustment scale (default setting is 5). Once the setting is changed, the controller will immediately be updated with the new Seasonal Adjust %. Decrease the Water Adjustment setting until the desired Seasonal Adjust % is shown. **If you minimize the Water Adjustment scale down to 1 and still require a reduction in Seasonal Adjust, move up the next Region (from Region 2 to 3, for example).**

Station Run Times: It is important to understand that Solar Sync provides a global seasonal adjustment to the controller. This means that all station run times will be modified by the seasonal adjust percentage shown. When programming the controller, the run times should be entered that represent peak season watering schedules. If the Solar Sync is adjusting to the appropriate seasonal adjust value but the run time for a particular station appears to be too long/short, adjust the station run time in the controller program.

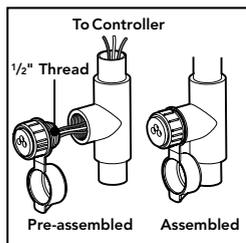
CONNECTING A HUNTER REMOTE

Connecting to a Hunter Remote (not included)

The X-Core Controller is compatible with Hunter Remote Controls (not included). The SmartPort® wiring harness (included with all Hunter Remotes) allows for fast and easy use of the Hunter controls. The Hunter remotes make it possible for you to operate the system without having to walk back and forth to the controller.

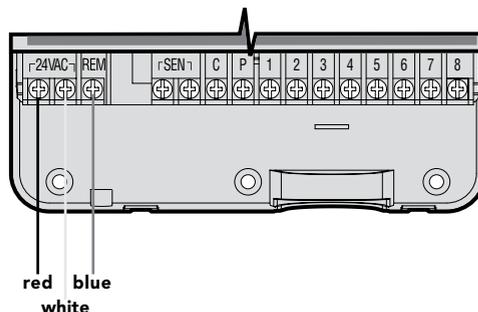
To install the SmartPort connector

1. Install a ½" female threaded "Tee" in the field wiring conduit approximately 12" below the X-Core.
2. Feed the red, white, and blue wires of the harness through the base of the "Tee" and into the wiring compartment as shown.
3. Screw the SmartPort harness housing into the "Tee" as shown.

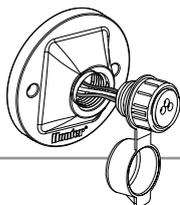


4. Attach the red, white, and blue SmartPort wires to the controller terminal as shown below:

- Red wire to left side "24VAC" terminal
- White wire to right side "24VAC" terminal
- Blue wire to "REM" terminal



NOTE: P/N 258200 can be used as an alternate method to mount the SmartPort connector.



POWER FAILURES

Due to the possibility of power failures, the controller has non-volatile memory. Programmed information will never be lost due to a power outage. The lithium battery will keep the correct time without AC power. Normal watering will resume when AC power is restored.

PROGRAMMING THE CONTROLLER

The X-Core display shows the time and day when the controller is idle. The display changes when the dial is rotated to indicate the specific programming information to enter. When programming, the flashing portion of the display can be changed by pressing the **+** or **-** buttons. To change something that is not flashing, press the **◀** or **▶** buttons until the desired field is flashing.

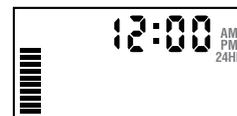
Three programs A, B, and C, each with the ability to have four daily start times, permit plants with different watering requirements to be separated on different day schedules.

Setting the Date and Time 🕒

1. Turn the dial to the **CURRENT TIME/DAY** position.
2. The current year will be flashing. Use the **+** or **-** buttons to change the year. After setting the year, press the **▶** button to proceed to setting the month.
3. The month and day will be in the display. The month will be flashing and the **1-12** icon will be displayed. Use the **+** or **-** buttons to change the month. Press the **▶** button to proceed to setting the day.
4. The day will be flashing and the **1-31** icon will be displayed. Use the **+** or **-** buttons to change the day. Press the **▶** button to proceed to setting the time.
5. The time will be displayed. Use the **+** and **-** buttons to select AM, PM, or 24 hour. Press the **▶** button to move to hours. Hours will be flashing. Use the **+** and **-** buttons to change the hour shown on the display. Press the **▶** button to move to minute. Minutes will be flashing. Use the **+** and **-** buttons to change the minutes shown on the display. The date, day, and time have now been set.



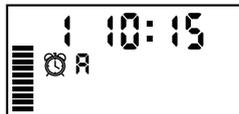
NOTE: A basic programming rule is that whatever symbol or character is flashing will be the item programmed. For instance, if the hour is flashing when setting the time, the hour can be changed or programmed. For illustration purposes in this manual, flashing characters are in GRAY type.



PROGRAMMING THE CONTROLLER

Setting the Program Start Time(s)

1. Turn the dial to the **START TIMES** position.
2. The factory preset is set on program A. If necessary, you can select program B, or C by pressing the **PRG** button.
3. Use the **+** or **-** button to change the start time. (The start times advance in 15 minute increments).
4. Press the **▶** button to add an additional start time, or **⏸** button for the next program.

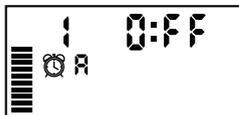


NOTE: One start time will activate all stations sequentially in that program. This eliminates the need to enter each station's start time. Multiple start times in a program can be used for separate morning, afternoon, or evening watering cycles. Start times may be entered in any order. The X-Core will automatically sort them.



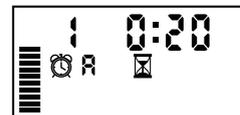
Eliminating a Program Start Time

With the dial set to **START TIMES** position, push the **+** or **-** button until you reach 12:00 AM (Midnight). From here push the **-** button once to reach the OFF position.



Setting Station Run Times

1. Turn the dial to **RUN TIMES** position.
2. The display will show the last program selected (A, B, or C), the station number selected,  icon, and the station will be flashing. You can switch to another program by pressing the **PRG** button.
3. Use the **+** or **-** button to change the station run time on the display. You can set the run times from 0 to 4 hours.
4. Press the **▶** button to advance to the next station.



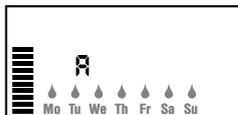
Setting Days To Water

1. Turn the dial to the **WATER DAYS** position.
2. The display will show the last program selected (A, B, or C). You can switch to another program by pressing the **PRG** button.
3. The controller will display the seven days of the week (MO, TU, WE, TH, FR, SA, SU). Each day will have a  icon or a  icon above the day. The  icon would represent an "On" water day, while a  icon would represent an "Off" watering day.



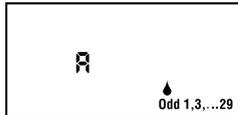
PROGRAMMING THE CONTROLLER

Selecting Specific Days of the Week to Water

1. With the  cursor on a specific day (the cursor will always start with MO), press the  button to activate a particular day of the week to water. Press the  button to cancel watering for that day. After pressing a button the cursor automatically advances to the next day.

2. Repeat step 1 until all desired days have been selected. The selected days will show a  to indicate their status is ON. The last  is the last day of watering for that program.

Selecting Odd or Even Days to Water

This feature uses numbered day(s) of the month for watering instead of specific days of the week (odd days: 1st, 3rd, 5th, etc.; even days: 2nd, 4th, 6th, etc.).

1. With the  cursor on SU press the  button once. The  icon and odd will be displayed.

2. If odd day watering is desired, turn the dial back to the run position.

3. If even day watering is desired, press the  button once. The  icon and **EVEN** will be displayed. You can move back and forth from **ODD** to **EVEN** by pressing the  and  buttons.

Selecting Interval Watering

With this option you can select interval watering from 1 to 31 days.

1. With the cursor on **EVEN**, press the  button once and the  icon will appear and a 1 flashing in the display. Interval watering schedule appears on the display.

2. Press the  or  button to select the number of days between watering days (from 1 to 31 days). This is called the interval.

The controller will water the selected program at the next start time and will then water at the interval programmed.



NOTE: The 31st of any month and February 29th are always "off" days if Odd watering is selected.

PROGRAMMING THE CONTROLLER

Setting Event Day(s) Off

The X-Core allows you to program a No Water Day(s). This feature is useful to inhibit watering on specific day(s). For example, if you always mow the lawn on Saturdays, you would designate Saturday as a **No Water Day** so that you are not mowing wet grass.

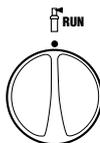
1. Turn the dial to the **WATER DAYS** position.
2. Enter an interval watering schedule as described on page 19.
3. Press the ► button to scroll to the **No Water Days** at the bottom of the display. **MO** will be flashing.
4. Use the ► button until the cursor is at the day of the week you wish to set as a No Water Day.
5. Press the ■ button to set this day as a no water day. The ☑ will illuminate over this day.
6. Repeat steps 4 and 5 until all desired event day(s) are off.



NOTE: You also have the option in the interval watering schedule to program **Odd or Even days off**.

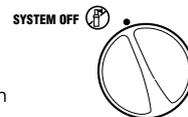
Automatic Watering

After programming the X-Core, set the dial to the **RUN** position to enable automatic execution of all selected watering programs and start times.



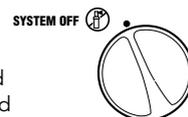
System Off

Valves currently watering will be shut off after the dial is turned to the **SYSTEM OFF** position for two seconds. All active programs are discontinued and watering is stopped. To return the controller to normal automatic operation, simply return the dial to the **RUN** position.

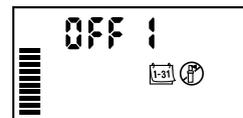


Programmable Rain Off

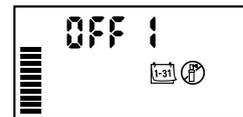
This feature permits the user to stop all programmed waterings for a designated period from 1 to 7 days. At the end of the programmed rain off period, the controller will resume normal automatic operation.



1. Turn the dial to the **SYSTEM OFF** position. Wait for **OFF** to be displayed.
2. Press the ■ button as many times as needed to set the number of days off (up to 7 days).
3. Turn the dial back to the **RUN** position at which **OFF**, a number, the  and  icons will be displayed.



The days off remaining will decrease at midnight each day. When it goes to zero, the display will show normal time of day and normal irrigation will resume at the next scheduled start time.

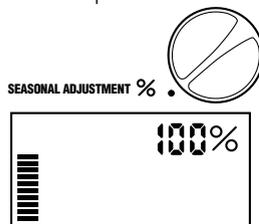


PROGRAMMING THE CONTROLLER

Seasonal Adjustment %

Seasonal Adjustment is used to make global run time changes without re-programming the entire controller. To use the Seasonal Adjustment feature:

1. Turn the dial to the **SEASONAL ADJUSTMENT** position.
2. The display will now show a flashing number followed by a %, as well as the bar graph which always remains on the display. Press the **+** or **-** button to adjust the percentage of the seasonal adjustment. Each bar on the graph represents 10%. This feature can adjust the controller from 10% to 150% of the original program.



To view the adjusted run times, simply turn the dial to the **RUN TIMES** position, the displayed run time will be updated accordingly as the seasonal adjustment is made.



NOTE: The controller should always be initially programmed in the 100% position.

When using a Hunter “Clik” weather sensor, the Seasonal Adjustment value can be adjusted as described.

When using the Solar Sync ET sensor, the Seasonal Adjustment value is automatically updated daily based on the Solar Sync sensor. The Solar Sync ET sensor measures weather patterns, determines the optimal Seasonal Adjustment value, and then updates the controller on a daily basis. This value can be overridden manually by pressing the **+** or **-** buttons to the desired Seasonal Adjustment value. **However, it is important to understand that the manually adjusted Seasonal Adjustment value will be replaced at midnight by the new updated value from the Solar Sync sensor.**

To revert to a manually adjusted mode, the Solar Sync sensor must be uninstalled. See page 14 for instructions on how to uninstall the Solar Sync sensor.

PROGRAMMING THE CONTROLLER

Manually Run a Single Station

1. Turn dial to **MANUAL – ONE STATION** position.
2. Station run time will flash in the display. Use the  button to move to the desired station. You may use the  or  button to select the amount of time for a station to water.
3. Turn the dial clockwise to the RUN position to run the station (only the designated station will water, then the controller will return to automatic mode with no change to the previously set program). Also see **One Touch Manual Start and Advance**.

MANUAL-ONE STATION 



One Touch Manual Start and Advance

You can also activate all stations to water without using the dial.

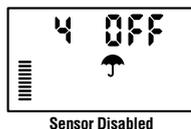
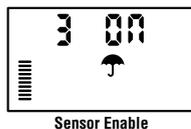
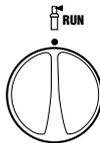
1. Hold down the  button for 2 seconds.
2. This feature automatically defaults to program A. You can select program B or C by pressing the  button.
3. The station number will be flashing. Press the  button to scroll through the stations and use the  or  button to adjust station run times. (If no buttons are pressed for a few seconds during step 2 or 3, the controller will automatically begin watering).
4. Press the  button scroll to the station you wish to begin with. After a 2 second pause, the program will begin. At any time during the manual cycle, you can use the  or  buttons to navigate from station to station manually.

ADVANCED FEATURES

Programmable Sensor Override

The X-Core allows the user to program the controller so that the sensor disables watering on only desired stations. For example, patio gardens that have pots under overhangs and roofs may not receive water when it rains and will continue to need to be watered during periods of rain. To program sensor override:

1. Turn the dial to the **RUN** position.
2. Press and hold the  button down while turning the dial to **START TIMES** position.
3. Release the  button. At this point, the display will show the station number, ON, and the  icon, will be flashing.
4. Press the  or  button to enable or disable the sensor for the station shown.
ON = Sensor enabled
(will suspend irrigation)
OFF = Sensor disabled (will allow watering)
5. Use the  or  buttons to scroll to the next station that you would like to program the sensor override.



NOTE: The controller default is for the sensor to disable watering on all zones when rain occurs.

When the X-Core receives an input from the sensor to disable watering, the display will indicate those stations that have been programmed to override the sensor. A station that is running in the sensor override mode will flash the  and  icons alternately.

Test Program of All Stations

The X-Core allows the user a simplified method for running a test program. This feature will operate each station in numerical sequence, from the lowest to the highest.

1. With the dial in the **RUN** position, press and hold the  button. The station number will be displayed and the time will be flashing.
2. Use the  or  buttons to set the run time from 1 to 15 minutes. The run time needs to be entered only once.
3. After a 2 second pause, the test program will start.

Hunter Quick Check™ Diagnostics

This feature allows you to quickly diagnose wiring problems with your controller. Instead of having to check each field wiring circuit for potential problems, you can use the Hunter Quick Check circuit test procedure. To initiate the Quick Check test procedure:

1. Press the , , , and  buttons simultaneously. In the standby mode, the LCD will display all segments.
2. Press the  button once to begin the Quick Check procedure. Within seconds, the system searches all stations for detecting any circuit problems. When a field wiring short is detected, an ERR symbol preceded by the station number will momentarily flash on the display. After the Quick Check completes running the circuit diagnostic procedure, the controller returns to the automatic watering mode.

ADVANCED FEATURES

Easy Retrieve™ Program Memory

The X-Core is capable of saving the preferred watering program into memory for retrieval at a later time. This feature allows for a quick way of resetting the controller to the original programmed watering schedule.

To save the program into the memory

1. With the dial in the **RUN** position, press and hold the **+** and **PRG** buttons for 5 seconds. The display will scroll three segments  from left to right across the display indicating the program is being saved into memory.
2. Release the **+** and **PRG** buttons.

To retrieve a program that was previously saved into memory.

1. With the dial in the **RUN** position, press and hold the **-** and **PRG** buttons for 5 seconds. The display will scroll three segments  from right to left across the display indicating the program is being saved into memory.
2. Release the **-** and **PRG** buttons.

Programmable Delay Between Stations

This feature allows the user to insert a delay between stations between when one station turns off and the next one turns on.

1. Start with the dial in the **RUN** position.
2. Press and hold the **-** button down while turning the dial to the **RUN TIMES** position.
3. Release the **-** button. At this point the display will show a delay time for all stations in seconds, which will be flashing.
4. Press the **+** or **-** buttons to increase or decrease the delay time between 0 and 4 hours.
5. Return the dial to the **RUN** position.

Clearing the Controller's Memory/Resetting the Controller

If you feel you have misprogrammed the controller, there is a process that will reset the memory to the factory defaults and erase all programs and data that have been entered into the controller.

1. Press and hold the **PRG** button.
2. While holding the **PRG** button press the RESET button for 3 seconds, then release the RESET button while continuing to hold the **PRG** button.
3. Continue holding **PRG** button until time is displayed (this takes about 8 seconds).

TROUBLESHOOTING GUIDE

Problem	Causes	Solutions
The controller is continuously watering	Too many start times have been programmed	Only one start time is necessary to activate a program (refer to Setting the Program Start Times on page 18)
There is no display	Check AC power wiring	Correct any errors
The display reads "No AC"	There is no AC power present (the controller is not receiving any power)	Check to see if the transformer is properly installed
Display reads "Off,   "	The rain sensor is interrupting irrigation or the sensor jumper has been removed	Slide the rain sensor bypass switch to the BYPASS position to bypass the rain sensor circuit, or reinstall the jumper
Rain sensor will not shut off the system	<ul style="list-style-type: none"> • Defective rain sensor • Jumper was not removed when sensor was installed • Stations have been programmed to override the sensor 	<ul style="list-style-type: none"> • Verify operation of rain sensor and proper wiring • Remove jumper from the sensor terminals • Reprogram the sensor override to enable the sensor (see page 11)
Frozen display, or showing incorrect information	Power surge	Reset the controller per page 24 "Clearing Controller Memory/Resetting the Controller"
Display shows "ERR" with a number (1 to 8)	Short in valve wiring circuit, or faulty solenoid on the station number indicated	Check wire circuit or solenoid for the valve number indicated. Repair short or replace solenoid. Press any button to clear the "ERR" from the display
Display shows "P ERR"	<ul style="list-style-type: none"> • Faulty pump relay or master valve wiring • Incompatible or defective relay or solenoid • Under sized wire to the pump relay or master valve 	<ul style="list-style-type: none"> • Check wiring to relay or master valve solenoid. Press any button to clear the "P ERR" from the display • Check electrical specification for the pump relay. Do not exceed controller's electrical rating. Replace if defective • Replace wire with larger gauge wire

TROUBLESHOOTING GUIDE

Problem	Causes	Solutions
Display shows a station is running but the ☂ and ⚙ icons are flashing	The sensor is interrupting irrigation, however the station has been programmed to override the sensor	Check the sensor override status (see page 23)
Automatic irrigation does not start at the start time and controller is not in the System Off mode	<ul style="list-style-type: none"> • AM/PM of time of day not set correctly • AM/PM of start time not set correctly • Start Time is disabled (set for Off) • Controller is not receiving AC power 	<ul style="list-style-type: none"> • Correct AM/PM of time of day • Correct AM/PM of start time • See Setting Program Start Times (see page 18) • Check AC power connections
The display shows dashes when the dial is in the Solar Sync Settings position	<ul style="list-style-type: none"> • The Solar Sync sensor is not connected to the controller • The Solar Sync sensor wires may have a break in them or a bad connection 	Connect the Solar Sync to the “SEN” positions on the wiring terminal. The display will then show the Region and Water Adjustment setting.
Run times for a particular station are too short/too long when using a Solar Sync sensor	Program Run Time too long/short	Solar Sync provides a global seasonal adjustment to the controller. If a particular station has run times too long or too short, make the appropriate adjustment to the program in the controller. Make sure to change seasonal adjust back to 100% before making changes to program run times. Do this by turning the dial to the Seasonal Adjust position and increasing/decreasing the value to 100%.
Seasonal Adjust seems low	<ul style="list-style-type: none"> • Region too high • Water Adjustment too low • Location of Sensor does not allow for full sun 	Increase the value on the Water Adjustment scale (the default setting is 5). If you max out on the Water Adjustment scale at 10 and still require more seasonal adjustment, move down one Region (from 4 to 3, for example) and start at Water Adjustment setting 5. Solar Sync will immediately update the Seasonal Adjust on the controller. If it is still too high, repeat the adjustment until the desired seasonal adjust is showing on the controller.

TROUBLESHOOTING GUIDE

Problem	Causes	Solutions
Seasonal Adjust seems high	<ul style="list-style-type: none"> • Region too low • Water Adjustment setting too high 	Decrease the value of the Water Adjustment setting. If you minimize the Water Adjustment scale at 1 and still require reduced seasonal adjustment, move up one Region (from 2 to 3, for example) and start at Water Adjustment setting 5. Solar Sync will immediately update the Seasonal Adjust on the Controller. If it is still too high, repeat the adjustment until the desired seasonal adjust is showing on the controller.
Solar Sync still sending Seasonal Adjust when Controller Bypass switch is in the "Bypass" position	Solar Sync's automated Seasonal Adjustment cannot be de-activated by the Bypass switch. The Bypass switch only controls the Rain/Freeze shutoff function of the Solar Sync.	
After removing the Solar Sync sensor from the controller, the seasonal adjust value cannot be changed manually	The Solar Sync sensor needs to be uninstalled if permanently removing it from the controller	After removing the Solar Sync sensor from the controller, turn the knob to Solar Sync Settings. The screen should show dashed lines. The sensor is now uninstalled (see page 14).
Display shows "no SS"	<ul style="list-style-type: none"> • Solar Sync sensor has been disconnected from controller but not uninstalled • Wiring connection from Solar Sync connection is faulty 	<ul style="list-style-type: none"> • Check Solar Sync sensor wiring connection to controller • Uninstall Solar Sync sensor if intent is to permanently remove sensor from controller (see page 14)

SPECIFICATIONS

Operating Specifications

- Station Run Times: 0 to 4 hours in 1-minute increments
- 3 Independent Watering Programs
- Start Times: 4 per day per program for up to 12 daily starts
- Watering Schedule: 365-day calendar, interval watering, odd/even watering
- AM/PM, 24-hour clock
- Simple manual operation
- Sensor override by station
- Programmable rain delay (1 to 7 days)
- Manual Seasonal Adjustment (10% to 150%)
- Automatic Seasonal Adjustment using Solar Sync sensor
- Sensor bypass switch
- X-Core-x00i for indoor use. X-Core-x00 for outdoor use
- Sea level to 6500 ft (2000 m) at -13° F to 140° F (-25° C to 60° C)

Dimensions

Indoor Cabinet

- Height: 6.5" (16.5 cm)
- Width: 5.75" (14.6 cm)
- Depth: 2" (5 cm)

Outdoor Cabinet

- Height: 8.625" (22 cm)
- Width: 7" (17.8 cm)
- Depth: 3.75" (9.5 cm)

Electrical Specifications

- Transformer input 120VAC $\pm 10\%$ 60 Hz (230VAC $\pm 10\%$ 50/60 Hz International Models)
- Transformer Output: 24VAC 1.0 amp
- Station Output: 0.56 amps per station
- Maximum Output: 0.90 amps (includes master valve)
- Battery: 3 V Lithium (included) used for remote programming and backup timekeeping. Use CR2032 3-volt.
- Electronic short circuit protection
- Non-volatile memory for program data
- UL Listed
- Model X-Core-x00 has an IP2X Rating
- Clean only with a cloth dampened with mild soap and water

Explanation of Symbols

~ = AC

 = Consult Documentation

 = Hazardous Voltages Present

 = Ground

CERTIFICATE OF CONFORMITY TO EUROPEAN DIRECTIVES

Hunter Industries declares that the irrigation controller Model X-Core complies with the standards of the European Directives of "electromagnetic compatibility" 87/336/EEC and "low voltage" 73/23/EEC.


Project Engineer

This product should not be used for anything other than what is described in this document. This product should only be serviced by trained and authorized personnel.

FCC part 15:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Hunter®

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Winterizing Your Tree

Mulching around trees is one of the most important things you can do to maintain their health through the winter. The mulch slows moisture loss while protecting the roots from rapid soil temperature change. It is best to put 3" – 4" of mulch around the base of the tree. Do not allow it to touch the tree so you don't promote fungus and mold on the tree.

If there has been little precipitation, give trees a **GOOD DEEP SOAKING OF WATER** just before the ground freezes in the fall.

Lightly prune and dead or weak branches.

Apply a fertilizer in early fall that has low amounts of nitrogen but high amounts of phosphorus and potassium. Do not fertilize young transplants until spring.