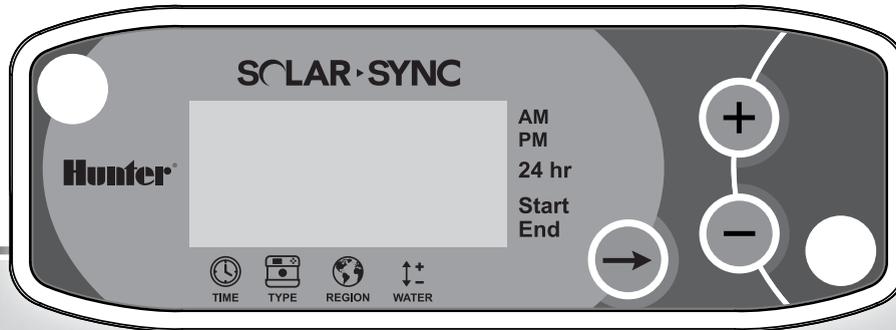


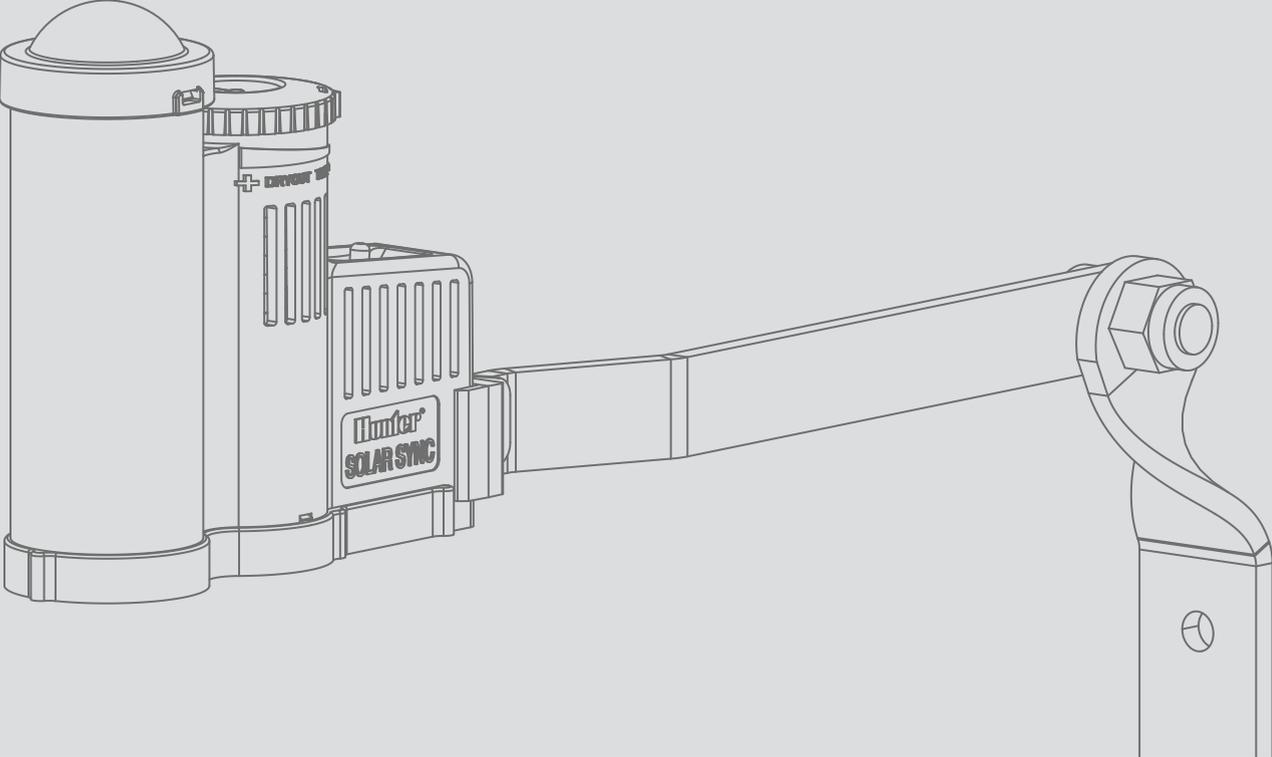
# SOLAR SYNC

ET Sensor and Module for Compatible Hunter Controllers



Owner's Manual and Programming Instructions

**Hunter**<sup>®</sup>



# TABLE OF CONTENTS

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Introduction .....	1
System Overview and Operation .....	2
System Installation .....	3-8
Programming Your Controller .....	9
Programming the Solar Sync Module .....	10-12
Calibration / Setup Period .....	13
Troubleshooting Guide .....	14
Specifications / Dimensions / FCC Notice .....	15
Certificate of Conformity to European Directives .....	16

## INTRODUCTION

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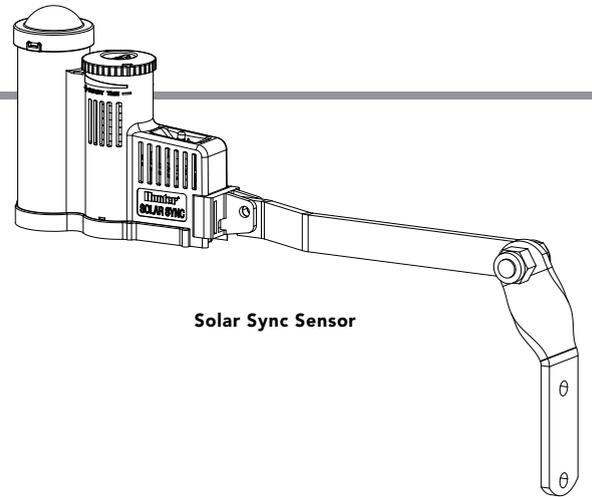
The Solar Sync is a sensor system that, when connected to a compatible Hunter controller, will automatically adjust your controller watering based upon changes in local climate conditions. The Solar Sync utilizes a solar and temperature sensor to measure on-site weather conditions used to determine evapotranspiration (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.

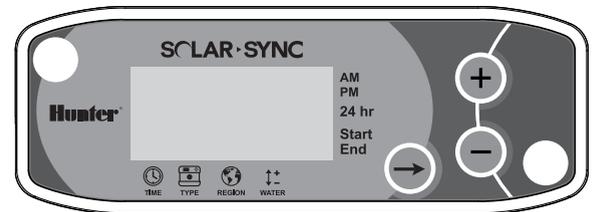
## SYSTEM OVERVIEW AND OPERATION

The Solar Sync System is simply and easily installed on any compatible Hunter irrigation controller (see controller Owner's Manual to verify compatibility). The System consists of the sensor that is placed in an area where it can receive full sun and rain. The module is installed next to or inside your Hunter controller. The Solar Sync sensor measures solar radiation and temperature and calculates the daily evapotranspiration (ET) factor for irrigation. This represents the amount of water lost by the plants due to local climatic conditions, which needs to be replaced by irrigation. The Solar Sync sensor also includes a Hunter Rain-Click™ rain sensor that will automatically shut down the irrigation system during rain events, thus preventing unwanted irrigation when it is raining.

Enter a mid summer watering program in your controller per the programming instructions in the Owner's Manual provided with your controller. The Solar Sync module receives data from the sensor and applies it daily to the controller's water schedule by adjusting the controller's programmed irrigation run times through the seasonal adjustment feature in the controller.



**Solar Sync Sensor**



**Solar Sync Module**

# SYSTEM INSTALLATION

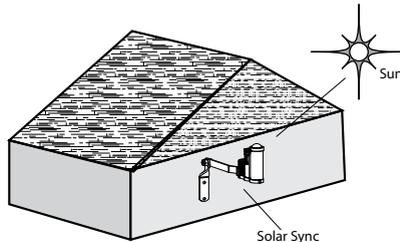
## Installing the Sensor

Using the screws provided, mount the Solar Sync sensor on any surface where it will be exposed to unobstructed sun and rainfall, but not in the path of sprinkler spray. The sensor needs to be oriented upright and the swivel bracket can be moved for mounting on angled surfaces. Loosen the locknut and screw before swiveling the bracket and then retighten. The Solar Sync sensor is designed to be wired directly to the Solar Sync module and not to the sensor terminals inside the controller. The Solar Sync sensor is supplied with 40 ft./12 m of wire, however, additional wire can be added to the sensor to a maximum of 200 ft./60 m (18 AWG/1 mm diameter minimum).

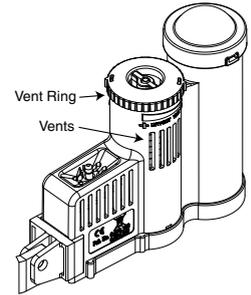


**Note:** Place Solar Sync sensor where it can receive full sun.

Attach the **Green** and **Black** wires from the sensor to each of the corresponding **Green** and **Black** wires from the module. It is recommended that these connections be made inside the controller cabinet, if mounted outdoors. Use waterproof wire connectors if the wire connection is installed outside.



The Rain-Clik™ will keep the irrigation from starting or continuing during rainfall. No adjustment or calibration is required for the Rain-Clik™ sensor. The Rain-Clik™ uses patented Quick Response™ technology that will shut the system off during the first few minutes of rain. The only adjustment that is necessary is the vent ring that will either slow down or speed up the time at which the sensor dries out and the system is turned back on. Opening the vent will speed up the dry out time and closing the vents will slow down the dry out time.



In addition, the Solar Sync's built-in temperature sensor provides system shutdown when freezing conditions occur. At approximately 37° degrees/3°C and below the Solar Sync module will command the controller to shut down. A "sensor off" indication will be displayed on your controller when the sensor is active. When temperatures rise above 37 degrees/3°C, automatic irrigation will be activated.



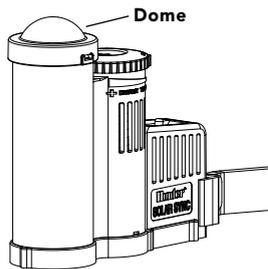
## Sensor Fault Message

If the Solar Sync module shows Err, check the connections between the module and the sensor.

# SYSTEM INSTALLATION

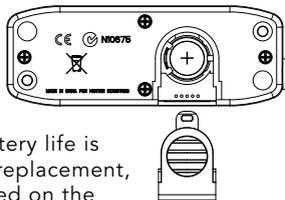
## Maintaining the Sensor

The Solar Sync sensor is designed for outdoor use, but must be kept clean to function correctly. Wiping the clear dome covering the solar radiation sensor every 6 months is recommended. Do not use harsh chemicals or abrasives on the clear dome.

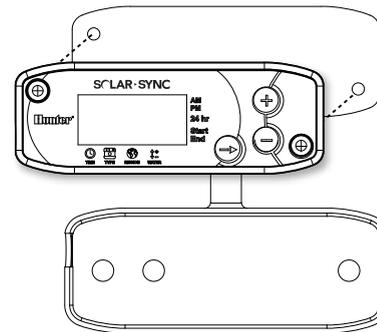


## Installing and Wiring the Module

Begin by activating the CR2032 backup battery (used for date/time backup in the event of a power outage) by pulling the battery insulator at the bottom of the module. The expected battery life is ten years. If the battery requires replacement, the battery compartment is located on the back of the Solar Sync module. Remove the cover and install the battery with the positive side (+) of the battery visible, facing toward you. Replace the battery cover. Replace battery with CR2032 type battery only. Use of another battery may present a risk of fire or explosion.



The Solar Sync module is designed to be wall-mounted next to the irrigation controller. A rubber cover is provided for outdoor installations to protect the module from the weather. Use two anchors or self-tapping screws to secure the module to the wall. Place the rubber cover mounting tab behind the module before screwing the module to the wall.



## Bypassing the Sensor

If the Rain Sensor or Freeze Sensor is preventing system operation, SENSOR OFF will be displayed on the controller's display. Simply move the Bypass switch on the controller to **BYPASS** and the Solar Sync's Rain and Freeze Sensor will be bypassed. This allows you to operate your system. The Solar Sync will continue to make adjustments to your controller's watering schedule.

The controller's Rain Sensor switch should be in the **ACTIVE** position for the Rain Sensor and Freeze Sensor to interrupt watering during rainy and/or freezing conditions.

 **CAUTION: Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.**

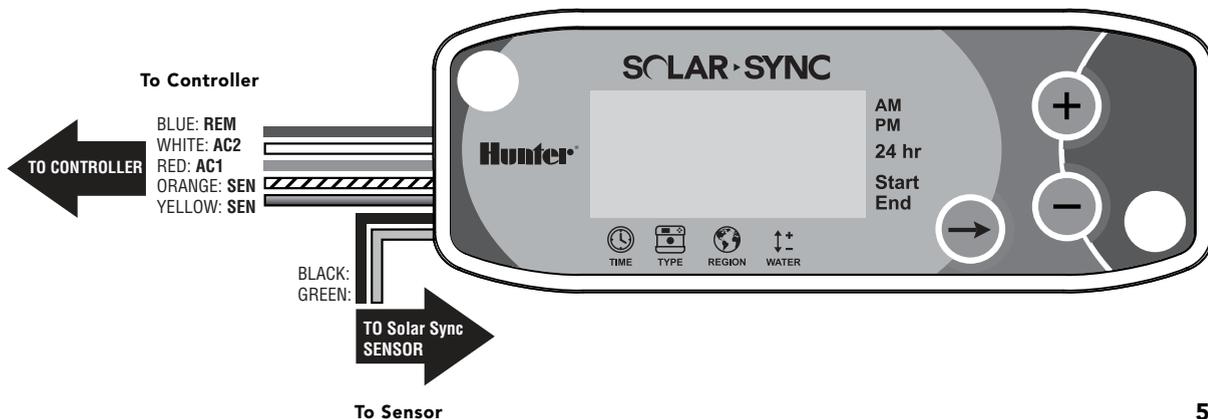
# SYSTEM INSTALLATION

## Installing the Solar Sync Module

Turn off AC power to the irrigation controller, before connecting the Solar Sync module to the controller. The 7-conductor cord extends through the left side of the module and is color-coded to simplify wiring connections.

Wire from module	Attach wire to:
Red	24 VAC (AC terminal 1)
White	24 VAC (AC terminal 2)
Blue	Remote terminal (REM)
Yellow	Sensor terminal (SEN)
Orange	Sensor terminal (SEN)
Green	Solar Sync sensor (green wire)
Black	Solar Sync sensor (black wire)

Solar Sync Module Wiring Connections

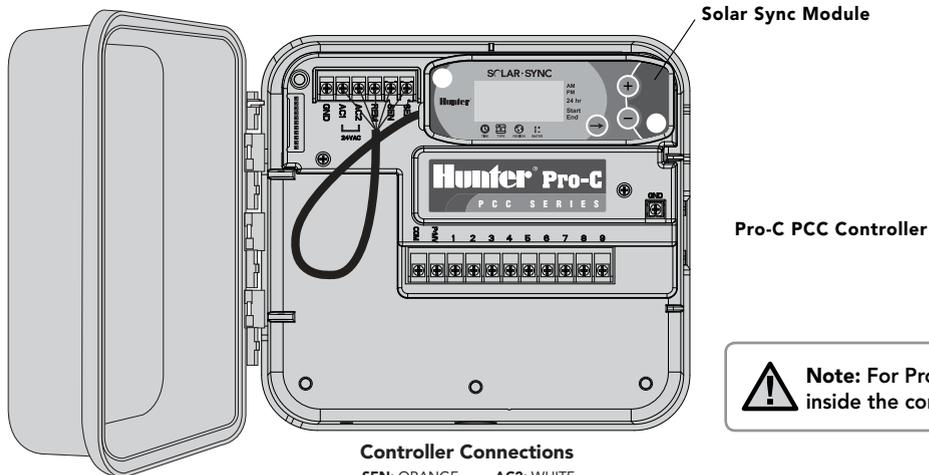


# SYSTEM INSTALLATION

## Pro-C Conventional Controller Connection (PCC Series)

The PCC series version of the Pro-C is designed so that the Solar Sync module can be installed inside the controller cabinet. Use the two screws provided to mount the module as shown in the diagram.

1. Connect the **red** wire from the Solar Sync module to the AC1 terminal.
2. Connect the **white** wire from the Solar Sync module to the AC2 terminal.
3. Connect the **blue** wire from the Solar Sync module to the REM terminal.
4. Remove the flat metal jumper from the two SEN terminals.
5. Connect the **yellow** wire to one of the SEN terminals.
6. Connect the **orange** wire to the other SEN terminal.



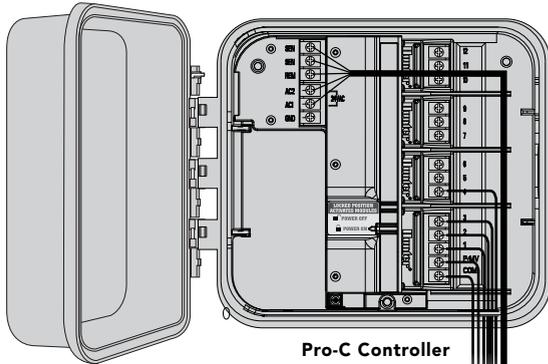
### Controller Connections

SEN: ORANGE      AC2: WHITE  
SEN: YELLOW      AC1: RED  
REM: BLUE



**Note:** For Pro-C PCC Series controllers, there are provisions inside the controller to mount the Solar Sync module.

# SYSTEM INSTALLATION



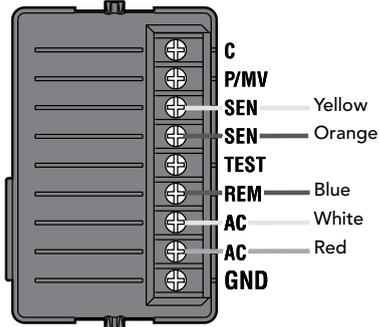
## Pro-C Controller (PC Series)

For the PC series Pro-C Modular controller, mount the Solar Sync module on the wall next to the controller cabinet. There is an additional knockout on the right side of the controller cabinet to route Solar Sync wires into and out of the cabinet.

1. Connect the **red** wire from the Solar Sync module to the AC1 terminal.
2. Connect the **white** wire from the Solar Sync module to the AC2 terminal.
3. Connect the **blue** wire from the Solar Sync module to the REM terminal.
4. Remove the flat metal jumper from the two SEN terminals.
5. Connect the **yellow** wire to one of the SEN terminals.
6. Connect the **orange** wire to the other SEN terminal.



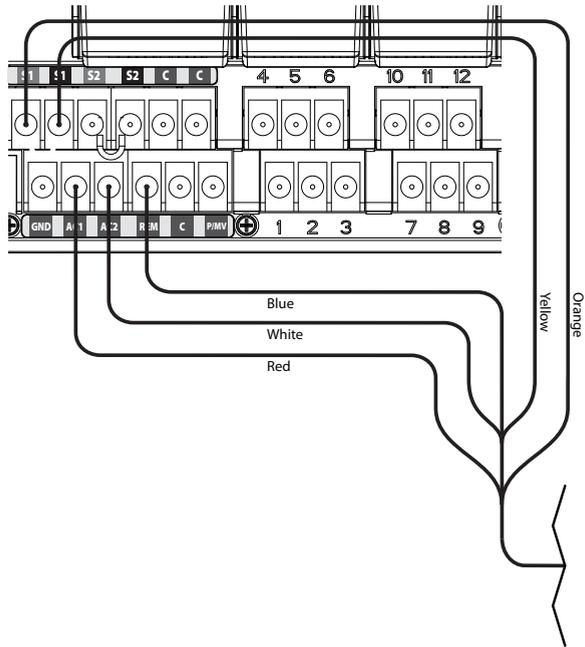
## ICC Power Module



## ICC Controller

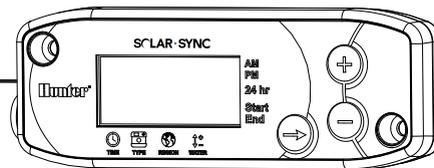
1. Connect the **red** wire from the Solar Sync module to the AC1 terminal.
2. Connect the **white** wire from the Solar Sync module to the AC2 terminal.
3. Connect the **blue** wire from the Solar Sync module to the REM terminal.
4. Remove the flat metal jumper from the two SEN terminals.
5. Connect the **yellow** wire to one of the SEN terminals.
6. Connect the **orange** wire to the other SEN terminal.

# SYSTEM INSTALLATION



## I-Core Controller

1. Connect the **red** wire from the Solar Sync module to the AC1 terminal on the controller.
2. Connect the **white** wire from the Solar Sync module to the AC2 terminal on the controller.
3. Connect the **blue** wire from the Solar Sync module to the REM terminal on the controller.
4. Remove the jumper wire from the sensor terminal pair. It doesn't matter which pair you use, S1 and S1, S2 and S2, etc.
5. Connect the **yellow** and **orange** wires from the module to a sensor terminal pair.



Solar Sync Module

# PROGRAMMING YOUR CONTROLLER

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Program your Hunter controller as specified in the Owner's Manual. **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%.



**Note: Set station run times for peak summer watering with seasonal adjustment set at 100%.**

## Making Adjustments

After programming the Solar Sync module and your controller, it is recommended that you leave it a few days to gather sun and temperature data. If necessary, there are two ways to make adjustments:

- If your landscape is wetter or drier than it should be, the watering adjustment feature on the Solar Sync module (see page 11) can be used to make global watering adjustments (see Troubleshooting Guide for more info).
- If you find an individual zone is wetter or drier than the rest of the site, simply increase or decrease the amount of run time entered in the controller for that station.
- When making adjustments to program run times, make sure to reset the seasonal adjust valve to 100%. Solar Sync will make the appropriate adjustment automatically based on measured weather conditions.

# PROGRAMMING THE SOLAR SYNC MODULE

The Solar Sync is simple to program. Only a few initial steps are necessary to program the module. When power is initially turned on, the display will show the time of day. Pressing the → button will sequence through the programming functions on the module. An arrow along the bottom of the display will indicate the function being programmed.



## Current Time

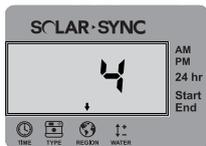
Press the → button until the arrow is displayed over the  icon. The time of day will be flashing. Use the + or - button to set the current time. The arrow to the right of the display indicates AM or PM.

**Note:** 24 hour mode will only be enabled with a 50 Hz power input.



## Controller Type

Press the → button until the arrow is displayed over the  icon. Use the + or - button to select the correct Hunter controller.



## Region

For accurate measurements, the Solar Sync module needs to be programmed for the typical ET (average July ET) for your region. Use the table on the next page to determine your region. Press the → button until the arrow is displayed over the  icon. Use the + or - button to select your region (regions 1 through 4).

# PROGRAMMING THE SOLAR SYNC MODULE

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.

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

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

# PROGRAMMING THE SOLAR SYNC MODULE



## Watering Adjustment $\updownarrow$

If you find that your landscape is “wetter” or “drier” than it should be, a watering adjustment function is provided to adjust watering equally to all stations. Use the  $\rightarrow$  button until the arrow is displayed over the  $\updownarrow$  icon. Use the  $+$  or  $-$  button to increase or decrease the amount of watering scaled 1 to 10 (1 for less water and 10 for more water). Hunter recommends observing performance carefully over the first weeks of operation before adjusting the watering.



**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.



## No Water Window

If required, the Solar Sync offers no water window capability that prevents any irrigation from occurring during a specific period of the day. The No Water Window is a hidden feature. Press and hold the  $\rightarrow$  button for 5 seconds to program the No Water Window.

An  $\rightarrow$  will be flashing at Start along the right side of the display. Use the  $+$  or  $-$  button to adjust the time you would like the no watering period to start. Pressing the  $\rightarrow$  button again will display an arrow flashing at End. Use the  $+$  or  $-$  button to adjust the time you would like the no watering period to end.

## CALIBRATION / SETUP PERIOD

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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 and program the module (as described in pages 10–12).
2. Allow system to operate at initial settings for a minimum of 3 days.
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** – 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).**
  - b. **Seasonal Adjust too high** – 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).**

**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.

# TROUBLESHOOTING GUIDE

Problem	Causes	Solutions
Controller shows "ERR" in display	<ul style="list-style-type: none"> <li>Module wires not properly connected to controller terminal</li> </ul>	Check the connection between module and controller and compare to wiring diagram in System Installation section of Owner's Manual.
Solar Sync module shows "ERR"	<ul style="list-style-type: none"> <li>Connection between module and sensor faulty</li> </ul>	Check connection between module and sensor (green and black wires).
Seasonal Adjust seems low	<ul style="list-style-type: none"> <li>Region too high</li> <li>Water Adjustment Setting too low</li> <li>Location of Sensor does not allow for full sun</li> </ul>	Make sure controller dial is in "RUN" position. Increase the value on the Water Adjustment scale (the default setting is 5). If you max out 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 at Water Adjustment setting 5. Solar Sync will immediately update the Seasonal Adjust on the controller. If it is still too low, repeat the adjustment until the desired seasonal adjust is showing on the controller.
Seasonal Adjust seems high	<ul style="list-style-type: none"> <li>Region too low</li> <li>Water Adjustment setting too high</li> </ul>	Make sure controller dial is in "RUN" position. Decrease value of the Water Adjustment setting. If you minimize the Water Adjustment scale at 1 and still require a reduced seasonal adjustment, move down up one Region (from 2 to 3, for example) and start at 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.
Rain or Freeze shutoff not activating	<ul style="list-style-type: none"> <li>Rain Sensor Bypass Switch on Controller set to "Bypass"</li> <li>Jumper Clip still on controller wiring terminal</li> </ul>	Set the Controller Bypass Switch in the "Active" position. Remove jumper clip.
Run times for a particular station are too short/too long	<ul style="list-style-type: none"> <li>Program Run Time too long/ too short</li> </ul>	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.
Solar Sync still sending Seasonal Adjust when Controller Bypass switch in the "Bypass" position	<ul style="list-style-type: none"> <li>Solar Sync's automated seasonal adjustment cannot be de-activated by the Bypass switch</li> <li>The Bypass switch only controls the Rain/Freeze shutoff function of the Solar Sync</li> </ul>	

# SPECIFICATIONS / DIMENSIONS / FCC NOTICE

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## Controller Compatibility

The Solar Sync is designed for use with Hunter Pro-C (PC or PCC series), I-Core and ICC controllers.

## Specifications

- Power Input: 24 VAC 50/60 Hz (from controller)
- Current draw: 25 mA @ 24 VAC
- Non-volatile memory
- Replaceable 10-year lithium battery: CR2032 (for backup timekeeping only)
- Max distance module from controller: 6 ft./2 m
- Max distance sensor to module: 200 ft./60 m
- Wiring: 18 AWG/1 mm or 20 AWG/0.8 mm diameter minimum from the sensor to the module
- UL Listed
- Direct burial and UV approved

## Dimensions

- Solar Sync Sensor: 3"H x 9"W x 1"D  
(7.6 cm x 22.9 cm x 2.5 cm)
- Solar Sync Module: 1-3/4"H x 5"W x 5/8"D  
(4.4 cm x 12.7 cm x 0.6 cm)

## FCC Notice

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.

# CERTIFICATE OF CONFORMITY TO EUROPEAN DIRECTIVES

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Hunter Industries declares that the irrigation sensor Solar Sync complies with the standards of the European Directives of "electromagnetic compatibility" 87/336/EEC and "low voltage" 73/23/EEC.

A handwritten signature in black ink, which appears to read "Peter W. Jayaram". The signature is written in a cursive style and is positioned above a horizontal line.

Project Engineer



# Hunter®

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