

# RAIN BIRD®



## ***STP Plus Controller Installation, Programming & Operation Guide***

**STP4PL • STP6PL • STP9PL**

# **Simple to Program Plus Controller**

## **Installation, Programming, and Operation Guide**

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# Safety and Regulatory Information

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## Symbols



**NOTE:** Symbol alerts the user to important operating, functionality, installation or maintenance instructions.



**WARNING:** Symbol alerts the user to the presence of electricity or electromagnetic energy which may constitute a risk of electric shock, radiation exposure or other hazard.



**CAUTION:** Symbol alerts the user to important instructions or conditions that could seriously affect irrigation effectivity or device operation.



**DIAL:** Symbol alerts user of requirement to turn the dial on the device to an appropriate setting in order to follow subsequent instructions.



**REPEAT:** Symbol indicates that a repetition of previous steps or actions may be required in order to continue or complete the process of programming the device.

## Safety Information



**WARNING:** Date and time are retained by a lithium battery which is to be disposed of in accordance with local regulations.

## Regulatory Information

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.



### Disposal of Electronic Waste

This symbol indicates that it is your responsibility to dispose of waste equipment (including batteries) by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your waste disposal service or the shop where you purchased the product.

**For technical assistance contact Rain Bird at 1-800-247-3782. Visit us on the web at [www.rainbird.com](http://www.rainbird.com)**

# Introduction

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## Welcome to Rain Bird

Thank you for Purchasing the Rain Bird Simple To Program Controller! In the following pages, you will find step by step instructions on how to use every function included in your STP Plus Controller. Thanks again and we hope you enjoy your new Controller.

## Controller Features

Rain Bird's Simple-to-Program (STP) controllers are indoor controllers that have 4, 6 or 9 zone capability. Custom irrigation schedules are entered for each zone to match specific irrigation needs.

Simple to use "At-a-Glance" programming displays all of the irrigation schedule information for each specific zone at the same time on the controller.

Key features of the STP Plus Controller:

- Independent zone control gives the flexibility to create individual, specific watering schedules for each zone.
- The STP Plus controller provides multiple start times per day (with user selectable offsets) on an individual zone basis.
- The Adjust Water feature allows the increase or decrease of irrigation run times for all zones quickly.
- In the event of a prolonged rain, the irrigation schedule can be delayed up to 72 hours using the controller's Rain Delay feature.
- The Water All and Water Zone buttons manually water all zones or a specific zone without impacting any zone's previously set schedule.
- To help manage water restrictions, the controller can be set up to only water on specific days of the week or "odd or even" days.
- The irrigation schedule is saved in the controller's non-volatile memory in case there is a power outage. Date and time are stored with an internal lithium battery for up to seven days.
- Extra 24 volt terminals are available on the terminal strip to allow attachment of a Wireless Rain Sensor (not included) or other powered accessories.

## Controller Functions

*This section is a guide to the displays, controls, and indicators on the STP Plus Controller.*

### 1 OFF

Turns off all watering features.

### 2 AUTO

Set dial here to run all programmed settings.

### 3 SET TIME

Set current time of day.

### 4 SET DATE

Set current date.

### 5 DISPLAY SCREEN

LCD displays program information and status.

### 6 WATER DAYS

Select which day(s) the displayed zone is watered.

### 7 CYCLES PER DAY

Select how many times per day the displayed zone is watered, and determines the delays between multiple start times.

### 8 ZONE OFF

Shuts off the displayed watering zone.

### 9 UP/DOWN ARROWS

Use UP/DOWN arrows on left or right to set time, date, run time, 1st start time, etc.

### 10 WATER ZONE

Manually waters an individual zone.

### 11 WATER ALL

Manually waters all zones.

### 12 ZONES

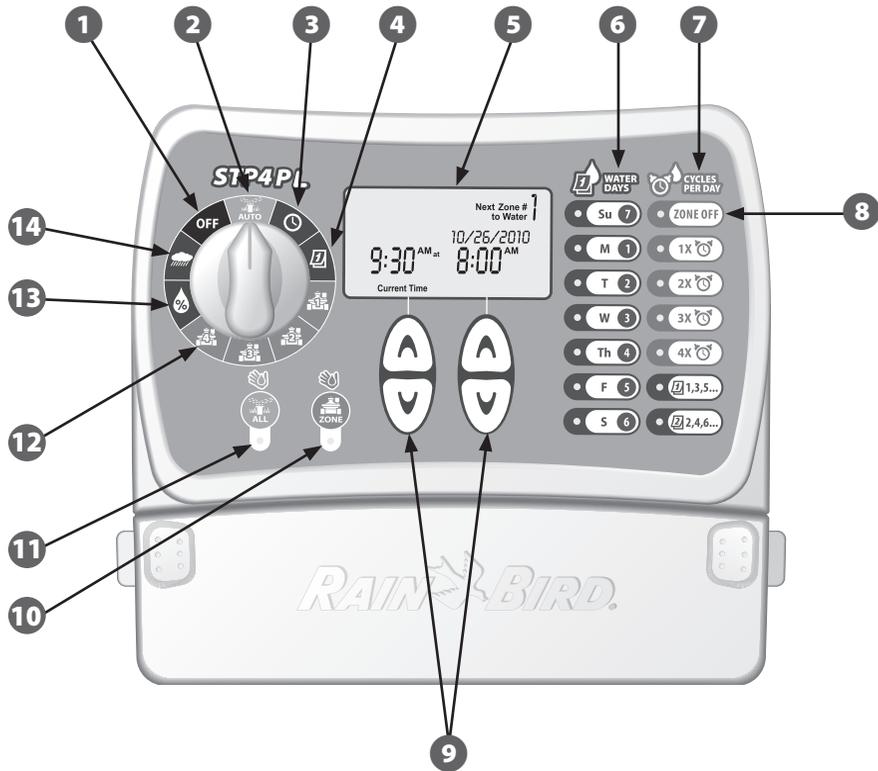
Select individual zone to program. (4 Zone model is shown, 6 and 9 zone models are available.)

### 13 ADJUST WATER

Adjusts watering amount (%).

### 14 RAIN DELAY

Delays watering for up to 72 hours.



# Programming

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## Set Clock

To input the correct time into the Controller, follow these steps:

 Turn the dial to SET TIME 

- 1 The Current Time screen appears. Use the left UP/DOWN arrows to adjust the time. (Verify that the AM/PM setting is correct.)



 **NOTE:** Press and hold the UP/DOWN arrow to accelerate settings.

 When finished, turn the dial to AUTO 

## Set Date

To input the correct date into the Controller, follow these steps:

 Turn the dial to SET DATE 

- 1 The Current Date screen appears. Use the left UP/DOWN arrows to adjust the year.
- 2 Use the right UP/DOWN arrows to adjust the month and day.



 **NOTE:** Press and hold the UP/DOWN arrow to accelerate settings.

 When finished, turn the dial to AUTO 

## Schedule Watering

**To set up a watering schedule for each zone, follow these steps:**



Turn the dial to the desired **ZONE**

- 1 The Schedule Watering screen appears with the selected zone displayed. Use the left UP/DOWN arrows to program the watering Start Time.

- 2 Use the right UP/DOWN arrows to program the Duration (run time) for the selected zone.



**NOTE:** The STP Plus Controller is designed to prevent any two zones from watering at the same time. This feature is called “Program Stacking”. If more than one zone is scheduled to irrigate at the same time, the next zone will begin irrigating when the previous zone has finished.

- 3 Using the **WATER DAYS** buttons on the right side of the controller, select the days (or only ODD/EVEN days) of the week for the zone to be watered.



**NOTE:** The days that are currently selected for watering will be lit. Press the button to enable or disable watering for a specific day. If the ODD (1,3,5) or EVEN (2,4,6) button is selected, all other days of the week will automatically turn off.

- 4 Using the **CYCLES PER DAY** buttons, select the number of times per day to water. The default setting is one time per day. (The **ZONE OFF** button will turn off watering for that zone.)



**NOTE:** If a multiple start times (2X, 3X, 4X) button is selected, there are several user-selectable offsets (hours from first start time) available. Successive presses of a **CYCLES PER DAY** button will cycle through the list of available offsets (see Table 1). The selected offset will be displayed on the screen.

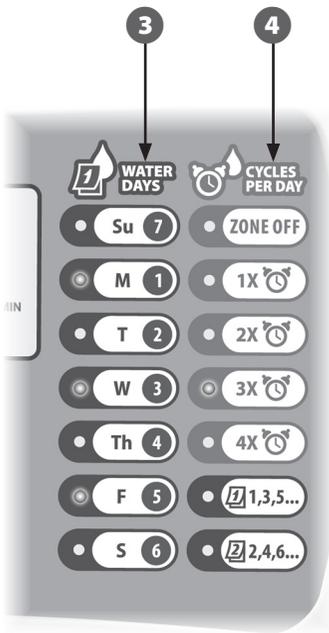


Turn the dial to each active zone and repeat steps 1-4.



**When finished, turn the dial to **AUTO****





**Table 1 - Watering Time Offsets**

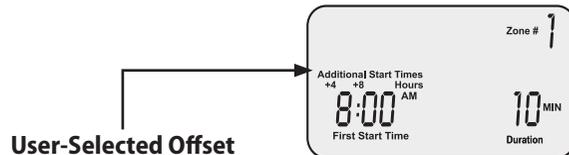
Cycles Per Day	List of Available Watering Time Offsets (Hours) for each Cycles Per Day button
2X	+6, +1, +2, +3, +4, +8, +9, +12
3X	+4 +8      +3 +6 +1 +2      +6 +12
4X	+3 +6 +9      +2 +4 +6 +1 +2 +3      +4 +8 +12

**!** **NOTE:** Successive presses of a CYCLES PER DAY button will cycle through the list of available offsets. Examples of multiple watering start times are provided in Table 2.

**Table 2 - Watering Start Times with Offsets**

Cycles	Offset	1st	2nd	3rd	4th
2X	+3	8:00 AM	11:00 AM	-	-
3X	+4 +8	8:00 AM	12:00 PM	4:00 PM	-
4X	+2 +4 +6	12:00 PM	2:00 PM	4:00 PM	6:00 PM

**Display with a Watering Time Offset selected:**



## Manual Water Zone

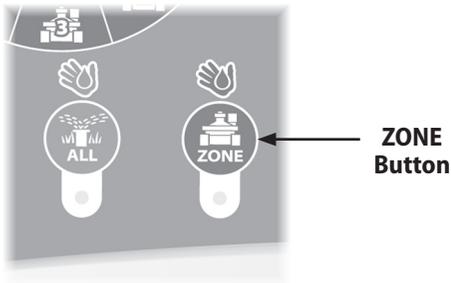
***This option can be used to water any single zone on demand instead of waiting for the programmed schedule:***

 Turn the dial to the desired ZONE 

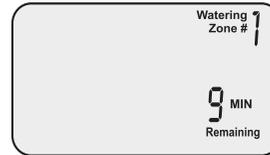
**1** The Schedule Watering screen appears with the selected zone displayed.



**2** Press the ZONE button to start watering for a default 10 minutes.



**3** The display will show the current watering zone and the time remaining.



**4** Use the right UP/DOWN arrows to increase or decrease the watering time remaining.

**5** To stop watering before the time is up, turn the dial to OFF.

 **NOTE:** This function will not affect the normal watering schedule.

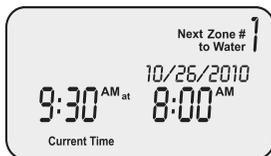
## Manual Water All

***This option can be used to water all zones consecutively instead of waiting for the programmed schedule:***

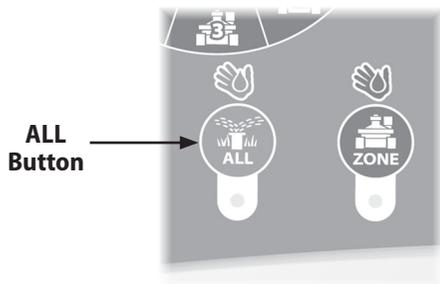


Turn the dial to **AUTO**

- 1 The AUTO screen appears.



- 2 Press the ALL button to start watering. The first zone will start watering for its currently programmed run time.



- 3 The display will show the current watering zone and the time remaining. When the current zone completes watering, the next zone will begin.



- 4 To end irrigation on the current zone before it is complete and advance to the next zone, press the ALL button.
- 5 To stop watering before the time is up, turn the dial to OFF.



**NOTE:** This function will not affect the normal watering schedule.

## Rain Delay

***This option can be used to suspend watering for up to 3 days (72 hours) due to weather or other reasons:***



Turn the dial to RAIN DELAY 

- 1 The Rain Delay screen appears. Use the right UP/DOWN arrows to adjust the amount of delay time.



- 2 Turn the dial to AUTO  The current time and the number of rain delay hours that are left until scheduled watering resumes is displayed.



**NOTE:** Once the Controller has waited the amount of time you select for Rain Delay, it will resume normal scheduled watering. Any scheduled watering that falls into the delay period will not occur.

## Adjust Water

***This option can be used to make run time adjustments that account for seasonal weather variation, without changing the initial zone settings:***

 Turn the dial to **ADJUST WATER** 

**1** The Adjust Water screen appears. Use the left UP/DOWN arrows to adjust the percentage increase or decrease to all zone run time settings.



 When finished, turn the dial to **AUTO** 



**NOTE:** If a zone is scheduled to water for 10 minutes and you set ADJUST WATER to +50%, then the zone run time will be increased to 15 minutes. Scheduled start times will not be affected.

It is important to note that the baseline schedule is set at 0% and not 100%.

When an ADJUST WATER value is entered, the percentage is displayed on the AUTO screen.



## Normal Operations

**When programming is complete and the dial is placed in AUTO, the screen will display one of the following:**

### Normal Operation

The screen displays current time, the zone that is scheduled to be watered next, and the date and time it will be watered.



### With Rain Delay

Screen displays current time and the number of rain delay hours that are left until regularly scheduled watering resumes.



## Watering Now

Screen displays current time, which zone is currently being watered, and the number of minutes remaining in the cycle for that zone



## Error Detected

When an error is detected, the affected Zone is displayed in upper-left corner.

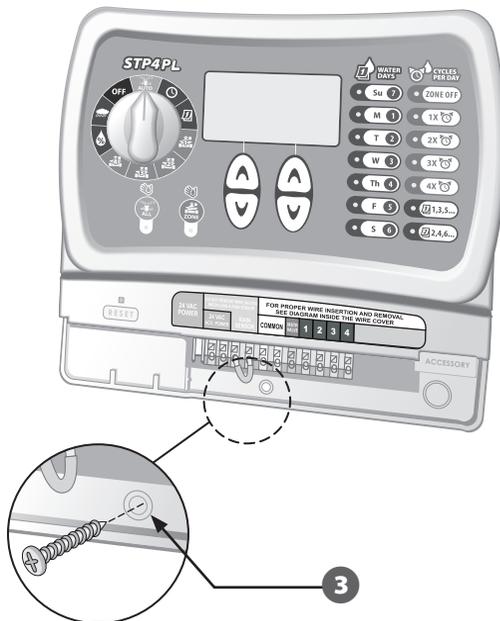
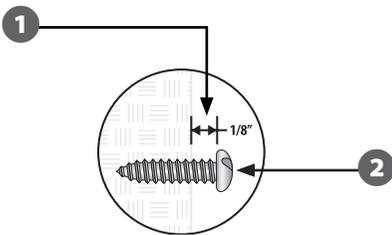


# Installation

## Mount Controller

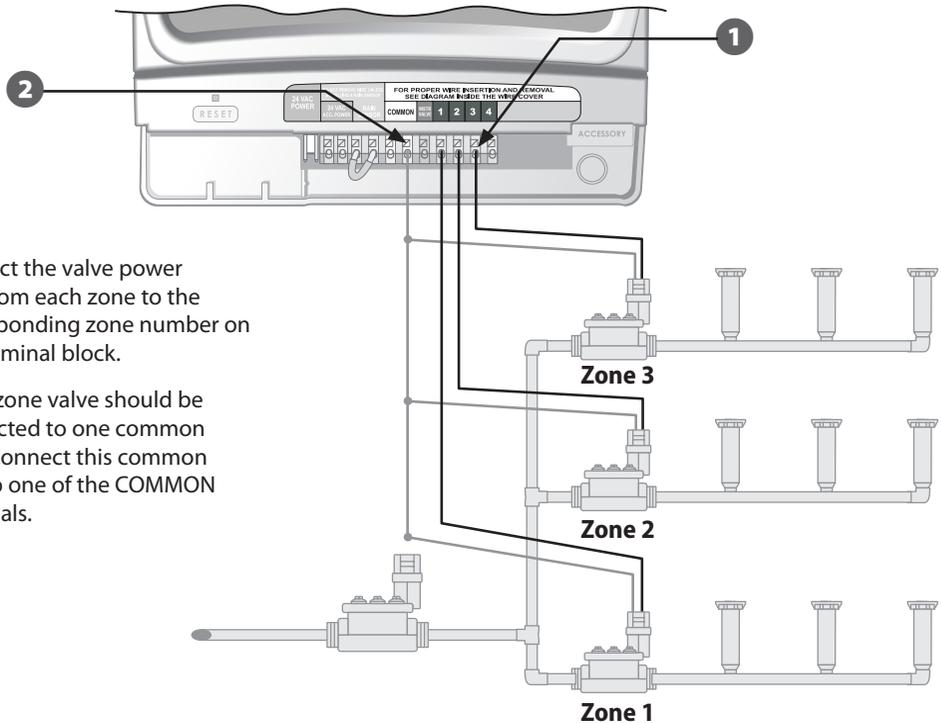
**Mount the STP Plus Controller in an accessible location indoors.**

- 1 Drive a screw into the wall, leaving an 1/8" gap between the screw-head and the wall. (Use the supplied wall anchors if necessary).
- 2 Locate the plastic bracket on the back of the controller, and hang it securely on the exposed screw.
- 3 Remove the wiring bay cover at bottom of controller and drive a screw through the center hole as shown.



# Connect Field Valve Wires

**Connect the valve wiring for every zone to the STP Plus controller.**



- 1** Connect the valve power wire from each zone to the corresponding zone number on the terminal block.
- 2** Every zone valve should be connected to one common wire. Connect this common wire to one of the COMMON terminals.

## Install Master Valve or Pump Start Relay

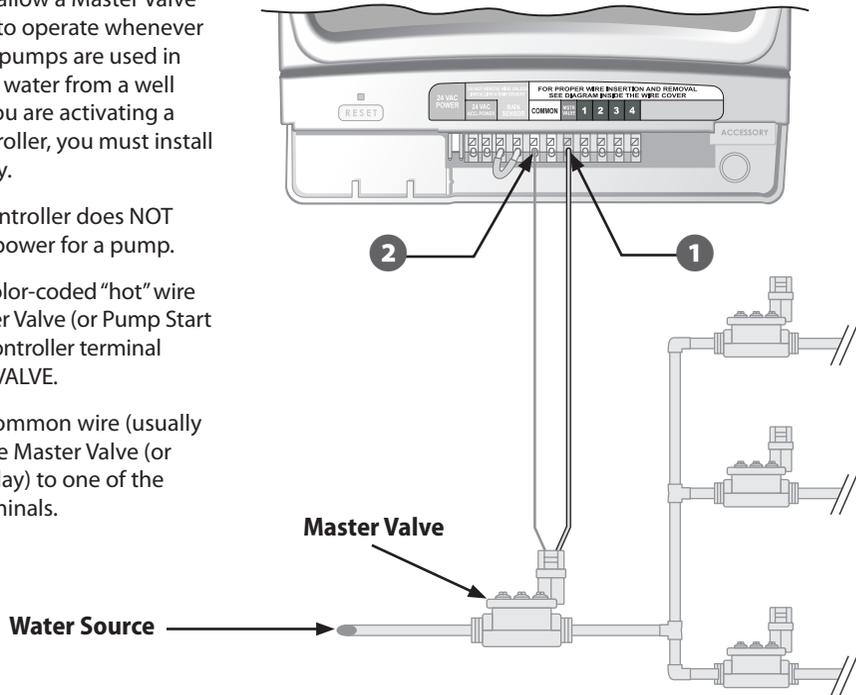
***This example shows a typical Master Valve connection. A Pump Start Relay connects to the controller the same way, but connects differently at the water source.***

STP Plus Controllers allow a Master Valve or Pump Start Relay to operate whenever a valve is operating (pumps are used in some places to draw water from a well or other source). If you are activating a pump from the controller, you must install a Pump Control Relay.



**NOTE:** The controller does NOT provide main power for a pump.

- 1** Connect the color-coded “hot” wire from the Master Valve (or Pump Start Relay) to the controller terminal marked MSTR VALVE.
- 2** Connect the common wire (usually white) from the Master Valve (or Pump Start Relay) to one of the COMMON terminals.

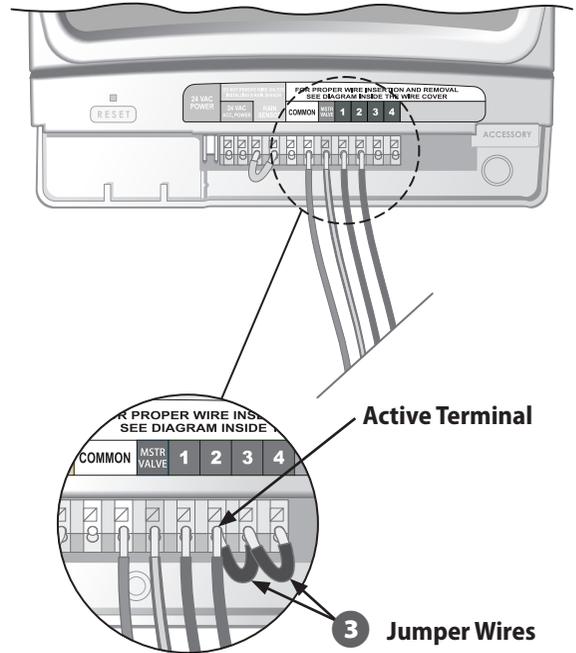


### **Additional instructions for connecting a Pump Start Relay.**

- 3** To avoid possible pump damage when using a Pump Start Relay, connect a short jumper wire from any unused zone terminal(s) to the nearest zone terminal in use.

For example: if a 4 zone controller model is in use with only two zones connected, route the terminals for Zones 3 and 4 to the nearest active terminal (in this example, Zone 2).

- !** **NOTE:** Make sure that the total draw of the Master Valve or Pump Start Relay, plus the draw of the valves does not exceed 0.650 Amps at 24VAC, 60 Hz.

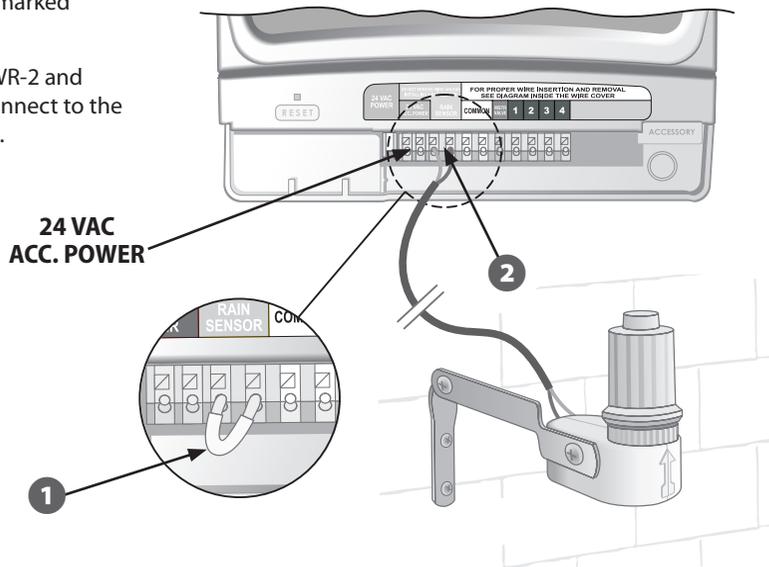


## Connect Rain Sensor

**Connect an optional Rain Sensor to the STP Plus Controller.**

- 1 Remove the jumper wire from the Rain Sensor terminals.
- 2 Connect both Rain Sensor delay wires to the terminals marked RAIN SENSOR.

**NOTE:** The Rain Bird WR-2 and SMRT-Y models also connect to the 24V power connection.



## Connect Power

**Connect the power cord and any optional accessories.**

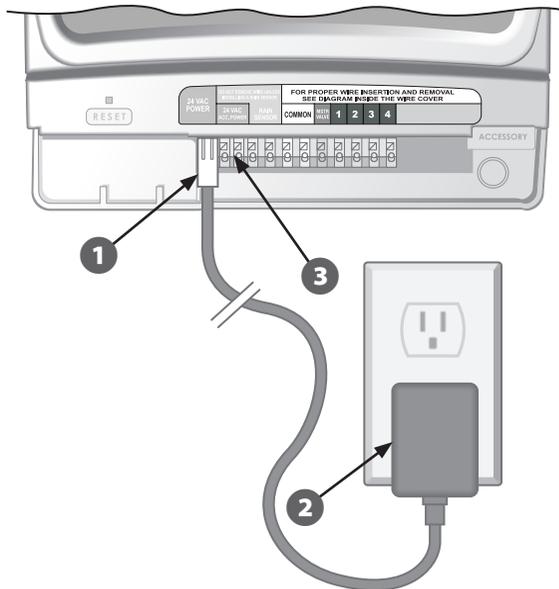
- 1 Attach the transformer connector to the 24VAC POWER pin connection on the terminal strip. (The connector is keyed to fit one way only.)

**!** **NOTE:** DO NOT plug in the transformer until you have completed and checked all wiring connections. Also, do not attempt to link two or more Controllers together with a single transformer.

- 2 Plug the transformer into the wall socket.

**!** **NOTE:** Do not plug the controller into a socket that is controlled by a secondary ON/OFF light switch or GFI outlet.

- 3 If an optional Wireless Sensor (not included) is to be used, attach the connector to the 24 VAC ACC. POWER terminal connections on the terminal strip.



# Troubleshooting

## Watering Issues

<b>Problem</b>	<b>Possible Cause</b>	<b>Possible Solution</b>
Automatic and Manual cycles do not begin watering.	Water source not supplying water.	Verify the main water line and all supply lines are open and operating properly.
	Wires not properly connected.	Verify all field wires and master valve/pump start relay wiring is connected properly.
	Wires loose or cut; corroded connections.	Check field wiring for broken, cut, or “skinned” wires and replace if necessary. Check all wire connections and replace with watertight splice connectors as needed.
	Dial not set to AUTO position.	Verify the dial is in the AUTO position.
	If a Rain Sensor is installed, it may be activated.	Wait until the Rain Sensor dries out, or disconnect the Rain Sensor from the yellow terminals on the Controller and replace it with a jumper wire connecting the two yellow terminals.
	If no Rain Sensor is installed, the jumper wire connecting the two yellow Rain Sensor terminals may be damaged or missing.	Connect the two yellow Rain Sensor terminals in the controller’s terminal bay with a short length of 14 to 18 gauge jumper wire.
	An electrical surge may have damaged the Controller’s electronics.	Press the Reset button located under the wiring bay cover. If there is no permanent damage, the controller should resume normal operation. Current time and date will need to be entered, but the watering schedule should remain intact.



# Programming Chart

Zone	Zone Description	Run Time (Max 240 min.)	Watering Days (circle days that apply)	* Start Time (15 min. increments)	Cycles Per Day (circle no. of cycles)
1		___ Min	M T W T F SA SU ODD EVEN	__:__ AM PM	1 2 3 4
2		___ Min	M T W T F SA SU ODD EVEN	__:__ AM PM	1 2 3 4
3		___ Min	M T W T F SA SU ODD EVEN	__:__ AM PM	1 2 3 4
4		___ Min	M T W T F SA SU ODD EVEN	__:__ AM PM	1 2 3 4
5		___ Min	M T W T F SA SU ODD EVEN	__:__ AM PM	1 2 3 4
6		___ Min	M T W T F SA SU ODD EVEN	__:__ AM PM	1 2 3 4
7		___ Min	M T W T F SA SU ODD EVEN	__:__ AM PM	1 2 3 4
8		___ Min	M T W T F SA SU ODD EVEN	__:__ AM PM	1 2 3 4
9		___ Min	M T W T F SA SU ODD EVEN	__:__ AM PM	1 2 3 4

**NOTE:** A total of 4 start times can be assigned for each zone (this can be helpful for zones irrigating tight soils and slopes)

* Start Time Schedule (multiple start times are based on user-selected watering time offsets)					
Cycles Per Day	1st Start Time	2nd Start Time	3rd Start Time	4th Start Time	Notes
One Time (1X)	__:__ AM PM	n/a	n/a	n/a	Enter the watering time offsets for the selected Cycles per Day. (See the Schedule Watering section, pages 6-7.)
Two Times (2X)	__:__ AM PM	___ hours	n/a	n/a	
Three Times (3X)	__:__ AM PM	___ hours	___ hours	n/a	
Four Times (4X)	__:__ AM PM	___ hours	___ hours	___ hours	

**Example:** If the 1st Start Time for Zone 1 is programmed for 8:00 AM and the user has selected 3X for Cycles per Day with the +4 +8 offset, then enter +4 and +8 in the 2nd and 3rd Start Time columns. The second start time would begin at 12:00 PM and the third start time would begin at 4:00 PM.

# Declaration of Conformity

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Application of Council Directives: 89/336/EEC

**Standards to which conformity is declared:** EN55022 Class B, AS/NZS3548  
EN61000-3-2  
EN61000-3-3  
EN55014-1: 2001  
EN55014-1: 2002  
EN61000-4-2  
EN61000-4-3  
EN61000-4-4  
EN61000-4-6  
EN61000-4-8  
EN61000-4-11  
EN60730

**Manufacturer:** Rain Bird Corporation  
Controls Manufacturing Division - USA  
419 South Motor Avenue, Azusa CA 91702-3232  
(619) 661-4400

**Equipment Description:** Irrigation Controller  
**Equipment Class:** Generic-Res, Comm, L.I.  
**Model Number:** STP, STP Plus and SST Controllers

*I the undersigned, hereby declare that the equipment specified above, conforms to the above Directive(s) and Standard(s):*

**Place:** Tijuana B.C., Mexico  
**Signature:**   
**Full Name:** Ryan Walker  
**Position:** General Manager



*The Intelligent Use of Water*

**Rain Bird Corporation**

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