# RAIN BIRD®

# ESP-TM2 Controller User Manual

# Introduction

## Welcome to Rain Bird

Thank you for choosing Rain Bird's ESP-TM2 controller. In this manual are step by step instructions for how to install and operate the ESP-TM2.



## Controller Features

| Feature | Description |
|---|---|
| Maximum Stations | 12 |
| Simultaneous Stations | 1 plus master valve |
| Start Times | 4 |
| Programs | 3 |
| Program Cycles | Custom Days, Odd, Even and Cyclic |
| Permanent Days Off | Per program |
| Master Valve Control | On/Off per station |
| Rain Delay | Supported |
| Rain/Freeze Sensor | Supported |
| Rain Sensor Control | Global or by station |
| Seasonal Adjust | Global or by program |
| Manual Station Run | Yes |
| Manual Program Run | Yes |
| Manual Test All Stations | Yes |
| Station Advance | Yes |
| Short Detect | Yes |
| Delay Between Stations | Yes |
| Accessory Port | Yes (5 pin) |
| Save & Restore Programming | Yes |

# Installation

## Mount Controller

**1** Drive a mounting screw into the wall, leaving an 1/8 inch gap between the screw head and the wall surface (use the supplied wall anchors if necessary), as shown.

**2** Locate the keyhole slot on back of the controller unit and hang it securely on the mounting screw.
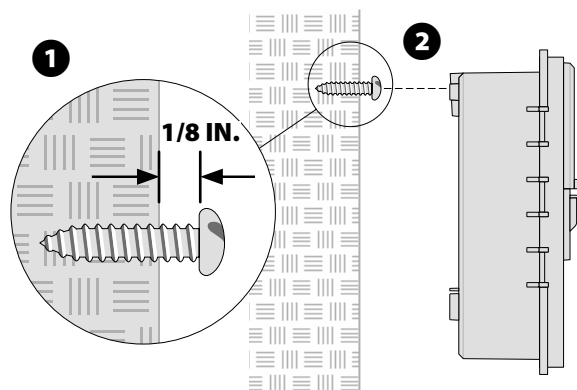


**3** Remove the wiring bay cover on the lower part of the controller unit, and drive a second screw through the open hole inside the controller and into the wall, as shown.
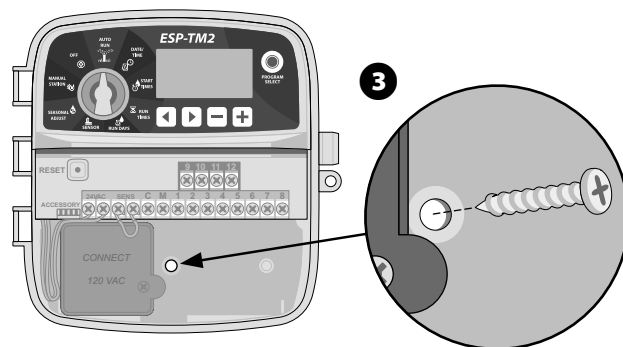


**!** **NOTE:** Choose a suitable mounting location close to a 120 VAC wall outlet.

# Wiring Connections

## Connect Valves

**1** Route all field wires through the opening at the bottom of the unit, or through the knock-out in back of the unit. Attach conduit if desired, as shown.
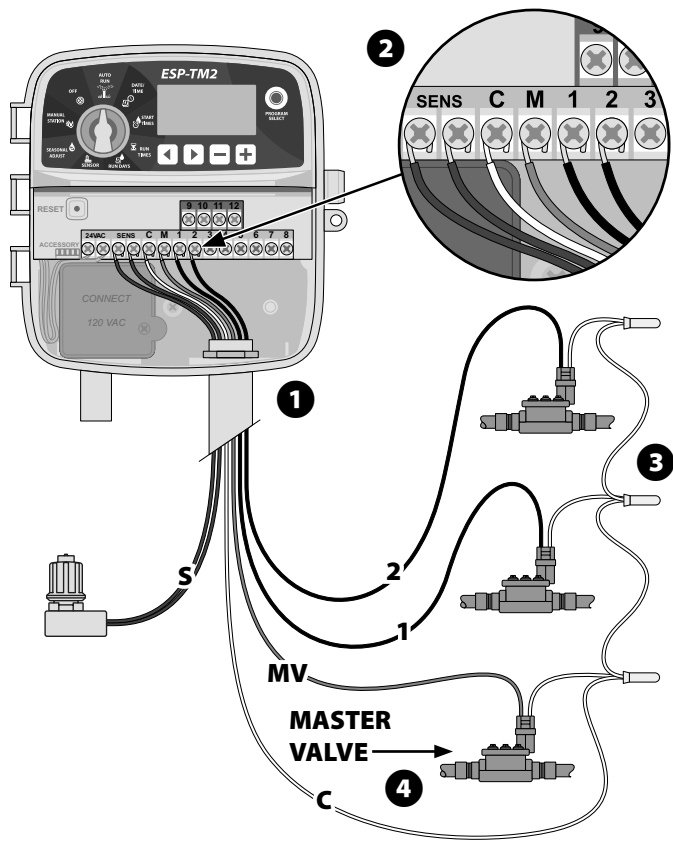
**2** Connect one wire from each valve to one of the numbered station terminals (1-12) on the controller, as shown.

**3** Connect a field common wire (C) to the common terminal (C) on the controller. Then connect the remaining wire from each valve to the field common wire, as shown.

**[!] NOTE:** The ESP-TM2 controller supports one valve solenoid per station terminal.



## Connect Master Valve (optional)

**4** Connect a wire from the master valve (M) to the master valve terminal (M) on the controller. Then connect the remaining wire from the master valve to the field common wire, as shown.

## Connect Pump Start Relay (optional)

***The ESP-TM2 can control a pump start relay, to turn the pump on and off as needed.***

**1** Connect a wire from the pump start relay (PSR) to the master valve terminal (M) on the controller. Then connect another wire from the pump start relay to the field common wire, as shown.

**2** To avoid the possibility of damage to the pump, connect a short jumper wire from any unused terminal(s) to the nearest terminal in use, as shown.
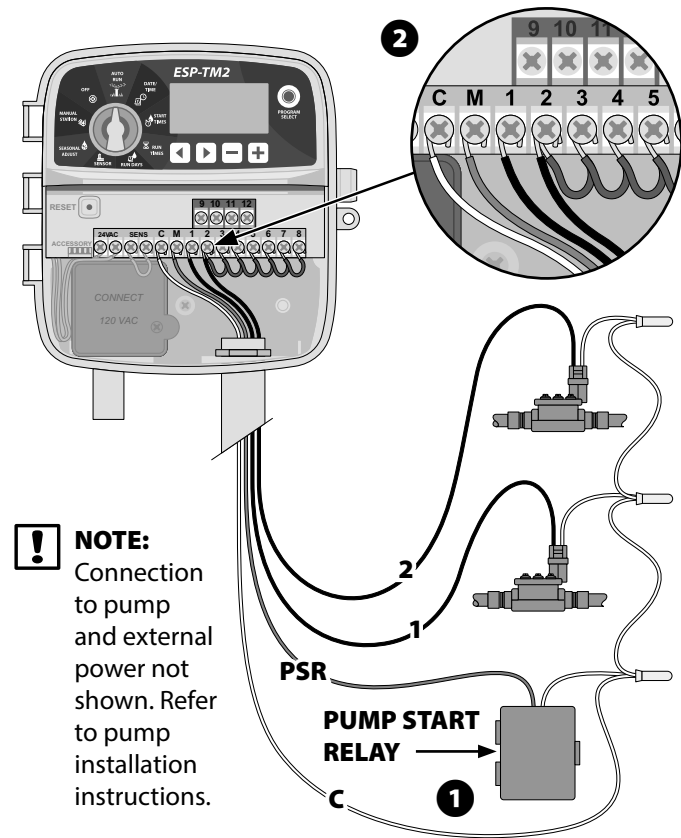


**[!] NOTE:** Connection to pump and external power not shown. Refer to pump installation instructions.

**[!] NOTE:** The ESP-TM2 controller DOES NOT provide power for a pump. The relay must be wired according to manufacturer instructions.

***Only the following Rain Bird pump start relay models are compatible with the ESP-TM2:***

| Description | Model # | Volts |
|---|---|---|
| Universal Pump Relay | PSR110IC | 110V |
| Universal Pump Relay | PSR220IC | 220V |

## Connect Rain/Freeze Sensor (optional)

*The ESP-TM2 controller can be set to obey or ignore a rain sensor.*

Refer to the Rain Sensor section under Advanced Programming.

**1** Remove the yellow jumper wire from the SENS terminals on the controller.

**2** Connect both rain sensor wires to the SENS terminals, as shown.
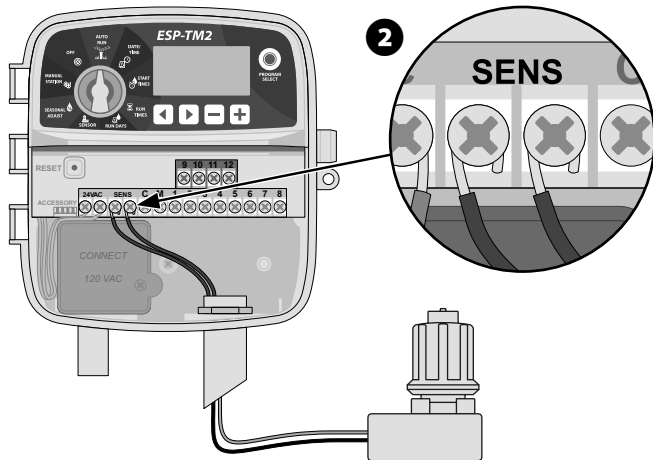


**!** **NOTE:** Do not remove the yellow jumper wire unless connecting a rain sensor.

**!** **NOTE:** Rain Bird controllers are only compatible with normally closed rain sensors.

**!** **NOTE:** For wireless rain/freeze sensors, refer to installation instructions for sensor.

**⚡** **WARNING:** Do not apply power until you have completed and checked all wiring connections.

## Connect Custom Wiring (optional)

*If desired, the provided 120 volt power cord can be removed and replaced with a custom wiring.*

To remove the factory installed power cord and connect custom wiring:

**1** Ensure that AC power is disconnected.

**2** Remove the controller junction box cover and disconnect the power cord to the unit.

**3** Remove the factory installed power cord by loosening the 2 screws securing the metal strain-relief bar, as shown.

**4** Connect the external power supply wires using the wire nuts and then re-secure the metal strain relief bar by tightening the 2 screws.



**TO EXTERNAL POWER SUPPLY**
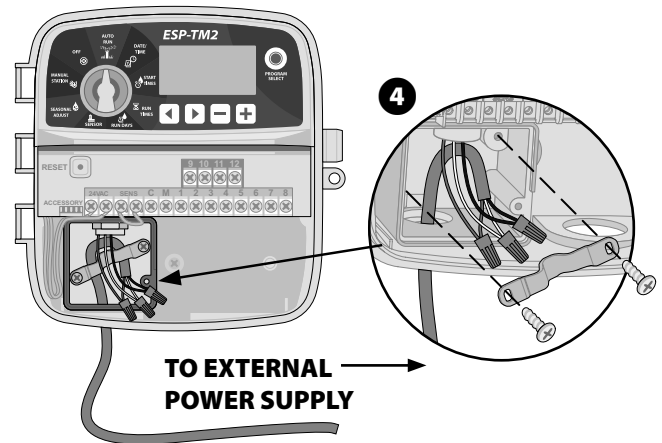
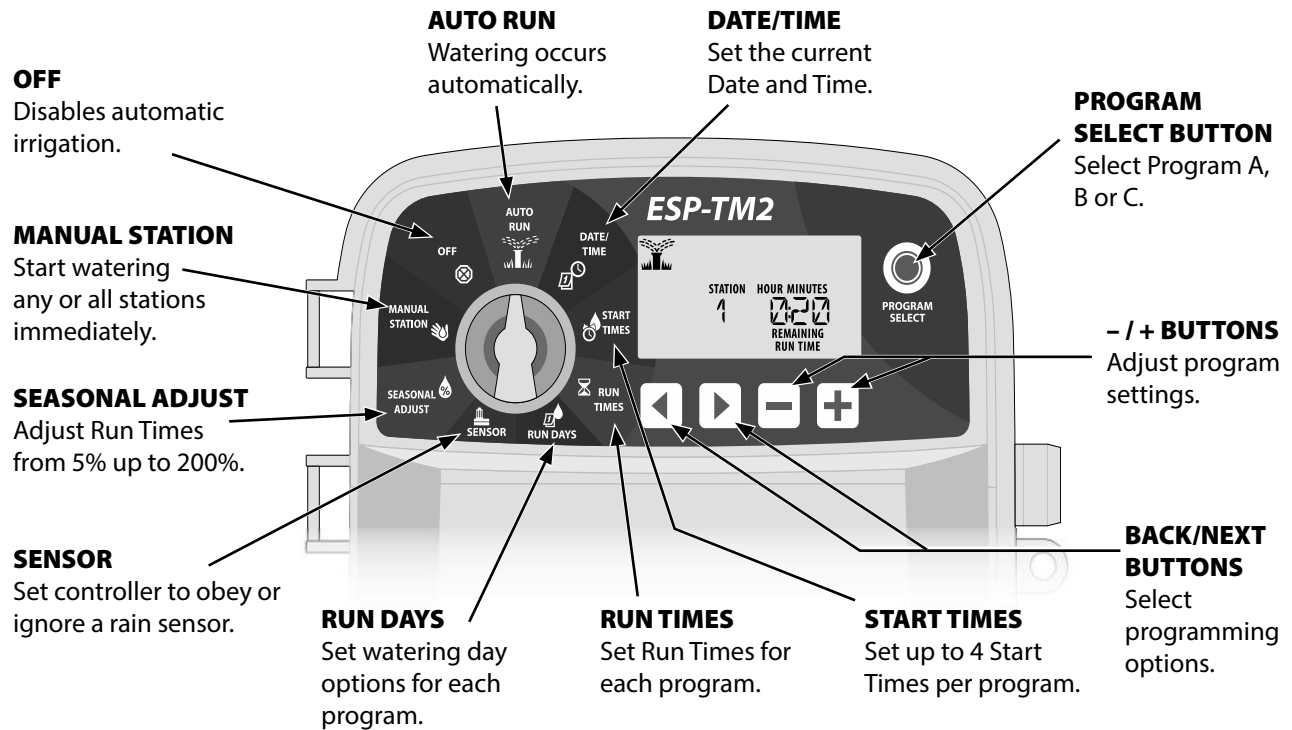| Power Wiring Connections (120VAC) |
| --- |
| Black supply wire (hot) to the black transformer wire |
| White supply wire (neutral) to the white transformer wire |
| Green supply wire (ground) to the green or green-yellow transformer wire |

**5** Verify that all wiring connections are secure and then replace the junction box cover.

**✋** **CAUTION**: The strain-relief bar must be re-secured for the unit to function properly.

**⚡** **WARNING**: DO NOT apply power until you have completed and checked all wiring connections.

# Controls and Indicators

*Turn the dial to select programming features.*

**OFF**
Disables automatic irrigation.

**AUTO RUN**
Watering occurs automatically.

**DATE/TIME**
Set the current Date and Time.

**PROGRAM SELECT BUTTON**
Select Program A, B or C.

**MANUAL STATION**
Start watering any or all stations immediately.

**SEASONAL ADJUST**
Adjust Run Times from 5% up to 200%.

**SENSOR**
Set controller to obey or ignore a rain sensor.

**– / + BUTTONS**
Adjust program settings.

**BACK/NEXT BUTTONS**
Select programming options.

**RUN DAYS**
Set watering day options for each program.

**RUN TIMES**
Set Run Times for each program.

**START TIMES**
Set up to 4 Start Times per program.

# Special Features

- Turn the dial to the desired position.
- Press and hold ◀ and ▶ at the same time.

**SET INTERSTATION DELAY**
A station delay (from 1 second to 9 hours) ensures that a valve has completely closed before the next one opens.

**SAVE PROGRAMMING**

**RESTORE PROGRAMMING**

**RESET TO FACTORY DEFAULTS**
All programmed schedules will be erased.

**SET MASTER VALVE BY STATION**
Allows a station to be controlled by a master valve or pump start relay.

**SET RAIN SENSOR BYPASS BY STATION**
Tells a station to obey or ignore a rain sensor.

**SET TO ODD, EVEN OR CYCLIC WATERING**
See Advanced Programming.

# Basic Programming

## ❶ Set Date and Time

Turn the dial to **DATE/TIME**.

- Press ◀ or ▶ to select the setting to change.
- Press ━ or ➕ to change the setting value.
- Press and hold ━ or ➕ to accelerate adjustments.

**To change the time format (12 hour or 24 hour):**

- With **MINUTES** blinking, press ▶ .
- Press ━ or ➕ to select the desired time format, then press ▶ to return to the time setting.

## ❷ Set Watering Start Times

*Up to four Start Times are available for each program.*

Turn the dial to **START TIMES**.

- Press **Program Select** to choose the desired Program (if necessary).
- Press ◀ or ▶ to select an available Start Time.
- Press ━ or ➕ to set the selected Start Time (ensure the AM/PM setting is correct).
- Press ▶ to set additional Start Times.

## ❸ Set Station Run Times

*Run Times can be set from one minute up to six hours.*

Turn the dial to **RUN TIMES**.

- Press **Program Select** to choose the desired Program (if necessary).
- Press ◀ or ▶ to select a Station.
- Press ━ or ➕ to set the Run Time for the selected Station.
- Press ▶ to set additional Station Run Times.

## ❹ Set Watering Days

### Custom Days of the Week
*Set watering to occur on specific days of the week.*

Turn the dial to **RUN DAYS**.

- Press **Program Select** to choose the desired Program (if necessary).
- Press ━ or ➕ to set the selected (blinking) day as either **ON** or **OFF**, and to automatically move to the next day.
- You can press ◀ or ▶ at any time to move the cursor to the previous or next day.

**CAUTION:** If Sunday is selected, ▶ will enter and activate Cyclic Watering (see the Advanced Programming section). If this is not desired, press the ◀ button to return to watering by Custom Days.

# Manual Watering Options

## Test All Stations

***Start watering immediately for all programmed stations.***

🖐 Turn the dial to **MANUAL STATION**.

- Press ▬ or ✚ to set a Run Time.
- Press and hold ▶ or turn the dial to **AUTO RUN** to start manual station test.

## Run a Single Station

***Start watering immediately for a single station.***

🖐 Turn the dial to **MANUAL STATION**.

- Press ▶ to display the MANUAL STATION screen.
- Press ◀ or ▶ to select a Station.
- Press ▬ or ✚ to set a Run Time.
- Press and hold ▶ or turn the dial to **AUTO RUN** to start the selected Station.
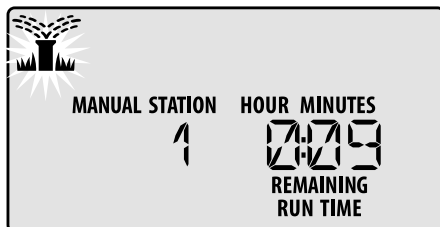
## Run a Single Program

***Start watering immediately for one program.***

Turn the dial to **AUTO RUN**.

- Press **Program Select** to choose the desired Program (if necessary).
- Press and hold ▶ to start the selected Program.

***During Manual Watering:***

The display shows a blinking sprinkler symbol, the active Station Number or Program, and the Remaining Run Time.
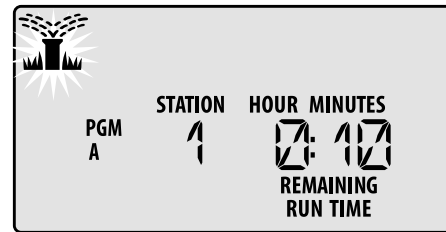


- To cancel manual watering, turn the dial to **OFF** for three seconds until the screen shows OFF.

# Normal Operation

## AUTO RUN

During watering, the display shows a blinking sprinkler symbol, the current Program and the Remaining Run Time.



## OFF

Turn the dial to ⊗ **OFF** to stop automatic irrigation or to cancel all active watering immediately.

⚠ **CAUTION:** Watering will NOT occur if the controller remains in **OFF**.

# Advanced Programming

## Odd or Even Calendar Days

*Set watering to occur on all ODD or EVEN calendar days.*

Turn the dial to **RUN DAYS**.

- Press **Program Select** to choose the desired Program (if necessary).
- Press and hold ◀ and ▶ at the same time until **ODD** or **EVEN** is displayed.

## Cyclic Days

*Set watering to occur at specific intervals, such as every 2 days, or every 3 days, etc.*

Turn the dial to **RUN DAYS**.

- Press **Program Select** to choose the desired Program (if necessary).
- On the **Custom Days** screen, press ▶ until the **Cyclic** screen is displayed (after SUN).
- Press ▬ or ✚ to set the desired DAY CYCLE, then press ▶
- Press ▬ or ✚ to set the DAYS REMAINING before the cycle begins. The NEXT watering day updates on the display to indicate the day that watering will start as shown.
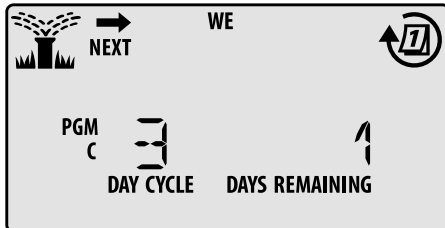


## Rain Sensor

*Set the controller to obey or ignore a rain sensor.*

When set to **ACTIVE**, automatic irrigation will be suspended if rainfall is detected. When set to **BYPASS** all programs will ignore the rain sensor.

Turn the dial to **SENSOR**.

- Press ▬ or ✚ to select **ACTIVE** (obey) or **BYPASS** (ignore).

**NOTE:** See **Special Features** to set Rain Sensor Bypass by Station.

## Seasonal Adjust

*Increase or decrease program run times by a selected percentage (5% to 200%).*

**Example:** If the Seasonal Adjust is set to 100% and the station Run Time is programmed for 10 minutes, the station will run for 10 minutes. If the Seasonal Adjust is set to 50%, the station will run for 5 minutes.

Turn the dial to **SEASONAL ADJUST**.

- Press ▬ or ✚ to increase or decrease the global percentage setting.
- To adjust an individual Program, press **Program Select** to choose the desired Program (if necessary).

## Delay Watering

*Suspend watering for up to 14 days.*

Turn the dial to **AUTO RUN,** then press and hold ✚

- Press ▬ or ✚ to set the DAYS REMAINING. The next watering day will update on the display to indicate when watering will resume.
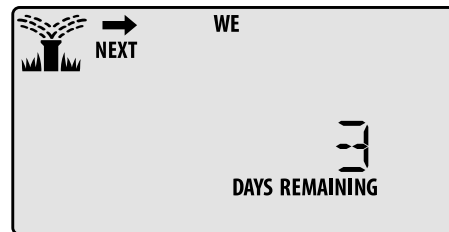


- To cancel a Rain Delay, set the DAYS REMAINING back to 0.

**NOTE:** When the delay expires, automatic irrigation resumes as scheduled.

## Permanent Days Off

*Prevent watering on selected days of the week (for Odd, Even or Cyclic programming only).*

 Turn the dial to **RUN DAYS**.

- Press **Program Select** to choose the desired Program (if necessary).

- Press and hold **Program Select**.

- Press ▬ to set the selected (blinking) day as a Permanent Day Off or press ✚ to leave the day **ON**.
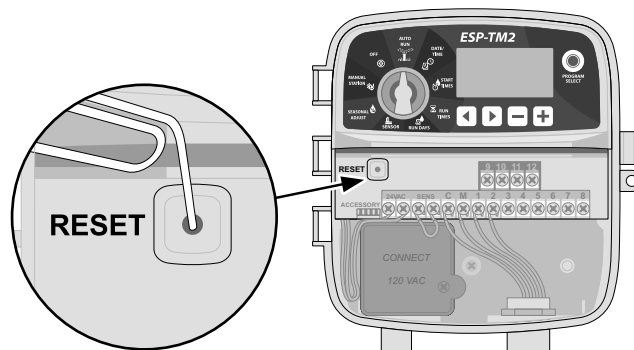


# *Options*

## Reset Button

*If the controller is not working properly, you can try pressing RESET.*

- Insert a small tool such as a paper clip, into the access hole and press until the controller is reset. All previously programmed watering schedules will remain stored in memory.



## Remote Accessories

A 5 pin accessory port is available for Rain Bird approved external devices.
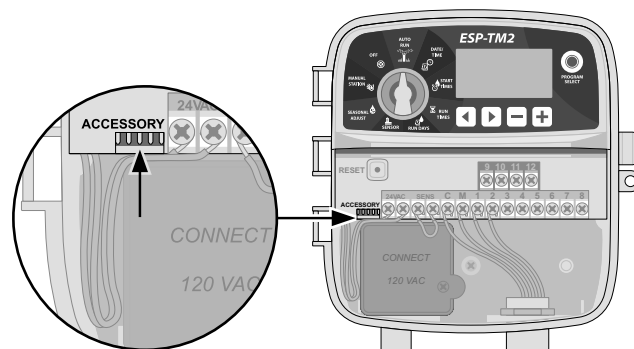
# *Troubleshooting*

## Watering Issues

| Problem | Possible Cause | Possible Solution |
|---------|----------------|-------------------|
| **Watering icon on the display is flashing, but the system is not watering** | Water supply issue. | Verify there is no disruption to the main water line and that all other water supply lines are open and functioning. |
| | Wiring is loose, not properly connected or damaged. | Check that wiring is securely connected at the controller and in the field. Check for damage and replace if necessary. Check wiring connections and replace with watertight splice connectors if needed. |
| **Automatic and/or Manual Watering will not start** | Connected rain sensor may be activated. | Let the rain sensor dry out or else disconnect it from the controller terminal block and replace it with a jumper wire connecting the two SENS terminals. |
| | Jumper wire connecting the two SENS terminals may be missing or damaged. | Jumper the two SENS terminals on the controller terminal block by connecting them with a short length of 14 to 18 gauge wire. |
| | Solenoid or master valve is shorted. | Confirm short message on the display. Correct the issue in the wiring. Clear the message by testing watering at the shorted valve or by pressing the ▶ button. |
| **Excessive watering** | Programs may have multiple start times that were set unintentionally | Programs (A, B or C) only require a single start time in order to run. Separate start times are not required for each valve. |

## Electrical Issues

| Problem | Possible Cause | Possible Solution |
|---------|----------------|-------------------|
| **Display is blank.** | Power not reaching the controller. | Verify the main AC power supply is securely plugged in or connected and working properly. |
| | | Verify the orange power supply wires are connected to the controller "24 VAC" terminals. |
| **Display is frozen and controller will not accept programming.** | An electrical surge may have interfered with the controller's electronics. | Unplug the controller for 2 minutes, then plug it back in. If there is no permanent damage, the controller should accept programming and resume normal operation. |
| | | Press and release the RESET button. |

## Safety Information

⚠ **WARNING**: This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capacity, or lack of experience and knowledge unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

⚠ **WARNING:** Special precautions must be taken when valve wires (also known as station or solenoid wires) are located adjacent to, or share a conduit with other wires, such as those used for landscape lighting, other "low voltage" systems or other "high voltage" power.

Separate and insulate all conductors carefully, taking care not to damage wire insulation during installation. An electrical "short" (contact) between the valve wires and another power source can damage the controller and create a fire hazard.

⚠ **WARNING**: All electrical connections and wiring runs must comply with local building codes. Some local codes require that only a licensed or certified electrician can install power. Only professional personnel should install the controller. Check your local building codes for guidance.

⚠ **CAUTION:** Use only Rain Bird approved accessory devices. Unapproved devices may damage the controller and void warranty.

For a list of compatible devices go to: www.rainbird.com

## Disposal of Electronic Waste

In compliance with European Directive 2002/96/CE and EURONORM EN50419:2005, this device must not be thrown away with household garbage. This device must be the object of an appropriate, selective removal procedure in order to recuperate it.

**!** **NOTE:** Date and time are retained by a lithium battery which must be disposed of in accordance with local regulations.

## Questions?

**Scan the QR code** ⟶
to visit www.rainbird.com/esptm2 for help setting up and operating the Rain Bird ESP-TM2 Controller

Call Rain Bird toll free Technical Support at **1-800-724-6247** (USA and Canada only)

**RAIN BIRD**

**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 the 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 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.

- Changes or modifications not expressly approved by Rain Bird Corporation could void the user's authority to operate the equipment. This product was FCC certified under test conditions that included the use of shielded I/O cables and connectors between system components. To bin in compliance with FCC regulations, the user must use shielded cables and connectors and install them properly.

- This class B digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations.
  *Cet appareil Numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.*