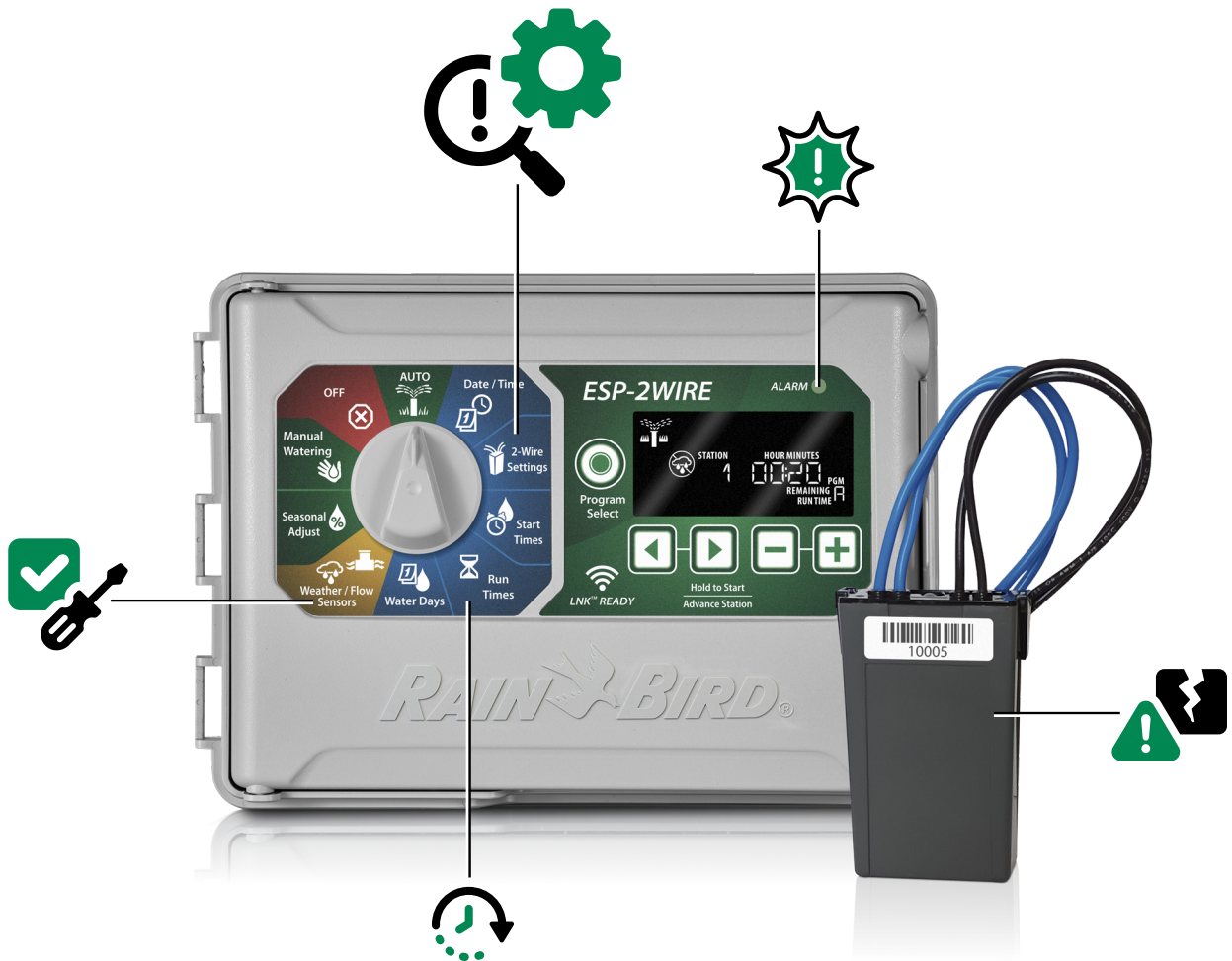


# ESP-2WIRE Controller

## Troubleshooting Guide

English



English



## ESP-2WIRE Controller Troubleshooting Guide

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ESP-2WIRE Controller



The ESP-2WIRE Controller is compatible with Rain Bird 2W-1 Decoders. (Sold separately)

## General Troubleshooting

### Watering Issues


Problem	Possible Cause	Possible Solution
Display shows a program is active, but system isn't watering.	Water source not supplying water.	<ul style="list-style-type: none"> <li>Verify there is no disruption to the main water line and that all other water supply lines are open and functioning properly.</li> <li>Verify that the MV bypass feature has not been mistakenly activated by turning the dial to the "Run Times" position and pressing &lt; and &gt; simultaneously. Reference the Special Features Card that came with your controller for additional information on this feature.</li> </ul>
	Wiring is loose or not properly connected or decoder addresses need to be reconfigured to ensure addresses are assigned to the correct station number.	<ul style="list-style-type: none"> <li>Check field wiring and decoder address configuration to ensure correct assignment.</li> <li>Decoder LEDs should blink green when activated by the controller.</li> </ul>
	Field wires are corroded or damaged.	<ul style="list-style-type: none"> <li>Check field wiring for damage and replace if necessary.</li> <li>Check wiring connections and replace with watertight splice connectors if needed.</li> </ul>
	Loss of AC power.	When there is a power loss and a 9 volt battery is installed, the system does not irrigate but programs show as remaining active.
	2-wire path short.	See "Finding System Shorts" on page 11 for more information.
	Cut 2-wire path.	Check connections or enter <b>Power Measure Mode</b> to view station decoder status. See "2-Wire Troubleshooting Menu" on page 9 for more information.
	Bad connection or broken output/solenoid wire.	Check connections and see "Decoder Status LED" on page 8 for more information.
	Valve solenoid not operating as intended or is shorted.	See "General Troubleshooting" on page 1 and "Decoder Status LED" on page 8 for more information.
NO AC message on display.	No power detected.	Check circuit breaker and that unit is plugged into socket or properly connected to power source.
	Controller may be plugged into a GFCI outlet or an outlet that is wired to a GFCI outlet.	Check power to the outlet or reset the circuit breaker.
It just rained and the ALARM light is not illuminated.	This is normal operation. The ESP-2WIRE does not consider the interruption of irrigation due to rainfall as an alarm condition.	This is normal operation.

## Watering Issues

Problem	Possible Cause	Possible Solution
Programmed schedules do not start.	Connected rain sensor may be activated.	Set rain sensor to "Sensor OFF" to ignore the rain sensor. If watering resumes, the sensor is operating properly and no further correction is needed.
	Connected rain sensor may not be operating properly.	<ul style="list-style-type: none"> <li>Let the rain sensor dry out or disconnect it from the controller terminal strip and replace it with a jumper wire connecting the two SENS terminals</li> <li>Set rain sensor to "Sensor OFF" to ignore the rain sensor. If watering resumes, the sensor is operating properly and no further correction is needed.</li> </ul>
	If no rain sensor is connected, the jumper wire connecting the two SENS terminals on the terminal strip may be missing or damaged.	Repair or replace the rain sensor jumper wire, or move dial position to "Weather Sensors" and set to "Sensor OFF".
	2-wire path short.	See "Finding System Shorts" on page 11 for more information.
Excessive irrigation.	Multiple start times in the same program.	Separate start times are not required for each valve. A program only requires single start time in order to run all stations in that program.
	Multiple programs are running at the same time.	Review programming to assure that the same station is not active in multiple programs.
	Valve is malfunctioning.	Check to see if the ALARM light on the controller is lit solid, then repair or replace the valve if necessary.
	Seasonal Adjust setting is too high.	Set "Seasonal Adjust" to an appropriate level. Setting "Seasonal Adjust" to 100% will run all stations for the programmed time.
Display is blank or frozen. The controller will not accept programming or is operating abnormally.	Power not reaching the controller.	Verify the main AC power supply is securely plugged in or connected and working properly.
	Controller needs to be reset.	Press the "Reset Button". For details see Reset Button in the ESP-2WIRE Advanced User Manual.
	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.
Front panel LED light is blinking or solidly illuminated but there is no message on the LCD.	Dial not in AUTO RUN position.	<ul style="list-style-type: none"> <li>Turn dial to "AUTO RUN" position.</li> <li>Press the "Reset Button". For details see Reset Button in the ESP-2WIRE Advanced User Manual.</li> <li>Power cycle the controller.</li> </ul>

## Front Panel Alarm Indicators

The ESP-2WIRE controller has built in error detection that can automatically generate an alarm caused by a programming error, an electrical short condition or a high/low flow condition. The ALARM LED on the ESP-2WIRE controller front panel will light up to indicate an alarm condition.

 NOTE: The dial must be in the AUTO position for an alarm message to appear on the display.



ESP-2WIRE Controller Cabinet



ESP-2WIRE Controller Front Panel

## Possible Front Panel Alarm Indications

Front Panel Alarm LED	LCD Message	Meaning	Resolution
Blinking RED.	NO START TIMES.	Start times have not been programmed.	Turn the dial to the "Start Times" position and assign a start time to at least one program.
	NO RUN TIMES.	Run times have not been programmed.	Turn the dial to the "Run Times" position and assign a run time to at least one station.
	NO WATER DAYS.	Water Days have not been programmed.	Turn the dial to the "Water Days" position and assign at least one day.

## Possible Front Panel Alarm Indications


Front Panel Alarm LED	LCD Message	Meaning	Resolution
Solid RED.	2-WIRE PATH SHORT.	High current detected on the 2-wire path. Potential Causes: <ul style="list-style-type: none"> <li>• Resistance caused by corrosion.</li> <li>• Exposed wire on the path.</li> <li>• Field wires may be crossed in the field (wire A connected to wire B) creating a dead short.</li> </ul>	See "Finding System Shorts" on page 11 for more information.  Alarm will clear automatically whenever a manual station, manual program, test all or scheduled program is activated if the short condition has been physically addressed in the field.
	STATION "X" WIRE SHORTED.	Solenoid short detected at a station indicated by the number.	Replace the solenoid at the station with the short condition if required. When an electrical error is detected, irrigation for the affected station is canceled and watering advances to the next operable station in the program.  The controller will attempt to water the affected station again at the next scheduled watering. Completion of a successful watering will clear the error condition associated with that station.
	MASTER VALVE SHORTED.	Short detected at the MV.	Check wiring at the MV and make repairs as necessary. If the wiring and connections are good, but the solenoid is shorted, replace the valve solenoid.


## Flow Alarm Issues

When a Flow Sensor is in use, the ESP-2WIRE monitors for high flow of 130% of regular learned flow. This percent limit can be adjusted in the Rain Bird App when used with LNK2™ WiFi Module.

If a high flow condition is detected, a “High Flow Alarm” is shown at the display and the red ALARM LED comes on. To clear the alarm press the “Right Arrow Button” during the alarm message.

Low Flow conditions are also monitored. The limit for Low Flow is 70% of the learned flow unless changed in the Rain Bird App, a “Low Flow Alarm” is shown at the controller display and the red ALARM LED comes on.

 NOTE: Turning the “Flow Sensor” feature off and on will cause the controller to learn new flow levels and ignore previous error conditions.



 NOTE: If the “Flow Sensor” measures flow when the controller is not scheduled for watering, a “High Flow Zone Alarm” is shown on the display and the red ALARM LED comes on. To clear the alarm press the “Right Arrow Button” during the alarm message.



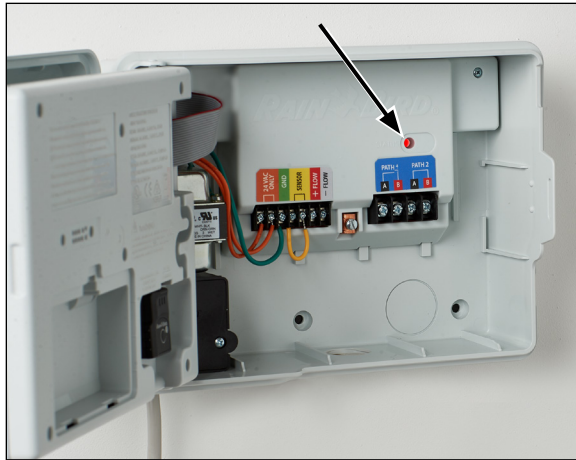
**ESP-2WIRE Controller Front Panel**  
High Flow Condition - Alarm

To clear the alarm press the “Right Arrow Button” during the alarm message.

## Flow Alarm Errors (solid LED illuminated)

Front Panel Alarm LED	LCD Message	Meaning	Resolution
Solid RED.	HIGH FLOW ALARM STATION "X".	High flow condition detected at a station indicated by the number.	<p>High flow alarms are triggered by flow of 130% or more than the learned or expected flow rate. This setting can be adjusted in the Rain Bird Mobile App when used with a LNK2 WiFi Module.</p> <ul style="list-style-type: none"> <li>If there is no leak or break, press the “Right Arrow Button” under the LCD display during the alarm message to clear the error.</li> <li>If there is a leak or break, press the “Right Arrow Button” under the LCD display during the alarm message to clear. After repair of the system, if the new flow rate is within 130% of the expected flow rate the error will be resolved.</li> </ul> <p> NOTE: Turning flow sensing off and then back on will cause the controller to learn new flow levels and ignore previous error conditions.</p>
	HIGH FLOW ZONE.	Flow has been detected when the controller is not scheduled for watering.	<p>This could indicate a leak on the mainline or a master valve that is stuck open. After addressing the cause, the alarm can be cleared by pressing the “Right Arrow Button” under the LCD display during the alarm message.</p>
	LOW FLOW ALARM STATION "X".	Low flow condition detected at a station indicated by the number.	<p>Low flow alarms are triggered by flow of 70% or less than the learned or expected flow rate. This setting can be adjusted in the Rain Bird Mobile App when used with a LNK2 WiFi Module.</p> <ul style="list-style-type: none"> <li>If no repairs are necessary, press the “Right Arrow Button” under the LCD display during the alarm message to clear the error.</li> <li>If the system needs repair, press the “Right Arrow Button” under the LCD display during the alarm message to clear the error. After repairs if the new flow rate is more than 70% of the expected flow rate, the error will be resolved.</li> </ul> <p> NOTE: Turning flow sensing off and then back on will cause the controller to learn new flow levels and ignore previous error conditions.</p>

## Back Plane Status LED




Controller with swing door and front panel open





ESP-2WIRE Controller back plane

## Back Plane Errors (solid or blinking LED illuminated)

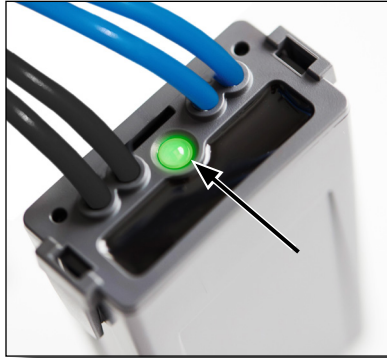
Back Plane Status LED	LCD Message	Meaning	Resolution
Off.	None.	The system is operating normally and no irrigation is active (manual or programmed). <b>Power Measure Mode</b> is not active and there is no 2-wire path short alarm.	None.
Blinking GREEN.	None.	The 2-wire path is energized and a decoder has been activated. There is no 2-wire path short.	None.
Solid RED.	2-WIRE PATH SHORT.	2-wire path short alarm. Also front panel ALARM remains red as long as the front panel shows short condition. Potential Causes: <ul style="list-style-type: none"> <li>Resistance caused by corrosion.</li> <li>Exposed wire on the path.</li> <li>Field wires may be crossed in the field (wire A connected to wire B) creating a dead short.</li> </ul>	Alarm will clear automatically whenever a manual station, manual program, test all or scheduled program is activated if the short condition has been physically addressed in the field. See "Finding System Shorts" on page 11 for more information.
Alternate BLUE, RED, GREEN.	SHORT FIND MODE_PATH ON FOR FIELD TESTING.	<b>Short Finding Mode</b> has been activated at the front panel or through the Rain Bird Mobile App.	This is a troubleshooting feature used to find shorts in the field.  <b>NOTE:</b> Turn the dial to any other position to exit <b>Short Finding Mode</b> . See "Finding System Shorts" on page 11 for more information.



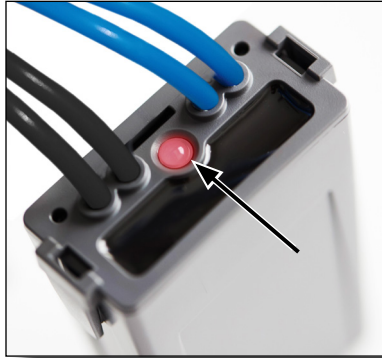
## Back Plane Errors (solid or blinking LED illuminated)

Back Plane Status LED	LCD Message	Meaning	Resolution
Solid BLUE.	XX VLTS ON PATH or XXX MA ON PATH.	<b>Power Measure Mode</b> has been activated at the front panel or through the Rain Bird Mobile App to indicate the voltage and milliamp draw on the system.	<p><b>Power Measure Mode</b> is used to show the voltage and electrical current draw on the 2-wire path.</p> <p> NOTE: In this mode all decoder LEDs should illuminate solid blue.</p> <ul style="list-style-type: none"> <li>• Normal voltage is between 26-28V.</li> <li>• Normal mA draw is between 30 and 350 in this mode with the LEDs illuminated blue and each decoder draws approximately 7 milliamps.</li> </ul> <p> NOTE: With a dead short on the system (electrical current is excessively high) the controller will activate <b>Short Finding Mode</b> automatically and the LED will alternate blue, red, and green.</p>
Blinking BLUE.	FINDING FIELD DEVICES or PINGING FIELD DEVICES.	Learning decoder addresses is in progress or the system is pinging the decoders programmed in the controller. This feature is activated at the front panel or through the Rain Bird Mobile App.	After address discovery, the LED light will return to the off state.

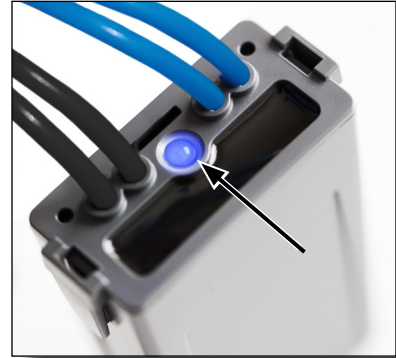
## Decoder Status LED



LED light - GREEN






LED light - RED



LED light - BLUE

### Decoder Status LED (solid or blinking LED illuminated)

Decoder Status LED	Legend/Meaning	Resolution
Off.	Station is inactive or the controller is in <b>Short Finding Mode</b> .	<p>There is no resolution needed if the controller is inactive.</p> <p> NOTE: If <b>Short Finding Mode</b> has been activated the LEDs turn off to more accurately measure electrical current draw in the field.</p> <p>See "Finding System Shorts" on page 11 to learn more about finding shorts in the field.</p>
Blinking GREEN.	Station is active, a solenoid is detected and current draw is normal.	None.
Solid RED.	Short detected on the decoder output. A station short error should appear on the controller front panel.	<p>The valve solenoid may need to be replaced to repair the short condition.</p> <p> NOTE: LED will remain red as long as the 2-wire path is energized (typically during the full irrigation program).</p>
Blinking RED.	Open wiring condition detected on the decoder output.	<p>There is an open output detected.</p> <ul style="list-style-type: none"> <li>Check the wiring between the decoder output and valve solenoid. LED will remain red as long as the 2-wire path is energized (typically during the full irrigation program).</li> </ul>
Solid BLUE.	<b>Power Measure Mode.</b>	<p><b>Power Measure Mode</b> has been activated at the front panel or through the Rain Bird Mobile App.</p> <p> NOTE: If a decoder LED is not illuminated solid blue it may not be connected to the 2-wire path.</p>
Blinking BLUE.	Address Discovery Mode or Ping Decoders Active.	<p>Learning decoder addresses is in progress or the system is pinging the decoders programmed in the controller.</p> <ul style="list-style-type: none"> <li>This feature is activated at the front panel or through the Rain Bird Mobile App. During address discovery if a decoder LED is not blinking blue, it may not be connected to the 2-wire path.</li> </ul>

## 2-Wire Troubleshooting Menu

### Access the Troubleshooting Menu



Turn the dial to: **2-Wire Settings**

- 1 Press the ◀ and ▶ keys simultaneously to access the menu.
- 2 The display message will scroll:

**PRESS + TO PING DECODERS**



After pressing + the 2-wire path will be energized and the system will begin looking for decoders connected to the 2-wire path to compare against what is programmed.

- Decoders connected to the 2-wire path should begin blinking blue.
- The “Back Plane Status LED” should begin blinking blue.
- The controller will return a list of stations found and stations not found.

- 3 Press ▶ to advance to **Power Measure Mode**.

Advancing to **Power Measure Mode** will energize the 2-wire path and give a Voltage reading on the 2-wire path.



NOTE: If there is a dead short on the system (excessively high electrical current consumption) the system will automatically revert to **Short Finding Mode** (see below).

- The “Back Plane Status LED” should turn solid blue.
- Any decoders connected to the 2-wire path should show a solid blue LED.
- Normal voltage is 26-28V.

If the voltage is not in the normal range, there may be a short on the 2-wire path.

See “Finding System Shorts” on page 11 to learn more about finding shorts in the field.

- 4 Press ▶ to advance to the Electrical Current Draw Measurement'

In this mode, with all decoder LEDs illuminated solid blue a normal mA reading is approximately 7 mA for every decoder that is connected.

For example:

If you have 20 decoders connected, a normal electrical current draw is approximately 140 mA (20 decoders x 7 mA).



NOTE: Normal mA draw will vary based on the number of decoders on the system.

- A reading below what is expected may mean decoders have become disconnected from the 2-wire path.
- A reading above what is expected may mean there is a short condition caused by exposed wire or resistance caused by corrosion.

- 5 Press ▶ to advance to **Short Finding Mode**.

### Using The Rain Bird Mobile App

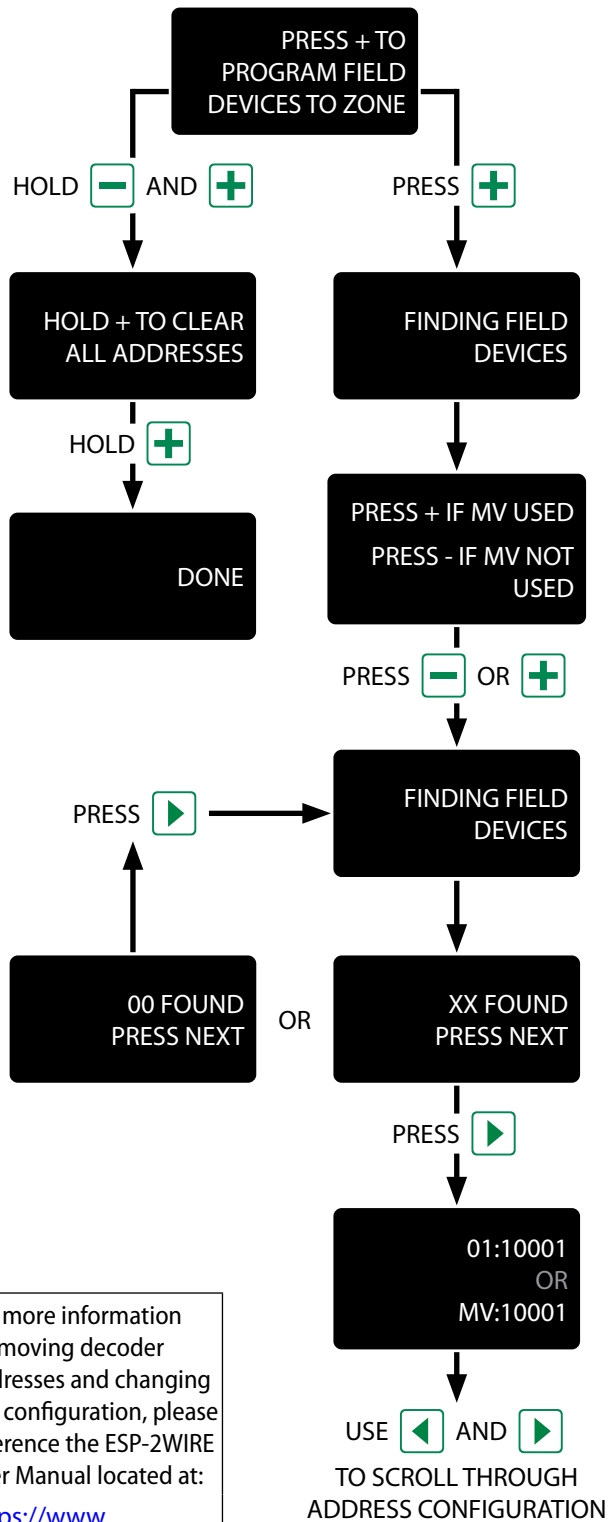
Alternatively, using the Rain Bird Mobile App and LNK2 you can access these features through the decoder settings menu.

- Pinging decoders from the Mobile App using LNK2 can be done by scanning the system in the decoder settings menu.
- The Mobile app will indicate which decoders are existing, which decoders are not found and which decoders may be new to the system.
- **Power Measure Mode** and **Short Finding Mode** can also be accessed through the decoder settings screen.

## Address Discovery UI



Turn the dial to: **2-Wire Settings**

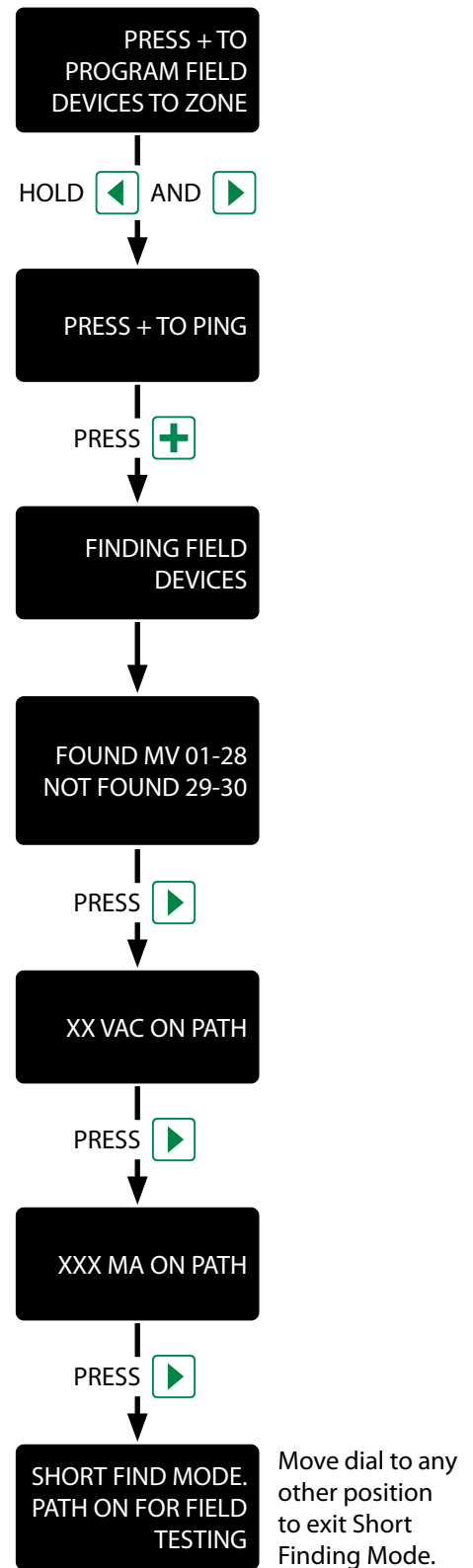


For more information on moving decoder addresses and changing the configuration, please reference the ESP-2WIRE User Manual located at: <https://www.rainbird.com/products/ESP-2WIRE>

## Troubleshooting UI




Turn the dial to: **2-Wire Settings**




## Finding System Shorts

**Short Finding Mode** will energize the 2-wire path and allow you to search in the field for electrical shorts using a clamp meter that reads milliamps.

- In this mode, the “Back Plane Status LED” will alternate blue, red, and green and all decoder LEDs will turn off.
- With decoder LEDs turned off, a normal milliamp reading for each decoder will be approximately 0.7 mA.

 NOTE: If a dead short is found during irrigation, the path will turn off and you will receive an alarm message on the front panel.

 NOTE: If a dead short is found during **Power Measure Mode** in the troubleshooting menu, the controller will automatically enter **Short Finding Mode**.

Using a clamp meter that reads milliamps and an as-built of the irrigation system, you can clamp individual wires of the 2-wire path and begin searching in the field for problems.

**For example:**

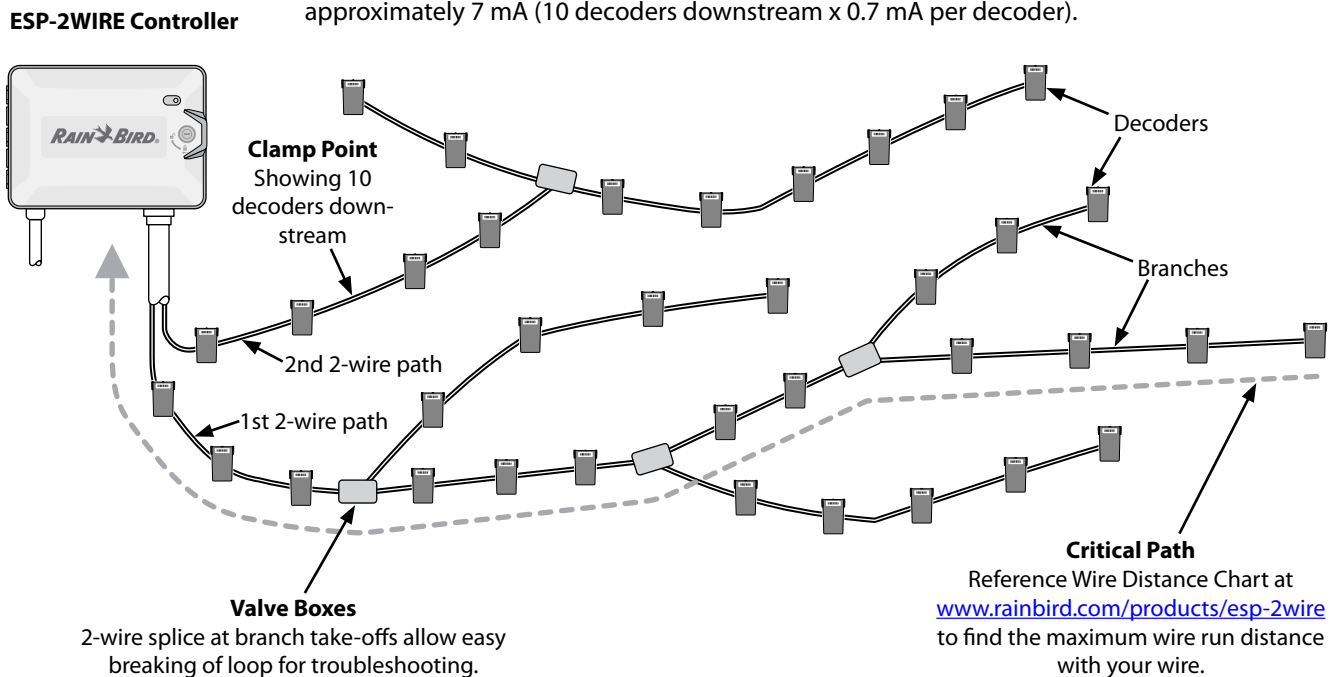
Clamping an individual wire with 10 decoders downstream should show a current of approximately 7 mA as shown in “Figure 1” below.

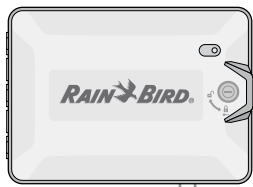
- If reading is too high, there is still a problem downstream.
- If reading is too low it may indicate decoders that have become disconnected.

After short conditions on the 2-wire path are resolved, **Short Finding Mode** can be ended by turning the dial to any other position. This will deactivate the 2-wire path until the next irrigation cycle.

**Figure 1: Short Finding Mode**

With the LEDs turned off: In this example, clamping should give a reading of approximately 7 mA (10 decoders downstream x 0.7 mA per decoder).





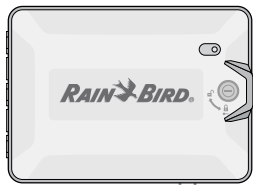
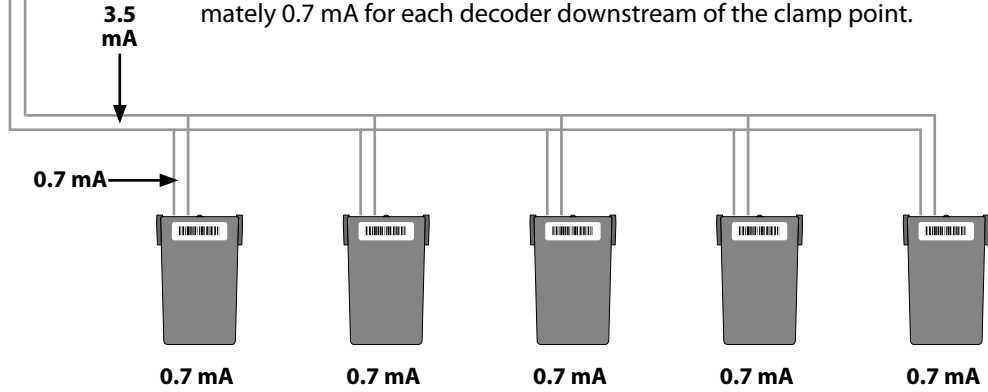
ESP-2WIRE Controller

Figure 2: Milliamp Flow



NOTE: Measurements below indicate decoder mA draw during **Short Finding Mode** with all decoders turned off. During **Power Measure Mode** with all LEDs illuminated a normal mA draw is 7 mA per decoder.

Normal mA draw on the 2-wire path in **Short Finding Mode** is approximately 0.7 mA for each decoder downstream of the clamp point.

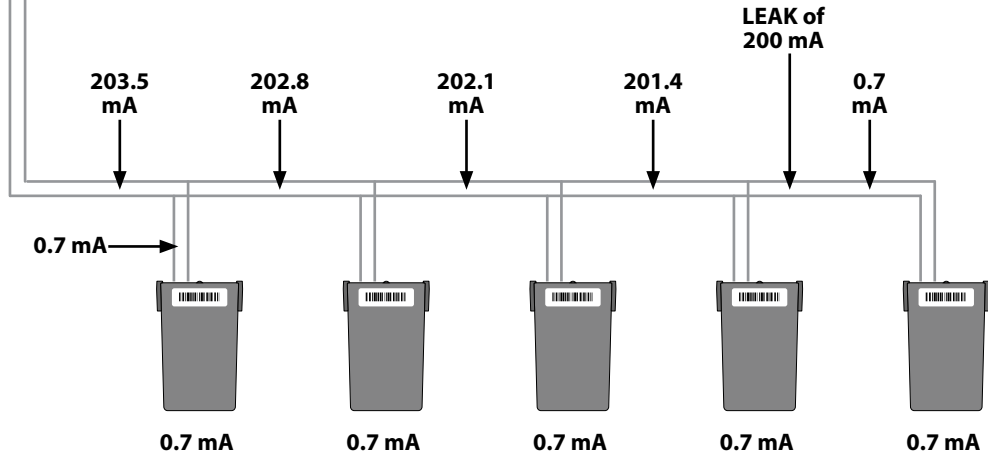


ESP-2WIRE Controller

Figure 3: Milliamp Leaks



NOTE: Using a clamp meter that reads milliamps, you can begin to determine where the system shorts are located.





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