

# CONNECTED WIRELESS SYSTEM GUIDE

## Module 2 - Hydronic Control Systems



Wireless Hydronic Controls

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## USING THIS MANUAL

For the latest Instructions go to: [WWW.MRPEXSYSTEMS.COM](http://WWW.MRPEXSYSTEMS.COM)

To cover all MrPEX® Wireless Products without requiring customers to download documentation unrelated to their installations, the Connected Wireless Systems Guide has been divided into 4 modules. Module 1 is required for all wireless systems since it covers installation of the Gateway and the MrPEX® Smart Home application. The remaining modules are specific to a particular group of controls.

Below is a description of several icons used to direct the reader's attention.

### Special Attention Boxes

This manual uses special attention icons to alert the reader of important safety concerns, information important to reliable operation of the controls or helpful installation/setup information.

**Safety:**

Indicates a condition which may cause severe personal injury, death or major property damage

**Important Information:**

Indicates information which requires special attention for correct operation of the control

**Your Benefit:**

Indicates helpful installation or setup information

## SYSTEM OVERVIEW

The MrPEX® Wireless Hydronics Control System uses the Zigbee 3.0 communications protocol to provide a universal language for smart components to work together seamlessly and securely, with or without an internet connection.



By connecting the Gateway to your home network, the system is connected to the worldwide web. Monitor or adjust your system from anywhere via the MrPEX® Smart Home application. If the connection to the internet is lost, the system continues to function with the settings selected.

## SYSTEM OVERVIEW WITHOUT INTERNET CONNECTION

MrPEX® offers the AC10RF Coordinator which uses the Zigbee 3.0 communications protocol to connect all system components, providing wireless communication easily and securely without the possibility of connecting to the internet. A separate document [Manual Hyperlink](#) is available to describe this operation.

Module 1 of the MrPEX® Wireless Systems Guide provides information about installation/setup of the Gateway that provides communication between devices and, if desired, with the internet. The following descriptions provide instructions for installation of the hydronic components.

## PUMP RELAY INSTALLATION

The Zone Pump Relay pairs with an Wireless Thermostat via the Gateway to provide a heat demand signal to the boiler and control a zone pump.

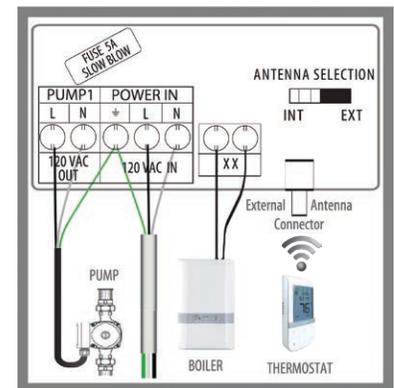


**The Single Zone Pump Relay Controller must be installed by a qualified contractor. Installation and repairs are to be performed according to all national and local codes required by the authority having jurisdiction. In the absence of local requirements, follow ANSI/NFPA 70, National Electrical Code. Failure to follow these requirements may lead to severe personal injury, death or major property damage. DO NOT SERVICE this equipment without disconnecting the AC electrical power.**

1. Carefully read these instructions and all instructions supplied with the unit before starting the installation.
2. Inspect the control for damage and be sure all required parts are included before beginning.
3. Remove 4 screws at the corners and lift off the plastic cover.
4. Check that the fuse installed is a 5A, slow blow fuse and that it is inserted correctly.
5. Attach the base of the Pump Relay to a wall or similar vertical structure in a suitable location near the boiler and pumps using the hardware supplied.



**DO NOT INSTALL this control in an area where water leaks or spray are possible. Failure to comply may result in serious injury, death or major property damage due to electrocution or fire.**



### Electrical Connections

#### Dry Contacts (rated 120VAC, max.2A)

XX Active Pump

#### 120VAC Connections

L	AC Line In
	Zone Pump Line Out (max. 1/6 HP)
N	AC Neutral
⊥	Earth Ground

Fuse: 5A slow blow, 5x15mm (2AG)

6. **BE SURE** all electrical power to the device is disconnected before wiring the device.
7. Wire 120 VAC power to the L (Hot), N (Neutral) and  $\perp$  (Ground) terminals labeled, "POWER IN".
8. Wire the 120 VAC power output to the pump from L (Hot), N (Neutral) terminals labeled, "PUMP". Connect the ground terminal to the "POWER IN"  $\perp$  (Ground) terminal as shown in the wiring schematic.
9. Wire the output terminals labeled "XX" to the boiler thermostat input ("TT").
10. Wire the thermostat contacts to R & W on the terminals labeled "24 VAC T-STAT". If a "C" wire is required connect it according to the drawing.
11. Reattach the control cover securing it with the 4 screws and switch on 120 VAC power to the unit. The LED labeled "POWER" will be illuminated.

## PUMP RELAY INSTALLATION

The Pump Relay pairs with an Wireless Thermostat via the Gateway or Coordinator to provide a heat demand signal to the boiler and control a zone pump. They can control up to 6 pumps with outputs for multiple heat demands.



**The Pump Relay must be installed by a qualified contractor. Installation and repairs are to be performed according to all national and local codes required by the authority having jurisdiction. In the absence of local requirements, follow ANSI/NFPA 70, National Electrical Code. Failure to follow these requirements may lead to severe personal injury, death or major property damage. DO NOT SERVICE this equipment without disconnecting the AC electrical power.**

1. Carefully read these instructions and all instructions supplied with the unit before starting the installation.
2. Inspect the control for damage and be sure all required parts are included before beginning.
3. Remove 4 screws at the corners and lift off the plastic cover.
4. Check that the fuse installed is a 5A, slow blow fuse and that it is inserted correctly.
5. Attach the base of the Pump Relay to a wall in a suitable location near the boiler and pumps using the hardware supplied.



**DO NOT INSTALL this control in an area where water leaks or spray are possible. Failure to comply may result in serious injury, death or major property damage due to electrocution or fire.**

6. **BE SURE** all electrical power to the device is disconnected before wiring the device.
7. Wire 120 VAC power to the L (Hot), N (Neutral) and  $\perp$  (Ground) terminals labeled, "POWER IN".



**For correct operation, it is important that the priority dip switch position matches the wiring configuration:**

- See Appendix A for schematic diagrams for typical installations
- If priority is OFF, the Zone 1 Thermostat cannot be wired, only a wireless thermostat will operate Zone 1
- If priority is off, 120 VAC power must be supplied to the green ZC and N connections for the pumps to operate. Power can be supplied from the CH pump output from the boiler or by switching ZCN Override to ON (See Appendix A).

## SECTION 2

# Module 2 – Wireless Hydronic Controls DEVICE INSTALLATION

8. Wire the 120 VAC power output to the priority zone pump from L (Hot), N (Neutral) terminals labeled, "PRIORITY PUMP1". The priority zone is typically used for a domestic hot water (DHW) demand.
9. Wire each successive pump to zone pumps as needed. Each ground terminal can support 2 ground wires for convenience.



**Priority Zone Function (Master relay controllers only) - When the "PRIORITY" dip switch is set to the "ON" position the following occurs:**

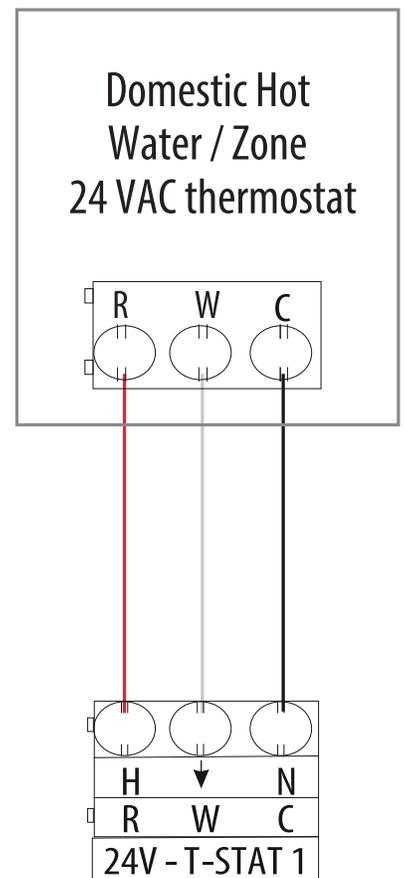
- Zone 1 pump is turned ON and all other pumps, including those on SLAVE relay controllers are turned OFF
- If the Zone 1 demand continues for more than 1 hour, the control will override Zone 1 priority and allow the other zone pumps to operate when a heat demand is present
- Once the Zone 1 demand is satisfied, the priority override feature resets and a Zone 1 heat demand will, again, take priority over the other zones.



**If the priority zone is used on the Relay with a wired room thermostat that requires separate C terminal, it should be wired as shown in the drawing. For a DHW thermal switch, a contact closure across R & W will initiate a demand.**

10. Reattach the control cover securing it with the 4 screws and switch on 120 VAC power to the unit. The LED labeled "POWER" will be illuminated.

Thermostat Connection



## ZONE CONTROLLER INSTALLATION

The Zone Controller connects with Wireless Thermostats via the Coordinator or Gateway to control up to 32 actuators in 8 zones. It also provides power switching to a system circulator and a wired output for heat demand to a boiler. Note that the maximum total current draw for the zone valve actuators is 3.3 amps.



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**The Zone Controller must be installed by a qualified contractor. Installation and repairs are to be performed according to all national and local codes required by the authority having jurisdiction. In the absence of local requirements, follow ANSI/NFPA 70, National Electrical Code. Failure to follow these requirements may lead to severe personal injury, death or major property damage. DO NOT SERVICE this equipment without disconnecting the AC electrical power.**

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1. Carefully read these instructions and all instructions supplied with the unit before starting the installation.
2. Inspect the control for damage and be sure all required parts are included before beginning.
3. Remove the cover by turning the screw to the unlock position  $\frac{1}{4}$  turn.
4. Unscrew two screws in the black line voltage cover and remove it.
5. Disconnect the 24 VAC supply connection.
6. Unscrew two screws on the left side of the control and remove the white internal wiring base.
7. Attach the Zone Controller to the wall in the desired suitable location.



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**DO NOT INSTALL this control in an area where water leaks or spray are possible. Failure to comply may result in serious injury, death or major property damage due to electrocution or fire.**

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8. Using appropriate wire connectors & strain relief fittings (not included) for the knock-out connections in the case, connect the 120 VAC power supply to the terminals provided.
9. Terminals 1 & 2 under the line voltage cover connect to a dry contact for the 120 VAC circulator. Voltage through this contact is not to exceed 250 VAC and the current is to be 10 amps or less.
  - Press the clamp with a small screwdriver
  - Insert the stripped wire end in the terminal
  - Release the clamp
  - Pull gently on the wire to make sure it is secure
10. Re-attach the white wiring base by inserting the tab on the right side into the base and securing it with the 2 screws on the left, making sure the power lines are not pinched.



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**Use the grooves provided in the wiring base for managing the pump and boiler wires. They provide a path for wires under the wiring base to the case knock-out openings.**

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The boiler can be controlled wirelessly by the Zone Controller if a Boiler Relay, configured as RX1 (sold separately) is used with the system. However, if desired, the boiler's thermostat input terminals (TT or RT) can be wired directly to terminals labeled "3" & "4" on the Zone Controller.

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11. If desired, connect wires from terminals 3 & 4 under the cover to the boiler thermostat (TT) connection to provide a boiler demand.
  - Press the clamp with a small screwdriver
  - Insert the stripped wire end in the terminal
  - Release the clamp
  - Pull gently on the wire to make sure it is secure
12. Attach up to 4 zone valve actuators to each zone by inserting the stripped wire ends into the round holes provided. To release a wire, use a small screwdriver to push the release mechanism next to each hole. Pull gently on the wires after they are inserted to be sure they are secure.



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Use the grooves provided in the wiring base for managing the valve wires. They provide a path for wires under the wiring base to the case strain relief openings.

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13. Re-attach the 24 VAC supply connection.
14. Check the fuse by removing the fuse holder and making sure the correct fuse is installed (4A)
15. Re-attach the line voltage cover by inserting 2 tabs on the right side into the wiring base and securing the screws.
16. Set the actuator jumper for the correct action. The default position is for normally closed (NC) actuators. To change to normally open (NO) move the jumper to the right and center pin.
17. Set the pump/boiler off delay jumper for the correct setting. The default setting is for no delay. To change the pump/boiler off delay to 15 minutes, move the jumper to the right and center pin.
18. Re-attach the unit cover by inserting the tabs on the right side into the unit and securing it with the ¼ turn latch.

## BOILER RELAY INSTALLATION

The Boiler Relay can be configured as a system remote boiler switch (RX1) or a single channel output to a thermal actuator or zone valve.



**The Boiler Relay must be installed by a qualified contractor. Installation and repairs are to be performed according to all national and local codes required by the authority having jurisdiction. In the absence of local requirements, follow ANSI/NFPA 70, National Electrical Code. Failure to follow these requirements may lead to severe personal injury, death or major property damage. DO NOT SERVICE this equipment without disconnecting the AC electrical power.**

- Carefully read these instructions and all instructions supplied with the unit before starting the installation.
- Inspect the control for damage and be sure all required parts are included before beginning.
- Remove the cover by loosening the 2 screws on the bottom of the unit and rotating the bottom upward until the top clips disengage.
- Attach the Receiver to the wall in the desired suitable location.

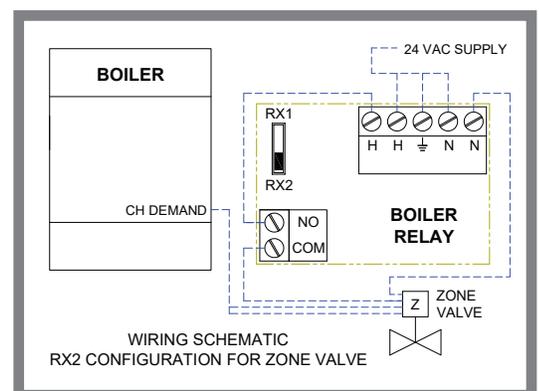
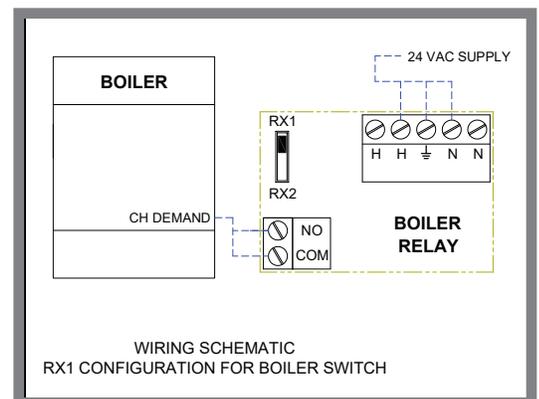


**DO NOT INSTALL this control in an area where water leaks or spray are possible. Failure to comply may result in serious injury, death or major property damage due to electrocution or fire.**

- Slide the configuration switch on the back of the cover to the desired position:

- RX1 for system remote boiler switch
- RX2 for valve actuator output

- Wire the receiver using the appropriate schematic diagram NOTE: The expected wait time for this activity to stop may exceed 5 minutes depending on the distance from the boiler.
- Re-attach the cover by engaging the cover clips with the top of the unit and rotating downward until it closes.
- Fasten the screws at the bottom of the unit.



## RADIATOR VALVE ACTUATOR INSTALLATION

The 3 Radiator Valve Actuator attaches to a Thermostatic Radiator Valve (TRV) that can connect wirelessly with your MrPEX® system to control room temperature.

1. Carefully read these instructions and all instructions supplied with the unit before starting the installation.
2. Inspect the control for damage and be sure all required parts are included before beginning.
3. Check the compatibility of this actuator with your TRV. If threads are not visible a MrPEX® RA adapter (included) may work with the valve.
4. Press up on the spring latch of the battery compartment and insert 2 AA batteries (included) ensuring the correct orientation. The LED on the top of the unit will flash green and then turn solid red.
5. Install the actuator on the radiator valve using the RA adapter if needed. Screw the unit (finger tight) to the radiator valve and check that the LED remains solid red.
6. Press any button on the unit to adapt it to the radiator valve. Once all movement and LED activity has stopped, the unit is ready to pair with your Wireless Radiant Thermostat.

NOTE: The expected wait time for this activity to stop may exceed 5 minutes depending on the distance from the boiler.

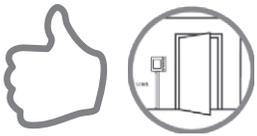


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**AFTER THE LED is off, listen for further activity from the actuator to be sure that it has completed its calibration cycle before advancing to the pairing step in Section 4. Failure to complete the calibration cycle may require the installer to reset the Radiator Valve Actuator (Section 5) and re-initiate the calibration sequence by repeating the steps above.**

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## WIRELESS RADIANT THERMOSTAT MOUNTING AND OPTIONAL TEMPERATURE SENSOR WIRING



MrPEX® components must be set up for wireless communication with the Gateway or with the AC10RF Coordinator. This process, called “joining”, should be performed with all devices installed in their intended location. If the intended operating location is unsuitable for the joining process for convenience or other factors, the device may be located in a convenient location during joining.

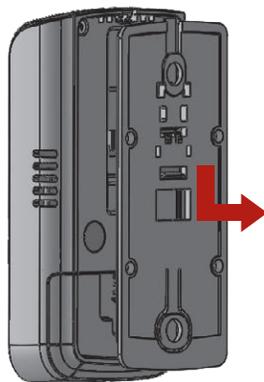
**DO NOT Mount** the Thermostat near any heat source, behind curtains, in direct sunlight, in areas of high humidity or area where water is present.



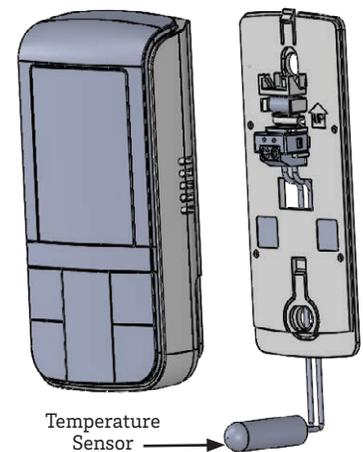
Avoid mounting the Thermostat on an exterior wall.

**Step 1.** Ensure that all required parts were included in the package.

**Step 2.** Remove the Thermostat from the backplate by lifting the tab in the top center and sliding the base downward.



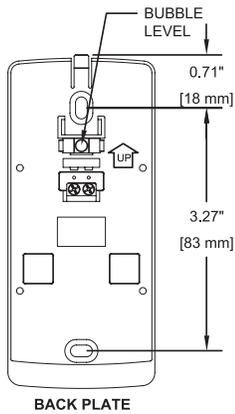
**Step 3.** Connect an external 10 kΩ NTC sensor (5113025 sold separately), if desired, to the sensor terminals on the backplate.



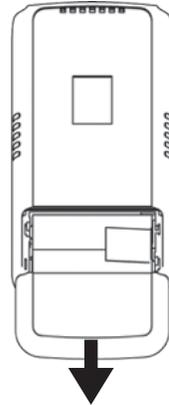
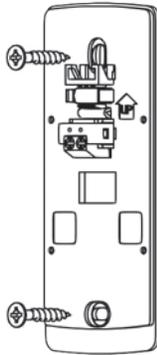
**FOR BEST RESULTS,** ensure that the Wireless Radiant Thermostat Thermostat backplate is level, using the integral bubble level, when mounting it. **NOTE THE ORIENTATION ARROW** molded into the backplate indicating correct orientation.

## SECTION 2

# Module 2 – Wireless Hydronic Controls DEVICE INSTALLATION



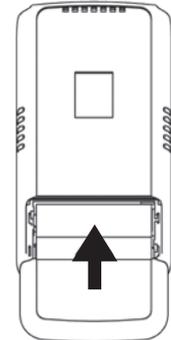
**Step 4.** Secure the backplate to the wall using the provided screws and wall anchors



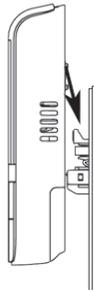
**Step 5.** Open the battery compartment



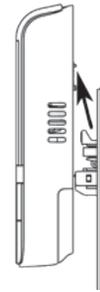
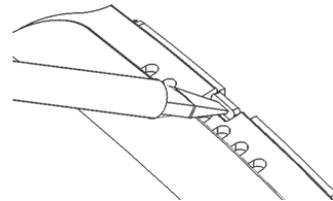
**Step 6.** Remove the battery tab to power the Thermostat



**Step 7.** Close the battery compartment

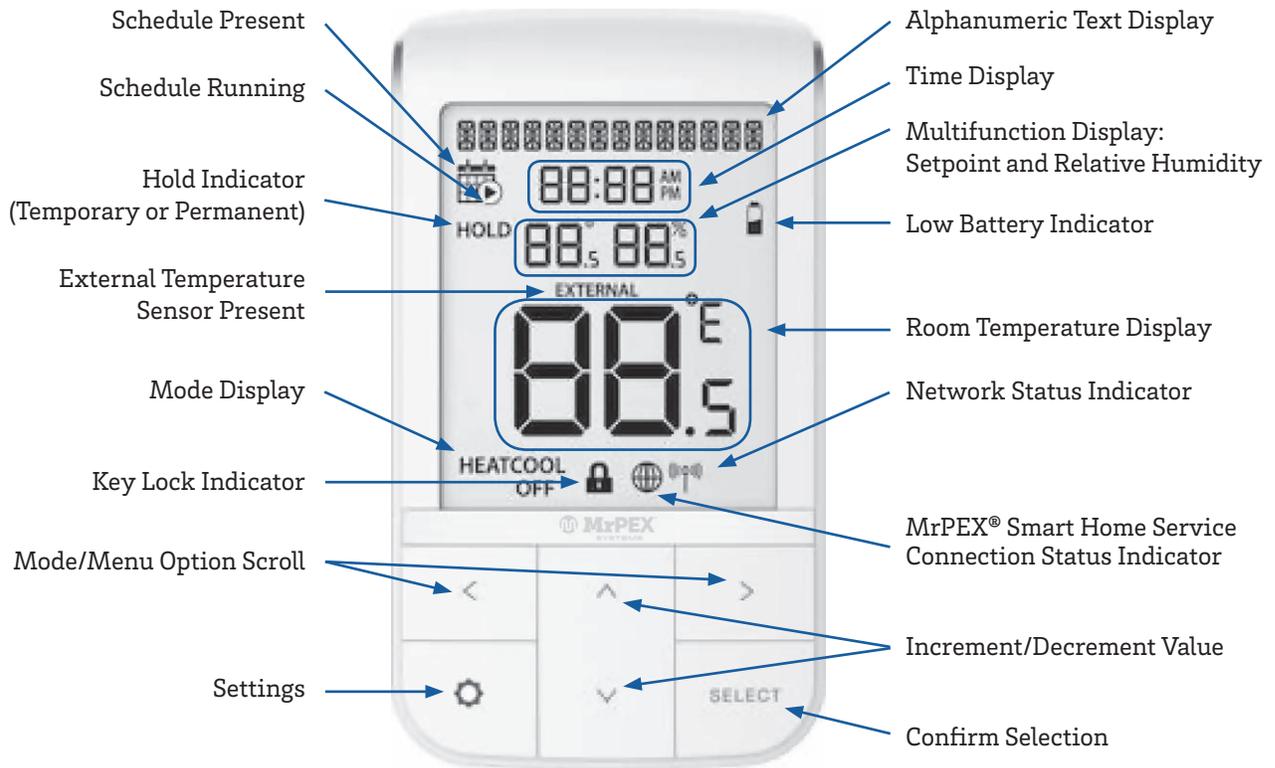


**Step 8.** Attach the Thermostat by positioning it against the backplate and sliding downward.



**The Thermostat can be removed by gently pushing the latch at the top of the thermostat and sliding the thermostat upward.**

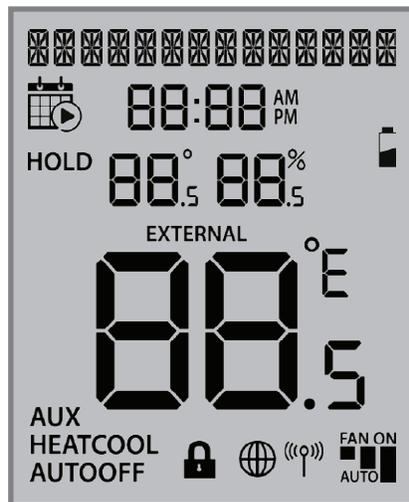
**THERMOSTAT HOME SCREEN AND KEY FUNCTIONS**



**DISPLAY SCREEN BOOT SEQUENCE**



Displays boot loader version number for 3 seconds



Displays all available LCD segments for 3 seconds



Displays MCU and Zigbee firmware version for 3 seconds

After the initial boot up sequence on the initial power up, the thermostat immediately enters the pairing process. Use the  $\wedge$  and  $\vee$  keys to select between the following devices:

DEVICE	MODEL(S)	DISPLAY
		PAIR? RELAY_CTL
		PAIR? RTR_VLV
		PAIR? REV1
		PAIR? REV2



To connect the Wireless Radiant Thermostat and other components using an Gateway, the gateway must be installed and activated. Please see the MrPEX® Installation Instructions (<https://www.mrpexsystems.com>) for information about setting up the gateway.

## PAIRING WITH PUMP RELAYS OR ZONE CONTROLLER

Before pairing, the Relay Controller and optional boiler relay (if desired) must be installed and powered in accordance with installation instructions included with these devices.

- The LED ring on the Gateway should be solid blue
- The Network Status LED on the Relay Controller should be flashing
- If an boiler relay is used, the LED backlight on the Auto/Manual switch of this device should be flashing red and the switch should be in the Auto position



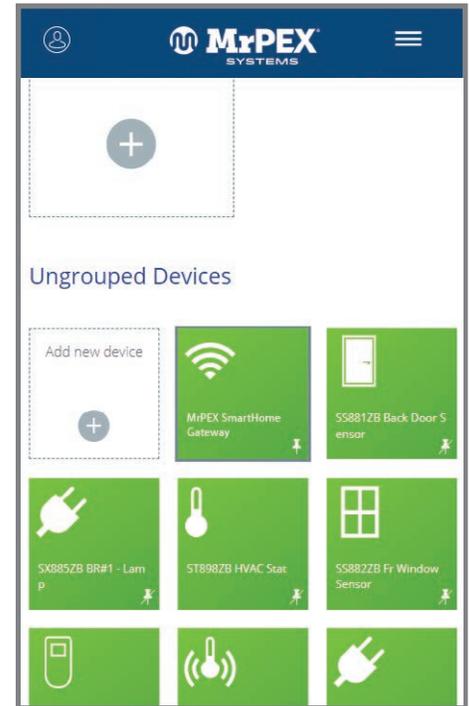
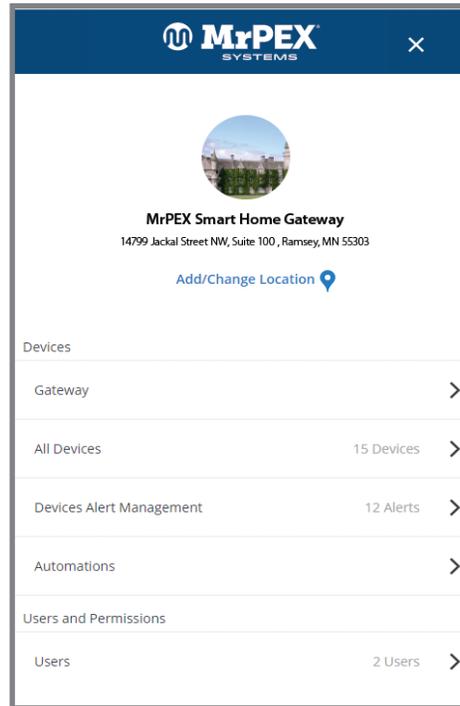
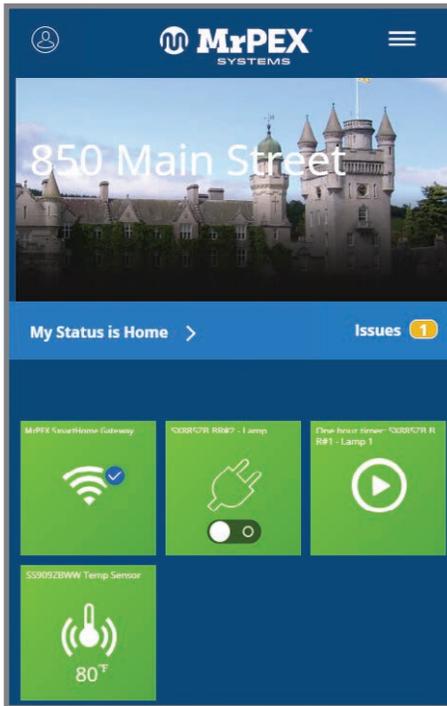
**Step 1.** If PAIR? RELAY\_CTL is not displayed and flashing, use the  $\wedge$  or  $\vee$  keys to display it. Press the SELECT key on the Thermostat.



The display will show JOINING- - - with a 10 minute countdown timer to show how much time is available to complete the next steps. The icon will flash at the bottom of the screen indicating that the thermostat is searching for a network to join.

## SECTION 3

# Module 2 – Wireless Hydronic Controls WIRELESS RADIANT THERMOSTAT PAIRING



**Step 2.** Open the MrPEX® Smart Home application, select the drop-down menu from the upper right of the screen and select: **All Devices** → **Add New Device**



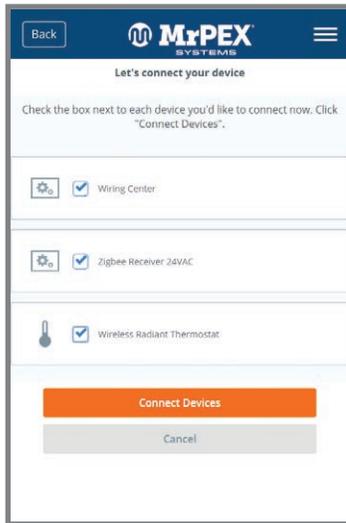
**Step 3.** Click the "Scan Devices" button. The Gateway LED will flash red as it searches for devices.

When the components are joined to the network

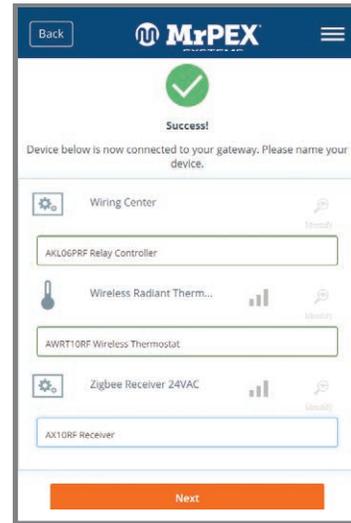
- The Network Status Indicator on the Thermostat will turn steady on,
- The Network Status LED on the Relay Controller will turn steady on, and
- If present, the red LED backlight on the Auto/Manual switch of the boiler relay will turn steady on

## SECTION 3

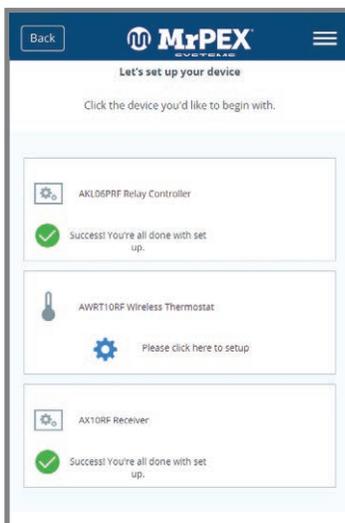
# Module 2 – Wireless Hydronic Controls WIRELESS RADIANT THERMOSTAT PAIRING



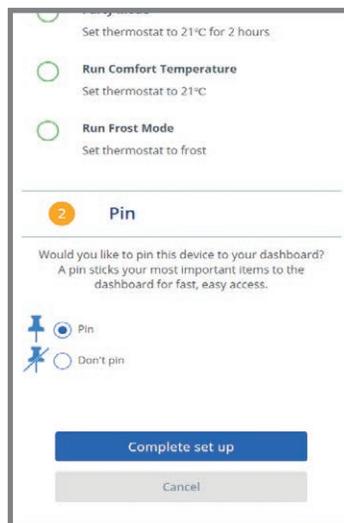
**Step 4.** Select the check boxes for the Wiring Center (Relay Controller), Zigbee Receiver and the Wireless Radiant Thermostat in the MrPEX® Smart Home application. Then press “Connect Devices”. The Gateway LED will return to a steady blue.



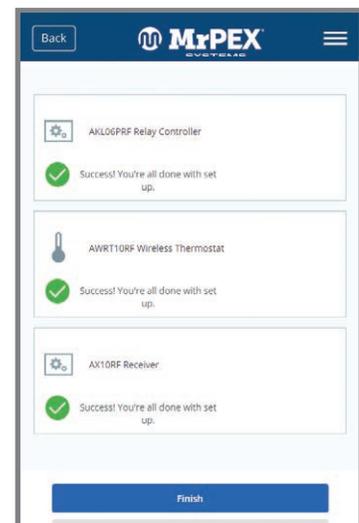
**Step 5.** Give each device a descriptive name that allows easy identification. If there are multiple relay controllers, identify each with respect to its location and/or purpose.



**Step 6.** Press “Please click here to setup” on the Wireless Thermostat.



**Step 7.** Make desired changes to setup. Scroll down and choose “Complete set up”.



**Step 8.** Choose “Finish” to complete the process.



Pressing the  icon on the Wireless Radiant Thermostat prior to pressing Finish on the MrPEX® Smart Home application starts the thermostat parameter setup. As covered in Section 8 of this manual, this can be setup after completing the pairing process.

# SECTION 3

## Module 2 – Wireless Hydronic Controls WIRELESS RADIANT THERMOSTAT PAIRING

Relay Controller ID

ID #	Zone 1	Zone 2	Zone 3	Zone 4
1	●			
2		●		
3			●	
4				●
5	●			●
6		●		●
7			●	●
8	●		●	●
9		●	●	●
0	●	●	●	●

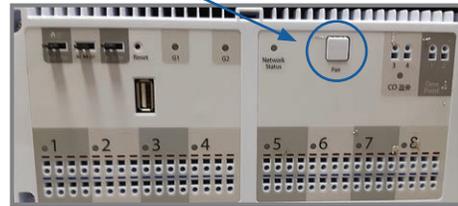
Relay Controller ID# Zone  
LED Pulse Code

ID #	LED Pattern Short = ●, Long = ▬
1	●
2	● ●
3	▬
4	▬ ●
5	▬ ● ●
6	▬ ▬
7	▬ ▬ ●
8	▬ ▬ ● ●
9	▬ ▬ ▬

Pump Relay Pairing Button



Zone Controller Pairing Button



Step 9. Once the Relay Controller is connected (network status LED is no longer flashing), briefly press the pairing button (shown above) on the relay controller. Zone LEDs on the Relay Controller will illuminate indicating the ID number of the device. This number will be used to set up thermostats to address the correct relay controller.



- When zone LEDs are illuminated in ID mode, the illuminated zone outputs will be activated.
- The Pump Relay uses the pulse codes shown above to identify the ID number. A short pulse = 1 and a long pulse = 3. Add the pulse values of all pulses for the ID value of the relay controller.

## SECTION 3

# Module 2 – Wireless Hydronic Controls WIRELESS RADIANT THERMOSTAT PAIRING



Once the Thermostat has joined the network, SCANNING- - - is displayed with a 10-minute countdown timer showing the time allowed to find all the relay controllers on the network



When the Thermostat has found all controllers in the network, it will display the default relay controller value (1) and the default zone value (1). If there is more than 1 relay controller on the network, the left value CNTRLR will flash. If there is only one relay controller the right value ZONE will flash.



**Step 9.** Use the  $\wedge$  and  $\vee$  keys to change the CONTROLLER value, then the  $\lt$  or  $\gt$  key to switch to the ZONE.



**Step 10.** Use the  $\wedge$  and  $\vee$  keys to change the ZONE value, then press SELECT. The Thermostat will then display PAIRING- - - as it associates with the selected controller and zone.



When paired, RLY\_CTL PAIRED will be displayed briefly along with the CNTRLR value and ZONE value.



The Thermostat will enter parameter setup mode, starting with parameter P 01. The current device type along with the Zigbee channel number will be displayed.



**Step 11.** Press the  $\odot$  key to exit parameter setup and go to the Home Screen. The display shows the current date & time, target temperature, relative humidity, network/internet status and room temperature.

## PAIRING WITH RADIATOR VALVE ACTUATORS

Before beginning, it is important that the Radiator Valve Actuator is installed and adapted properly as detailed in the installation instructions. The following is a review of those instructions.

### RADIATOR VALVE ACTUATOR INSTALLATION REVIEW

**Step 1.** Install the batteries and wait until the LED is solid red before installing the actuator on the radiator valve. Remember that the knurled nut on the actuator should only be finger tight. Using pliers or other tools can damage the device.

**Step 2.** After attaching the actuator to the valve, press any of the buttons to initialize the Radiator Valve Actuator. This process may take several minutes, and the valve may continue to initialize after the light is no longer illuminated.

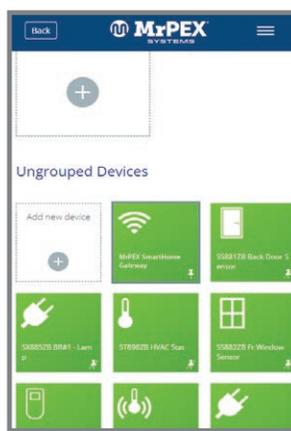
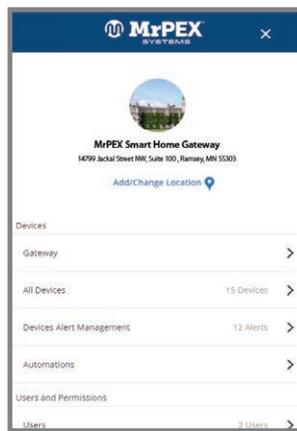
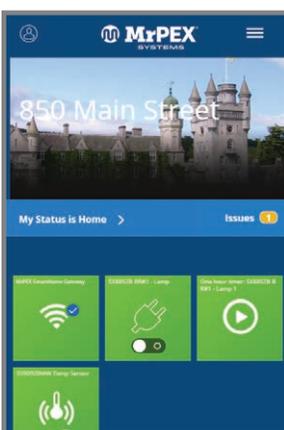


**DO NOT BEGIN pairing with the Radiator Valve Actuator unless the light is out and there is no motor activity. Listen closely to the Valve Actuator to be sure it is not operating before proceeding.**

### RADIATOR VALVE ACTUATOR PAIRING PROCEDURE

Before pairing, the radiator valve actuators and optional boiler relay (if desired) must be installed and powered in accordance with the installation instructions included with the devices.

- The LED ring on the Gateway should be solid blue
- The LED on the Valve Actuator(s) should be off with NO MOTOR ACTIVITY,
- If an boiler relay is used, the LED backlight on the Auto/Manual switch of this device should be flashing red with the switch in the Auto position.



**Step 1.** Open the MrPEX® Smart Home application, select the drop-down menu from the upper right of the screen and select: **All Devices → Add New Device**



**Step 2.** Click the "Scan Devices" button. The Gateway LED will flash red as it searches for devices.

## SECTION 3

# Module 2 – Wireless Hydronic Controls WIRELESS RADIANT THERMOSTAT PAIRING



10 seconds



The LED indicator will flash red.

**Step 3.** Press and hold the pair button for 10 seconds to enter pairing mode on each actuator to be connected.



**Step 4.** Use the  $\wedge$  and  $\vee$  keys on the Wireless Radiant Thermostat to switch from RLAY\_CTL to RDTR\_VLV. Press SELECT to initiate pairing.



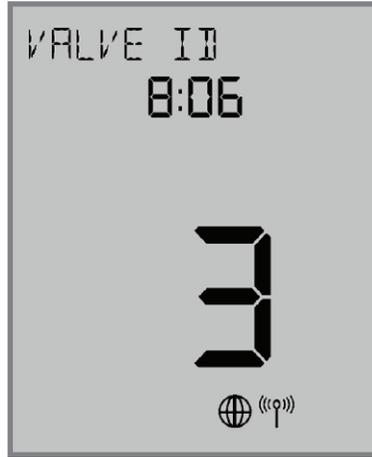
JOINING- - - is displayed with a 10 minute countdown timer to show the remaining time available to complete the next steps. The  $\left(\text{Ⓢ}\right)$  icon will flash at the bottom of the screen indicating that the thermostat is searching for a network to join.



Once the Wireless Radiant Thermostat joins a network, the  $\left(\text{Ⓢ}\right)$  icon will stop flashing and the network channel will be briefly displayed. After that, PAIRING- - - is displayed with a countdown timer showing the time allowed for the remaining pairing steps.



If there are any unpaired valve actuators already on the network, they will be paired with the Wireless Radiant Thermostat.



As each Valve Actuator joins the network, it is paired with the Thermostat and the valve ID number displayed on the screen will increment. Once paired, the LED on the valve actuator will turn off.

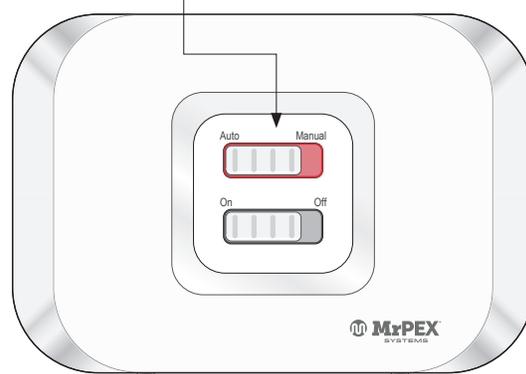


If the user presses the  key, the timer times out or 6 valves have been paired, the display will show the total number of valves paired for 3 seconds before going to the parameter setup mode.



In parameter setup mode, the Wireless Radiant Thermostat starts with P 01 (displayed with RDTR\_VLV flashing)

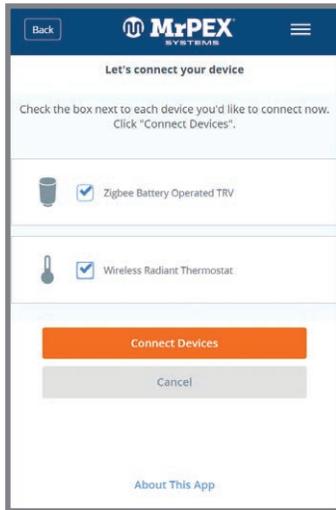
LED is solid red.



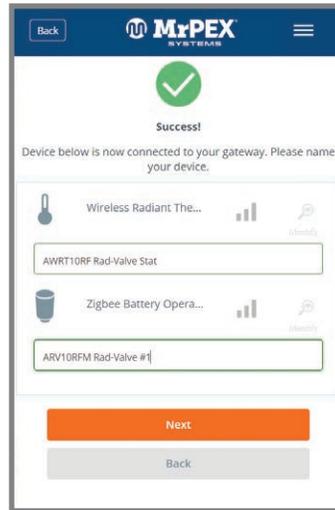
**If an Boiler Relay configured as RX1 has joined the network, it will automatically be paired with the thermostat and the LED backlight on the Auto/Manual switch will stay solid red.**

## SECTION 3

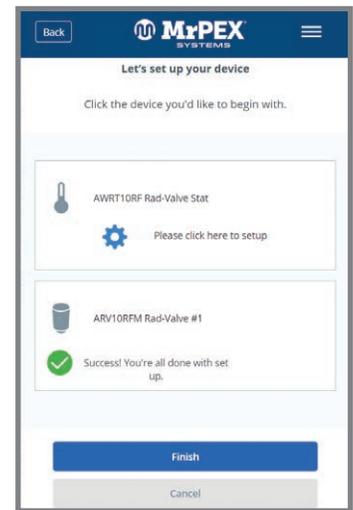
# Module 2 – Wireless Hydronic Controls WIRELESS RADIANT THERMOSTAT PAIRING



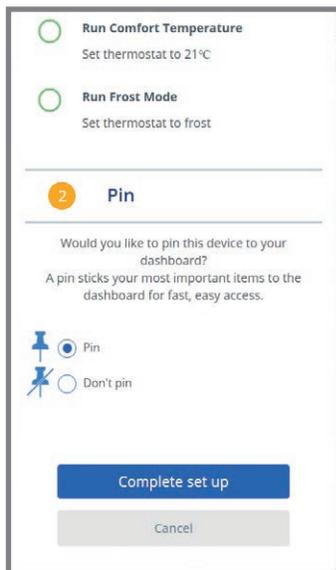
**Step 5.** Select the check boxes for the Zigbee Battery Operated TRV and the Wireless Radiant Thermostat in the MrPEX® Smart Home application. Then press “Connect Devices”. The Gateway LED will return to a steady blue.



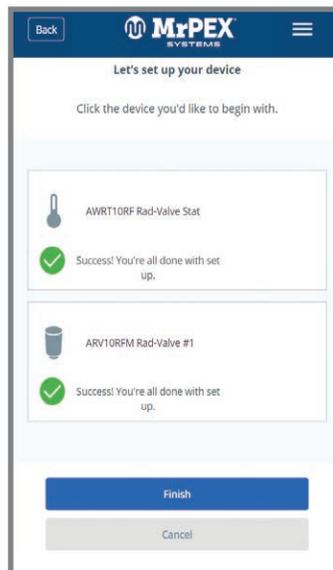
**Step 6.** Give each device a descriptive name that allows easy identification. If there are multiple radiator valves, identify each with respect to its location and/or purpose.



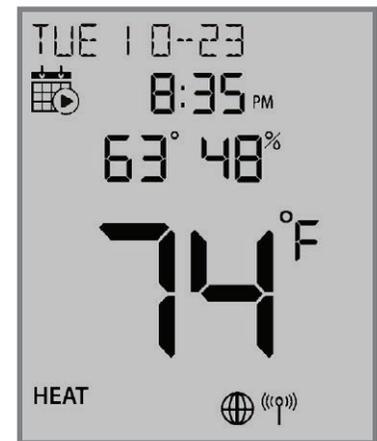
**Step 7.** Press “Please click here to setup” on the Wireless Thermostat.



**Step 8.** Press “Finish” to complete the connection to the MrPEX® Smart Home application.



**Step 9.** Press “Finish” to complete the connection to the MrPEX® Smart Home application.



**Step 10.** Press the  key to exit parameter setup and go to the Home Screen. The display shows the current date & time, target temperature, relative humidity, network/internet status and room temperature.

## PAIRING WITH BOILER RELAY FOR BOILER SWITCHING (RX1)



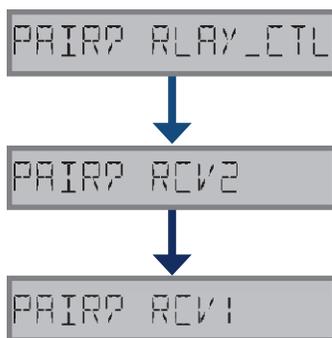
- This pairing procedure is only used when direct control of an Boiler Relay by the Wireless Radiant Thermostat is desired.
- Each system will support only one boiler relay configured as RX1 and one configured as RX2.



This configuration is typical in boiler systems in which there is only one thermostat in the system such as a single steam heating loop or single forced circulation, hot water loop. For systems with multiple zones, a zone relay controller such as the MrPEX® Zone Pump Relays or Zone Controller is recommended.

Before starting the pairing process, be sure that the boiler relay is installed as shown in the installation instructions included with the device.

- The switch on the inside cover must be configured to RX1
- The LED backlight on the Auto/Manual switch of the boiler relay should be flashing red
- The Auto/Manual switch of the boiler relay should be in the AUTO position
- The Gateway must be powered with solid blue LED indication that it is connected to the internet
- The Thermostat should be powered up and flashing PAIR? RLAY\_CTL



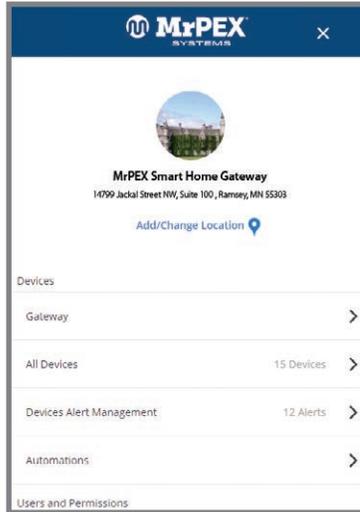
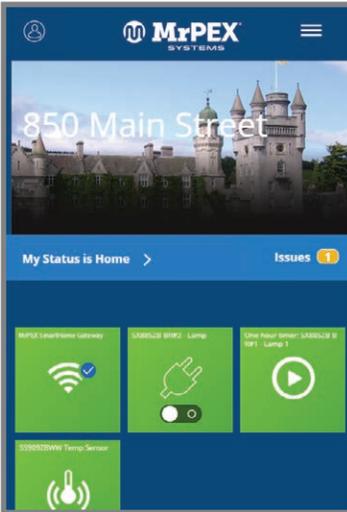
**Step 1.** On the Thermostat, press until PAIR? RCV1 is displayed. Press SELECT.



JOINING- - - will be displayed with a 10 minute countdown timer and a flashing network status indicator.

# SECTION 3

## Module 2 – Wireless Hydronic Controls WIRELESS RADIANT THERMOSTAT PAIRING

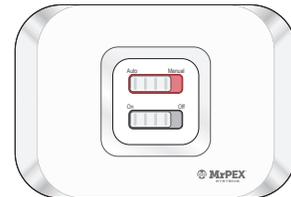


**Step 2.** Open the MrPEX® Smart Home application, select the drop-down menu from the upper right of the screen and select: **All Devices → Add New Device**

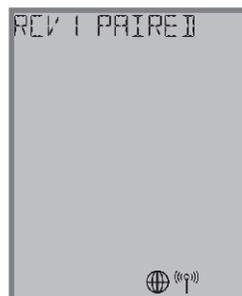


**Step 3.** Click the "Scan Devices" button. The Gateway LED will flash red as it searches for devices.

When the boiler relay joins the network, the red LED backlight on the Auto/Manual Switch will turn steady on.



Once the Thermostat joins a network, the  icon will stop flashing and the network channel will be displayed briefly. The home screen will show PAIRING- - - with a 10-Minute countdown timer as the Thermostat looks for an RX1 device.



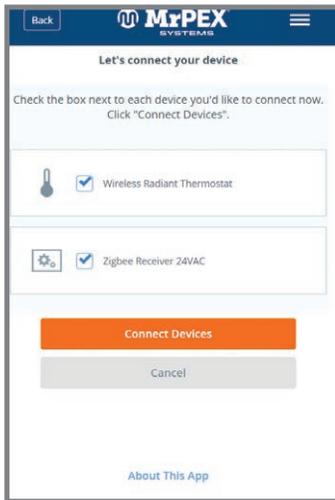
After pairing is complete, a confirmation screen is displayed on the Thermostat for 3 seconds, then the device will enter the parameter setup mode.



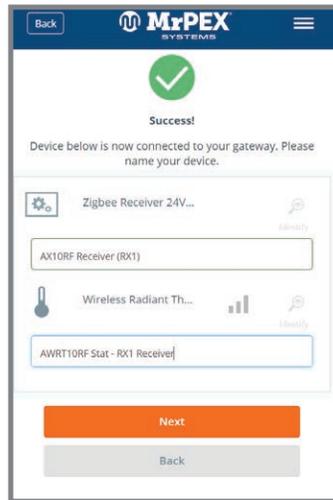
The thermostat display will show "PAIR: RCV1" with P 01 indicating it is in the parameter setup mode. "Cn" (Connected) indicates that the boiler relay is paired and connected.

## SECTION 3

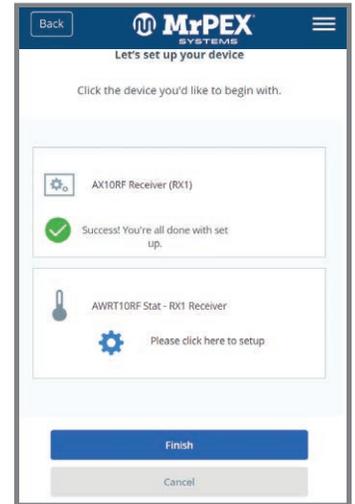
# Module 2 – Wireless Hydronic Controls WIRELESS RADIANT THERMOSTAT PAIRING



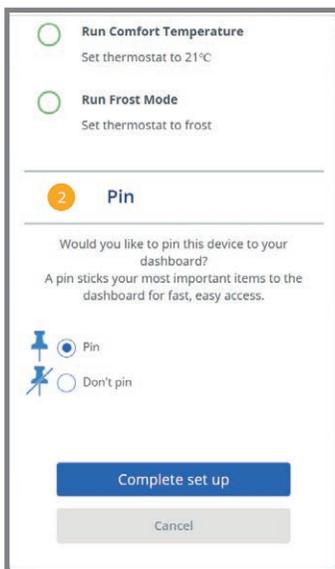
**Step 4.** Select the check boxes for the Zigbee Receiver 24VAC and the Wireless Radiant Thermostat in the MrPEX® Smart Home application. Then press “Connect Devices”. The Gateway LED will return to a steady blue.



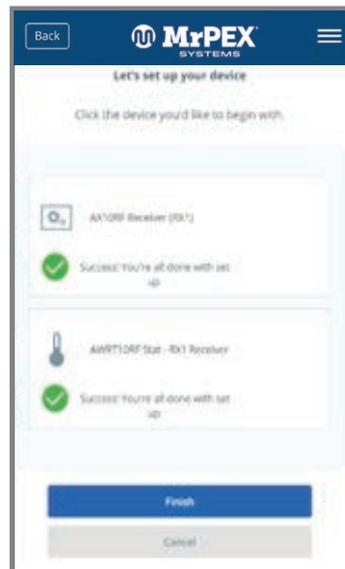
**Step 5.** Give each device a descriptive name that allows easy identification. If there are multiple relay controllers, identify each with respect to its location and/or purpose.



**Step 6.** Press “Please click here to setup” on the Wireless Thermostat.



**Step 7.** Make desired changes to setup. Scroll down and choose “Complete set up”.



**Step 8.** Choose “Finish” to complete the process.



If you do not rename the Wireless Radiant Thermostat in the MrPEX® Smart Home application, the device may stay in parameter setup mode. Press the  key to exit setup.

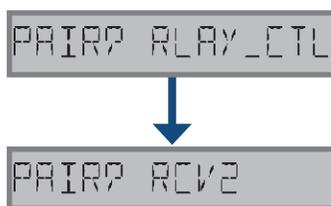
## PAIRING WITH BOILER RELAY FOR ZONE VALVE SWITCHING (RX2)



- This pairing procedure is only used when direct control of an boiler relay by the Thermostat is desired.
- Each system will support only one Boiler Relay configured as RX1 and one configured as RX2. These two configurations can be used together to provide boiler switching and zone valve operation.

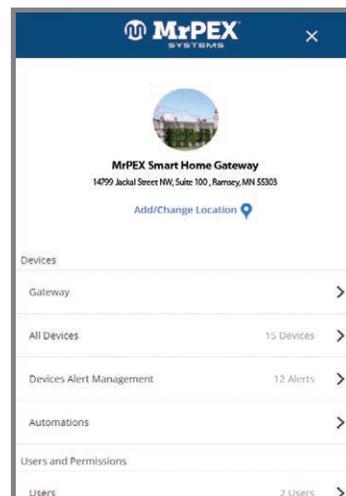
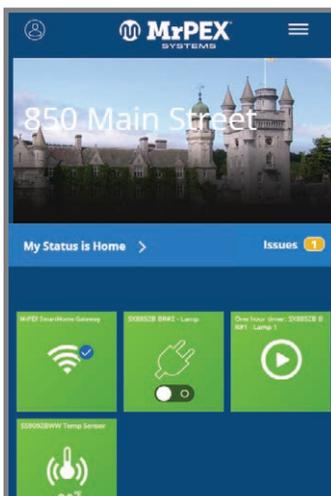
Before starting the pairing process, be sure that the boiler relay is installed as shown in the installation instructions included with the device.

- The switch on the inside cover must be configured to RX2
- The LED backlight on the Auto/Manual switch of the boiler relay should be flashing red
- The Auto/Manual Switch of the boiler relay should be in the AUTO position
- The Gateway must be powered with solid blue LED indication that it is connected to the internet
- The Thermostat should be powered up and flashing PAIR? RLAY\_CTL



**Step 1.** On the Wireless Radiant Thermostat, press until PAIR? RCV2 is displayed. Press SELECT.

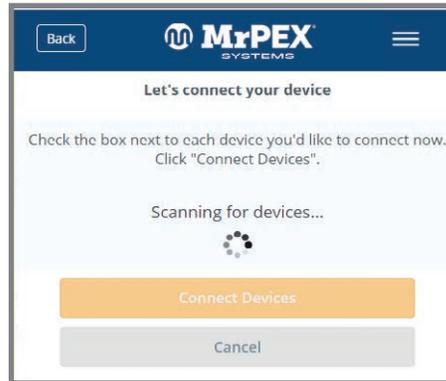
JOINING- - - will be displayed with a 10 minute countdown timer and a flashing network status indicator.



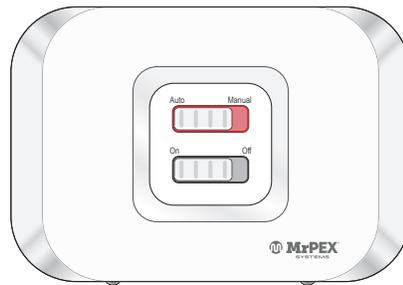
**Step 2.** Open the MrPEX® Smart Home application, select the drop-down menu from the upper right of the screen and select: **All Devices** → **Add New Device**

## SECTION 3

# Module 2 – Wireless Hydronic Controls WIRELESS RADIANT THERMOSTAT PAIRING



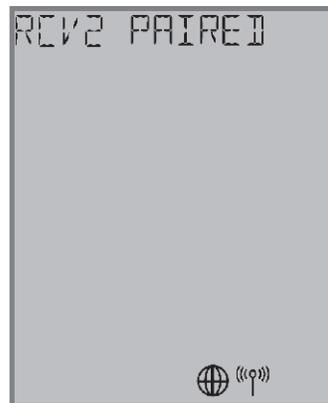
**Step 3.** Click the "Scan Devices" button. The Gateway LED will flash red as it searches for devices.



When the boiler relay joins the network, the red LED backlight on the Auto/Manual Switch will turn steady on.



Once the Wireless Thermostat joins a network, the  icon will stop flashing and the network channel will be displayed briefly. The home screen will show PAIRING- - - with a 10-Minute countdown timer as the Wireless Thermostat looks for an RX2 device.



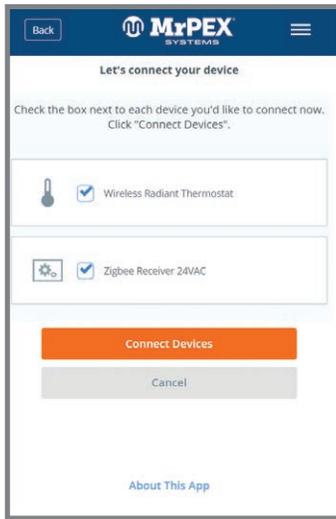
After pairing is complete, a confirmation screen is displayed on the Wireless Thermostat for 3 seconds, then the device will enter the parameter setup mode.



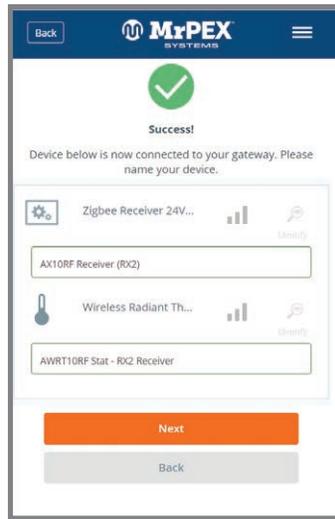
The thermostat display will show PAIR: RCV2 with P 01 indicating it is in the parameter setup mode. Cn (Connected) indicates that the boiler relay is paired and connected.

## SECTION 3

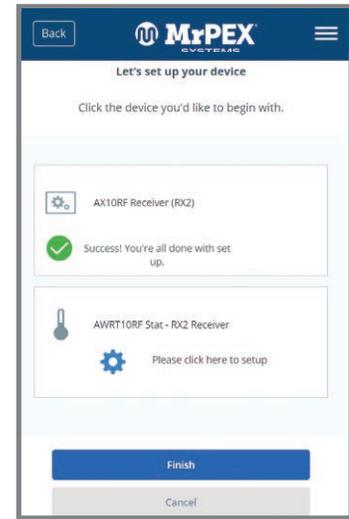
# Module 2 – Wireless Hydronic Controls WIRELESS RADIANT THERMOSTAT PAIRING



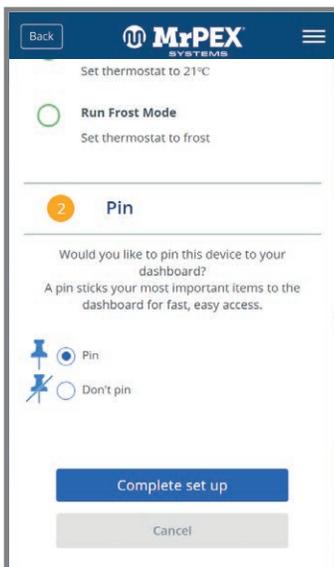
**Step 4.** Select the check boxes for the Zigbee Receiver 24VAC and the Wireless Radiant Thermostat in the MrPEX® Smart Home application. Then press "Connect Devices". The Gateway LED will return to a steady blue.



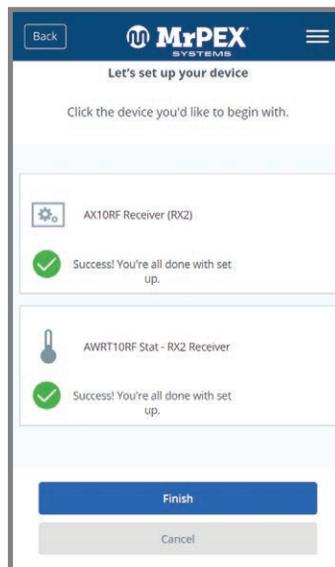
**Step 5.** Give each device a descriptive name that allows easy identification. If there are multiple relay controllers, identify each with respect to its location and/or purpose.



**Step 6.** Press "Please click here to setup" on the Wireless Thermostat.



**Step 7.** Make desired changes to setup. Scroll down and choose "Complete set up".



**Step 8.** Choose "Finish" to complete the process.



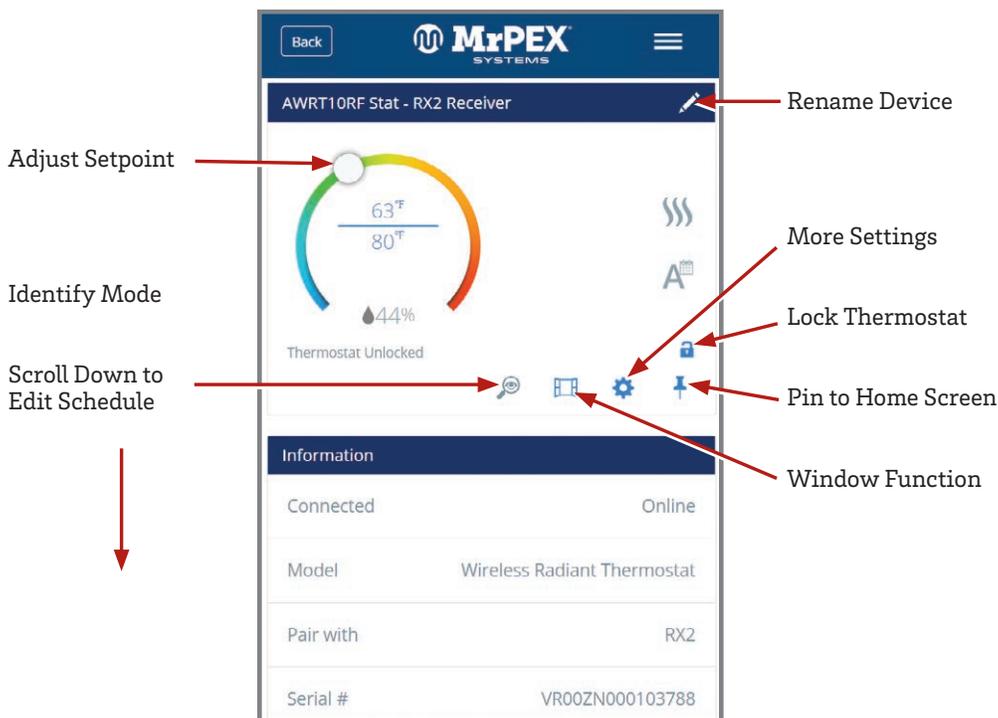
**If you do not rename the Thermostat in the MrPEX® Smart Home application, the device may stay in parameter setup mode. Press the  key to exit setup.**

## DASHBOARD OVERVIEW

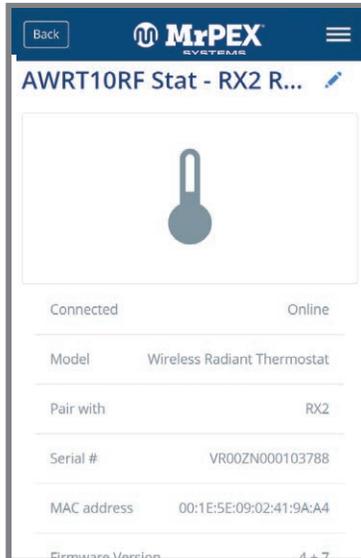
**MrPEX® Smart Home Application:** The following illustrates the dashboard and control panel for the Wireless Radiant Thermostat in the MrPEX® Smart Home Application on a mobile device or computer.



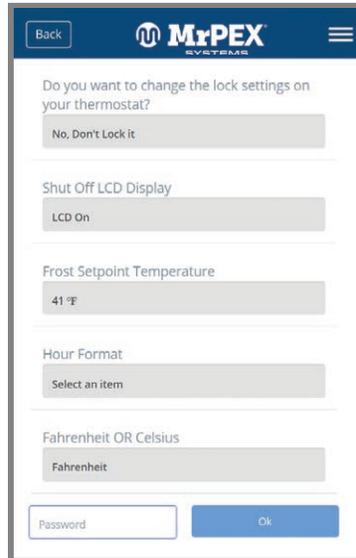
**Thermostat Options:** Press Thermostat Options to advance to the screen below.



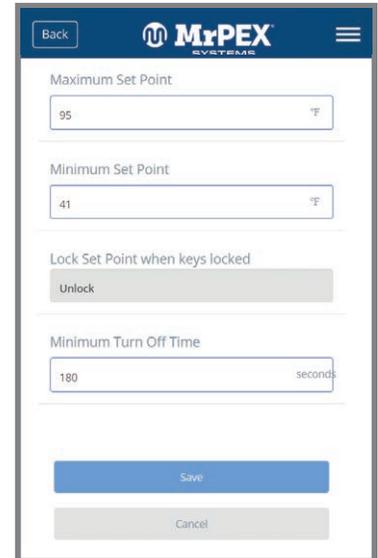
## PARAMETER SETTINGS



**Step 1.** Choose the  icon to access parameter settings. Scroll down to see the available settings.

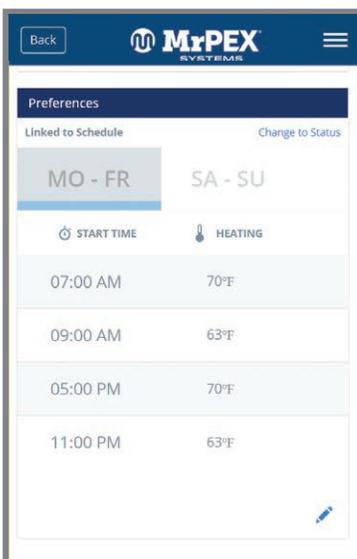


**Step 2.** Parameters listed can be changed without a password. Enter "49" in the password field and press "Ok" to access advanced options.

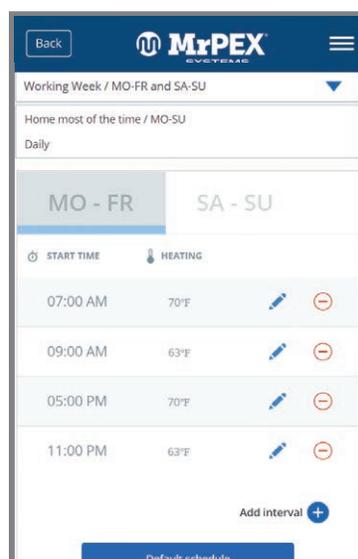


**Step 3.** After making parameter adjustments, press the "Save" button

## THERMOSTAT SCHEDULE SETUP



**Step 1.** Scroll down under Preferences to see the default schedule. Choose the edit icon at the bottom to customize the schedule.



**Step 2.** Choose from three schedule types on the drop-down menu and scroll down to edit the schedule. Select the  icon to adjust the start time or temperature for any interval. Choose "Add interval" to insert more intervals.





If changes to the wireless setup are required, components in MrPEX® wireless systems can be reset to factory defaults.

## ZONE PUMP RELAYS AND ZONE CONTROLLER

### Resetting Relay Controllers without Internet Connection



To reset the AKL Relay Controllers, locate the Pair button on the top of the cabinet near the cover screw on the right side.



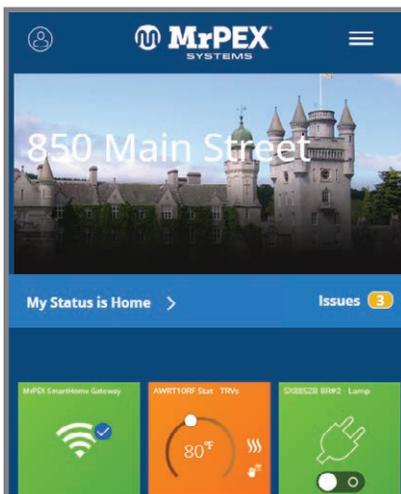
1. Press and hold the Pair button for about 20 seconds until the G1/G2 lights start flashing. After releasing the button, the network status light begins flashing.
2. To complete the reset, cycle the power to the Relay Controller off for 10 seconds.



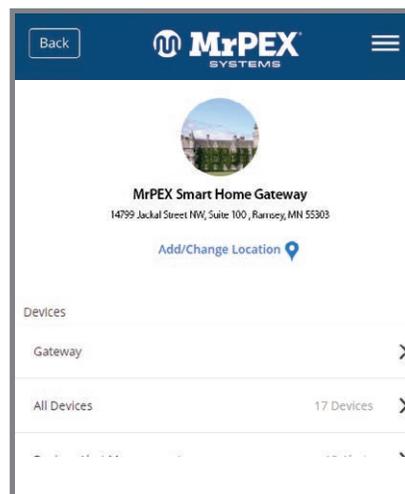
The Zone Controller **WILL NOT OPERATE** correctly until the power is cycled off and on.

### Resetting Relay Controllers with Internet Connection

To reset the Zone Controller, delete them from the MrPEX® Smart Home mobile application as follows:



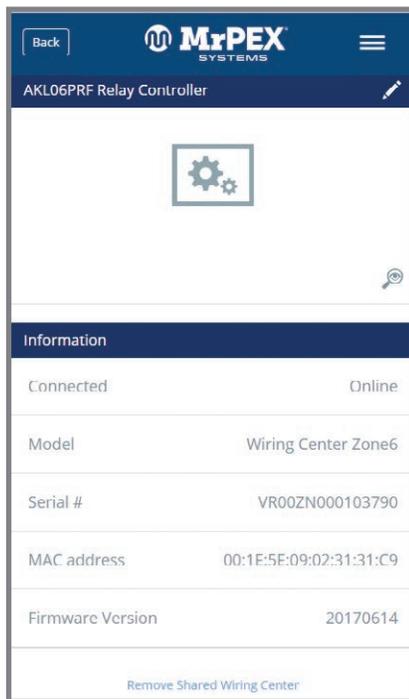
**Step 1.** Select the menu from the upper right of the home screen.



**Step 2.** Choose "All Devices"



**Step 3.** Choose the appropriate Relay Controller (Wiring Center) from the list. An information screen appears.



**Step 4.** Scroll to the bottom of the screen and select "Remove Shared Wiring Center".

**Step 5.** Once the AKL Relay Zone Controller is removed, be sure to cycle the power for more than 10 seconds to fully reset the unit.

## BOILER RELAY

### Resetting Boiler Relay without Internet Connection



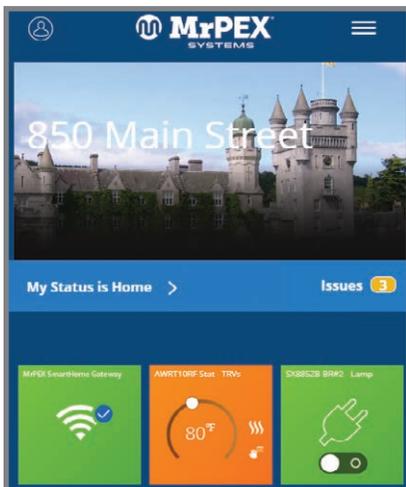
The boiler relay has 2 reset buttons on the bottom surface of the unit cover. The right button is for the receiver and the left is for the system.



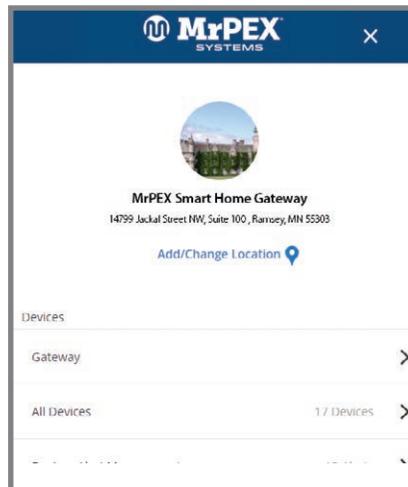
1. Using a small stiff wire, press and hold the right reset button until the red auto/manual backlight LED flashes.
2. Using the same probe, press and hold the left reset button until the red auto/manual backlight LED and the green on/off backlight LED flash alternately.
3. To complete the reset, cycle the power to the boiler relay off for 10 seconds.

### Resetting Receiver with Internet Connection

To reset the boiler relay, delete the icon from the MrPEX® Smart Home mobile application in the same way as the Relay Controllers (Wiring Centers):



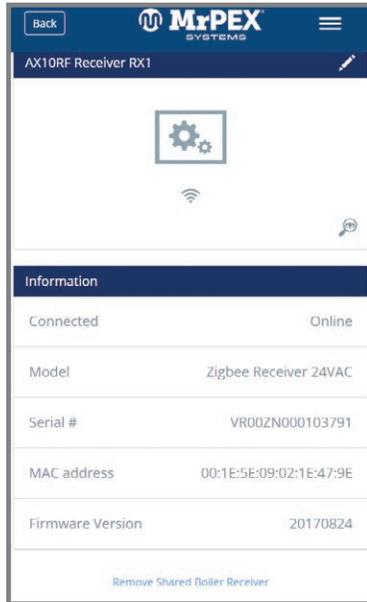
**Step 1.** Select the menu from the upper right of the home screen.



**Step 2.** Choose "All Devices"



**Step 3.** Choose the appropriate Receiver from the list. An information screen appears.

**Resetting Boiler Relay with Internet Connection (Continued)**

**Step 4.** Scroll to the bottom of the screen and select “Remove Shared Boiler Receiver”.

**Step 5.** Once the Boiler Receiver is removed, be sure to cycle the power for more than 10 seconds to fully reset the unit.

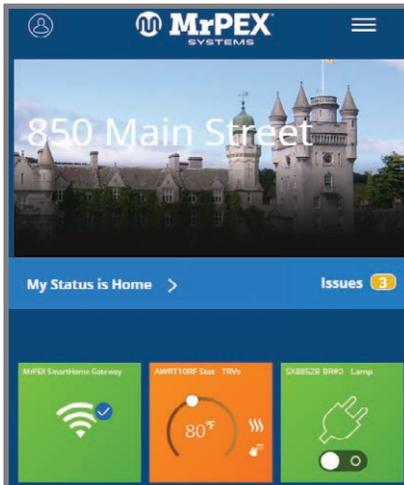
**RADIATOR VALVE ACTUATORS****Resetting Radiator Valve Actuators without Internet Connection**

**Step 1.** Press all three buttons on the Valve Actuator for 30 seconds. The light will flash amber.

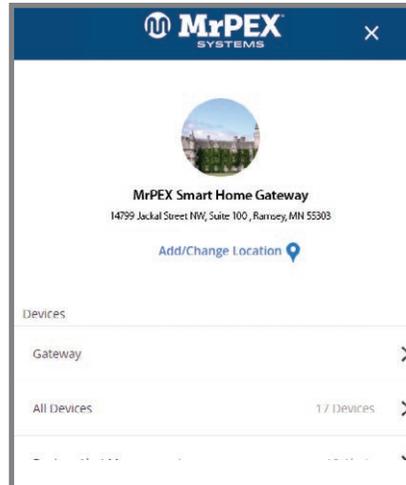
**Step 2.** Open the battery compartment and remove one of the batteries.

**Step 3.** Reinsert the battery. The Valve Actuator is now, once again, ready for pairing with an Wireless Radiant Thermostat.



**Resetting Radiator Valve Actuators with Internet Connection**

**Step 1.** Select the menu from the upper right of the home screen.



**Step 2.** Choose "All Devices"



**Step 3.** Choose the appropriate Receiver from the list. An information screen appears.



**Step 4.** Scroll to the bottom of the screen and select "Remove Radiator Valve".

**Step 5.** Once the Radiator Valve is removed, press and hold all 3 buttons on the Radiator Valve Actuator for 30 seconds. The light will flash amber.

**Step 6.** Open the battery compartment and remove one of the batteries.

**Step 7.** Reinsert the battery. The Valve Actuator is now ready for pairing with an Wireless Radiant Thermostat.

## THERMOSTAT SETTINGS

Installers can access parameters on the Wireless Radiant Thermostat using the MrPEX® Smart Home application if an Gateway is used and connected to the internet. Alternatively, the parameters may be entered directly through the display and keypad on the Wireless Radiant Thermostat. The following procedure outlines parameter adjustments using the keypad. Changes made on the MrPEX® Smart Home application or on the Thermostat may take a few minutes to go into effect.

Before starting setup procedures, press any key to light the display and prepare the Thermostat for input.



**Settings:** Press the  key to enter settings menu. Available settings are shown on the Settings Chart. Use the < or > keys to scroll through available settings.



**Time/Date Functions:** If S 02 through S 10 are not accessible, change the S 11 value to "49" on the display using the ^ or v keys and press enter. Change item P02 to YES to enable scheduling in the thermostat.



**Reset to Factory Settings:** To reset the Thermostat to factory settings, change the S 11 value to "86" and choose "Y" to reset.

Generally, once in settings or parameter setup mode, use < and > to move between settings and parameters, and ^ and v to change setting or parameter values. Use SELECT to confirm changes. The table on the following page titled "Wireless Radiant Thermostat Settings" lists the settings available from the thermostat screen and keypad.



**Scheduling functions with date and time are OFF as default for the Thermostat. To enable the time & date display, choose S11 and push the ^ key until 49 is displayed (holding the ^ or v key will increment/decrement by 10). Use the < and > keys to go to P02 and choose YES to enable the scheduling function.**

TABLE 6.1 WIRELESS RADIANT THERMOSTAT SETTINGS

SETTING #	DESCRIPTION	OPTIONS	
S 01	Temperature Units	°F	Degrees Fahrenheit
		°C	Degrees Celsius
S 03	Clock Format	12-hour	Example- 9:45 pm
		24-hour	Example:- 21:45
S 04	Daylight Savings Time	ON	Automatic Daylight Savings Time Enable
		OFF	Automatic Daylight Savings Time Disable
S 05	Month	01-12	MM Format (DD/MM/YYYY)
S 06	Date	01-31	DD Format (DD/MM/YYYY)
S 07	Year	2018-2099	YYYY Format (DD/MM/YYYY)
S 08	Hour	00-23	HH Format (HH:MM)
		12-11 am/pm	HH Format (HH:MM am/pm)
S 09	Minute	00-59	MM Format (HH:MM or HH:MM am/pm)
S 10	Schedule	WK	Weekly Schedule
		5+2	Weekday/Weekend Schedule
		DAY	Daily Schedule
S11	Parameters	22	Leave Network
		35	Delete Offline Devices
		38	Delete Relay Controllers
		49	Parameter Settings (See Parameter Table on next page)
		86	Reset to Factory Settings
S 12	Identify Mode	99	Rejoin Network
		Press SELECT to Identify Network & Associated Device(s)	

AVAILABLE ONLY WHEN P02 SCHEDULE IS ENABLED

## THERMOSTAT PARAMETERS

The following parameters are accessed using S11 from the settings menu. The table below identifies and describes the available parameters.

**Table 6.2 Wireless Radiant Thermostat Parameters**

PARA. #	FUNCTION	DEFAULT	RANGE	DESCRIPTION
P01	Pair Device	RLAY_CTL	RLAY_CTRL	Zone Pump Relays and Zone Controller: Displays controller ID & Zone number
			RDTR_VLV	ARV/AVA Valve Actuators: Displays total # of paired valves
			RCV1	Boiler Relay (RX1): Cn = Connected
			RCV2	Boiler Relay (RX2): Cn = Connected
P02	Internal Schedule	N (inactive)	N (inactive)	Settings S 03 through S 10 are not available
			Y (active)	Schedule Mode
P03	Temperature Control Method	AUTO	AUTO	RLAY CTL (HEAT), RCV1, RCV2 = TPI RLAY CTRL (COOL) = DLTA 1.0°F (0.5°C) RDTR VLV = DLTA 0.5°F (0.25°C)
			TPI	TPI control is based on the current temperature differential (Proportional) and historical performance (Integral) to determine the next duty cycle percentage.
			DLTA 1.0/0.5 DLTA 0.5/0.25	Heat turns on when Troom = Tsetpoint – Delta, Cooling turns on when Troom = Tsetpoint + Delta
P04	Minimum OFF Time	180 seconds	180 - 300 seconds	Minimum period that the thermostat must be off before starting a new cycle to prevent short cycling. (TPI Only)
P08	Temperature Offset	0.0°F or °C	±6.0°F (3.0°C)	Temperature offset for current active temperature sensor
P09	Freeze Protection	41°F (5°C)	41 to 63°F (5 to 17°C)	Minimum allowable temperature for the system. Below the specified temperature a heat demand will be signaled.
			Off	
P10	Maximum Target Temperature	95°F (35°C)	42 to 95°F (5.5 to 35°C)	Maximum allowable temperature setting for heating and cooling mode.
P11	Minimum Target Temperature	41°F (5°C)	41 to 94°F (5 to 34.5°C)	Minimum allowable temperature setting for heating and cooling mode.
P15	External Sensor	OFF (Disabled)	ON (Enable) OFF (Disable)	Enable or Disable external sensor for remote sensing. "EXTERNAL" is only displayed if P16 function is set to "AIR".
P16	External Sensor Function	FLR (Floor)	FLR (Floor) or AIR	Floor temperature is used to control the room temperature based on the room and radiant floor temperature.
				Air is used when a remote sensor is used in place of the internal thermostat sensor.
P17	Maximum Floor Temperature	81°F (27°C)	52 to 95°F (11 to 35°C)	Maximum temperature that a heat demand will be signaled. P15 must be ON and External Sensor Function must be FLR. Not displayed for RDTR VLV.
P18	Minimum Floor Temperature	50°F (10°C)	41 to 95°F (5 to 35°C)	Minimum temperature that a cooling demand will be signaled. P15 must be ON and External Sensor Function must be FLR. Not displayed for RDTR VLV.

## THERMOSTAT PARAMETERS

**Table 6.2 Wireless Radiant Thermostat Parameters (Cont.)**

PARA. #	FUNCTION	DEFAULT	RANGE	DESCRIPTION
P19	Radiator Actuator Control	ON/OFF	ON/OFF PI	ON/OFF radiator valve control uses simple proportional control PI radiator valve control is described in detail in the ARV/AVA Radiator Valve Actuator manual. This parameter is only available if P01 = RDTR VLV.
P21	Valve Protection	ON	ON (enabled) OFF (disabled)	When enabled, the radiator valve protection function periodically operates the valve, exercising it to prevent failure. This parameter is only available if P01 = RDTR VLV.
P25	Key Lock Source	KYS+APP	APP	When KYS+APP is selected, parameter P26 (Lock Setpoint) can be activated from either the display and keypad of the Wireless Radiant Thermostat by using the MrPEX® Smart Home application. If APP is chosen, parameter P26 is only available online via the mobile application. This parameter is only available for internet connected thermostats.
P26	Lock Setpoint	Unlock	Unlock Lock	When set to "Lock", the temperature setpoint cannot be changed from the keypad without changing this parameter to "Unlock".

## THERMOSTAT SCHEDULE SETUP (LOCAL)

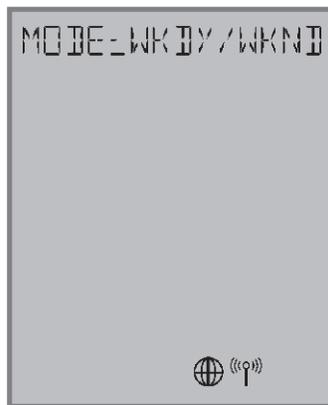


The Wireless Radiant Thermostat is supplied as a non-programmable thermostat as default. Change P02 above to Y for programmable thermostat functionality.

**Step 1.** Press the  key to enter settings menu. Available settings are shown on the Settings Chart. Use the < or > keys to scroll through available settings.



**Step 2.** Use the  and  keys to select the schedule type. See Schedule Option Table below. Press SELECT.



**Step 3.** Use the  and  keys to change the schedule Mode if desired. Press SELECT.



**Step 4.** Use the  and  keys to change the day or group of days for programming. Press SELECT.

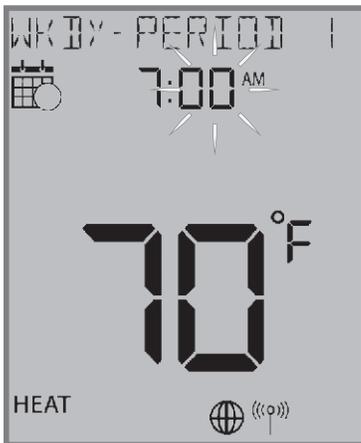
## SCHEDULE OPTIONS

S10 SELECTION	MODE SELECTION	DESCRIPTION
WK	WEEKLY	Temperature schedule for entire week: Monday through Sunday
5+2	WKDY/WKND	Temperature schedule for Weekday (Mon-Fri) and Weekend (Sat-Sun)
DAY	DAILY	Temperature schedule for each day of the week

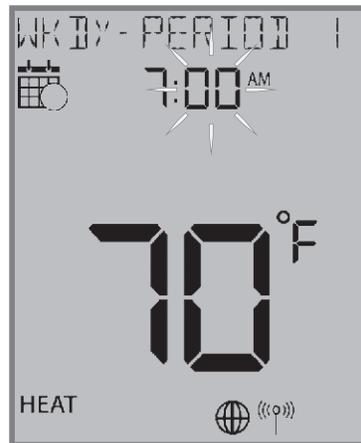
## SECTION 6

## Module 2 – Wireless Hydronic Controls

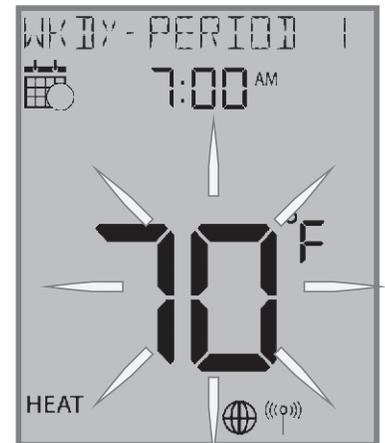
### WIRELESS RADIANT THERMOSTAT PARAMETER & SETTINGS ADJUSTMENT



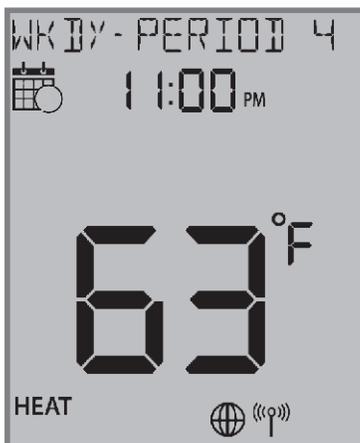
**Step 5.** Use the  $\wedge$  and  $\vee$  keys to change the hour to begin the first period. Press SELECT.



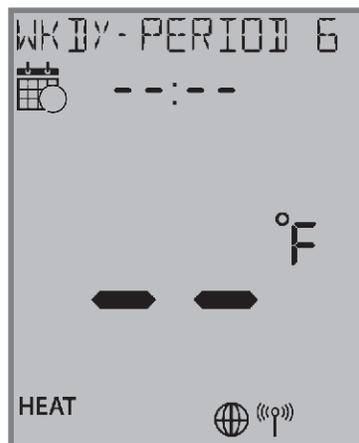
**Step 6.** Use the  $\wedge$  and  $\vee$  keys to change the minute to begin the first period. Press SELECT.



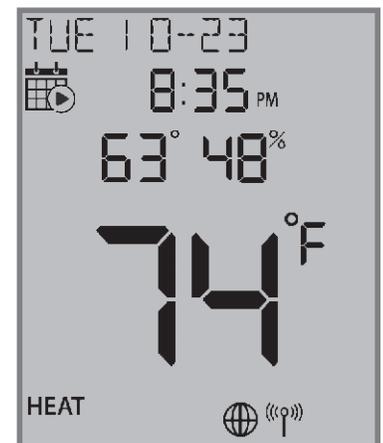
**Step 7.** Use the  $\wedge$  and  $\vee$  keys to change the temperature to begin the first period. Press SELECT.



**Step 8.** Use the  $\>$  key to switch to the next period. Set the hour, minute and temperature for each period desired.



**Step 9.** Leave the time & temperature fields blank "--" to skip periods that aren't required.

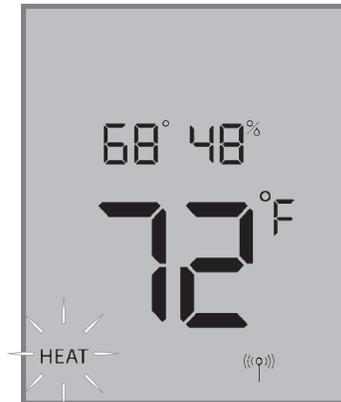


**Step 10.** Press the  $\odot$  key to back out of the menu or simply allow the setting screen to time out after which it will return to the standard display screen.

## SETTING THE HVAC MODE



**Step 1.** Press any key on the keypad to activate the backlit display preparing it for input. Press the < or > key to toggle between HVAC Modes (HEAT/COOL/OFF).



The new mode setting will flash and the current setpoint temperature will appear above the room temperature display. If the mode is OFF, the setpoint will change to 41°F (5°C).

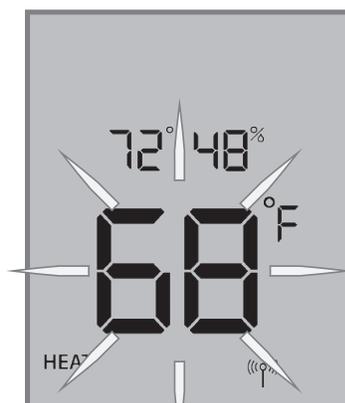


**Step 2.** Press SELECT to accept the new HVAC mode. The HVAC mode stops flashing. If the Thermostat is setup as programmable, the current time & date will be displayed as well as the schedule icon.

## CHANGING TEMPERATURE SETPOINT IN NON-PROGRAMMABLE MODE



**Step 1.** Press any key on the keypad to activate the backlit display to prepare for input. Press the ^ or v key to adjust the target temperature

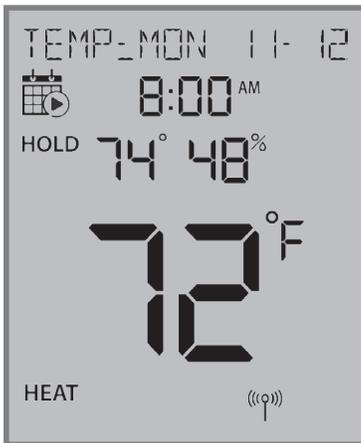


The positions of the setpoint temperature and the current room temperatures are swapped on the display.

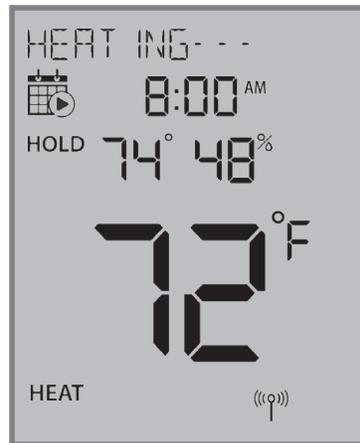


**Step 2.** Press the ^ or v keys to adjust the target setpoint. The new setpoint will take affect once the display stops flashing.

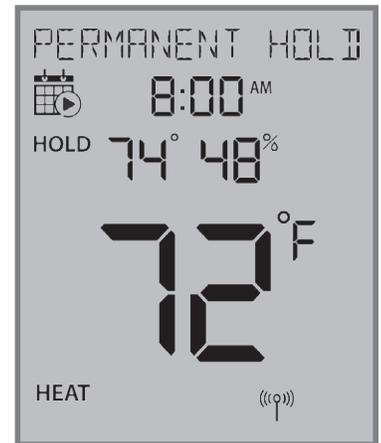
## OVERRIDING SCHEDULED TEMPERATURE



If the setpoint is changed while a schedule is running, the thermostat display will display "TEMP: DAY MM-DD" and show "HOLD", indicating it is in temporary hold until the next schedule period.



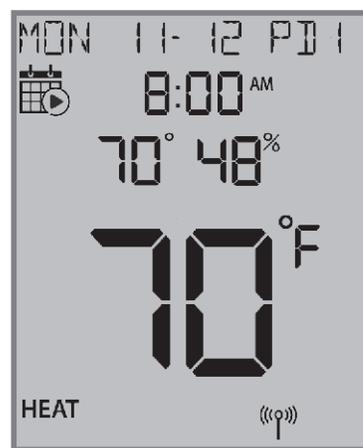
If the temperature change results in a heat demand, the text above will alternate between "Temp: DAY MM-DD" and HEATING- - -.



Pressing SELECT while the target setpoint is flashing will toggle "PERMANENT HOLD" which indicates the target temperature will remain as set, ignoring scheduled changes, until changed by the user.



While in Permanent Hold, "PERM: DAY MM-DD" will be displayed along with "HOLD" below the calendar icon.



To return to the programmed schedule, use the  $\wedge$  or  $\vee$  keys to set the temperature to the scheduled temperature. If "PERMANENT HOLD" is displayed, use the select key to toggle it off.

## THERMOSTAT ERROR MESSAGES

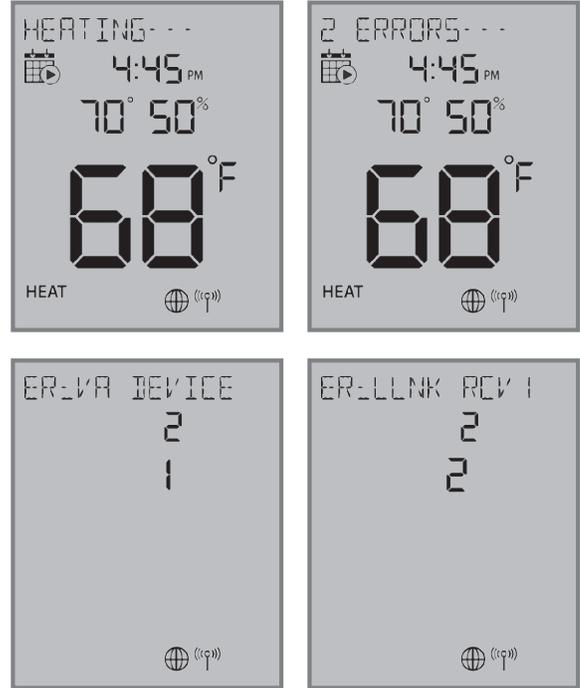
Error messages are displayed on the alphanumeric text line at the top of the screen. These messages will alternate with the current status message.

**Table 6.2 Wireless Radiant Thermostat Parameters**

ERROR MESSAGE	DESCRIPTION	CORRECTIVE ACTION
ER:VA DEVICE	Thermostatic Radiator Valve (TRV) hardware issue.	Remove the Actuator from the radiator valve and check to see if the valve plunger is operating.  If the plunger is working correctly, try resetting the actuator as described in Section 8
ER:XSNSR OPEN	External Sensor Open – Not Connected: Parameter P15 is enabled for external sensor but no sensor connection is detected.	If no external sensor is used, disable Parameter P15.  If an external sensor is used, check continuity of the circuit.  Check for wire damage or defective sensor.
ER:XSNSR SHORT	External Sensor Short: Control senses no resistance across sensor.	Check for wire damage creating sensor lead short circuit.  Compare sensor resistance to the chart supplied below. If the resistance value is significantly different than predicted by the chart, replace the sensor.
ER:LLNK RC	Lost Link with Relay Controller	Reset the Relay Controller and Wireless Radiant Thermostat. Repeat pairing procedure.
ER:LLNK VA #	Lost Link with ARV/AVA valve actuators: # indicates total number of valves	Reset ARV/AVA Actuators and Wireless Radiant Thermostat. Repeat pairing procedure.
ER:LLNK RCV1	Lost Link with Receiver: Configured as RX1	Reset Boiler Relay and Wireless Radiant Thermostat. Repeat pairing procedure.
ER:LLNK RCV2	Lost Link with Receiver: Configured as RX2	Reset Boiler Relay and Wireless Radiant Thermostat. Repeat pairing procedure.
ER:LLNK ZN #	Lost Link with Thermostat for Zone (1-8) of this Relay Controller	Reset Thermostat corresponding with the ZN message. Repeat pairing procedure.
ER:LLNK RC-CO	Lost Link between Relay Controller and Coordinator/Gateway	Reset Relay Controller. Repeat pairing procedure.
ER:LLNK RC-RCV	Lost Link between Relay Controller and Receiver (RX1)	Reset Receiver and repeat pairing procedure.
ER:LLNK VA-CO	Lost Link between ARV/AVA Valve Actuator and Coordinator	Reset ARV/AVA Actuator
ER:LOWBAT VA	Low Battery ARV/AVA Actuator	Replace batteries in the ARV/AVA Actuator.
ER:VA GEAR	Gear Issue with ARV/AVA Valve Actuator	Replace the ARV/AVA Actuator.
ER:VA ADAPT	Issue with adapting ARV/AVA Actuator and valve combination	Reset ARV/AVA Actuator and Thermostat and repeat the Pairing procedure.

### MULTIPLE ERROR MESSAGES

If there is more than one error, the Wireless Radiant Thermostat will show the number of errors on the text message line alternating with the standard display.

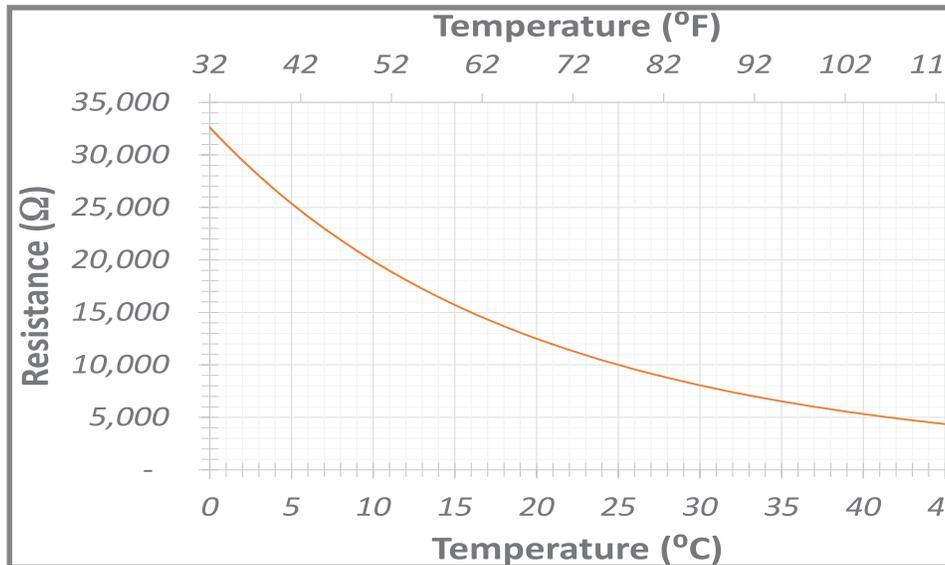


Pressing the ^ and v keys while the "# ERRORS" message is displayed allows review of all errors. The lower number indicates the error sequence .

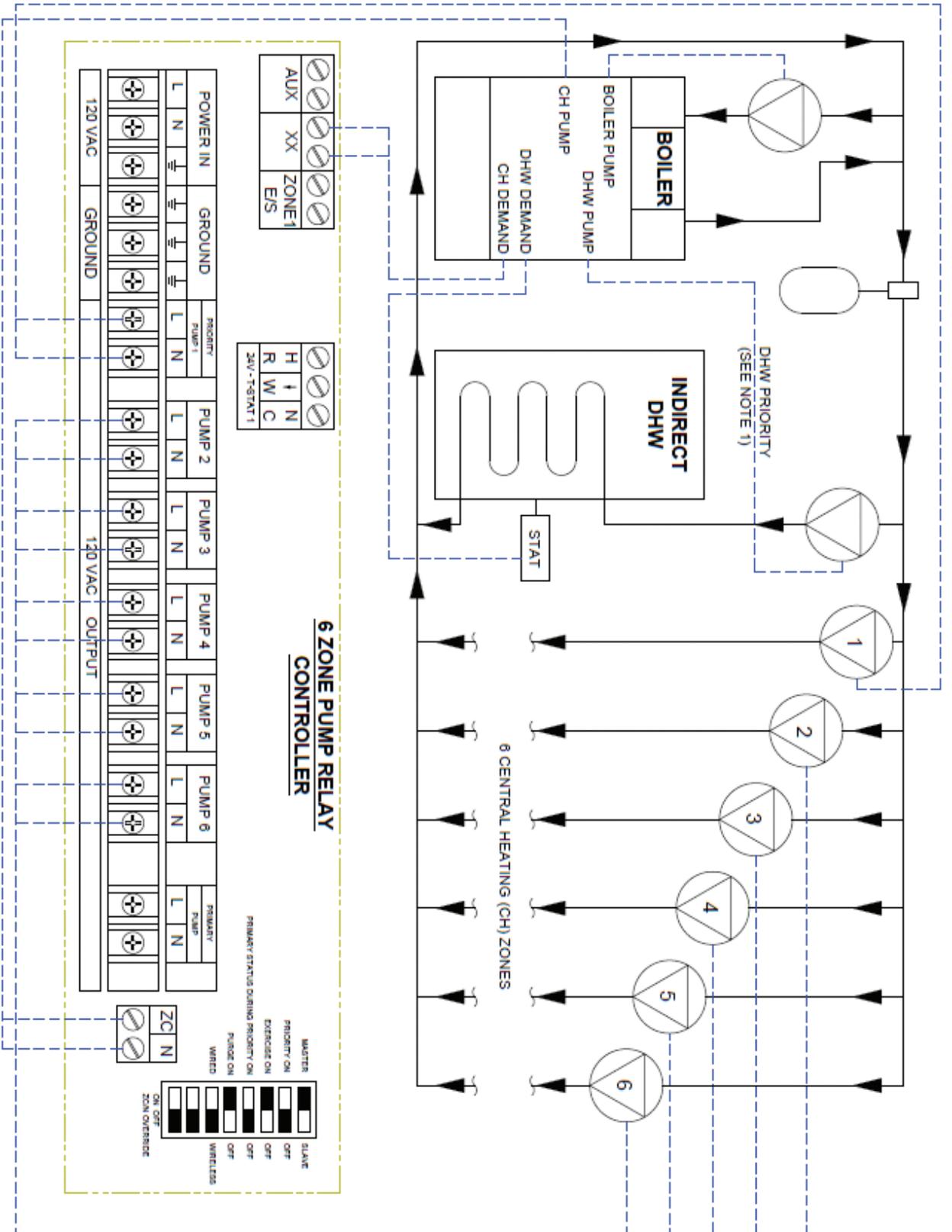
### OPTIONAL EXTERNAL TEMPERATURE SENSOR

The following graph allows comparison of expected versus actual resistance values for troubleshooting the optional external sensor. Be sure that the sensor is not exposed to direct sunlight or other sources of heat that may give erroneous values.

**FIGURE 7.1: RESISTANCE VALUE GRAPH FOR EXTERNAL NTC THERMISTOR**

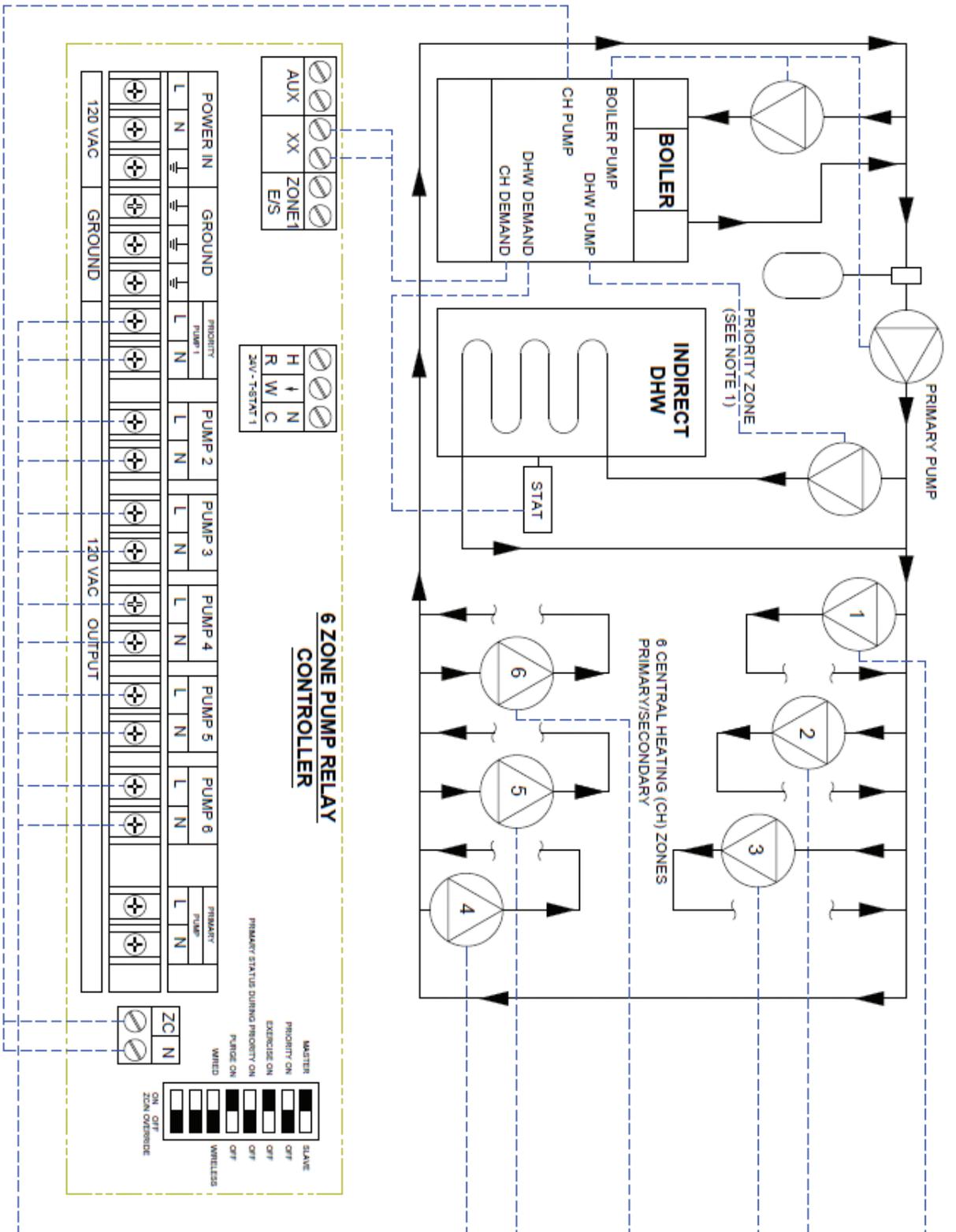






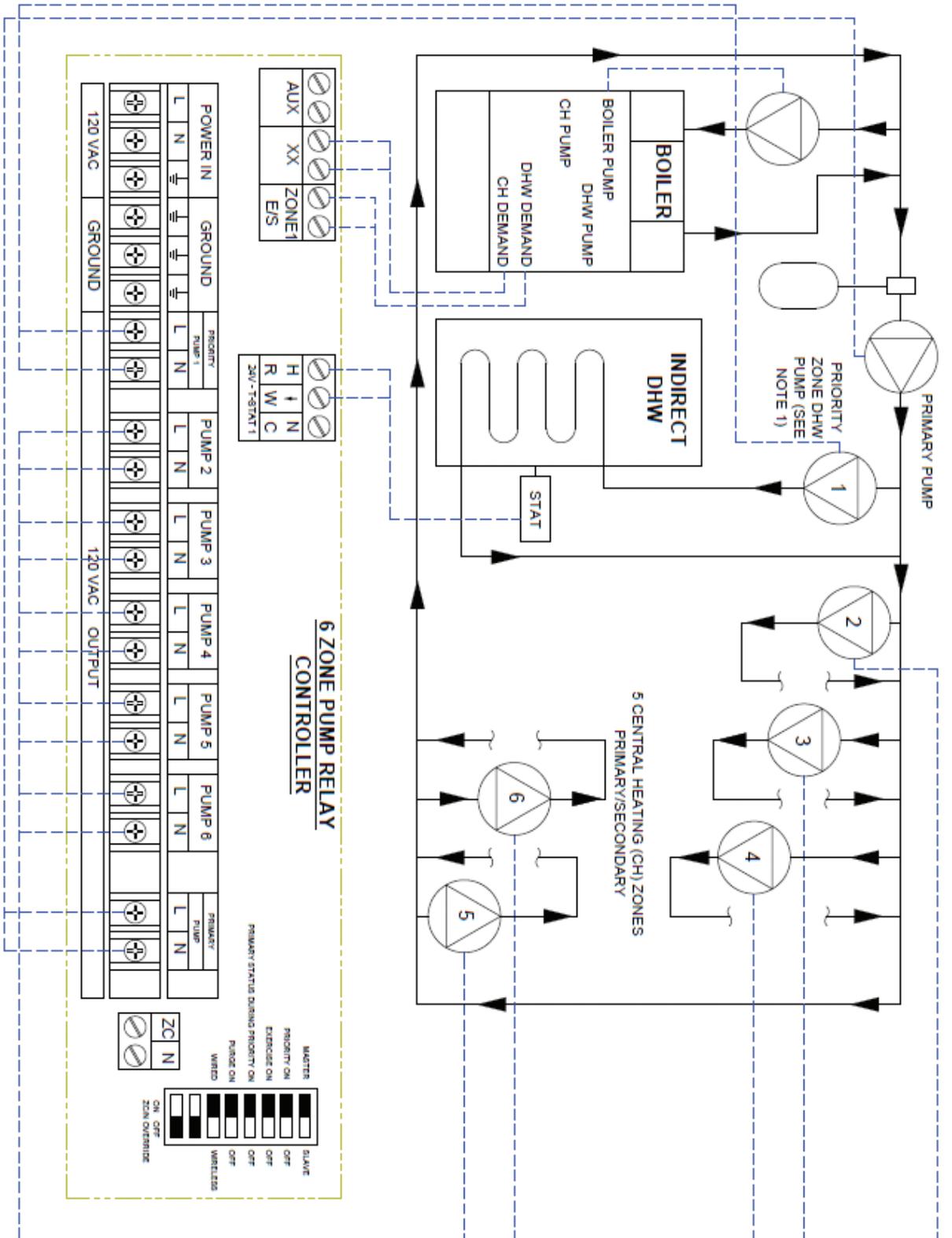
**FIGURE A-2: MRPEX® PUMP RELAY CONTROLLER**

- Domestic Hot Water (DHW) Priority controlled by boiler (Priority Dip Switch – Off)
- 6 Central Heating (CH) Zones
- Boiler CH pump output enables/disables heating zones



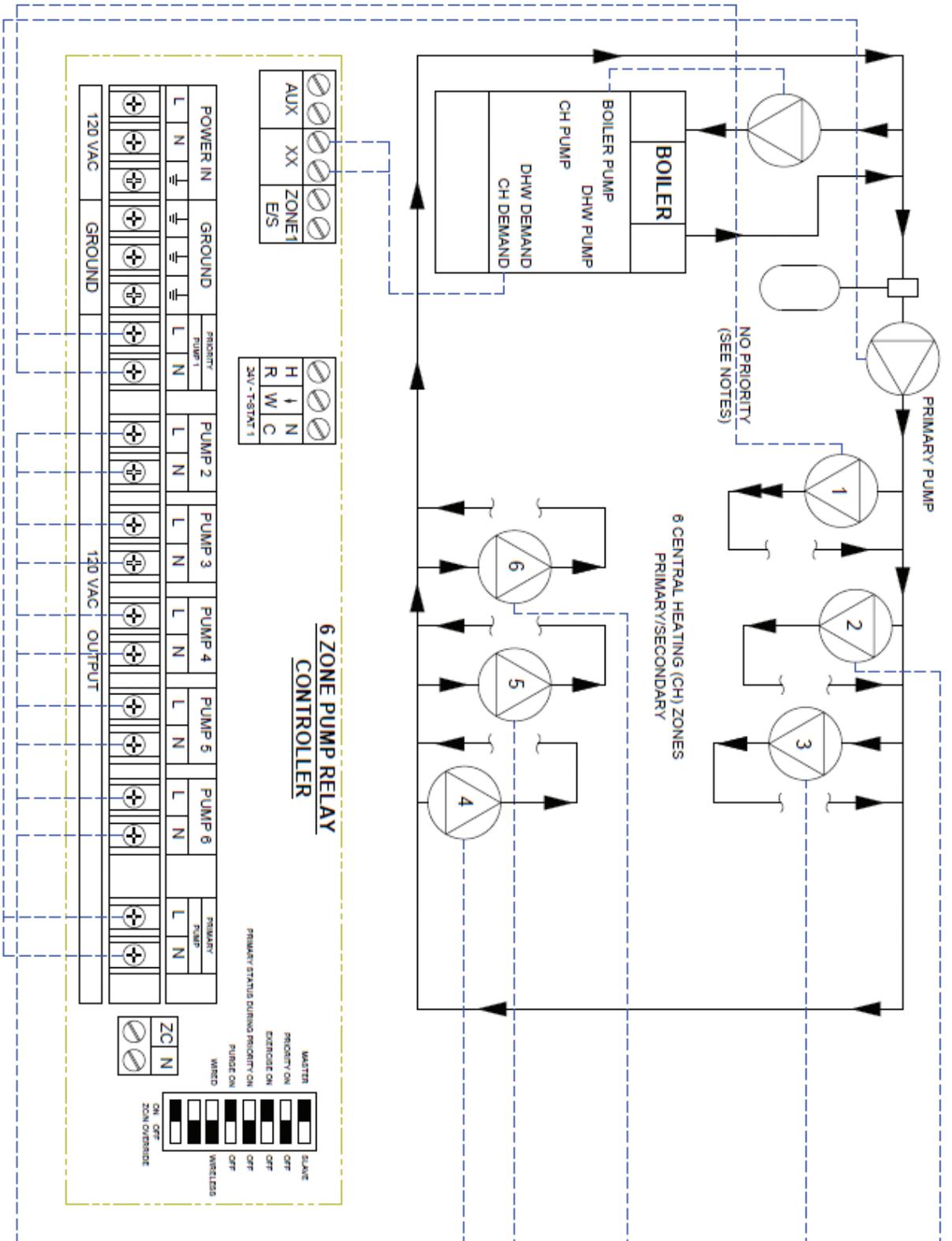
**FIGURE A-3: MRPEX® PUMP RELAY CONTROLLER**

- Domestic Hot Water (DHW) Priority controlled by boiler (Priority Dip Switch – Off)
- Primary Pump powered by Pump Relay Controller
- 6 Central Heating (CH) Zones
- Boiler CH pump output enables/disables heating zones



**FIGURE A-4: MRPEX® PUMP RELAY CONTROLLER**

- Domestic Hot Water (DHW) Priority controlled by (Priority Dip Switch – On)
- Primary Pump powered by Pump Relay Controller
- 6 Central Heating (CH) Zones
- Boiler CH pump output enables/disables heating zones



**FIGURE A-5: MRPEX® PUMP RELAY CONTROLLER**

- No Zone 1 Priority – Turn Priority Dip Switch to OFF – Turn ZC/N OVERRIDE to ON
- Primary Pump powered by Pump Relay Controller
- 6 Central Heating (CH) Zones
- Zone 1 Thermostat cannot be wired. Wireless Thermostats Only