



## CT224 Setup Tutorial

### Table of Contents

#### 1. Introduction

#### 2. Configuring Controller for Operation

- A. Example 1 – Over Temp Operation with Hysteresis @ 5° F.
- B. Example 2 – Under Temp Operation with Hysteresis @ 5° F.
- C. Example 3 – Over Temp Operation with Alarm and Output Tripping Separately
- D. Example 4 – Under Temp Operation with Alarm and Output Tripping Separately
- E. Example 5 – Over Temp Operation with Pressing Enter
- F. Example 6 – Over Temp Operation with Manual Reset
- E. Example 7 – Over Temp Operation with Offset
- F. Example 8 – How to Rename Zones
- G. Example 9 – How to Exercise Relays
- H. Example 10 – How to Freeze Outputs

#### 3. Definition of Terms / Use for Operation

- A. Menu
- B. Program

## 1. Introduction

This setup tutorial will step through some of the main ways that the CT224 can be used. After completion, the user will have a good understanding of the features and how to use them. Each section will build off of the one before it.

Buttons	Scrolling through Zones	Main Menu	Sub Menu
	Back	Returns to monitor zones	Returns to previous step
	Forward	Up	Changes current value in step
	Back	Down	Scrolls through current step
	Forward	Enters into selected menu option	Goes to next step

Table 1 Quick Reference Guide

**Note:** Holding down any button for 3 seconds and you will be put into the main menu.

## 2. Configuring Controller for Operation

### Example 1: Over Temp Operation with Hysteresis @ 5° F

1. Begin by placing the CT224 on a desk or table.
2. Connect one sensor to the unit, note which type of sensor you have connected.
3. Apply power to the CT224. The display should light and the message "Initializing Inputs" will be displayed. A few seconds later the unit will display "Zone 1 Off".
4. Press and hold any one of the keys on the front panel until the main menu is displayed. This will take about 3 seconds.
5. Move the cursor to 2. "Configuration", then press Enter.
6. Select 1. "Change Passwords" and press Enter.
7. Select "Yes" by pressing the up arrow, then Enter.

8. Select "Program Password", and press Enter.
9. Enter 1111 for password by using the up arrow and right arrow. This will enable password protection for the "Configuration Menu" option, in the main menu.
10. Press Back to exit one menu level.
11. Select 2. "Configuration", and then Enter.
12. You will see the prompt to enter the password. Enter 1111 and press enter. You will then enter the configuration menu.
13. Select 2. "Change Program", and then Enter.
14. Leave all outputs set to N for "Reverse Acting outputs?", this will cause all outputs to be direct acting. Press Enter.
15. Set "Temperature Scale" to "F" for degrees Fahrenheit, by using the up arrow, then press Enter.
16. Set "Zone to be displayed during normal operation" to "Any", then press Enter. This will allow the user to choose the zone that will be displayed on the CT224.
17. Set "Minutes of Alarm Silence when a key is pressed" to 1 minute, then press Enter. This will cause the alarm to resound 1 minute after the output has been tripped, if the current reading is still above the trip setting.
18. Set "If an input fails" to "Sound Alarm", then press Enter. This will cause the alarm to sound if the input fails.
19. Set "Zone 1 Choose input type:" to the input type that has been connected to Zone 1 on the controller, then press Enter.
20. Set "Zone 1 Trip 1:" to 85° F, then press Enter.
21. Set "Zone 1 Trip 1: Trip Over or Under" to "Over", then press Enter.
22. Set "Zone 1 Trip 1: Sound Alarm on trip" to "Yes", then press Enter.
23. Set "Zone 1 Trip 1: Outputs to trip:" to "Output1:Y" and the other outputs leave as N, then press Enter.
24. Set "Zone 1 Trip 1: Untrip Outputs by" to "Using Hysteresis", then press Enter.
25. Set "Zone 1 Trip 1: Set Hysteresis:" to "5", then press Enter.

26. The display will read "Zone 1 Trip 2: Off". Press & hold Enter until CT224 re-initializes the controller (about 3 seconds).
27. The current temp reading will now be displayed on the controller for Zone 1.
28. Heat the sensor until the alarm and output trip. (Hold onto the sensor to increase the temperature of the sensor or place inside of a plastic bag and then place the bag and sensor into a cup of warm water).
29. Press Enter to silence the alarm. (Note: With the configuration settings above, the alarm will continue turning on every minute until the temperature falls below the trip point and hysteresis band).
30. Maintain the sensor above 85° F. After 1 minute the alarm will resound. Press Enter to turn the alarm off. To prevent the alarm from resounding allow temperature to fall below hysteresis level for alarm trip point.
31. Allow the sensor to cool so that Output 1 will untrip. Output 1 will turn off at 80° F, due to the hysteresis setting of 5.
32. With the CT224 operating, remove a wire from the sensor on one of the terminals on the CT224.
33. The alarm will sound because the CT224 is configured to sound the alarm on a failed sensor.
34. Reconnect the wire that was removed.
35. The CT224 will resume reading the input and turn off the alarm.

You have now configured Zone 1 to trip on an over temp condition using hysteresis to untrip. This means the controller will trip the outputs when the sensor reads a value of 75° F or higher and will not untrip until below 80° F.

### **Example 2: Under Temp Operation with Hysteresis @ 5° F**

Note: Procedure is similar to Example 1, expect need to configure controller for "Under Temp instead of "Over Temp". Follow the guidelines below for complete instructions on configuring the controller

1. Press and hold any one of the keys on the front panel until the main menu is displayed.
2. Move the cursor to option 2. Configuration, then press Enter.

3. You will be prompted for a password. The password was set in example, to be 1111. Enter 1111 and press Enter. If any other password is entered, except the Master Password, the Configuration menu will not be accessed
4. Select 2. "Configuration", and then Enter.
5. You will see the prompt to enter the password. Enter 1111 and press enter. You will then enter the configuration menu.
6. Select 2. "Change Program", and then Enter.
7. Change "Output 1" to "Y", so Output 1 will now be reverse acting. Then press Enter.
8. Change from "C" to "F", then press Enter.
9. Set Zone to "Any", then press Enter.
10. Set "Alarm Silence" to 1 minute, then press Enter.
11. Set "If an input fails" to "Sound Alarm", then press Enter.
12. Set "Zone 1" to the input type that has been connected to Zone 1 on the controller, then press Enter.
13. Set "Zone 1 Trip 1:" to 65° F, then press Enter.
14. Set "Zone 1 Trip 1: Trip Over or Under" to "Under", then press Enter.
15. Set "Zone 1 Trip 1: Sound Alarm on trip" to "Yes", then press Enter.
16. Set "Zone 1 Trip 1: Outputs to trip:" to "Output1:Y" and the other outputs leave as N, then press Enter.
17. Set "Zone 1 Trip 1: Untrip Outputs by" to "Using Hysteresis", then press Enter.
18. Set "Zone 1 Trip 1: Set Hysteresis:" to "5", then press Enter.
19. The display will read "Zone 1 Trip 2: Off". Press & hold Enter until CT224 re-initializes.
20. The current temp reading will now be displayed on the controller for Zone 1.
21. Cool sensor until alarm and output trip. (Put sensor in a freezer or place sensor in a bag and place in cold water).

22. Press Enter to silence the alarm. (Note: With configuration set above alarm will continue turning on every minute until temp is above trip point and hysteresis band).
23. The contacts or logic output will now be in its normal state, due to the output configured for reverse acting.
24. Allow sensor to heat up so that Output 1 will untrip. Output 1 will turn off at 70° F, due to the hysteresis setting of 5°.
25. The contacts or logic output will now be in its energized state or high state, due to Output 1 set for reverse acting. Setting the output for reverse acting can be a good way to protect equipment in case of power interrupts to the CT224.

You have now configured Zone 1 to trip on an under temp condition using hysteresis to untrip. This means the controller will trip the outputs when the sensor reads a value of 65° F or lower and will not untrip until above 70° F. To enter programming the password must be entered. This shows how the password protection can prevent unauthorized users from changing the settings.

### **Example 3: Over Temp Operation with Alarm and Output Tripping Separately**

1. Enter Configuration menu. The password 1111 will be used to gain entry. Choose 1. "Change Password" and press Enter. Select "Program Password" and enter 0000, the press Enter. This will disable the password protection for entering the "Configuration Menu".
2. Set all outputs to "N" for "Reverse Acting Outputs".
3. Continue to set the settings from "Temperature Scale" to "Zone 1 Choose Input Type" as appropriate.
4. The following settings below will be use to set Trip1 for an alarm at 85° F and set Trip 2 for an Output trip at 90° F.
5. Set "Zone 1 Trip 1:" to 85° F, then press Enter.
6. Set "Zone 1 Trip 1: Trip Over or Under" to "Over", then press Enter.
7. Set "Zone 1 Trip 1: Sound Alarm on trip" to "Yes", then press Enter.
8. Set "Zone 1 Trip 1: Outputs to trip:" Set all outputs to "N".
9. Set "Zone 1 Trip 1: Untrip Outputs by" to "Using Hysteresis", then press Enter.

10. Set "Zone 1 Trip 1: Set Hysteresis:" to "5", then press Enter.
11. Set "Zone 1 Trip 2:" to 90° F, then press Enter.
12. Set "Zone 1 Trip 2: Trip Over or Under" to "Over", then press Enter.
13. Set "Zone 1 Trip 2: Sound Alarm on trip" to "No", then press Enter.
14. Set "Zone 1 Trip 2: Outputs to trip:" to "Output1:Y" and the other outputs leave as N, then press Enter.
15. Set "Zone 1 Trip 2: Untrip Outputs by" to "Using Hysteresis", then press Enter.
16. Set "Zone 1 Trip 2: Set Hysteresis:" to "5", then press Enter.
17. The display will read "Zone 2 Choose Input Type: No Input Connected". Press & hold Enter until CT224 re-initializes.
18. The current temp reading will now be displayed on the controller for Zone 1.
19. Heat the sensor until the alarm trips.
20. Continue to heat the sensor further until Output 1 trips at 90° F. The alarm and output should both be tripped now.
21. Press Enter to clear the alarm.
22. Allow the sensor to cool so that Output 1 will untrip. Output 1 will turn off at 85° F and Alarm will turn off at 80° F, due to the hysteresis settings of 5.

You have now configured Zone 1 Trip 1 on an over temp condition using hysteresis to untrip and Zone 1 Trip 2 on an over temp condition using hysteresis to untrip. This type of configuration is common when doing over temp protection. The alarm gives warning to operator and higher trip will shutdown equipment before serious damage results.

#### **Example 4: Under Temp Operation with Alarm and Output Tripping Separately**

1. Press and hold any one of the keys on the front panel until the main menu is displayed.
2. Continue to set the settings from "Reverse Acting Outputs" to "Zone 1 Choose Input Type" as appropriate.
3. Set "Zone 1 Trip 1:" to 70° F, then press Enter.

4. Set "Zone 1 Trip 1: Trip Over or Under" to "Under", then press Enter.
5. Set "Zone 1 Trip 1: Sound Alarm on trip" to "Yes", then press Enter.
6. Set "Zone 1 Trip 1: Outputs to trip:" Set all outputs to "N".
7. Set "Zone 1 Trip 1: Untrip Outputs by" to "Using Hysteresis", then press Enter.
8. Set "Zone 1 Trip 1: Set Hysteresis:" to "5", then press Enter.
9. Set "Zone 1 Trip 2:" to 60° F, then press Enter.
10. Set "Zone 1 Trip 2: Trip Over or Under" to "Under", then press Enter.
11. Set "Zone 1 Trip 2: Sound Alarm on trip" to "No", then press Enter.
12. Set "Zone 1 Trip 2: Outputs to trip:" to "Output1:Y" and the other outputs leave as N, then press Enter.
13. Set "Zone 1 Trip 2: Untrip Outputs by" to "Using Hysteresis", then press Enter.
14. Set "Zone 1 Trip 2: Set Hysteresis:" to "5", then press Enter.
15. The display will read "Zone 2 Choose Input Type: No Input Connected". Press & hold Enter until CT224 re-initializes.
16. The current temp reading will now be displayed on the controller for Zone 1.
17. Cool the sensor until the alarm trips. (Put sensor in a freezer or place sensor in a bag and place in cold water.)
18. Continue to cool the sensor further until Output 1 trips at 60° F. The alarm and output should both be tripped now.
19. Press Enter to clear the alarm.
20. Allow the sensor to warm up so that Output 1 will untrip. Output 1 will turn off at 65° F and Alarm will turn off at 75° F, due to the hysteresis setting of 5.

You have now configured Zone 1 Trip 1 on an under temp condition using hysteresis to untrip and Zone 1 Trip 2 on an under temp condition using hysteresis to untrip. This type of configuration is common when doing under temperature protection. Alarm gives warning to operator and cooler temperature will shutdown equipment before serious damage results.

#### **Example 5: Over Temp Operation with Pressing Enter**

1. Press and hold any one of the keys on the front panel until the main menu is displayed.
2. Continue to set the settings from "Reverse Acting Outputs" to "Zone 1 Choose Input Type" as appropriate.
3. Set "Zone 1 Trip 1:" to 85° F, then press Enter.
4. Set "Zone 1 Trip 2: Trip Over or Under" to "Over", then press Enter.
5. Set "Zone 1 Trip 1: Sound Alarm on trip" to "Yes", then press Enter.
6. Set "Zone 1 Trip 1: Outputs to trip:" to "Output1:Y" and the other outputs leave as N, then press Enter.
7. Set "Untrip Outputs by" to "Pressing Enter", then press Enter.
8. Set "Zone 1 Trip 1: Set Hysteresis:" to "5", then press Enter.
9. The display will read "Zone 1 Trip 2:" set to "Off".
10. Press & hold Enter until CT224 re-initializes.
11. The current temp reading will now be displayed on the controller for Zone 1.
12. Heat sensor until alarm and output trip.
13. Press any button but Enter to silence the alarm.
14. Press Enter and output will untrip. If the output temperature after pressing Enter is still high alarm will not resound or retrip until temp falls below set hysteresis band. The output will also untrip regardless of pressing Enter if temp falls below 80° F, the hysteresis band is still in effect with the "Pressing Enter" selection.

You have now configured Zone 1 to trip on an over temp condition using "Enter" to untrip. This means the controller will trip the outputs when the sensor reads a value of 85° F or higher and will not untrip unless Enter is pressed or the temp falls below 80° F.

### **Example 6: Over Temp Operation with Manual Reset**

1. Press and hold any one of the keys on the front panel until the main menu is displayed.
2. Continue to set the settings from "Reverse Acting Outputs" to "Zone 1 Choose Input Type" as appropriate.

3. Set "Zone 1 Trip 1:" to 85° F, then press Enter.
4. Set "Zone 1 Trip 2: Trip Over or Under" to "Over", then press Enter.
5. Set "Zone 1 Trip 1: Sound Alarm on trip" to "Yes", then press Enter.
6. Set "Zone 1 Trip 1: Outputs to trip:" to "Output1:Y" and the other outputs leave as N, then press Enter.
7. Set "Untrip Outputs by" to "Manual Reset Only", then press Enter.
8. Set "Zone 1 Trip 1: Set Hysteresis:" to "5", then press Enter.
9. The display will read "Zone 1 Trip 2: Off". Press & hold Enter until CT224 re-initializes.
10. The current temp reading will now be displayed on the controller for Zone 1.
11. Heat sensor until alarm and output trip.
12. Press any button to silence the alarm.
13. To untrip output hold down any of the buttons for at least 3 sec and move cursor to 3. "Manual Reset", then press Enter.
14. This is the only way to reset this output. The change in temperature will have no effect on the controller once the output has been tripped, until the CT244 has been manually reset.

You have now configured Zone 1 to trip on an over temp condition using "Manual Reset Only" to untrip. This means the controller will trip the outputs when the sensor reads a value of 85° F or higher and will not untrip unless the "Manual Reset" option has been selected in the main menu.

### **Example 7: Over Temp Operation with Offset**

1. Configure CT224 according to values in Example 1, then continue below.
2. Press and hold any one of the keys on the front panel until the main menu is displayed.
3. Move the cursor to 2. "Configuration", then press Enter.
4. Select 3. "Modify Offsets", and then Enter.

5. Set "Offset for Zone 1: 100 Tenths".
6. Press & hold Enter until CT224 re-initializes and the CT224 will display Zone 1 with current temp reading 10° F above the actual temperature.

You have now configured Zone 1 with an offset of 10° F. The offset will allow you to improve accuracy of the readings and allow you to minimize the error present.

### **Example 8 – How to Rename Zones**

1. Press and hold any one of the keys on the front panel until the main menu is displayed.
2. Move the cursor to 4. "Options", then press Enter.
3. Select 1. "Rename Zones", and then Enter.
4. Set "Name for Zone 1 is:" set "MINCO", use the up arrow for changing the letters/numbers, and the right arrow for moving to the next letter/number.
5. After Zone name is changed, press & hold Enter until CT224 re-initializes and the CT224 will display the new Zone name.

### **Example 9 – How to Exercise Relays**

1. Press and hold any one of the keys on the front panel until the main menu is displayed.
2. Move the cursor to 4. "Options", then press Enter.
3. Select 2. "Exercise Outputs", and then Enter.
4. Press any key to Exercise Outputs. Lights on all outputs except the alarm should be on.
5. Press any key to turn off all the outputs.
6. Press & hold Enter until CT224 re-initializes to the normal operating mode.

You have now tested all the relay outputs except the alarm output. Exercising the relay outputs allows you to quickly determine if the relays are working and how your attached application is responding to the relays.

### **Example 10 – How to Freeze Outputs**

1. Press and hold any one of the keys on the front panel until the main menu is displayed.
2. Move the cursor to 4. "Options", then press Enter.
3. Select 3. "Freeze Outputs", and then Enter.
4. The CT224 will then return back to the Main Menu with the cursor at "Monitor Zones", press Enter again.
5. The CT 224 will re-initialize and return to its normal operating mode, displaying "Outputs Are Frozen".
6. To remove the "Frozen Outputs" repeat example 10.

You have now learned how to freeze and unfreeze the outputs on the CT224. Freezing the outputs will disable the program from changing the state of any output as long as "Outputs Are Frozen" is display the screen of the CT224.

### 3. Definition of Terms / Use for Operation

#### A) Menu

##### 1. Monitor Zones

Select this option to return to Monitoring Mode to read and evaluate the inputs and outputs.

##### 2. Configuration Menu

The Configuration Menu may require a password to enter, by default no password is required. The Configuration Menu contains the following options.

1. *Change Passwords*
2. *Setup*
3. *Modify Offsets*
4. *Comm Settings*

**1. Change Passwords** - Select the password to change. A message asking if you would like to change a password will be shown. Choose 'Yes' to change a password or 'No' to exit the Change Passwords option. By setting a password to 0000, the password will be deactivated. The valid range for a password is 0000 to 9999. If a password is already entered, the user will be required to enter the existing password in order to change it. If you forget your password, the master password can be used, it is found on the last page of this manual. Available selections are:

1. *Program Password*
2. *Unlatch Password*

**1. Program Password** – Changes the password that is used to protect the Change Program option.

**2. Unlatch Password** – Changes the password that is used to protect Manual Reset of the Outputs.

**2. Setup** - This section is used to configure all inputs and outputs. (May be password protected.) When this section is exited, either due to the 60-second timeout or exited by the user, the CT224 will automatically reset and start scanning with the new program settings. The CT224 will also reset when program settings are changed via the communications link using MincoSoft's CT224 Software. This is the main section of the CT224 configuration process and has a full section below covering its use. See section 4B, Entering the Program Settings, for more information.

**3. Modify Offsets** - Adjust the offset for each input zone. The offsets are used to improve accuracy of the readings. This could be useful if a 2-wire RTD is used or a particular value is crucial in a process. The offset can be used so that less error is present. The units for the offset are Tenths. So, if the reading is off by -1 degree (or 1 unit in any other measurement), the number that should be entered for the offset value is 10, because this will raise the value by 10 tenths or +1 degree.

**4. Comm Settings** – This selection steps through setting the monitor address and the baud rate for the serial communications. The settings chosen must match the settings selected by the master device that will be communicating with the CT224. The first screen requests the user to enter the Modbus address. The valid range of addresses is from 1 to 247. If 0 is selected, the CT224 will not monitor the communication lines. Each CT224 is factory set to a default Modbus address of 1. If communications are not used, it is acceptable to leave the default address at 1. If multiple CT224 are to be used, the addresses should be changed to prevent communication errors. The next screen will request setting the baud rate. Valid baud rates are: 600, 1200, 2400, 4800, 9600, and 19200.

**3. Manual Reset** - Use this option to reset the outputs if a trip has occurred and Manual Reset Only was selected when configuring the outputs. (May be password protected.)

**4. Options** – Options Menu allows the user to personalize the zone names and exercise the relays.

1. *Rename Zones*
2. *Exercise Relays*
3. *Freeze Outputs*

**1. Rename Zones** – This option is used to personalize the display. Up to 16 characters can be entered to describe the input location. Capital letters (A-Z), numbers (0-9), and spaces are allowed.

**2. Exercise Relays** – This option can be used to trip the outputs for test purposes. This can be helpful to verify that wiring is correct and that connections are secure. When selected and relays are in tripped condition, the unit will keep the outputs tripped until another key is pressed.

**3. Freeze Outputs** – Selecting this option will disable the program from changing the state of any output. The message “Outputs are Frozen” is displayed on the screen when this selection is active and the CT224 is in Monitor Mode. To unfreeze the outputs, choose this option again and the Freeze Outputs option will be disabled.

## B) Program

Using the keypad to configure the CT224, use the Setup Worksheet provide in the manual to speed up the process and reduce errors. Due to the 60-second timeout in the CT224, it is best to fill out the Setup Worksheet before configuring the unit. This will also allow you to have record of the settings that are programmed into the unit for future reference.

A description for each of the configuration options is give on the following pages.

**Reverse acting outputs?** - Choose the outputs you would like to configure for reverse action.

N – Relay: Normally Open (NO) contact will be open and the Normally Closed (NC) contact will be closed.

Logic: Output will be low (0V) in untripped state.

Y – Relay: NO contact will be closed and the NC contact will be open in the untripped state. The Logic: Output will be high (+5V) in untripped state.

**Temperature Scale:** - Choose the temperature scale that the CT224 should use. RTDs and thermocouples will use this temperature scale for display. Options are F, Fahrenheit and C, Celsius.

**Zone to be displayed during normal operation:** - Choose how the input readings should be displayed.

The user can always adjust the displayed reading by pressing keys, after 5 seconds the CT224 will resume it's process of displaying the High, Low or Scanning through inputs.

High – Highest input reading is displayed, regardless of input type.

Low – Lowest input reading is displayed, regardless of input type.

Any – Display will stay on the zone that the user has set it to.

**Minutes of alarm silence when a key is pressed:** - Set the amount of time to wait until the alarm will resound, if the alarm condition is still present. Valid range is 1 to 100 minutes or Stays Off. This setting only resounds the alarm, it will not re-trip an output. It is designed to remind personnel that there is still a trip condition in affect.

**If an input fails:** - This setting allows the user to determine what action the CT224 should take if a broken sensor is detected.

Sound alarm – Alarm will sound if input fails. Alarm will resound according to the "Minutes of alarm silence when a key is pressed" set in the previous step.

Trip output(s) associated with failed input – All outputs configured to trip on the channel that has a failed input will trip.

Ignore – Continue operating like the input is still functioning properly.

**Choose input type:** - Select the input type for this zone.

**4-20mA Transmitters** – Output proportional to process variable for PSI, BAR, % Relative Humidity, mm/sec, in/sec, G, °C, °F.

**Enter Low End of Transmitter Range:** - This setting will only be displayed if a 4-20mA input is selected in the previous step. All ranges for RTDs and thermocouples are fixed. The valid input range is between -999 and 9999.

**Enter High End of Transmitter Range:** - This setting is also only available when a 4-20mA input is selected. The valid input range is between -999 and 9999. The high end of the transmitter range must be higher than the low end.

**Zone X Trip 1:** - Set the trip value for this zone. When Trip 2 is displayed it will correspond to the second trip value for the zone. Valid temperature ranges are shown in the charts found under “Choose input type:”. If a value not within the range for the sensor is entered, a warning will be displayed and a new, valid setting should be entered.

**Trip Over or Under?** – This setting determines when the outputs will trip.

Over – Outputs for the zone will trip when the reading is higher than the trip value.

Under – Outputs for the zone will trip when the reading is lower than the trip value.

**Sound Alarm on Trip?** – Yes will cause the alarm to sound and alarm output to trip when the reading passes the trip value. Selecting No will not sound the alarm when the outputs are tripped.

**Outputs to trip:**

**Output1\_\_ Output2\_\_**

**Output3\_\_ Output4\_\_** - A Y after the output indicates to trip the output when the reading passed the trip value. An N after the output indicates the output should not be tripped.

**Untrip Outputs by:** - This setting will determine how the outputs associated with this trip will be untripped.

Manual Reset Only – This setting causes the outputs to latch. The outputs can only be reset by entering the Main Menu and selecting Manual Reset. (A password may be necessary to reset the relays.)

Pressing Enter – The outputs will untrip when Enter is pressed.

Using Hysteresis – The outputs will untrip when the input value exits the hysteresis (deadband) limit.

Note: The order of precedence for the methods of untrip is Manual Reset Only, Pressing Enter, and then Using Hysteresis. This means that if at any time an output is tripped and configured by a zone to untrip using Manual Reset Only, the only way to untrip that zone is using the Manual Reset.

Note: When any zone causes a trip for an output, all zones that have caused a trip on that output will be refreshed. This means that if an output has been tripped and then cleared by pressing Enter and another zone causes that output to retrip, the output will act as though both trips have reoccurred at the same time to cause the output to trip. So, if the second trip were to reset by dropping below the programmed hysteresis value, the output will still be tripped, due to the first zone, which caused the trip. To reset the output again, Enter would need to be pressed.

**Set Hysteresis:** - Hysteresis is the amount that the reading must move past the trip value before the outputs will reset. For example, the system is configured to trip at 100°F, has a 10°F hysteresis and will trip Output 1 on an over temperature reading. The reading increases to 100°F, so Output 1 trips. The reading will need to go below 90°F before Output 1 will reset.

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