# Multi-Zone Leak Detector

*Application and Panel Manual*

**COPELAND**

# 1. Overview

The Multi-Zone Leak Detector Application and Panel (*P/N 851-4074*) has a total of six (6) zones. The Visograph display provides a parts per million (PPM) reading. One MRLDS Halo-carbon and CO2 sensor can be connected in each zone. The Multi-Zone Leak Detector application is fully integrated with the E2, has relay outputs for third party devices, or can operate fully independently as a stand-alone device. Leak detector versions 5.32F12 and higher are BACnet MS/TP capable and can be used with E2E 4.09F04 and higher. The BACnet leak detector Description File for E2 is *P/N 527-0600*.

Each zone is capable of operating an audible and visible alarm based on user defined alarm and spill setpoints. In addition, each zone has the ability to trigger a circuit shutdown in the event of a spill.

The Leak Detector Panel comes equipped with a local strobe and horn. Optional hardware includes remote horn and strobes, MRLDS Halo-carbon and CO2 sensors, and battery backup panel.

## 1.1 Parts and Ordering Information

The table *Replacement Parts* below lists the replacement part ordering information for leak detector and its components.

Table 1: Component Replacement Part Numbers

| Component Replacement Part Numbers | |
| --- | --- |
| Description | Copeland Part # |
| Programmed Leak Detector iPro-Genius with connectors<br><br>*When ordering this part, specify the 525-10xx program found on the label affixed to the currently installed iPro (also found on the panel part number label on the top right corner of panel) | 618-8003 |
| IPX206D Expansion Module for iPro | 318-8004 |
| Visograph with the graphics loader, Display Interface for iPro | 818-9205 |
| 120VAC to 24VAC, 50VA, Class 2 Transformer (T1-T8) | 640-0041 |
| 120VAC to 24VAC, 10VA, Class 2 Transformer (T9-T14) | 640-0039 |
| Leak Detector Panel Relay Board | 638-1125 |
| "Zone MRLDS POWER" Green LED Indicator, 24VAC | 150-4030 |
| "Panel Power ON" Green LED Indicator, 120VAC | 150-4032 |
| "UPS CONNECTED" Blue LED Indicator, 102VAC | 150-4034 |
| Horn and Strobe | 118-5112 |
| Push Button Silence | 851-4084 |

Table 1: Component Replacement Part Numbers

| Component Replacement Part Numbers | |
| --- | --- |
| Description | Copeland Part # |
| Break Glass Safety Switch | 118-4122 |
| 6 Zone Leak Detector Panel, All AC powered components | 851-4074 |
| 6 Zone Leak Detector Panel, DC gas detector power, AC horn/strobe power | 851-4550 |
| Leak Detector Panel Relay Board 24VDC Version (compatible with 851-4550 panel only) * | 638-1126 |
| 120VAC to 24VDC power supply (compatible with 851-4550 panel only) * | 250-2541 |

Table 2: Replacement Parts

| Gas Detector Replacement Parts | | |
| --- | --- | --- |
| Description | Copeland Part # | Compatible Leak Panel PART# |
| Copeland MRLDS 250 R22 Gas Specific | 809-0031 | |
| Copeland MRLDS 250 R404A Gas Specific | 809-0034 | |
| Copeland MRLDS 250 R407A Gas Specific | 809-0035 | |
| Copeland MRLDS 250 R407C Gas Specific | 809-0036 | |
| Copeland MRLDS 250 R407F Gas Specific | 809-0037 | |
| Copeland MRLDS 250 R410A Gas Specific | 809-0038 | 851-4074 or 851-4550 |
| Copeland MRLDS 250 R422A Gas Specific | 809-0039 | |
| Copeland MRLDS 250 R422D Gas Specific | 809-0040 | |
| Copeland MRLDS 250 R448A Gas Specific | 809-0041 | |
| Copeland MRLDS 250 R449A Gas Specific | 809-0042 | |
| Copeland MRLDS 250 R513A Gas Specific | 809-0043 | |
| Copeland MRLDS 250 R513A Gas Specific | 809-0044 | |
| Copeland SC 404A Gas Specific | 809-1201 | |
| Copeland SC 407A Gas Specific | 809-1202 | 851-4550 Only |
| Copeland SC 448A Gas Specific | 809-1203 | |
| Copeland IR 0-5000ppm Carbon Dioxide | 809-1215 | 851-4074 or 851-4550 |
| Copeland IR 0-10000ppm Carbon Dioxide | 809-1216 | |

## 1.2  Operation

Each zone will operate a horn and strobe in the event of a leak. If the PPM reading that is sent to the panel has reached the user-configured parameter, the horn and strobe will be activated by a relay output.

If a leak is present and it is large enough to reach the spill parameter set by the user, the panel will trigger another set of relay outputs. Through the E2 software or third party system, a spill alarm can trigger a circuit shutdown. In the event that an alarm has been triggered, the user will be able to silence that alarm for a period of time that is user-configurable.

## 1.3  Panel

The user interface is located on the front panel. From here the user can view status, set parameters, and silence alarms from (in addition to alarm silence buttons located in each zone). Also located on the front panel are power indication lights for the system, each zone, and battery backup status (if an uninterruptible power supply UPS is required).
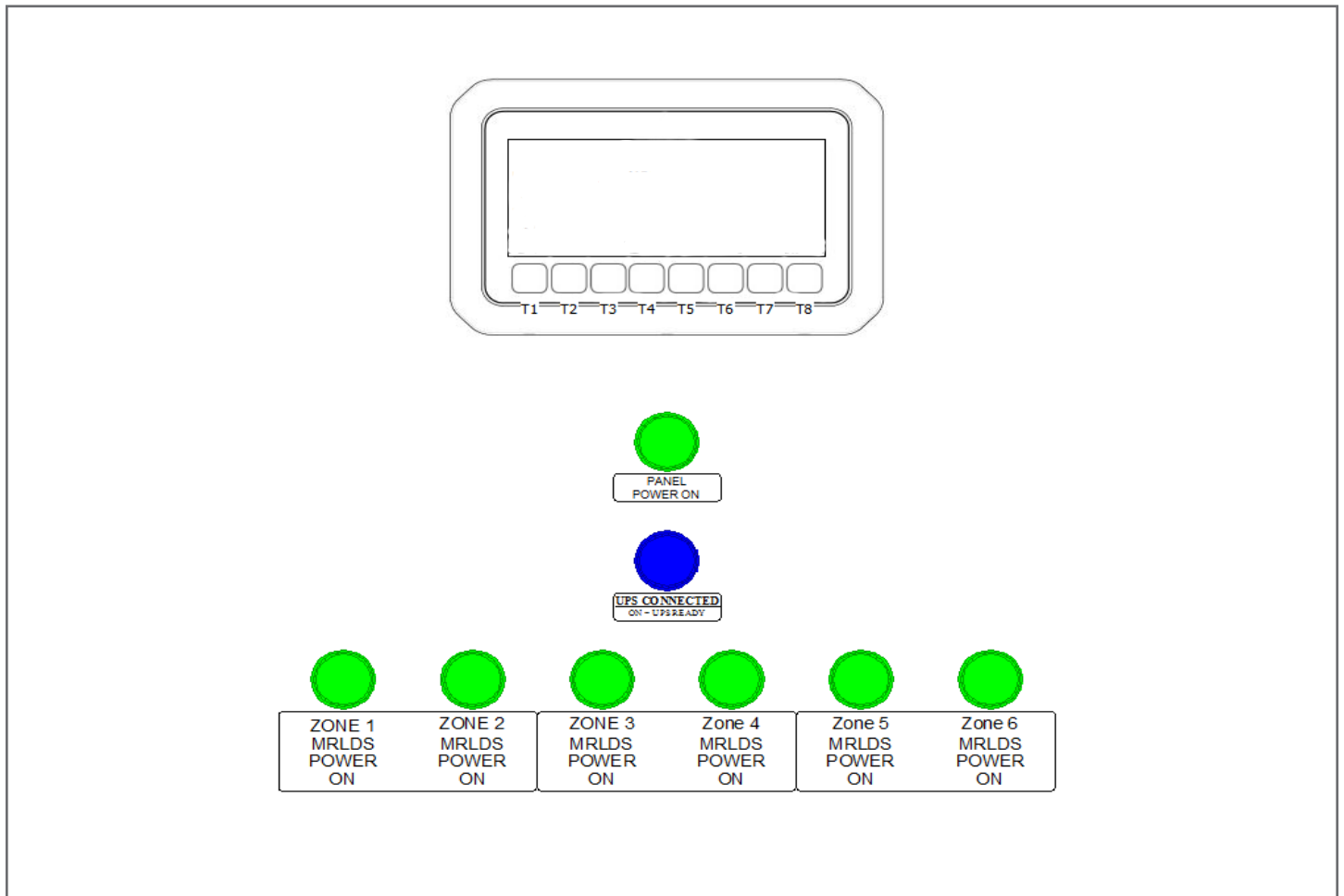
*Front Lamps*

## 1.4  Zone Terminal Blocks

Each zone has a dedicated control board to interface field wiring connections with factory wiring connections in the panel. The *538-1125 AC Zone Relay Board and Terminals (for 851-4074 panel only)* illustration below shows an example of zone 1 board, terminal strip, and terminal descriptions.



| 851-4074 Multi-zone Leak Detector Panel Terminal Legend | | | |
|---|---|---|---|
| Brd #1 | | Description | Voltage/Rating |
| 1 | | MRLDS 1 + | 1-5V IN |
| 2 | | MRLDS 1 - | 0V |
| 3 | | MRLDS 1 Shield (Ground) | Ground |
| 4 | | iPro Analog Out 1 - | 24VAC 10 mA MAX |
| 5 | | iPro Analog Out 1 + | 24VAC 10 mA MAX |
| 6 | | MRLDS 1 24VAC Power Out | 24VAC 1/2A MAX |
| 7 | Zone 1 | MRLDS 1 24VAC Power Out | 24VAC 1/2A MAX |
| 8 | | Remote Horn/Strobe 24VAC Neutral | 24VAC 4A MAX |
| 9 | | Remote Horn Out  24VAC Hot | 24VAC 1A MAX |
| 10 | | Remote Strobe Out  24VAC Hot | 24VAC 1A MAX |
| 11 | | Indicator on 851-4084 Alarm Silence 24VAC Hot | 24VAC 1A MAX |
| 12 | | Zone 1 Dry Out - Normally Open Contact | 120VAC @ 10A MAX |
| 13 | | Zone 1 Dry Out - Common | 120VAC @ 10A MAX |
| 14 | | Zone 1 Dry Out - Normally Closed Contact | 120VAC @ 10A MAX |

*538-1125 AC Zone Relay Board and Terminals (for 851-4074 panel only)*

The 851-4550 Leak Detector Panel with DC powered gas detectors has a slightly different leak detector control board than the 851-4074 panel. The 851-4550 panel has a DC control board that is colored red for easy identification from its green AC counterpart in the 851-4074 panel. Additionally, the red 538-1126 DC control board is configured to provide DC power for installations using DC gas detectors. The red 538-1126 DC control board can only be used in the panel designed for it, P/N 851-4550.



| 851-4550 Multi-zone Leak Detector Panel Terminal Legend | | | |
|---|---|---|---|
| Brd #1 | Zone | Description | Voltage/Rating |
| 1 | | MRLDS 1 + | 1-5V IN |
| 2 | | MRLDS 1 - | 0V |
| 3 | | MRLDS 1 Shield (Ground) | Ground |
| 4 | | iPro Analog Out 1 - | 24VAC 10 mA MAX |
| 5 | | iPro Analog Out 1 + | 24VAC 10 mA MAX |
| 6 | | MRLDS 1 24VAC Power Out | 24VAC 15VA MAX |
| 7 | Zone 1 | MRLDS 1 24VAC Power Out | 24VAC 15VA MAX |
| 8 | | Remote Horn/Strobe 24VAC Neutral | 24VAC 4A MAX |
| 9 | | Remote Horn Out  24VAC Hot | 24VAC 1A MAX |
| 10 | | Remote Strobe Out  24VAC Hot | 24VAC 1A MAX |
| 11 | | Indicator on 851-4084 Alarm Silence 24VAC Hot | 24VAC 1A MAX |
| 12 | | Zone 1 Dry Out - Normally Open Contact | 120VAC @ 10A MAX |
| 13 | | Zone 1 Dry Out - Common | 120VAC @ 10A MAX |
| 14 | | Zone 1 Dry Out - Normally Closed Contact | 120VAC @ 10A MAX |

*538-1126 DC Zone Relay Board and Terminals (for 851-4550 panel only)*

The full description of all terminals and connections is affixed to the inside of each panel door and is shown in the *Zone Terminal Descriptions* below.

### 851-4074 Multi-zone Leak Detector Panel Terminal Legend

| Brd #1 | Zone | Description | Voltage/Rating |
|---|---|---|---|
| 1 | | MRLDS 1 + | 1-5V IN |
| 2 | | MRLDS 1 - | 0V |
| 3 | | MRLDS 1 Shield (Ground) | Ground |
| 4 | | iPro Analog Out 1 - | 24VAC 10 mA MAX |
| 5 | | iPro Analog Out 1 + | 24VAC 10 mA MAX |
| 6 | | MRLDS 1 24VAC Power Out | 24VAC 1/2A MAX |
| 7 | Zone 1 | MRLDS 1 24VAC Power Out | 24VAC 1/2A MAX |
| 8 | | Remote Horn/Strobe 24VAC Neutral | 24VAC 4A MAX |
| 9 | | Remote Horn Out 24VAC Hot | 24VAC 1A MAX |
| 10 | | Remote Strobe Out 24VAC Hot | 24VAC 1A MAX |
| 11 | | Indicator on 851-4084 Alarm Silence 24VAC Hot | 24VAC 1A MAX |
| 12 | | Zone 1 Dry Out - Normally Open Contact | 120VAC @ 10A MAX |
| 13 | | Zone 1 Dry Out - Common | 120VAC @ 10A MAX |
| 14 | | Zone 1 Dry Out - Normally Closed Contact | 120VAC @ 10A MAX |

| Brd #2 | Zone | Description | Voltage/Rating |
|---|---|---|---|
| 1 | | MRLDS 2 + | 1-5V IN |
| 2 | | MRLDS 2 - | 0V |
| 3 | | MRLDS 2 Shield (Ground) | Ground |
| 4 | | iPro Analog Out 2 - | 24VAC 10 mA MAX |
| 5 | | iPro Analog Out 2 + | 24VAC 10 mA MAX |
| 6 | | MRLDS 2 24VAC Power Out | 24VAC 1/2A MAX |
| 7 | Zone 2 | MRLDS 2 24VAC Power Out | 24VAC 1/2A MAX |
| 8 | | Remote Horn/Strobe 24VAC Neutral | 24VAC 4A MAX |
| 9 | | Remote Horn Out 24VAC Hot | 24VAC 1A MAX |
| 10 | | Remote Strobe Out 24VAC Hot | 24VAC 1A MAX |
| 11 | | Indicator on 851-4084 Alarm Silence 24VAC Hot | 24VAC 1A MAX |
| 12 | | Zone 2 Dry Out - Normally Open Contact | 120VAC @ 10A MAX |
| 13 | | Zone 2 Dry Out - Common | 120VAC @ 10A MAX |
| 14 | | Zone 2 Dry Out - Normally Closed Contact | 120VAC @ 10A MAX |

### 851-4074 Multi-zone Leak Detector Panel Terminal Legend

| Brd #3 | Zone | Description | Voltage/Rating |
|---|---|---|---|
| 1 | | MRLDS 3 + | 1-5V IN |
| 2 | | MRLDS 3 - | 0V |
| 3 | | MRLDS 3 Shield (Ground) | Ground |
| 4 | | iPro Analog Out 3 - | 24VAC 10 mA MAX |
| 5 | | iPro Analog Out 3 + | 24VAC 10 mA MAX |
| 6 | | MRLDS 3 24VAC Power Out | 24VAC 1/2A MAX |
| 7 | Zone 3 | MRLDS 3 24VAC Power Out | 24VAC 1/2A MAX |
| 8 | | Remote Horn/Strobe 24VAC Neutral | 24VAC 4A MAX |
| 9 | | Remote Horn Out 24VAC Hot | 24VAC 1A MAX |
| 10 | | Remote Strobe Out 24VAC Hot | 24VAC 1A MAX |
| 11 | | Indicator on 851-4084 Alarm Silence 24VAC Hot | 24VAC 1A MAX |
| 12 | | Zone 3 Dry Out - Normally Open Contact | 120VAC @ 10A MAX |
| 13 | | Zone 3 Dry Out - Common | 120VAC @ 10A MAX |
| 14 | | Zone 3 Dry Out - Normally Closed Contact | 120VAC @ 10A MAX |

| Brd #4 | Zone | Description | Voltage/Rating |
|---|---|---|---|
| 1 | | MRLDS 4 + | 1-5V IN |
| 2 | | MRLDS 4 - | 0V |
| 3 | | MRLDS 4 Shield (Ground) | Ground |
| 4 | | iPro Analog Out 4 - | 24VAC 10 mA MAX |
| 5 | | iPro Analog Out 4 + | 24VAC 10 mA MAX |
| 6 | | MRLDS 4 24VAC Power Out | 24VAC 1/2A MAX |
| 7 | Zone 4 | MRLDS 4 24VAC Power Out | 24VAC 1/2A MAX |
| 8 | | Remote Horn/Strobe 24VAC Neutral | 24VAC 4A MAX |
| 9 | | Remote Horn Out 24VAC Hot | 24VAC 1A MAX |
| 10 | | Remote Strobe Out 24VAC Hot | 24VAC 1A MAX |
| 11 | | Indicator on 851-4084 Alarm Silence 24VAC Hot | 24VAC 1A MAX |
| 12 | | Zone 4 Dry Out - Normally Open Contact | 120VAC @ 10A MAX |
| 13 | | Zone 4 Dry Out - Common | 120VAC @ 10A MAX |
| 14 | | Zone 4 Dry Out - Normally Closed Contact | 120VAC @ 10A MAX |

### 851-4074 Multi-zone Leak Detector Panel Terminal Legend

| Brd #5 | Zone | Description | Voltage/Rating |
|---|---|---|---|
| 1 | | MRLDS 5 + | 1-5V IN |
| 2 | | MRLDS 5 - | 0V |
| 3 | | MRLDS 5 Shield (Ground) | Ground |
| 4 | | iPro Analog Out 5 - | 24VAC 10 mA MAX |
| 5 | | iPro Analog Out 5 + | 24VAC 10 mA MAX |
| 6 | | MRLDS 5 24VAC Power Out | 24VAC 1/2A MAX |
| 7 | | MRLDS 5 24VAC Power Out | 24VAC 1/2A MAX |
| 8 | Zone 5 | Remote Horn/Strobe 24VAC Neutral | 24VAC 4A MAX |
| 9 | | Remote Horn Out 24VAC Hot | 24VAC 1A MAX |
| 10 | | Remote Strobe Out 24VAC Hot | 24VAC 1A MAX |
| 11 | | Indicator on 851-4084 Alarm Silence 24VAC Hot | 24VAC 1A MAX |
| 12 | | Zone 5 Dry Out - Normally Open Contact | 120VAC @ 10A MAX |
| 13 | | Zone 5 Dry Out - Common | 120VAC @ 10A MAX |
| 14 | | Zone 5Dry Out - Normally Closed Contact | 120VAC @ 10A MAX |
| 15 | | Zone 5 Exhaust Fan Control Normally Open | 120VAC @ 10A MAX |
| 16 | | Zone 5 Exhaust Fan Control Normally Open | 120VAC @ 10A MAX |

| Brd #6 | Zone | Description | Voltage/Rating |
|---|---|---|---|
| 1 | | MRLDS 6 + | 1-5V IN |
| 2 | | MRLDS 6 - | 0V |
| 3 | | MRLDS 6 Shield (Ground) | Ground |
| 4 | | iPro Analog Out 6 - | 24VAC 10 mA MAX |
| 5 | | iPro Analog Out 6 + | 24VAC 10 mA MAX |
| 6 | | MRLDS 6 24VAC Power Out | 24VAC 1/2A MAX |
| 7 | | MRLDS 6 24VAC Power Out | 24VAC 1/2A MAX |
| 8 | Zone 6 | Remote Horn/Strobe 24VAC Neutral | 24VAC 4A MAX |
| 9 | | Remote Horn Out 24VAC Hot | 24VAC 1A MAX |
| 10 | | Remote Strobe Out 24VAC Hot | 24VAC 1A MAX |
| 11 | | Indicator on 851-4084 Alarm Silence 24VAC Hot | 24VAC 1A MAX |
| 12 | | Zone 6 Dry Out - Normally Open Contact | 120VAC @ 10A MAX |
| 13 | | Zone 6 Dry Out - Common | 120VAC @ 10A MAX |
| 14 | | Zone 6 Dry Out - Normally Closed Contact | 120VAC @ 10A MAX |
| 15 | | Zone 6 Exhaust Fan Control Normally Open | 120VAC @ 10A MAX |
| 16 | | Zone 6 Exhaust Fan Control Normally Open | 120VAC @ 10A MAX |
| 89 | All Zones | General Alarm Out - Common - Dry Contact | 120VAC @ 10A MAX |
| 90 | All Zones | General Alarm Out - Normally Open - Dry Contact | 120VAC @ 10A MAX |
| 91 | UPS Panel Status Indicator | 120VAC in from UPS Status Indicator Output | Connect UPS Status Indicator Output here. Controls Blue Indicator on this Panel Door. |
| 92 | | 120VAC in from UPS Status Indicator Output | |
| GRD | | Earth Ground | 120VAC, 60Hz, Single Phase, 15A |
| 120V NEUT | Panel Control Power | 120VAC Neutral - IN (Line or Optional UPS Panel 851-4071) | (Connect UPS Power Out here if using 851-4071 UPS Panel) |
| 120V HOT | | 120VAC HOT - IN (Line or Optional UPS Panel 851-4071) | |

## Input Field Connections



### COMPONENT REPLACEMENT PART NUMBERS

| Description | Copeland PART # |
|---|---|
| Programmed Leak Detector iPro-Genius with connectors *When ordering this part, specify the 525-10XX program found on the label affixed to the currently installed iPro (also found on the panel part number label on the top right corner of panel) | 618-8003 |
| IPX206D Expansion Module for iPro | 318-8004 |
| Visograph with graphics loader, Display Interface for iPro | 818-9205 |
| 120VAC to 24VAC, 50VA, Class 2 Transformer (T1-T8) | 640-0041 |
| 120VAC to 24VAC, 10VA, Class 2 Transformer (T9-T14) | 640-0039 |
| Leak Detector Panel Relay Board | 638-1125 |
| "Zone MRLDS POWER" Green LED Indicator, 24VAC | 150-4030 |
| "Panel Power ON" Green LED Indicator, 120VAC | 150-4032 |
| "UPS CONNECTED" Blue LED Indicator, 120VAC | 150-4034 |

*Zone Terminal Descriptions*

**NOTE**: Zones 5 and 6 have additional terminals for an optional break glass device and exhaust fan output.

## 1.5  Additional I/O Terminals



**Input Field Connections**

*Inputs*

## 1.6  Power Connection Terminals

The field connections for supply power to the panel are made on the 120 VAC HOT IN/UPS POWER IN terminal block below the zone board.



ZONE 6

Upstream disconnect and branch circuit protection (MCCB, 20A Max.) supplied by the installer, is required for each lighting/power circuit.

Tighten all connections to recommended specifications before applying power.

Use recommended field conductor wire sizes. Copper conductor only, 60° Celsius minimum.

120VAC HOT IN/ IPS POWER IN

Recommended Specification
Torque: 0.6-0.8 Nm
Wire Sizes: 24-10 AWG

*Power In*

# 2. Set Up Instructions

**NOTE:** When updating screen parameters on the Visograph, only one Visograph at a time may be connected to the Multi-Zone Leak Detector.

Press the corresponding button along the bottom labeled (**T1**-**T8**) to navigate to the desired item. Press **SET** once to enter edit mode, and use the up and down arrow keys to change values and press **SET** once to save the selected value.
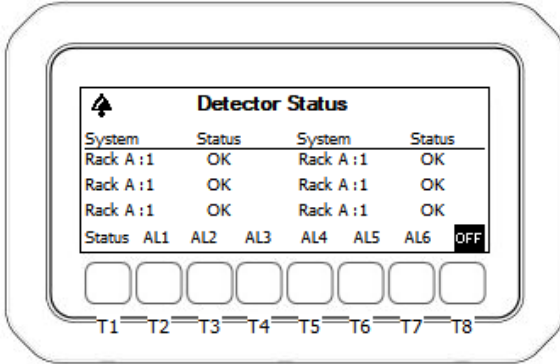


*Main Screen*

The main screen shows the associated refrigerated rack system and circuit number of each detector zone, which is listed under the **System** column. The zone status is shown under the **Status** column. Active alarms will cause the bell icon to flash in the upper left corner. Press and hold **OFF** (**T8**) to silence the alarm located on the panel. The strobe will remain on until the condition no longer exists and the alarm is manually reset.

The zones in alarm condition are indicated by flashing **AL1** through **AL6**, respectively. Each zone can be silenced by pressing the corresponding **T2** through **T7**. The zone alarm can be reset by holding the corresponding button for three (3) seconds.

**NOTE:** Alarm silence and reset functions on the main screen: T2 = AL1, T3 = AL2, T4 = AL3, T5 = AL4, T6 = AL5, T7 = AL5, T8 = OFF

## 2.1 Configuring Modbus Settings
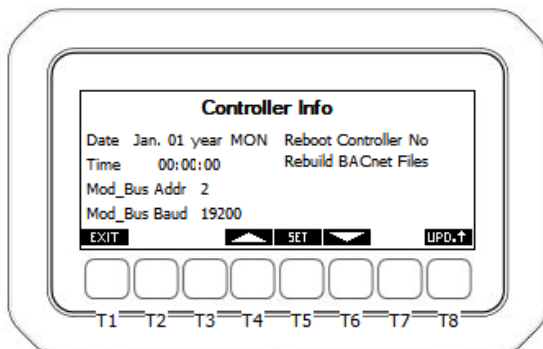


*Controller Info Screen*

If the communication to the E2 will be using Modbus protocol, the Modbus address and baud rate must be configured before successful communication will occur.

To set controller information from the **Detector Status** screen:

1. Press and hold **T4** and **T5** for three (3) seconds.
2. The **Setup** screen will appear.
3. Use the up and down arrow keys to highlight and select **Controller Info** and press **SET**.
4. The **Controller Info** screen will appear.
5. Use the up and down arrow keys to highlight and set the date, time, and Modbus address.
6. Press **SET** after each selection to save changes.
7. After all Modbus settings have been configured, a controller reboot must be performed. Use the down arrow key to select **No** next to **Reboot Controller**, press **SET** to edit and use the arrow keys to select Yes. Press **SET** again. The controller will reboot and boot back up with the new settings applied.

**NOTE:** Set the Modbus address to the next available address. Press SET after making each change to save your entries.

## 2.2 Configuring BACnet Settings

If the communication to the E2 will be using BACnet MS/TP protocol, the BACnet MS/TP settings must be configured before successful communication will occur.
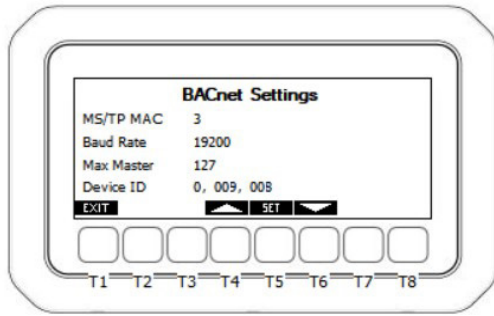
To configure the BACnet Settings from the **Detector Status** screen:

1. Press and hold **T4** and **T5** for three (3) seconds.
2. The **Setup** screen will appear.
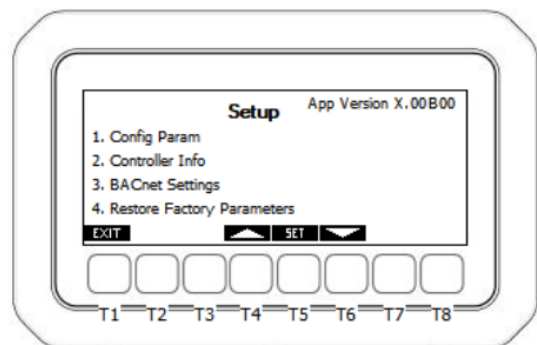


*BACnet Setup Screen*

3. Scroll to **3**. **BACnet Settings** and press **SET** to enter.



*BACnet Settings Screen*

4. **MS/TP MAC**: This parameter specifies the MS/TP network MAC address of the Leak Detector. Each BACnet device on the bus must have a unique number here. Enter a unique number between 0-127 and press **SET** to save.

5. **Baud Rate**: This parameter specifies how fast data is sent over the serial line. Set to match the baud rate of the serial port of the E2 controller.

6. **Max Master**: This parameter defines the value of the highest allowable address for master nodes on the network. Determine the highest MS/TP MAC address used on the bus and set **Max Master** equal to this value. *Example: If there are 40 controllers on the bus and the highest address is 40, set the max master of all 40 controllers to 40.*

7. **Device ID**: Enter the BACnet device identifier here. Enter a unique number for the MS/TP network in the range of 0-4, 194, 303.

8. When at least one (1) setting has been edited, a **CANCEL** option will appear above the **T7** key and a **SAVE** option above the **T8** key. Pressing **Cancel** will revert the system back to the previous settings and no change will be applied.
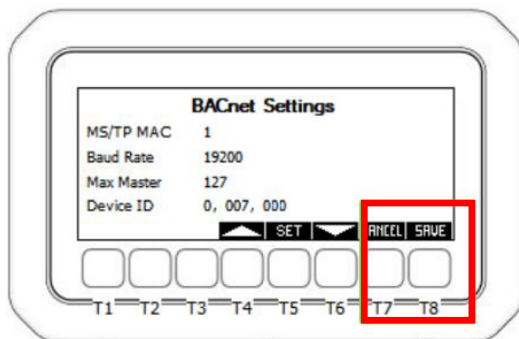


*BACnet Save Settings*

Pressing **SAVE** will apply the changes made and the system will reboot.
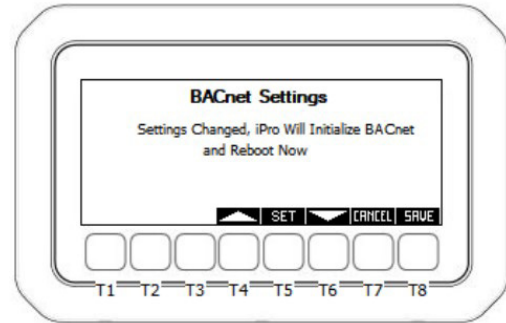


*BACnet Reboot Screen*

Once the Leak Detector is booted back up, it is ready for connection to E2.
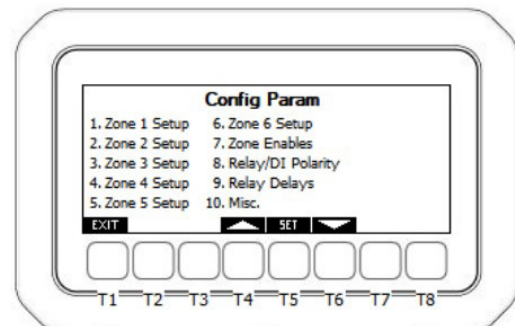
## 2.3 Configuring Each Leak Detector Zone

To configure the parameters, from the **Detector Status** Screen:

1. Press and hold **T4** and **T5** for three (3) seconds.
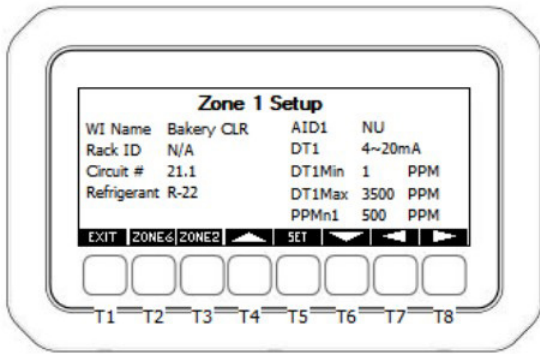
2. The **Setup** screen will appear.
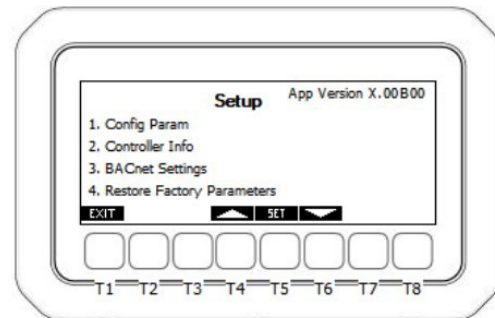


*Leak Detector Setup Screen*

3. Use the up and down arrow keys to highlight and select **Config Param**.



*Leak Detector Configuration Screen*

4. To configure each zone, select the corresponding **Zone X Setup**. This example will configure Zone 1 Setup, the steps are the same for **Zones 1-6.** Select **Zone 1** and press **SET**.



*Leak Detector Zone 1 Setup Parameters Screen 1*

On the **Zone 1 Setup** screen, each parameter in the table below can be edited by using the **T4/T6** keys to change values and the **T5 SET** key to save the selection. Scrolling between pages within the zone setup is done by using **T7/T8** keys. To advance to next or previous zone setup menu, use **T2** or **T3** shortcut keys. Configure each parameter in the *Zone 1 Parameters Page 1* table and see the instruction column of the table for required action.

### Table 3: Zone 1 Parameters Page 1

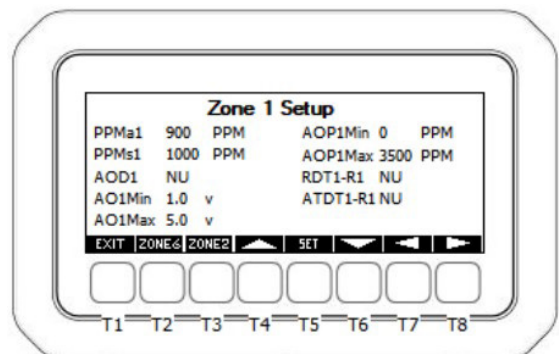| Parameter Name | Description | Instruction |
|---|---|---|
| WI Name | Represents the walk in cooler/freezer box name for the associated leak detection zone. | Select a walk in box name from the list and press **SET** to save. |
| Rack ID | Selects the corresponding refrigeration rack system that this zones refrigeration is physically piped to. | Select a rack system name from the list and press **SET** to save. |
| Circuit # | Represents the corresponding refrigeration circuit number for this leak detection zone. | Enter a circuit number and press **SET** to save. |
| Refrigerant | Selects the refrigerant gas type used for this zone. | Choose the gas type for this zone from the list and press **SET** to save. |
| AID1 | AID1 selects which analog input will be used for the leak sensor signal input for zone 1. | Preset from factory, no action. |
| DT1 | DT1 selects the voltage scale for the leak sensor signal input. | All Copeland MRLDS 250 Gas Specific Sensors, set 1-5V. For Copeland SC Gas Specific Sensors, set 0-10V Nonlinear.* For Copeland IR R744 Sensors, set 0-10V. |

### Table 3: Zone 1 Parameters Page 1

| Parameter Name | Description | Instruction |
|---|---|---|
| DT1 Min/DT 1 Max | DT1 Min represents the PPM minimum value when the leak sensor is at minimum signal voltage. DT1 Max represents the PPM maximum value when the leak sensor is at maximum signal voltage. | Depending on sensors used, set Copeland part numbers to: *809-1001 = 1 PPM min. - 1000 PPM max.* *809-1012 = 1 PPM min. - 3500 PPM max.* *809-0035 = 1 PPM min. - 3500 PPM max.* *809-1020 = 1 PPM min. - 5000 PPM max.* *809-1201-1203 = Parameter not used, will be hidden on screen. Automatically calculated by equation.* *809-1215 = 1 DT Min. - 5000 DT Max.* *809-1216 = 1 DT Min. - 10000 DT Max.* |
| PPMn1 PPMa1 PPMs1 | PPMn1 Represents the PPM level that must be reached by the leak sensor to trigger a notification. PPMa1 Represents the PPM level that must be reached by the leak sensor to trigger an alarm. PPMs1 Represents the PPM level that must be reached by the leak sensor to trigger a spill alarm. | Depending on sensors used, set Copeland part numbers to: For Walk-In Boxes using 809-1001, set 999 PPMn1, PPMa1, PPMs1. For Walk-In Boxes using 809-1012, 809-0031 to 0044, set 1000 PPMn1, PPMa1, PPMs1. For rack and/or machine rooms using 809-1012, 809-0031, to 0044 = 3000 PPMn1, PPMa1, PPMs1. For Walk In Boxes Using 809-1020, 809-1215, set 4999 PPMn1, PPMa1, PPMs1. For Walk In Boxes Using 809-1020, 809-1216, set 5000 PPMn1, PPMa1, PPMs1. |

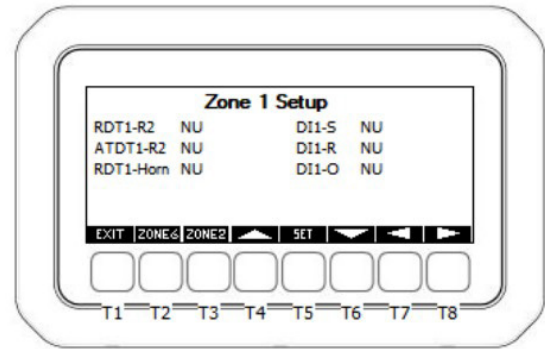Advance to the next page of setup parameters by pressing **T8**.



*Leak Detector Zone 1 Setup Parameters Screen 2*

## Table 4: Zone 1 Parameters Page 2

| Parameter Name | Description and Instruction | Instruction |
|---|---|---|
| AOD1 | Selects the physical analog output number to be used for the zone analog output signal. | Preset from factory, no action. |
| AO1Min/ AO1Max | AO1Min is the minimum signal level that AOD1 will output at the minimum PPM level set by AOP1Min. AO1Max is the maximum signal level that AOD1 will output at the maximum PPM level set by AOP1Max. | **AO1Min** - Set to 1.0 volts and press **SET** to save. **AO1Max** - Set to 5.0 volts and press **SET** to save. |
| AOP1Min/ AOP1Max | AOP1Min is the minimum PPM level that corresponds to the output signal of AO1Min. AOP1Max is the maximum PPM level that corresponds to the output signal of AO1Max. | All sensor part numbers, AO1P1Min: AOP1Min-Set to 0 PPM and press **SET** to save. Set AOP1Max according to the PPM value listed next to the part number of the gas detector installed: 809-1001 AOP1Max-Set to 1000 PPM and press **SET** to save. 809-1012, 809-0031 to 0044 (all MRLDS 250 Models): AOP1Max-Set to 3500 PPM and press **SET** to save. 809-1201 to 1203: AOP1Max-Set to 4000 PPM and press **SET** to save. 809-1020, 809-1215: AOP1Max-Set to 5000 PPM and press **SET** to save. 809-1216: AOP1Max-Set to 10000 PPM and press **SET** to save. |
| RDT1-R1 | Relay 1 output assignment for detector 1. | Preset from factory, no action. |
| ATDT1-R1 | Advisory type selection that would manage relay 1 for detector 1 (RDT1-R1.): Not Used, Notice, Alarm, Spill. | Preset from factory, no action. |

Advance to the next page of setup parameters by pressing **T8**.



*Leak Detector Zone 1 Setup Parameters Screen 3*

## Table 4: Zone 1 Parameters Page 2

| Parameter Name | Description and Instruction | Instruction |
|---|---|---|
| RDT1-R2 | Relay 2 output assignment for Detector 1. | Preset from factory, no action. |
| ATDT1-R2 | Advisory type selection that would manage relay 2 for detector 1: Not Used, Notice, Alarm, Spill. | Preset from factory, no action. |
| RDT1-Horn | Relay output assignment for the horn associated with detector 1. | Preset from factory, no action. |
| DI1-S | Digital input of Detector 1 used for Horn Silence. | Preset from factory, no action. |
| DI1-R | Digital input of Detector 1 used for Alarm Reset. | Preset from factory, no action. |
| DI1-O | Digital input of Detector 1 used for Alarm On. | Preset from factory, no action. |

After all parameters for Zone 1 setup have been reviewed and set, use the **T3** shortcut key to advance to the next zone, repeat the above setup steps for each installed Leak Detector zone.

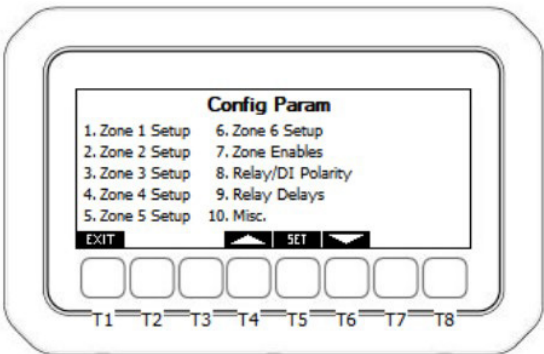## 2.4  Configuring Horn Silence Time

To configure the parameters from the **Detector Status** Screen:

1. Press and hold **T4** and **T5** for three (3) seconds.
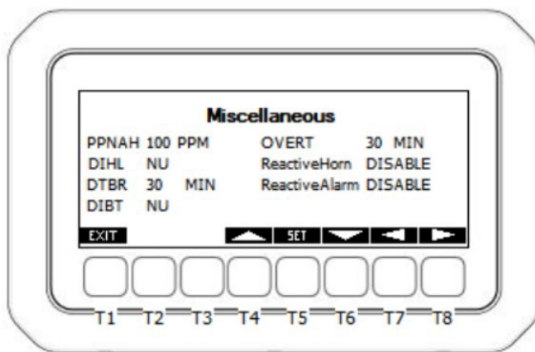2. The **Setup** screen will appear.
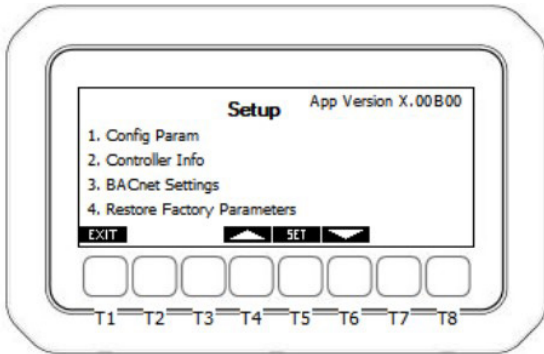


*Horn Silence Time Setup Screen*

3. Select **Config Param**.



*Horn Silence Time Configuration Screen*
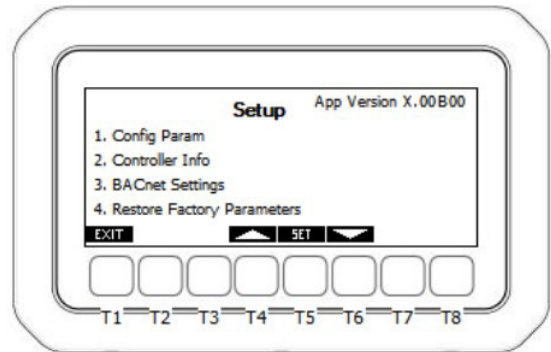
4. Select **10**. **Misc** and press **SET**.



*Horn Silence Time Miscellaneous Screen*
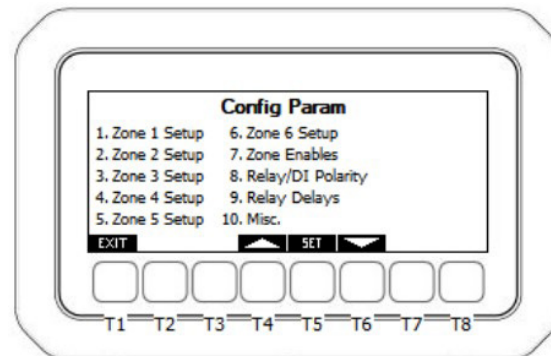
5. Scroll to **DBTR** and adjust desired silence time.

## 2.5  Configuring Relay Delays

1. To configure relay delay parameters, navigate to the **Setup** menu.



*Relay Delay Setup Screen*

2. Select **Config Param**.



*Relay Delay Configuration Screen*

3. Select **9**. **Relay Delays** and press **SET**.
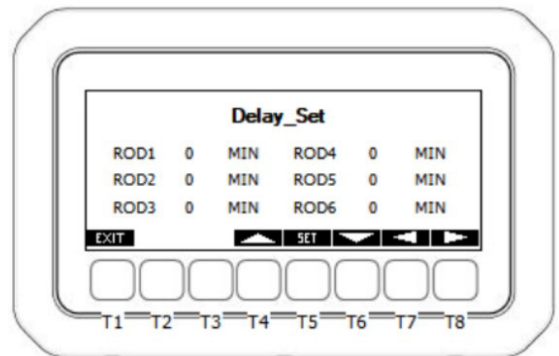


*Set Delays Screen*

4. Set all delays in all pages to 0 min for no delay. Press **SET** to save each selection.

## 2.6 Battery Backup Override

The **OverBatCMD** represents the command to override battery backup. The **OverDIBat** represents the digital input to the battery backup.

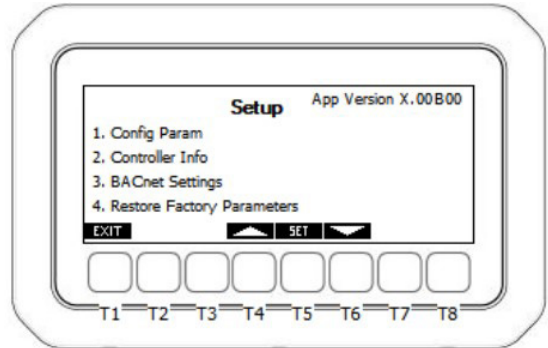1. To configure battery backup override, navigate to the **Setup** menu.
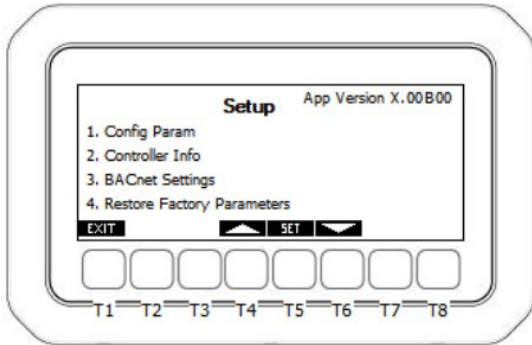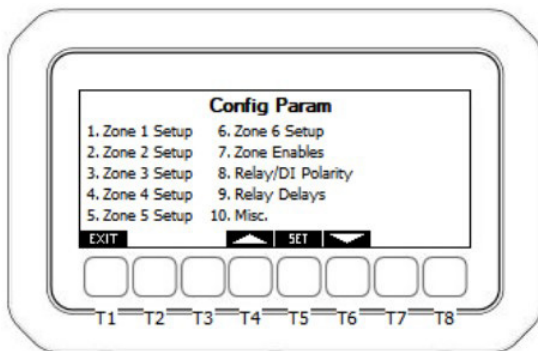


*Battery Backup Override Setup Screen*

2. Select **Config Param.**



*Battery Backup Configuration Screen*

3. Select **10**. **Misc.** and press **T8** to scroll over to page 2.



*Battery Backup Override Miscellaneous Screen*

4. Set **OverBatCMD** and **OverDIBat** to **OFF** and press **SET** to save.

## 2.7 Configuring a Break Glass Safety Switch

If the installation requires a Break Glass safety switch, the input will be connected to the alarm on digital inputs.

1. To configure a Break Glass safety switch, navigate to the **Setup** menu.



*Break Glass Safety Switch Setup Screen*
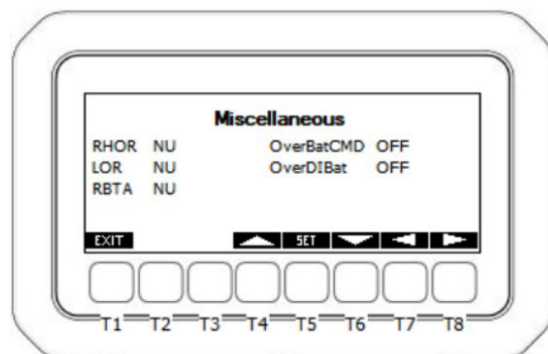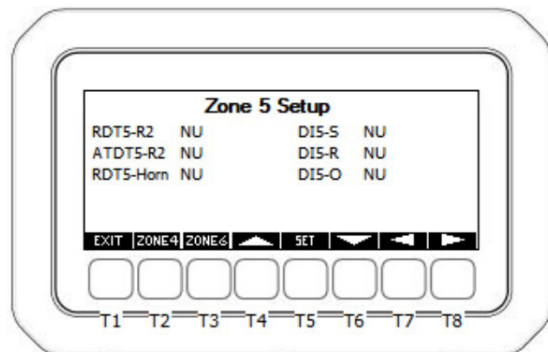
2. Select **Config Param.**



*Break Glass Safety Switch Configuration Screen*

3. Select **5. Zone 6 Setup** and press **T8** twice to scroll to screen 3.



*Break Glass Safety Switch Zone 5 Setup Screen*

4. Scroll down to parameter **DI5-0** and press **SET** to edit, select **DI8** from the list and press **SET** to save.

5. If a second Break Glass safety switch is required, press button **T3** to advance directly to **Zone 6 Setup**. Once in **Zone 6 Setup**, press **T8** twice to scroll to screen 3.
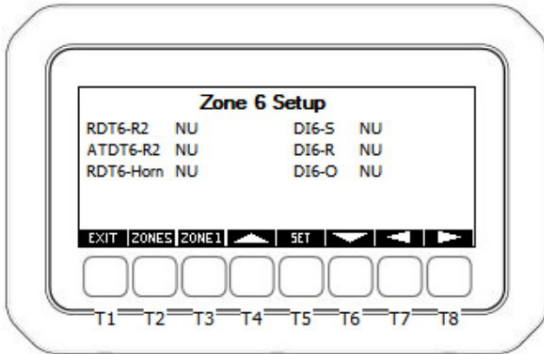


*Break Glass Safety Switch Zone 6 Setup Screen*

6. Scroll down to parameter **DI6-0** and press **SET** to edit, select **DI9** from the list, and press **SET** to save.

7. Press **Exit**. The Break Glass configuration is complete.

## 2.8  Enabling and Disabling Zones

Once zone setup has been completed for Zone 1 setup through Zone 6 setup, make sure each zone is enabled for operation. Zones that are not physically installed or in use should be set to **DISABLE**.

*NOTE:* Setting a zone to DISABLE will inhibit all leak detection and alarming capabilities permanently until the zone is set back to ENABLE.
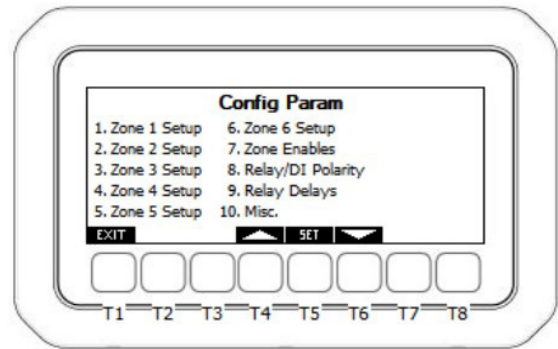
To configure the **Zone Enables** from the **Detector Status** screen:

1. Press and hold **T4** and **T5** for three (3) seconds.
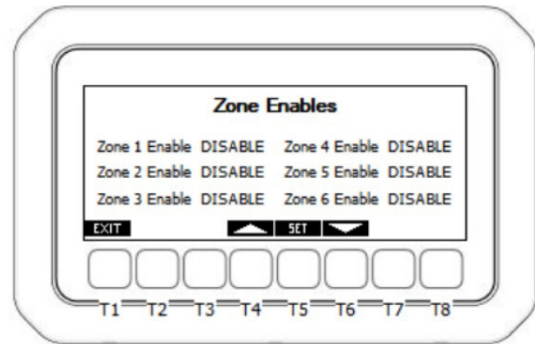
2. The **Setup** screen will appear.
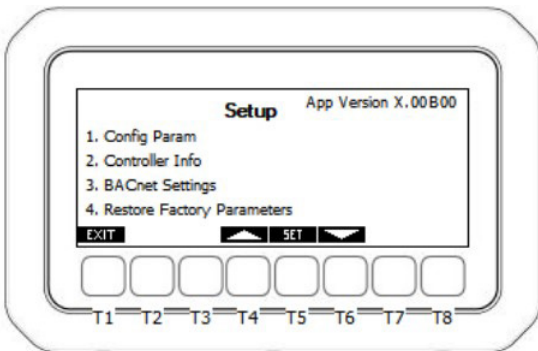


*Enabling and Disabling Zones Setup Screen*

3. Select **Config Param.**



*Enabling and Disabling Zones Configuration Screen*

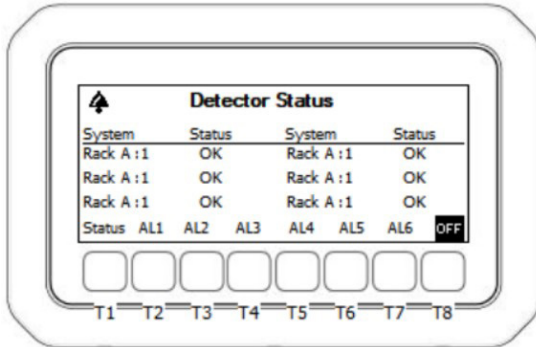4. Select **7. Zone Enables** and press **SET**.
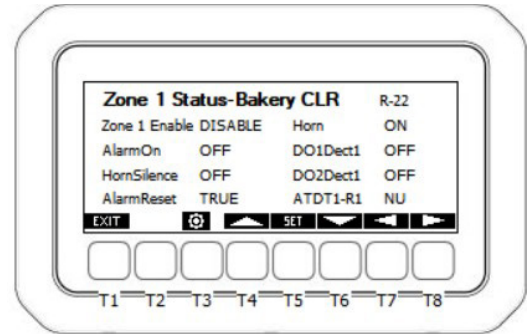


*Zone Enables Screen*

5. Scroll through each zone and set each zone that needs to be placed in operation to **ENABLE**.

# 3. Viewing Zone Status Screens

To view a quick status of current PPM levels within each zone, press **T1** Status from the main **Detector Status** screen:
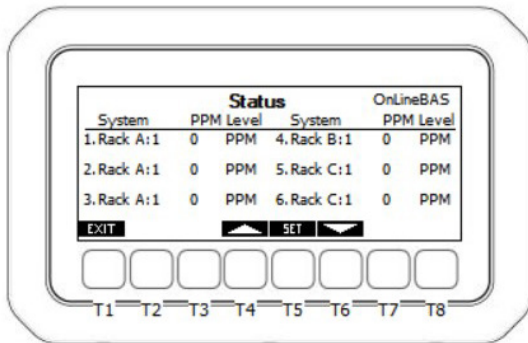


*Zone Detector Status Screen*

Pressing **T1** Status jumps to the PPM level status. The rack name and circuit number can be quickly viewed next to the associated PPM level of that zone.



*PPM Level Status Screen*

To enter the detailed individual zone status, scroll to the desired zone and press **SET**. For convenience the zone enable can be edited from the detailed zone status.



*Detailed Zone Status Screen*

Pressing the gear icon with button **T3** is a shortcut to the **Zone Setup** menu.

# 4. Table of Parameters

Table 5: Parameters

| Parameter Name | Description |
|---|---|
| WI Name Zone 1 | Selects the walk-in box name for Zone 1 |
| WI Name Zone 2 | Selects the walk-in box name for Zone 2 |
| WI Name Zone 3 | Selects the walk-in box name for Zone 3 |
| WI Name Zone 4 | Selects the walk-in box name for Zone 4 |
| WI Name Zone 5 | Selects the walk-in box name for Zone 5 |
| WI Name Zone 6 | Selects the walk-in box name for Zone 6 |
| Rack ID Zone 1 | Selects the refrigeration system name to which this zone is physically piped |
| Rack ID Zone 2 | Selects the refrigeration system name to which this zone is physically piped |
| Rack ID Zone 3 | Selects the refrigeration system name to which this zone is physically piped |
| Rack ID Zone 4 | Selects the refrigeration system name to which this zone is physically piped |
| Rack ID Zone 5 | Selects the refrigeration system name to which this zone is physically piped |
| Rack ID Zone 6 | Selects the refrigeration system name to which this zone is physically piped |
| Circuit # Zone 1 | Selects the refrigeration circuit number for this zone |
| Circuit # Zone 2 | Selects the refrigeration circuit number for this zone |
| Circuit # Zone 3 | Selects the refrigeration circuit number for this zone |
| Circuit # Zone 4 | Selects the refrigeration circuit number for this zone |
| Circuit # Zone 5 | Selects the refrigeration circuit number for this zone |
| Circuit # Zone 6 | Selects the refrigeration circuit number for this zone |
| Refrigerant Zone 1 | Selects the refrigerant gas type for this zone |
| Refrigerant Zone 2 | Selects the refrigerant gas type for this zone |
| Refrigerant Zone 3 | Selects the refrigerant gas type for this zone |
| Refrigerant Zone 4 | Selects the refrigerant gas type for this zone |
| Refrigerant Zone 5 | Selects the refrigerant gas type for this zone |
| Refrigerant Zone 6 | Selects the refrigerant gas type for this zone |
| ENDT1 | Leak detector # 1 is enabled |
| ENDT2 | Leak detector # 2 is enabled |
| ENDT3 | Leak detector # 3 is enabled |
| ENDT4 | Leak detector # 4 is enabled |

Table 5: Parameters

| Parameter Name | Description |
|---|---|
| ENDT5 | Leak detector # 5 is enabled |
| ENDT6 | Leak detector # 6 is enabled |
| DT1 | Leak detector 1 type. 1-5V, 0-10V, and 4-20mA |
| DT2 | Leak detector 2 type. 1-5V, 0-10V, and 4-20mA |
| DT3 | Leak detector 3 type. 1-5V, 0-10V, and 4-20mA |
| DT4 | Leak detector 4 type. 1-5V, 0-10V, and 4-20mA |
| DT5 | Leak detector 5 type. 1-5V, 0-10V, and 4-20mA |
| DT6 | Leak detector 6 type. 1-5V, 0-10V, and 4-20mA |
| DT1Min | Leak detector 1 minimum PPM value at 1 or 0 V, depending on the type |
| DT1Max | Leak detector 1 maximum PPM value at 1 or 0 V, depending on the type |
| DT2Min | Leak detector 2 minimum PPM value at 1 or 0 V, depending on the type |
| DT2Max | Leak detector 2 maximum PPM value at 1 or 0 V, depending on the type |
| DT3Min | Leak detector 3 minimum PPM value at 1 or 0 V, depending on the type |
| DT3Max | Leak detector 3 maximum PPM value at 1 or 0 V, depending on the type |
| DT4Min | Leak detector 4 minimum PPM value at 1 or 0 V, depending on the type |
| DT4Max | Leak detector 4 maximum PPM value at 1 or 0 V, depending on the type |
| DT5Min | Leak detector 5 minimum PPM value at 1 or 0 V, depending on the type |
| DT5Max | Leak detector 5 maximum PPM value at 1 or 0 V, depending on the type |
| DT6Min | Leak detector 6 minimum PPM value at 1 or 0 V, depending on the type |
| DT6Max | Leak detector 6 maximum PPM value at 1 or 0 V, depending on the type |
| PPMn1 | Leak detector 1 Notice parameter |
| PPMa1 | Detector 1 Alarm parameter |
| PPMs1 | Detector 1 Spill parameter |
| PPMn2 | Detector 2 Notice parameter |
| PPMa2 | Detector 2 Alarm parameter |
| PPMs2 | Detector 2 Spill parameter |
| PPMn3 | Detector 3 Notice parameter |

## Table 5: Parameters

| Parameter Name | Description |
|---|---|
| PPMa3 | Detector 3 Alarm parameter |
| PPMs3 | Detector 3 Spill parameter |
| PPMn4 | Detector 4 Notice parameter |
| PPMa4 | Detector 4 Alarm parameter |
| PPMs4 | Detector 4 Spill parameter |
| PPMn5 | Detector 5 Notice parameter |
| PPMa5 | Detector 5 Alarm parameter |
| PPMs5 | Detector 5 Spill parameter |
| PPMn6 | Detector 6 Notice parameter |
| PPMa6 | Detector 6 Alarm parameter |
| PPMs6 | Detector 6 Spill parameter |
| PPNAH | Alarm-Spill Hysteresis |
| RDT1-R1 | Relay 1 output assignment for detector 1. Controlled by selection in ATDT1-R1 |
| RDT2-R1 | Relay 1 output assignment for detector 2. Controlled by selection in ATDT2-R1 |
| RDT3-R1 | Relay 1 output assignment for detector 3. Controlled by selection in ATDT3-R1 |
| RDT4-R1 | Relay 1 output assignment for detector 4. Controlled by selection in ATDT4-R1 |
| RDT5-R1 | Relay 1 output assignment for detector 5. Controlled by selection in ATDT5-R1 |
| RDT6-R1 | Relay 1 output assignment for detector 6. Controlled by selection in ATDT6-R1 |
| RHOR | General horn relay assignment |
| ATDT1-R1 | Advisory type selection that would manage relay 1 for Detector 1 (RDT1-R1) |
| ATDT2-R1 | Advisory type selection that would manage relay 1 for Detector 2 (RDT2-R1) |
| ATDT3-R1 | Advisory type selection that would manage relay 1 for Detector 3 (RDT3-R1) |
| ATDT4-R1 | Advisory type selection that would manage relay 1 for Detector 4 (RDT4-R1) |
| ATDT5-R1 | Advisory type selection that would manage relay 1 for Detector 5 (RDT5-R1) |
| ATDT6-R1 | Advisory type selection that would manage relay 1 for Detector 6 (RDT6-R1) |
| LOR | General advisory light relay assignment |
| RDT1-R2 | Relay 2 output assignment for detector 1. Controlled by selection in ATDT1-R2 |
| RDT2-R2 | Relay 2 output assignment for detector 2. Controlled by selection in ATDT2-R2 |
| RDT3-R2 | Relay 2 output assignment for detector 3. Controlled by selection in ATDT3-R2 |

## Table 5: Parameters

| Parameter Name | Description |
|---|---|
| RDT4-R2 | Relay 2 output assignment for detector 4. Controlled by selection in ATDT4-R2 |
| RDT5-R2 | Relay 2 output assignment for detector 5. Controlled by selection in ATDT5-R2 |
| RDT6-R2 | Relay 2 output assignment for detector 6. Controlled by selection in ATDT6-R2 |
| ATDT1-R2 | Advisory type selection that would manage relay 2 for Detector 1 (RDT1-R2) |
| ATDT2-R2 | Advisory type selection that would manage relay 2 for Detector 2 (RDT2-R2) |
| ATDT3-R2 | Advisory type selection that would manage relay 2 for Detector 3 (RDT3-R2) |
| ATDT4-R2 | Advisory type selection that would manage relay 2 for Detector 4 (RDT4-R2) |
| ATDT5-R2 | Advisory type selection that would manage relay 2 for Detector 5 (RDT5-R2) |
| ATDT6-R2 | Advisory type selection that would manage relay 2 for Detector 6 (RDT6-R2) |
| RBTA | Relay assignment for back up battery. Output managed by DIBT |
| RDT1-Horn | Relay output assignment for the horn associated with Detector 1 |
| RDT2-Horn | Relay output assignment for the horn associated with Detector 2 |
| RDT3-Horn | Relay output assignment for the horn associated with Detector 3 |
| RDT4-Horn | Relay output assignment for the horn associated with Detector 4 |
| RDT5-Horn | Relay output assignment for the horn associated with Detector 5 |
| RDT6-Horn | Relay output assignment for the horn associated with Detector 6 |
| DIHL | Digital input assignment to silence the general horn |
| DTBR | Horn delay time before activating |
| DI1-S | Digital input of Detector 1 used for Horn Silence |
| DI1-R | Digital input of Detector 1 used for Alarm Reset |
| DI1-O | Digital input of Detector 1 used for Alarm On |
| DI2-S | Digital input of Detector 2 used for Horn Silence |
| DI2-R | Digital input of Detector 2 used for Alarm Reset |
| DI2-O | Digital input of Detector 2 used for Alarm On |
| DI3-S | Digital input of Detector 3 used for Horn Silence |

## Table 5: Parameters

| Parameter Name | Description |
|---|---|
| DI3-R | Digital input of Detector 3 used for Alarm Reset |
| DI3-O | Digital input of Detector 3 used for Alarm On |
| DI4-S | Digital input of Detector 4 used for Horn Silence |
| DI4-R | Digital input of Detector 4 used for Alarm Reset |
| DI4-O | Digital input of Detector 4 used for Alarm On |
| DI5-S | Digital input of Detector 5 used for Horn Silence |
| DI5-R | Digital input of Detector 5 used for Alarm Reset |
| DI5-O | Digital input of Detector 5 used for Alarm On |
| DI6-S | Digital input of Detector 6 used for Horn Silence |
| DI6-R | Digital input of Detector 6 used for Alarm Reset |
| DI6-O | Digital input of Detector 6 used for Alarm On |
| DIBT | Digital input as battery backup alarm |
| REHR | Reactive Horn Relay |
| REASR | Reactive Alarm/Spill Relay |
| ROD1 | ON delay Relay 1 |
| ROD2 | ON delay Relay 2 |
| ROD3 | ON delay Relay 3 |
| ROD4 | ON delay Relay 4 |
| ROD5 | ON delay Relay 5 |
| ROD6 | ON delay Relay 6 |
| ROD7 | ON delay Relay 7 |
| ROD8 | ON delay Relay 8 |
| RFD1 | OFF delay Relay 1 |
| RFD2 | OFF delay Relay 2 |
| RFD3 | OFF delay Relay 3 |
| RFD4 | OFF delay Relay 4 |
| RFD5 | OFF delay Relay 5 |
| RFD6 | OFF delay Relay 6 |
| RFD7 | OFF delay Relay 7 |
| RFD8 | OFF delay Relay 8 |
| ROD9 | ON delay Relay 9 |

## Table 5: Parameters

| Parameter Name | Description |
|---|---|
| ROD10 | ON delay Relay 10 |
| ROD11 | ON delay Relay 11 |
| ROD12 | ON delay Relay 12 |
| ROD13 | ON delay Relay 13 |
| ROD14 | ON delay Relay 14 |
| ROD15 | ON delay Relay 15 |
| RFD9 | OFF delay Relay 9 |
| RFD10 | OFF delay Relay 10 |
| RFD11 | OFF delay Relay 11 |
| RFD12 | OFF delay Relay 12 |
| RFD13 | OFF delay Relay 13 |
| RFD14 | OFF delay Relay 14 |
| RFD15 | OFF delay Relay 15 |
| RLP1 | Polarity of RL1 |
| RLP2 | Polarity of RL2 |
| RLP3 | Polarity of RL3 |
| RLP4 | Polarity of RL4 |
| RLP5 | Polarity of RL5 |
| RLP6 | Polarity of RL6 |
| RLP7 | Polarity of RL7 |
| RLP8 | Polarity of RL8 |
| DIP1 | Polarity of DI01 |
| DIP2 | Polarity of DI02 |
| DIP3 | Polarity of DI03 |
| DIP4 | Polarity of DI04 |
| DIP5 | Polarity of DI05 |
| DIP6 | Polarity of DI06 |
| DIP7 | Polarity of DI07 |
| DIP8 | Polarity of DI08 |
| DIP9 | Polarity of DI09 |
| DIP10 | Polarity of DI010 |
| DIP11 | Polarity of DI011 |
| RLP9 | Polarity of RL9 |
| RLP10 | Polarity of RL10 |
| RLP11 | Polarity of RL11 |

## Table 5: Parameters

| Parameter Name | Description |
|---|---|
| RLP12 | Polarity of RL12 |
| RLP13 | Polarity of RL13 |
| RLP14 | Polarity of RL14 |
| RLP15 | Polarity of RL15 |
| DIP12 | Polarity of DI12 |
| DIP13 | Polarity of DI13 |
| DIP14 | Polarity of DI14 |
| DIP15 | Polarity of DI15 |
| DIP16 | Polarity of DI16 |
| DIP17 | Polarity of DI17 |
| DIP18 | Polarity of DI18 |
| DIP19 | Polarity of DI19 |
| DIP20 | Polarity of DI20 |
| AID1 | Analog input of Detector 1 |
| AID2 | Analog input of Detector 2 |
| AID3 | Analog input of Detector 3 |
| AID4 | Analog input of Detector 4 |
| AID5 | Analog input of Detector 5 |
| AID6 | Analog input of Detector 6 |
| AOD1 | Analog output of Detector 1 |
| AOD2 | Analog output of Detector 2 |
| AOD3 | Analog output of Detector 3 |
| AOD4 | Analog output of Detector 4 |
| AOD5 | Analog output of Detector 5 |
| AOD6 | Analog output of Detector 6 |
| AO1Min | Min analog output of Detector 1 |
| AO1Max | Max analog output of Detector 1 |
| AO2Min | Min analog output of Detector 2 |
| AO2Max | Max analog output of Detector 2 |
| AO3Min | Min analog output of Detector 3 |
| AO3Max | Max analog output of Detector 3 |
| AO4Min | Min analog output of Detector 4 |
| AO4Max | Max analog output of Detector 4 |
| AO5Min | Min analog output of Detector 5 |

## Table 5: Parameters

| Parameter Name | Description |
|---|---|
| AO5Max | Max analog output of Detector 5 |
| AO6Min | Min analog output of Detector 6 |
| AO6Max | Max analog output of Detector 6 |
| AOP1Min | Min PPM of analog output of Detector 1 |
| AOP1Max | Max PPM of analog output of Detector 1 |
| AOP2Min | Min PPM of analog output of Detector 2 |
| AOP2Max | Max PPM of analog output of Detector 2 |
| AOP3Min | Min PPM of analog output of Detector 3 |
| AOP3Max | Max PPM of analog output of Detector 3 |
| AOP4Min | Min PPM of analog output of Detector 4 |
| AOP4Max | Max PPM of analog output of Detector 4 |
| AOP5Min | Min PPM of analog output of Detector 5 |
| AOP5Max | Max PPM of analog output of Detector 5 |
| AOP6Min | Min PPM of analog output of Detector 6 |
| AOP6Max | Max PPM of analog output of Detector 6 |
| OVERT | Override time |
| RODR1 | ON delay IPX106D Relay 1 |
| RODR2 | ON delay IPX106D Relay 2 |
| RODR3 | ON delay IPX106D Relay 3 |
| RODR4 | ON delay IPX106D Relay 4 |
| RODR5 | ON delay IPX106D Relay 5 |
| RODR6 | ON delay IPX106D Relay 6 |
| RFDR1 | OFF delay IPX106D Relay 1 |
| RFDR2 | OFF delay IPX106D Relay 2 |
| RFDR3 | OFF delay IPX106D Relay 3 |
| RFDR4 | OFF delay IPX106D Relay 4 |
| RFDR5 | OFF delay IPX106D Relay 5 |
| RFDR6 | OFF delay IPX106D Relay 6 |
| RLPR1 | Polarity of IPX106D Relay 1 |
| RLPR2 | Polarity of IPX106D Relay 2 |
| RLPR3 | Polarity of IPX106D Relay 3 |
| RLPR4 | Polarity of IPX106D Relay 4 |
| RLPR5 | Polarity of IPX106D Relay 5 |
| RLPR6 | Polarity of IPX106D Relay 6 |

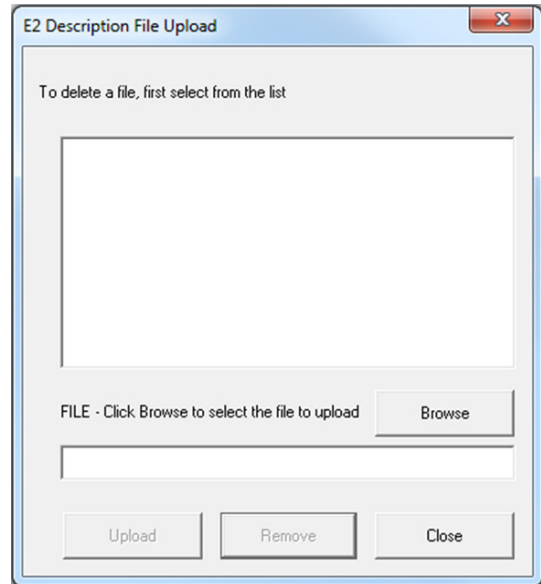# 5. Uploading the Multi-Zone Refrigerant Leak Detector Description File to E2

*NOTE:* UltraSite32 Software should be installed to perform uploading of Description Files.

1. Connect to E2 using UltraSite32 (refer to UltraSite32 TCP/IP Connection Manual (*P/N 026-1002*).

2. Launch the UltraSite program and Login. Type **USER** in the Username and **PASS** in the Password fields.

3. Double click to open the Directory Level to view the Site Level. Refer to *Description File Upload graphic* below.

4. Right click on **Site Level** and click **Connect**.

5. Double click on **Site Level** and locate the E2 Unit where the Multi-Zone Refrigerant Leak Detector will be installed.

6. Right click on the unit and select **Upload Description File**.
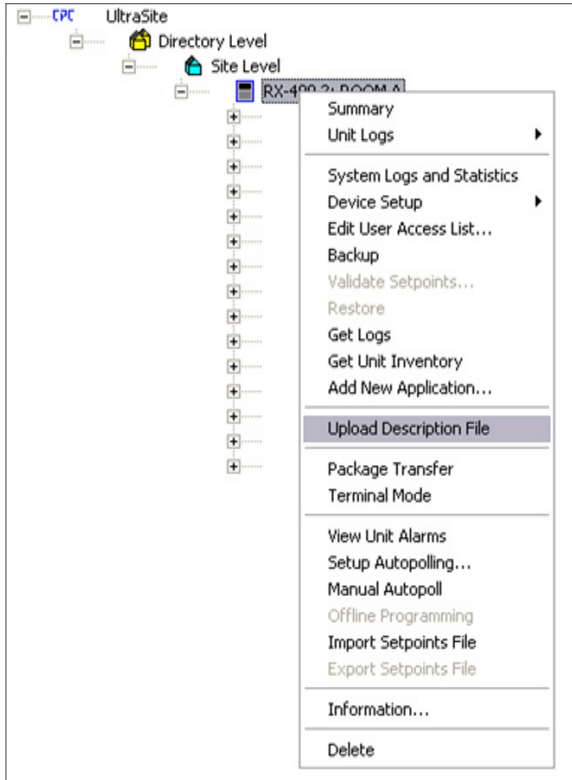


*Description File Upload*

7. Click the **Browse** button.



*E2 Description File Upload*

8. Browse the computer and select the appropriate description (∗.dsc) file for the Multi-Zone Refrigerant Leak Detector.

*NOTE: Select the appropriate Description File for the communication type with E2. Leak Detector 5.32F12 and later supports BACnet MS/TP. The BACnet MS/TP file P/N is 527-0600 and the Modbus file P/N is 527-0389. To use BACnet MS/TP with Leak Detector and E2, the E2 must be 4.09F04 or later and Leak Detector 5.32F12 or later.*
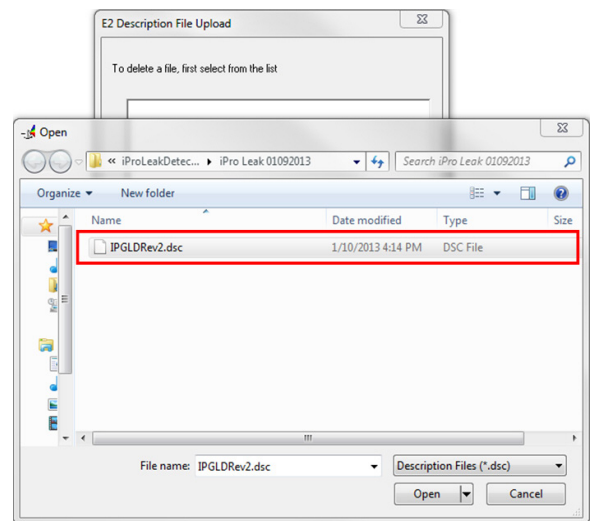


*E2 Description File Upload*

9. Click **OPEN**.

10. Click **UPLOAD**. A window will appear with a message that the Description File was imported, click **OK**.
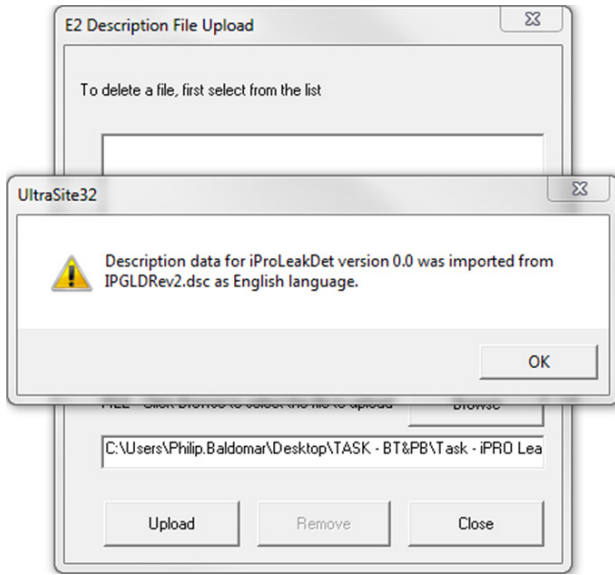


*E2 Description File Upload*

11. The description (∗dsc) file will appear inside the box.
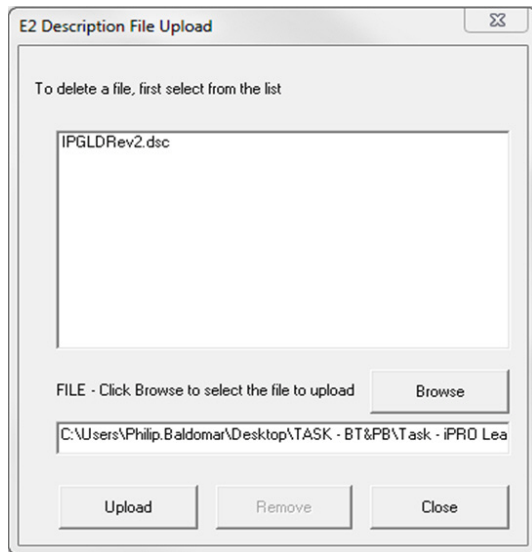


*E2 Description File Upload*

12. Once completed, disconnect from the E2 unit.

13. Reboot the E2 controller.

## 5.1 Licensing the Multi-Zone Leak Detector in the E2

If the BACnet description file (*P/N 527-0600*) will be used for leak detector communication, no license key is required, there will be 10 instances of Leak Detector available by default.

1. Log on to the E2 controller and Press [Menu] [& 7] [L 9].

2. Press [F1] to add the license for the Description File.

3. Enter the 16-digit number provided from Technical Support.
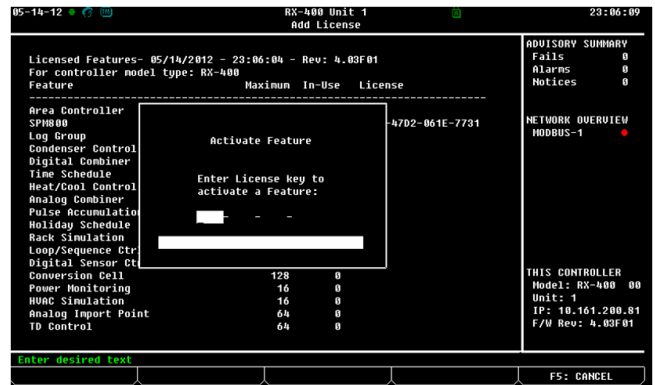
4. Press [↵].



*Adding License*

## 5.2 Device Setup in the E2

### 5.2.1 E2 Serial Port Setup - Modbus

1. Log into to E2 by pressing the [Log In/Out] button.

2. Type **USER** in the Username and **PASS** in the Password fields.

3. Press [Menu] [& 7] [# 3] [! 1] to enter General Controller Info setup.

4. Press [F2] twice move to **C3: Serial Tab**.



*Serial Port Set Up*

5. Highlight **COM6 Connection** value:

  • Press [F4] for the Look Up menu and select **MODBUS**-**1** (if **MODBUS**-**1** is being used, select **MODBUS**-**2** or **MODBUS**-**3**).

  • Press the [Enter] to set configuration.

  • Set the MODBUS Connection as follows: (Press [F4] to select options and set the configuration.)

    » COM2 Baud: 9600

    » COM2 Data Size: 8

    » COM2 Parity: None

    » COM2 Stop Bits: 1

6. Press 〔↔〕 to save changes.

7. Press 〔🏠〕 to go back to the Home screen.

### 5.2.2   E2 Serial Port Set Up - BACnet MS/TP

1. Login to E2 with **Username: user**; **Password: pass**

2. Press [Alt] + [M] on the E2 keyboard to access the serial tab of the general controller setup screen. This screen will have a connection field for all available COM ports on the E2. Highlight the COM port connection you will be using for BACnet MS/TP and press [F4] (**LOOKUP**) and select BACnet MS/TP -1, -2, or -3 from the list of network types.
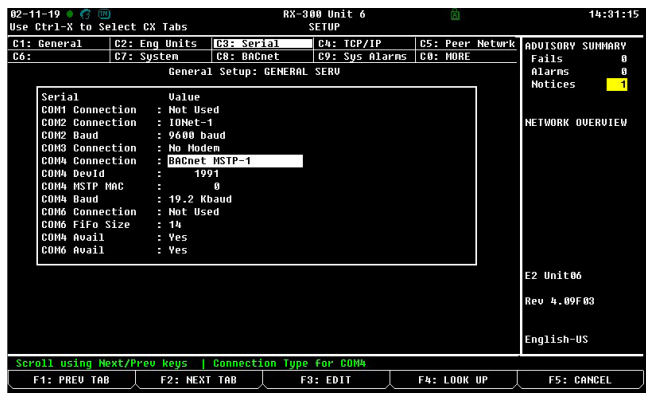


*BACnet MS/TP Serial Port Set Up*

3. Three fields will become visible underneath the COM4 Connection that pertain to the way the device communicates:

  a. **COM4 DevId** - This is the E2 BACnet Device ID; set this to a unique number from all other BACnet nodes on the network in the range of 0-4194303.

  b. **COM4 MSTP MAC** - This is the E2 BACnet MSTP MAC address; set this to a unique number for E2 in the range of 1-127. Each BACnet device on the network must have its own unique MS/TP MAC for successful communication.

  c. **COM4 Baud** - Default setting is 9600; this must be changed to 19.2k or 38.4k. (All devices connected to the same COM port should be set to the same baud rate).

4. Now the BACnet MS/TP specific settings must be configured. From the Home screen on E2 press [Alt] + [T] on the keypad to navigate to this screen:
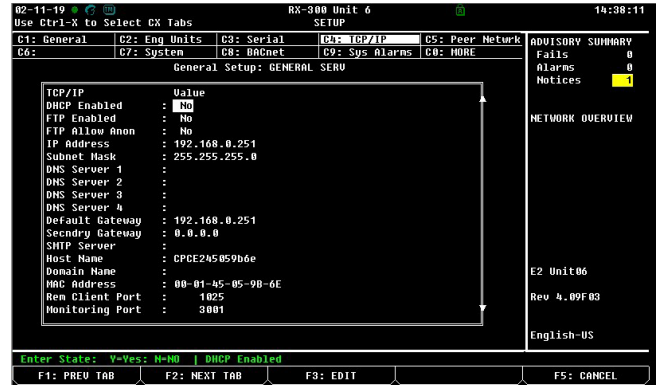


*BACnet TCP/IP Tab*

5. Press [Ctrl] + [*8] at the same time to reach the **BACnet** tab:
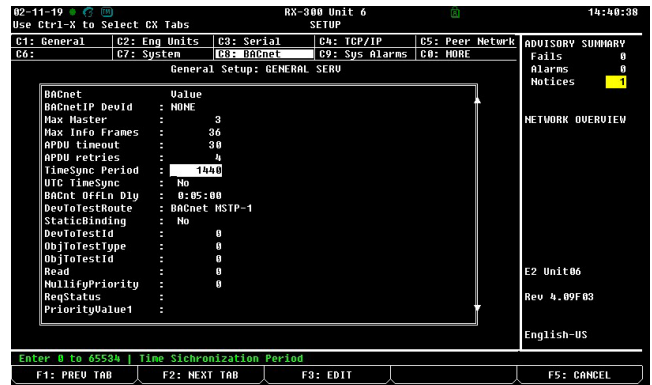


*BACnet General Setup Screen*

6. These settings must be configured in the **BACnet** tab:

  a. **Max Master** - The default setting is 127, edit and change the value to be equal to the highest BACnet MAC address that E2 will communicate with on any of its three (3) COM ports. Determine what BACnet MS/TP devices are connected to E2's COM ports, then determine the highest MS/TP MAC address of all the devices. Set the E2 **Max Master** equal to the highest MS/TP MAC address determined.

  b. **Max Info Frames** - This is the max number of BACnet frames E2 can transmit per token. Set to 36.

c. **PDU Timeout** - This is the amount of time in seconds between re-transmissions of an APDU requiring acknowledgment for which no acknowledgment has been received. Enter a value of **30** in this field.

d. **APDU Retries** - This is the maximum amount of times that an APDU shall be retransmitted. Enter a value of **3** in this field.

e. **TimeSync Period** - This is the number of minutes between time synchronization broadcasts. Enter a value of **1440** here.

f. **UTC TimeSync** - This toggles the time sync broadcast to use coordinated universal time mode. Toggle this field to **NO**.

## 5.3  Device Wiring
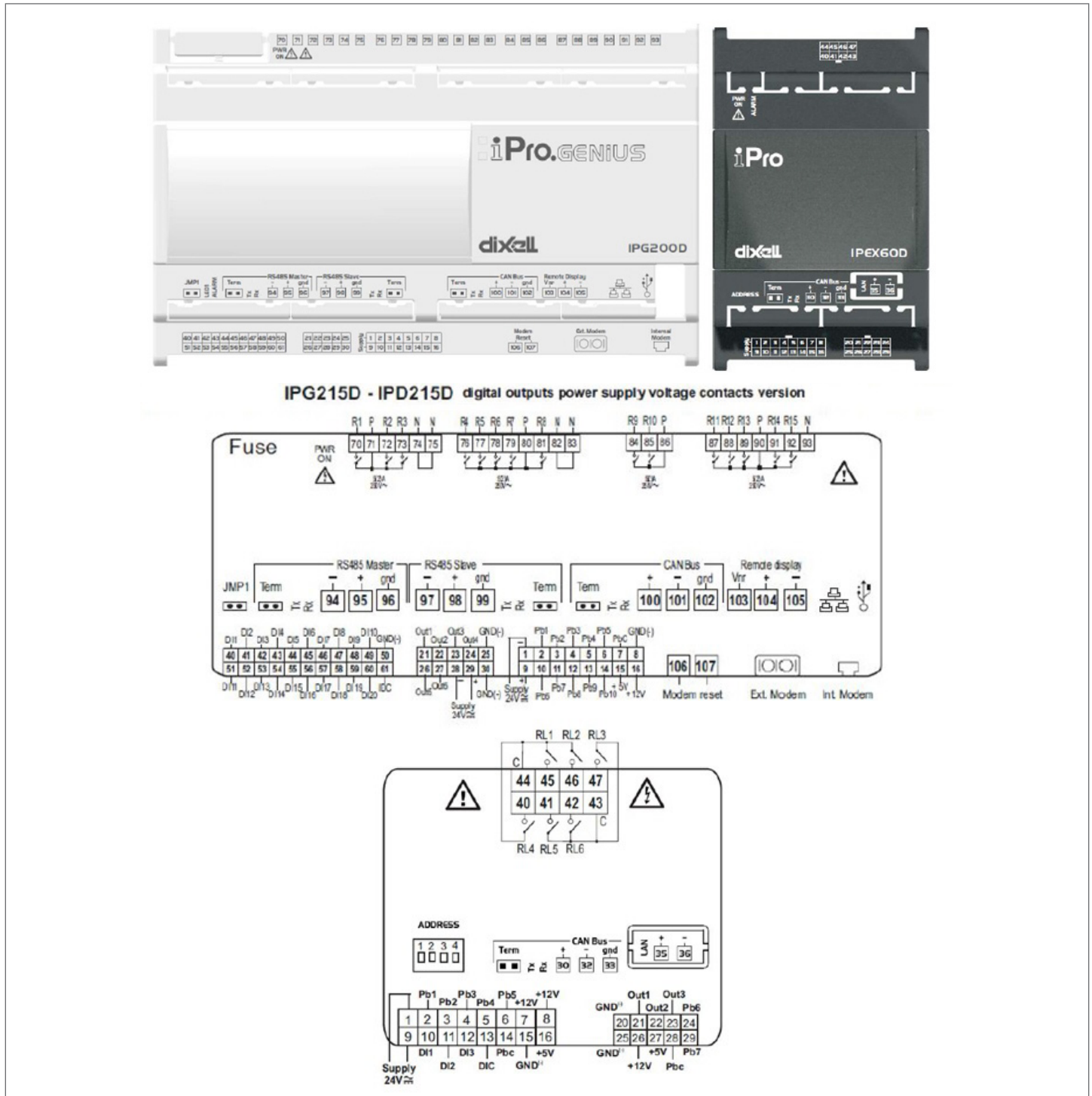


*Device Wiring*

## 5.4 Connecting Communication Wires - Modbus

If the communication protocol between Leak Detector and E2 is using Modbus, connect the RS485 wiring to the RS485 slave terminal on the iPro controller, terminals 97, 98, 99. The polarity of the + and - wires is reversed between the E2 serial port and the leak detector serial port.



*Multi-Zone Leak Detector Wiring*

*NOTE:* The polarity of the MODBUS connection between E2 and the Multi-Zone Refrigerant Leak Detector is reversed.

### 5.4.1 Connecting Communication Wires - BACnet MS/TP

The BACnet MS/TP connection should be wired in a daisy chain topology, no star or T configurations are allowed. Connect the BACnet network cable to the three terminal connector on the E2 COM port you wish to assign as BACnet MS/TP. Connect the network cable to the leak detector on the RS485 master port terminals 94, 95, 96.

Reverse the polarity of +/- on the RS485 cable between the E2 serial port and the leak detector serial port. Copeland specs General Cable 92454A (*Copeland P/N 135-0600*) shielded twisted pair cables for use as BACnet MS/TP wiring.

## 5.5 Adding the Multi- Zone Refrigerant Leak Detector in E2

1. Press [Menu] [7] [7] [2] to open the **Connected I/O Boards and Controllers** setup.

2. Press [F2] twice to move to **C4: Third Party** tab. Highlight the Multi-Zone Refrigerant Leak Detector application and enter the number of devices under **Quantity**.



*Third Party Tab*

3. Press [⏎] to save changes.

4. Press [⌂] to go back to the Home screen.

## 5.6 Commissioning Multi-Zone Refrigerant Leak Detector - Modbus

1. Press [Menu] [7] [7] [1] to enter the **Network Summary** screen.

2. Highlight the Multi-Zone Refrigerant Leak Detector to be commissioned and press [F4].
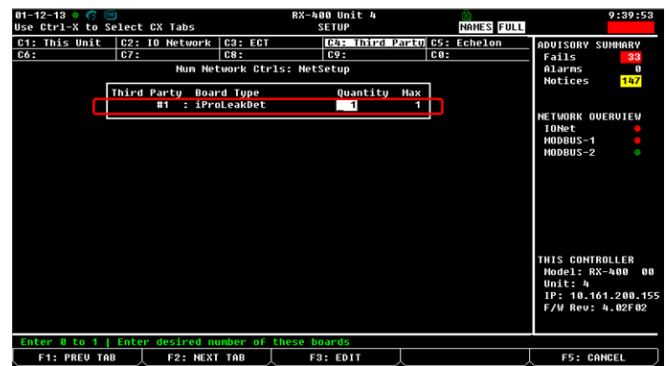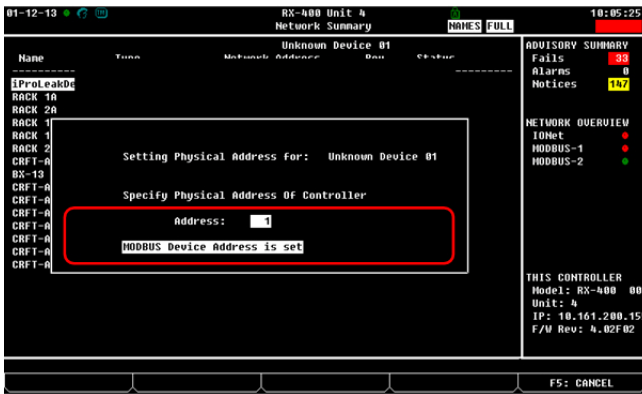


*Network Summary Screen*

3. If a box with **Select Network** appears on the screen, select the MODBUS number where the device was configured.
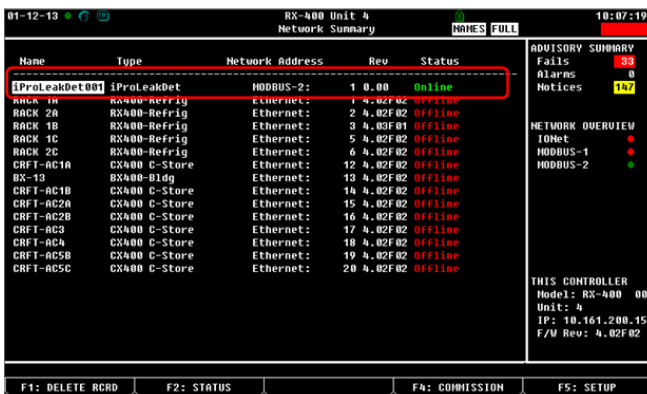
4. Select address for the device and press [Enter].
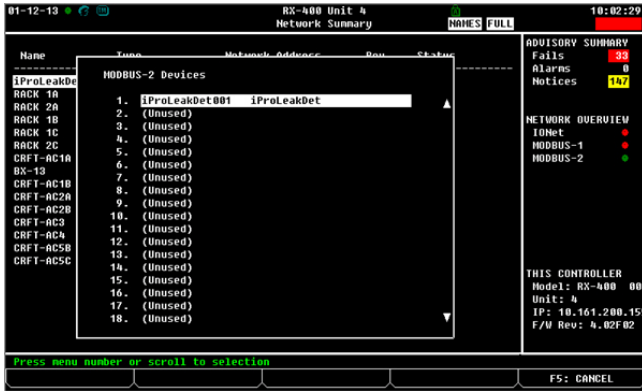


*Network Summary Screen*

5. This screen will appear. Press [Enter] to continue.



*Network Summary Screen*

6. Press [⤲] to save the assigned address.

7. Press [🏠] button to return to the Home screen. Press [Menu] [&7] [&7] [1] to enter the Network Summary screen.

8. The Multi-Zone Refrigerant Leak Detector should appear **ONLINE** after a few seconds.



*Network Summary Screen*

## 5.7 Commissioning Multi-Zone Refrigerant Leak Detector - BACnet MS/TP

1. Login to the E2 and press [Alt] + [N] to reach the **Network Summary** screen.
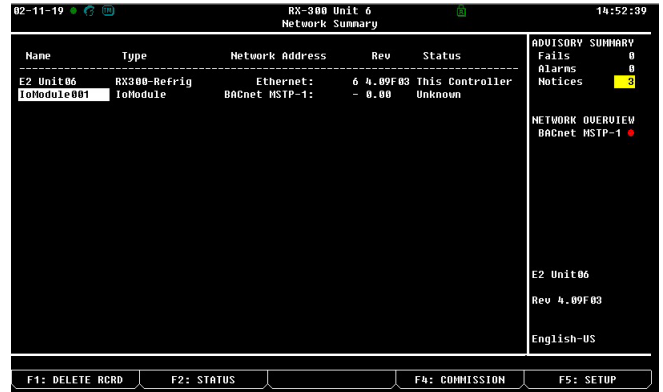


*BACnet MS/TP Network Summary Screen*

2. Press [F5] (Setup) to enter device setup in the General tab. Set **Do Initial Sync to Yes, Initial Action to Send Device Cfg to E2, and Cfg Sync Action to Send Device Cfg to E2**. Press [⤲] to save and exit back to **Network Summary** screen.
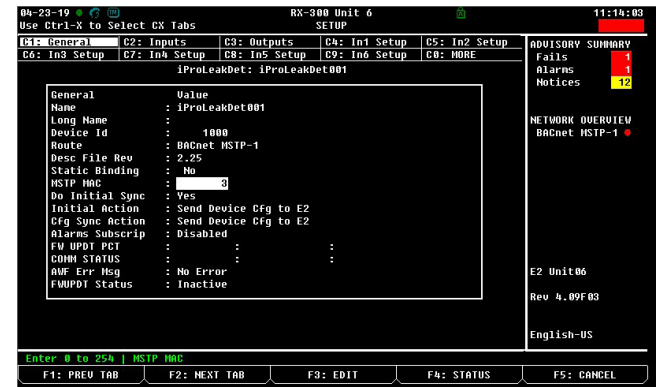


*BACnet MS/TP General Screen*

3. Highlight the device and press [F4] commission for a list of networks. Select the BACnet MS/TP route assigned to the COM port.



*BACnet MS/TP Select Network*

4. E2 will scan for available BACnet MS/TP devices.



*BACnet MS/TP Device Commission*

5. E2 will display a list of the MS/TP devices discovered during the scan. The number in parenthesis is the BACnet MAC address and the 6-digit number adjacent to it is the BACnet Device ID. Select the device you want to commission and press ⏎ on the E2 keypad.
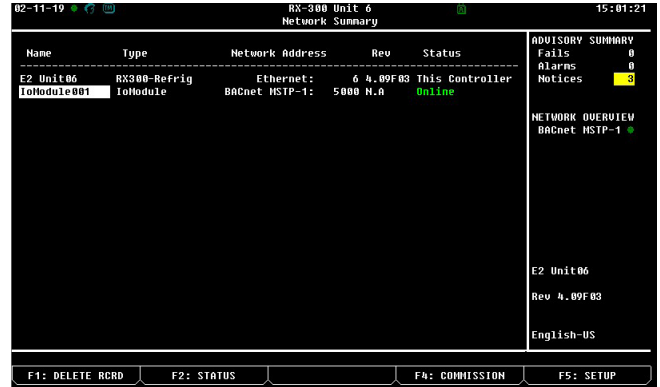


*BACnet MS/TP Devices*

6. Press ⏎ again on E2 keypad and then E2 will display BACnet Device ID is set:



*BACnet MS/TP Device ID is Set*

7. Press ⟨⟩ to save and exit back to the **Network Summary** screen:



*BACnet MS/TP Device Status Online*

8. The device status should now change to **Online** in green. Allow approximately five (5) minutes for initial communication startup and synchronization to complete before editing parameters.

## 5.8  Viewing E2 Status Screen

Press ⟨Alt⟩ + ⟨N⟩ to reach the Network Summary page. Highlight the Multi-Zone Refrigerant Leak Detector and press ⏎.
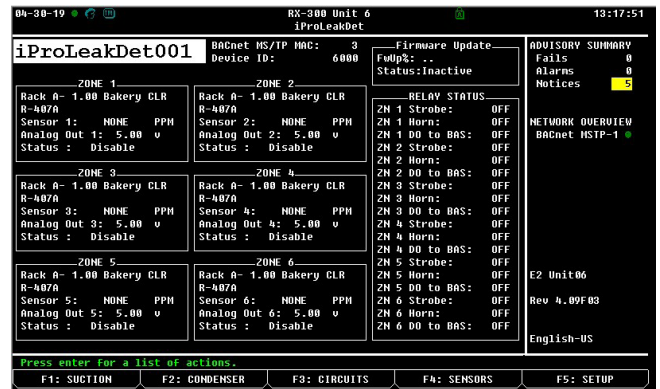


*Viewing Status*

## 5.9 Resetting Spill Alarm

When the Leak Detector version 5.32F12 or later is communicating with E2, the zone spill alarms can be reset from E2. Once the zone PPM has fallen back below the spill setpoint (PPMs), the alarm can be reset.
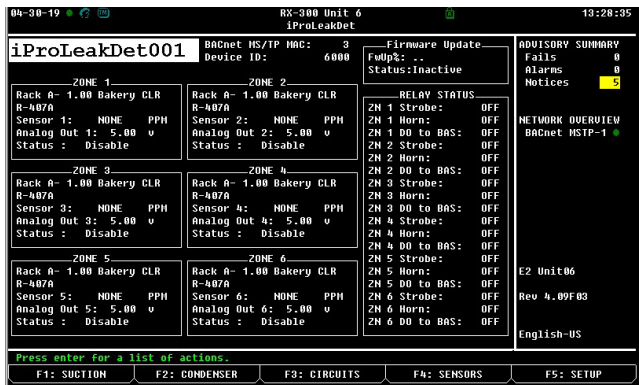
Perform the following steps at E2 to reset a zone spill alarm:

1. Login to the E2 controller and press **Alt** + **N** keys at the same time to reach the Network Summary page:
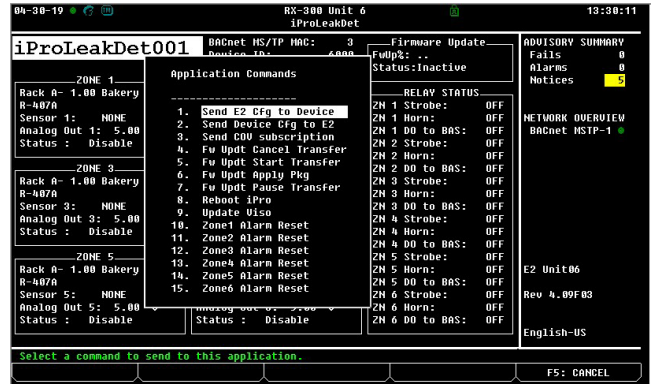


*Resetting Spill Alarm Network Summary Screen*

2. Scroll down and highlight the Leak Detector and press **F2 STATUS** to reach the status screen.



*Resetting Spill Alarm Status Screen*

3. With the Leak Detector controller name highlighted, press **Enter** on the E2 keyboard.

4. A pop-up window will appear, select **9. Application Commands**.



*Resetting Spill Alarm Application Commands Screen*

5. The zone alarm resets are performed by using the Zone1 Alarm Reset-Zone6 Alarm Reset application command. After selecting the desired application command, the window will automatically close and E2 will perform the application command.

6. After a zone alarm resets the status, the zone box should go back to OK and the horn, strobe and E2 relays should return to off in the Relay Status box.

*NOTE:* In order to reset a zone spill alarm, the zone PPM level must be below the PPM level set by parameter PPMs in the Leak Detector.

**COPELAND**