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COPELAND P-N 851-
4074 Multi Zone Leak
Detector Application
and Panel

COPELAND P-N 851-4074 Multi Zone Leak Detector Application and Panel User Guide

Contents

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COPELAND P-N 851-4074 Multi Zone Leak Detector Application and Panel

Specifications

- Product Name: MultiZone Leak Detector
- Model Number: P/N 851-4074 or 851-4550
- Application: Refrigerant leak detection system
- Monitoring Areas: Up to six (6) separate spaces (zones)
- Technology: Infrared-sensing technology
- Communication Protocols: Modbus RTU, BACnet MS/TP
- Alarm Features: Audible and visible alarms, circuit shutdown capability

Product Usage Instructions

Connecting the Leak Detector

1. Connect the leak detector to the desired detection zone.
2. Ensure proper wiring for analog signal communication with then main panel.

Configuring Modbus Settings

1. Press and hold T4 and T5 keys for three (3) seconds.
2. Select Controller Info from the Setup screen.
3. Set the date, time, and Modbus address using arrow keys.
4. Save changes after each selection by pressing SET.
5. Perform a controller reboot after configuring all Modbus settings.

Frequently Asked Questions (FAQ)
Q: How many zones can be monitored with one panel?
A: Up to six (6) separate spaces (zones) can be monitored with one panel.

Overview

- The Multi-Zone Leak Detector application and panel (P/N 851-4074 or 851-4550) is a refrigerant leak detection system for monitoring refrigerant leaks in walk-in boxes, rack houses and machine rooms.
- Up to six (6) separate spaces (zones) can be monitored for refrigerant leaks with one panel. The system uses infrared-sensing technology to determine the concentration of refrigerant and reports this back to the main panel via analog signal wiring.
- The Visograph display is the interface to the leak panel, displaying the Parts Per Million (PPM), and programming for the zones. One leak detector can be connected in each detection zone.
- The Multi-Zone Leak Detector application is fully integrated with the E2E, has relay outputs for third-party devices, or can operate fully independent as a stand-alone device. The communication with E2E can use either Modbus RTU or BACnet MS/TP protocol.
- 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.

Configuring Modbus Settings
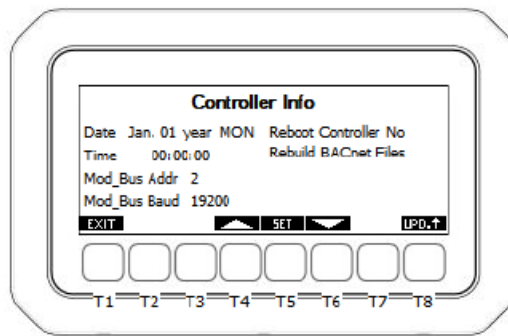
Visograph Display with T1-T8 Labels

To set controller information from the Detector Status screen:

1. Press and hold the T4 and T5 keys 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.

Configuring BACnet Settings
To configure the BACnet Settings from the Detector Status screen:

1. Press and hold the T4 and T5 keys for three (3) seconds.
2. The Setup screen will appear.
3. Scroll to 3. BACnet Settings and press SET to enter.
4. MS/TP MAC: This parameter specifies the MS/TP network MAC address of the I/O Module. 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 E2E controller.
6. Max Master: This parameter defines value 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 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.

Connecting Communication Wires

If the communication protocol between Leak Detector and E2E 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 E2E serial port and the leak detector serial port.

Note: The polarity of the Modbus connection between E2E and the Multi-Zone Refrigerant Leak Detector is reversed.
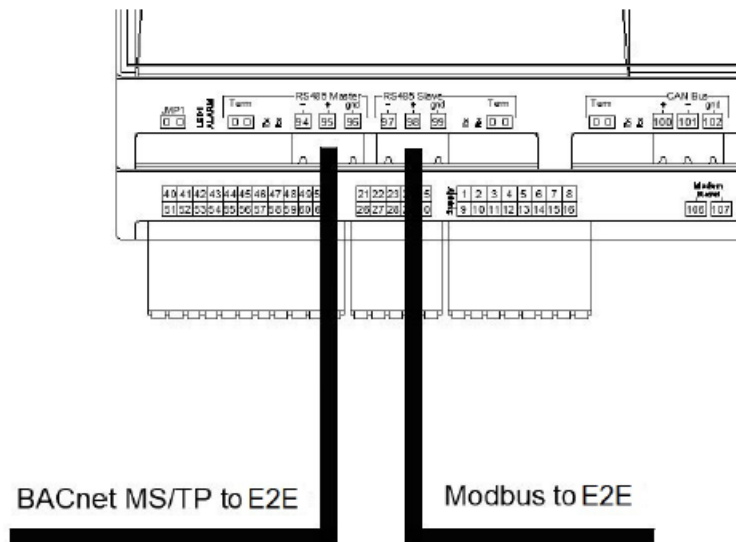
BACnet MS/TP

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 connectors on the E2E 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 E2E 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.
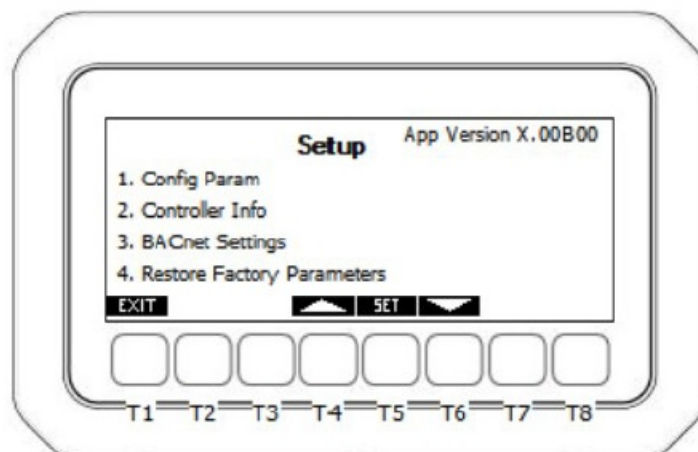

BACnet MS/TP Wiring

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.

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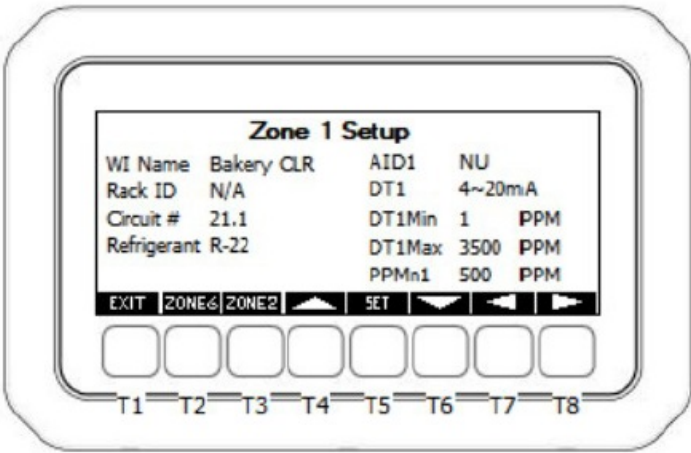

Leak Detector Setup Screen

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.
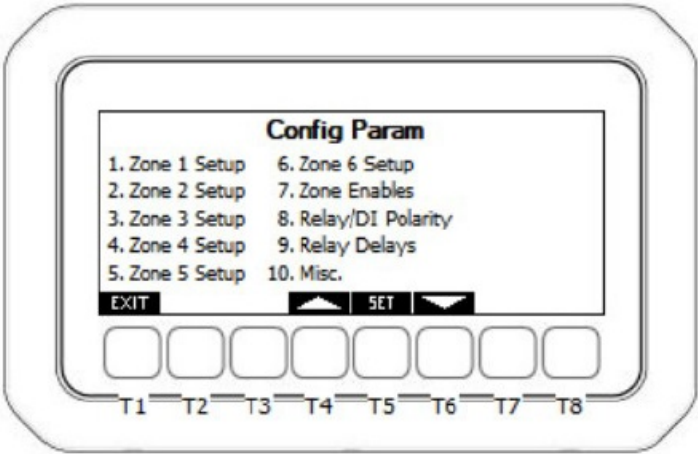

Leak Detector Configuration Screen

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 Zone 1 Parameters Page 1 table and see the instruction column of the table for the required action.

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
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 DT Min. - 1000 DT Max.** **809-1012 = 1 DT Min. - 3500 DT Max.** **809-0031 to 0044 All MRLDS 250 Models = 1 DT Min. - 3500 DT Max.** **809-1020 = 1 DT Min. - 5000 DT 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.
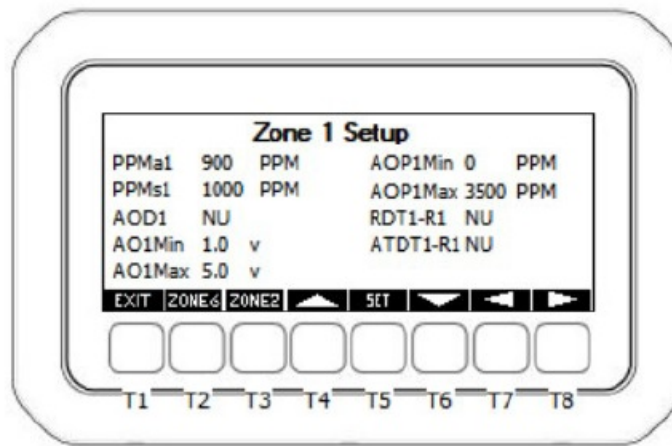
Leak Detector Zone 1 Setup Parameters Screen 2

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

For a full copy of the Multi-Zone Leak Detector Application and Panel Manual (P/N 026-1313), scan the QR code:

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Documents / Resources

COPELAND P-N 851-4074 Multi Zone Leak Detector Application and Panel [pdf] User Guide
P-N 851-4074, P-N 851-4550, P-N 851-4074 Multi Zone Leak Detector Application and Panel, P-N 851-4074, Multi Zone Leak Detector Application and Panel, Detector Application and Panel, Application and Panel, Panel

References

- **User Manual**