SIGNALINE HEAT

LocatorPlus

Installation Manual

CE

UL

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Revision 1 (2018)
Web: www.lgmproducts.com

ISO 9001:2015 certified

Contents

Please read this instruction leaflet thoroughly before commencing installation.

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Key Points

⇒ Install the Signaline LocatorPlus accordingly to meet local and country installation requirements.

⇒ The Locator Plus must be installed in accordance with NFPA 70 & 72, NEC 760 (National Electric Code) and Authorities Having Jurisdiction.

⇒ Ensure the product is installed, commissioned and maintained by persons according to good engineering practices and who have received sufficient training on the unit.

⇒ Only use Signaline FT and FT-R Digital Linear Heat Detection cable with the LocatorPlus.

⇒ Test the Linear Heat Detection Cable before connecting it to the LocatorPlus using a multimeter.

⇒ Ensure the end of line resistor (1kohm) is securely connected at the end each linear heat detection cable.

⇒ If only one zone is required leave the end of line resistor (1kohm) connected across the terminals of the unused zone.

⇒ Ensure any cable glands used are tightened to form a secure and moisture proof seal around the detection cable and any other cable in or out of the unit.

⇒ Do not exceed the maximum operating voltage of the LocatorPlus36Vdc).

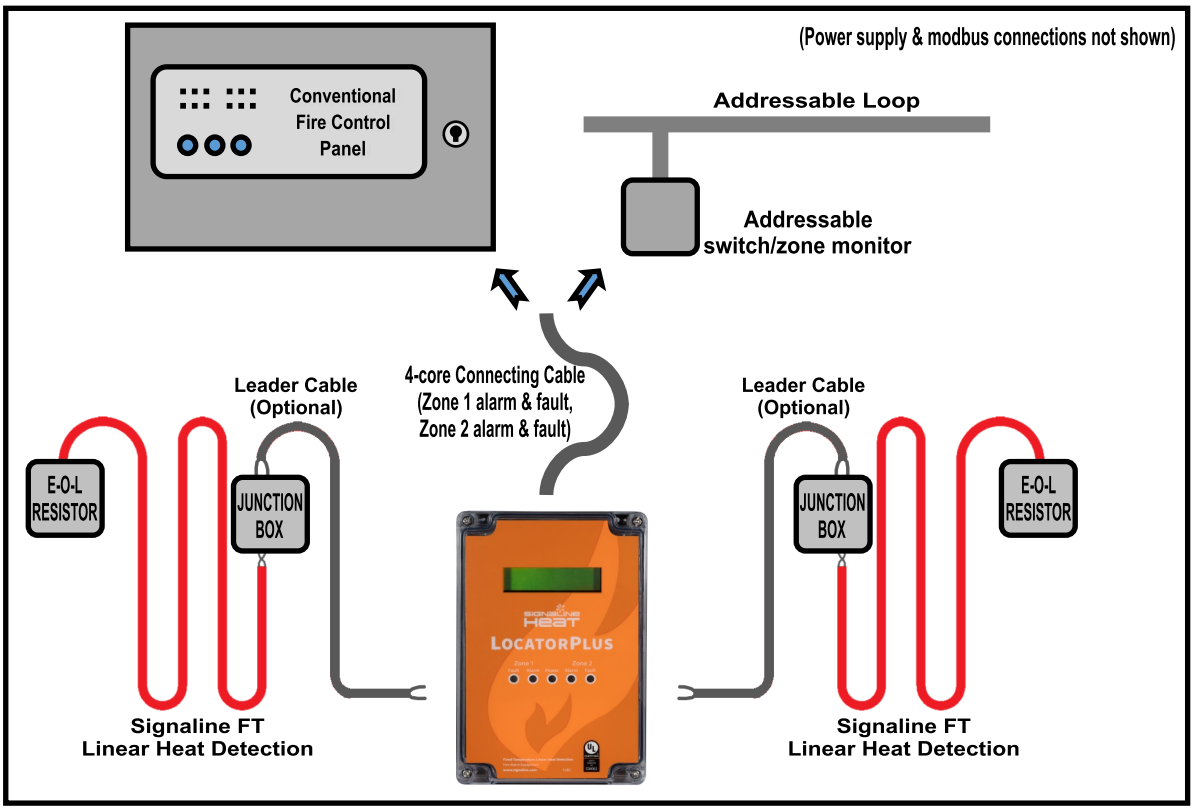
⇒ Do not connect lengths of linear heat detection cable in 'T' connections or spurs.

Signaline LocatorPlus Functionality

The Signaline LocatorPlus is a dual zone module for monitoring up to two zones of Signaline FT or FT-R Digital Linear Heat Detection (SIGNALINE FT AND FT-R) Cable. If an overheat/fire situation triggers either zone of the cable, this unit automatically calculates and displays the distance along the cable, in feet and metres, to the alarm point.

The two zones can operate independently of each other, or in interlock mode and a separate alarm and normally conducting fault output are provided for each zone. The unit is intended to be installed between the Digital Linear Heat Detection cable and a conventional or addressable fire alarm control panel.

It has power, fault and alarm lights, as well as volt free outputs for fault and alarm, corresponding to each zone. It may also be connected to a industrial process control system using the two wire RS-485 Modbus RTU output.



Product Specification

Model	Signaline LocatorPlus (SLP-001)
Dimensions	180 x 120 x 60.5mm HxWxD (7.1in x 4.72 x 2.38in)
Rating	NEMA 4, 4X (IP65)
Finish	Light Grey with clear lid
Display	2 line, 16 character backlit display showing zone status
Approvals	UL 864 10th ed.
Power requirements	All circuits power limited if powered from a power limited supply
Operating voltage	12Vdc (Min), 24Vdc (Nominal), 36Vdc (Max)
Operating current	<15mA (Min), <7mA (Nominal), <5mA (Max)
Alarm current	<40mA (Min), <23mA (Nominal), <15mA (Max)
Operating temp. range	-20°C – +50°C (-4°F – +122°F)
Terminal block spacing	5mm Rising Clamp
Rating	16A
Wire size	0.08mm2 (28AWG) to 4mm2 (11AWG)
Supervised circuits	Power, Input Zone 1 & Input Zone 2
Inputs	Up to two zones of Signaline FT or FT-R Linear Heat Detection
Zone length	Up to 3000m (10,000ft)
End of Line resistor	1kohm (included)
Short circuit current	0.5mA
Max voltage	5V
Ground fault impedance	0ohms
Communications	Two wire RS-485 Modbus RTU
Sounder	2.4kHz 92dBa @ 10cm Buzzer
Alarm	2x Form C volt-free relay contacts (resistive, common)
Max V	30Vac or 42.4Vdc
Max Current	2A Max Switching Power 60W, 62.5VA
Fault	2x Optoisolated phototransistor output (resistive, common)
Max V	35Vdc
Max Current	80mA Max Power Dissipation 150mW

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Leader Cable

The LocatorPlus can be connected via leader cable to the start of the Linear Heat Detection cable. During installation the voltage drop across the leader cable is calibrated out to give an accurate distance reading when an alarm is triggered.

The maximum length of leader cable that can be used per zone is dependent upon the cable diameter. The following is a guideline for typical cable sizes and maximum length:

Cable Size	Max Leader Cable Length
20AWG	(16x0.2mm or 0.8mm dia, copper) 1000m
22AWG	(7x0.25mm or 0.6mm dia, copper) 600m
24AWG	(7x0.2mm or 0.5mm dia, copper) 390m

Static Discharge Cautionary

The following items are cautionary notes that will help prevent equipment damage or malfunction caused by static discharge:

CAUTION Static charges produce voltages high enough to damage electronic components. Follow these precautions when installing, servicing, or operating the LocatorPlus:

⇒ Work in a static-free area.

⇒ Discharge any static electricity you may have accumulated.

⇒ Discharge static electricity by touching a known, securely grounded object.

⇒ Do not handle the printed circuit board (PCB) without proper protection against static discharge.

In the event that the LocatorPlus malfunctions after encountering a static discharge correct operation of the unit can be restored by interrupting power to unit for a brief period (approximately 10s). Setup information can be verified by following the steps in the installation procedure section. In the event of the setup information being corrupted the unit should be reset following the Resetting the LocatorPlus procedure.

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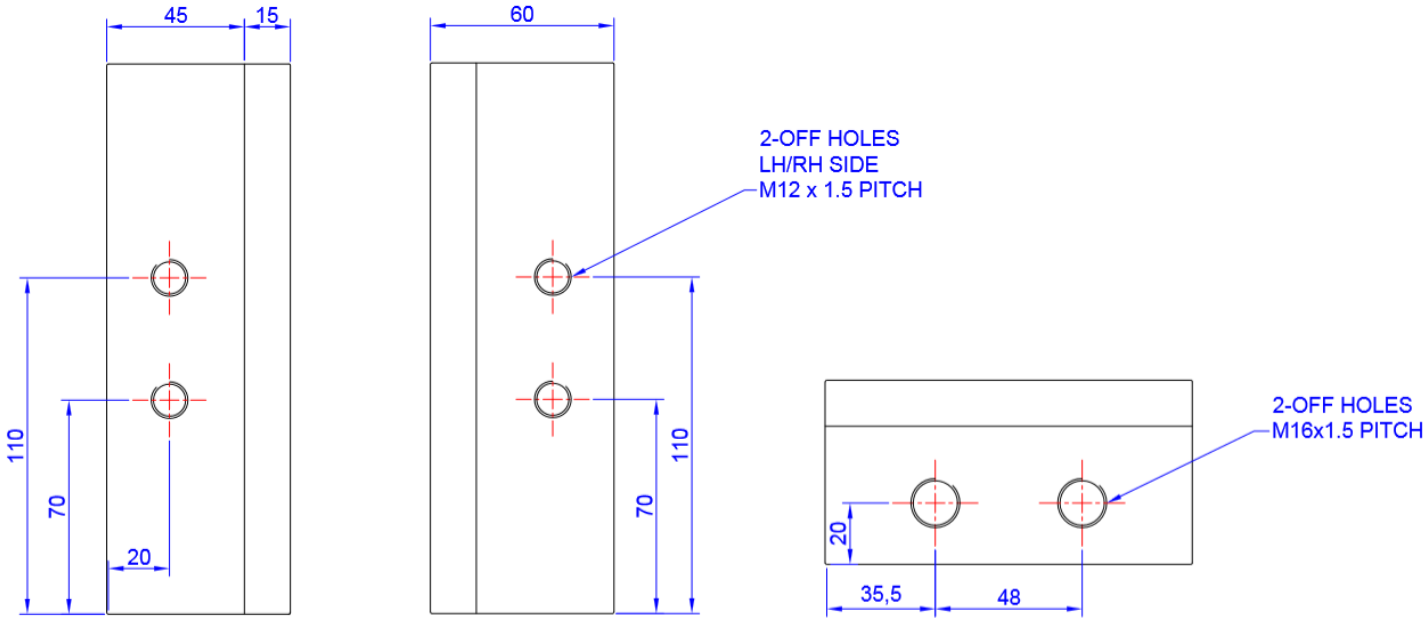
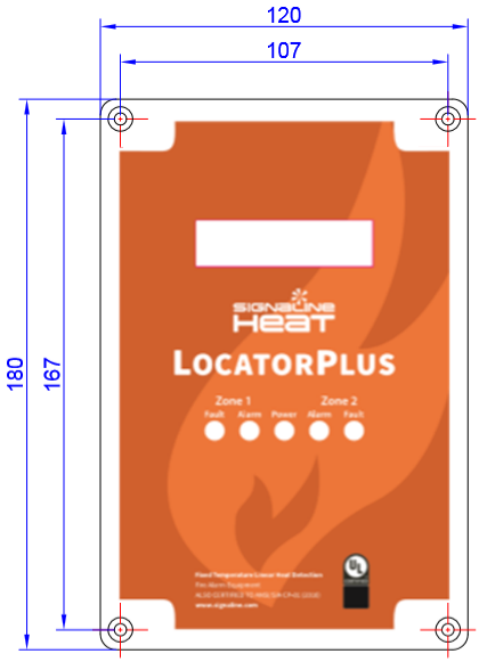
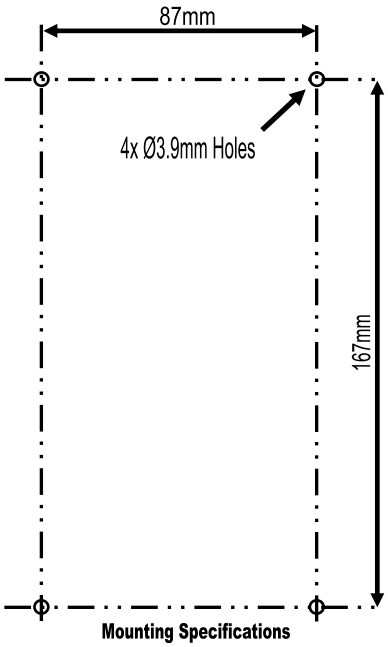
Dimensional Diagrams







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Installation

The Signaline LocatorPlus allows accurate location of an alarm point along a length of Signaline FT and FT-R Linear heat detector cables. It continuously monitors up to two zones of SIGNALINE FT AND FT-R cable for a fault (open circuit) or an alarm (overheat or fire condition). Because of the wide range of applications that digital Linear Heat Detection cable can be used for, it may not always be possible, or be too time consuming, to locate where along the cable an alarm has occurred. Using the Signaline LocatorPlus, when an alarm occurs the distance to the overheat condition is immediately calculated and displayed on the integrated display.

If a fault is detected, the corresponding fault output stops conducting, triggering a fault at the fire alarm control panel. If an alarm is detected, the corresponding alarm output changes state, triggering an alarm at the fire alarm panel. The fault outputs also stop conducting on power loss to the unit or microprocessor fault, triggering a fault at the fire alarm control panel.

The two wire RS-485 Modbus RTU output also outputs the current state of both zones. See the section "RS-485 Modbus Communications" for more detail.

There are two primary configurations of the Signaline LocatorPlus (see figure 1):

1) The SIGNALINE FT AND FT-R cable can be connected directly to the Signaline LocatorPlus

2) The SIGNALINE FT AND FT-R cable is connected to a length of leader cable which is connected to the Signaline LocatorPlus. (In this scenario the leader cable must be "calibrated out" during commissioning of the Signaline LocatorPlus)

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Connection Diagram

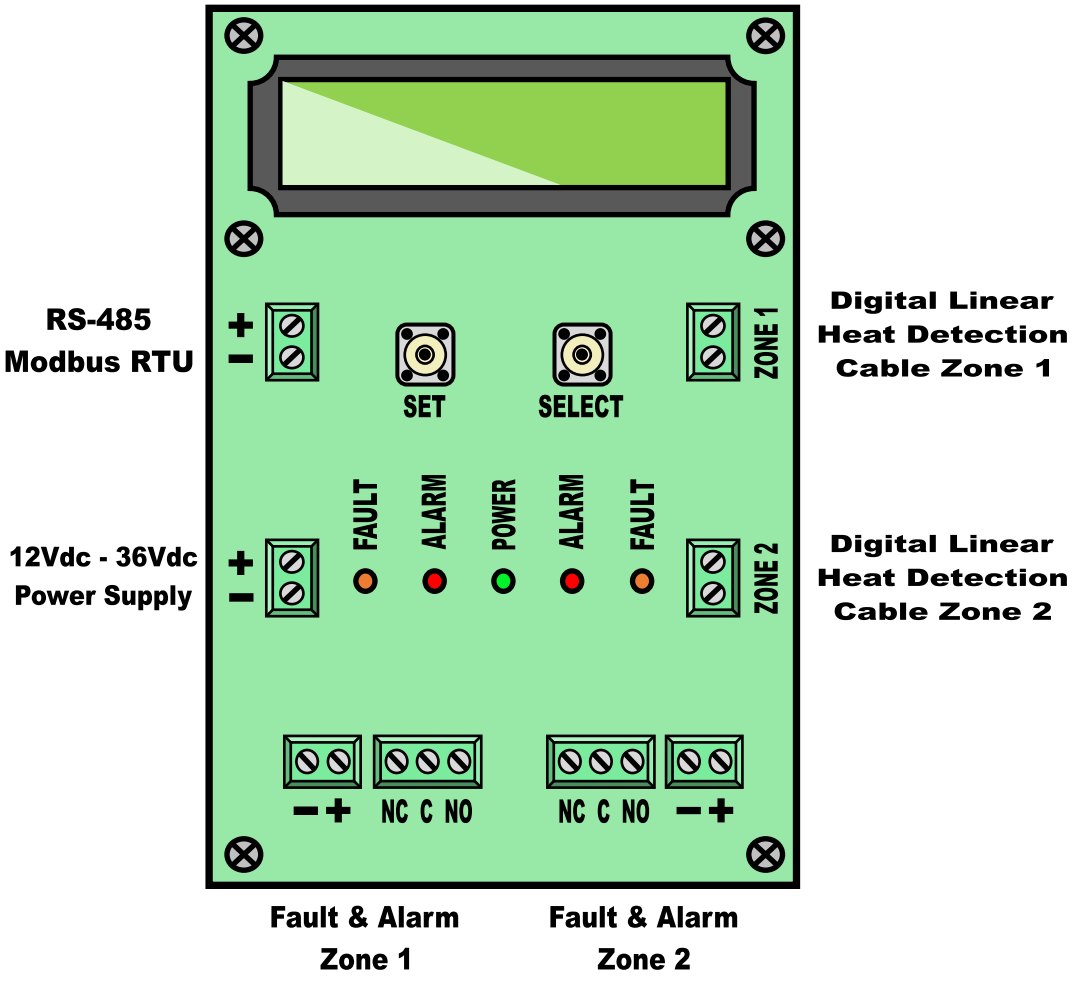


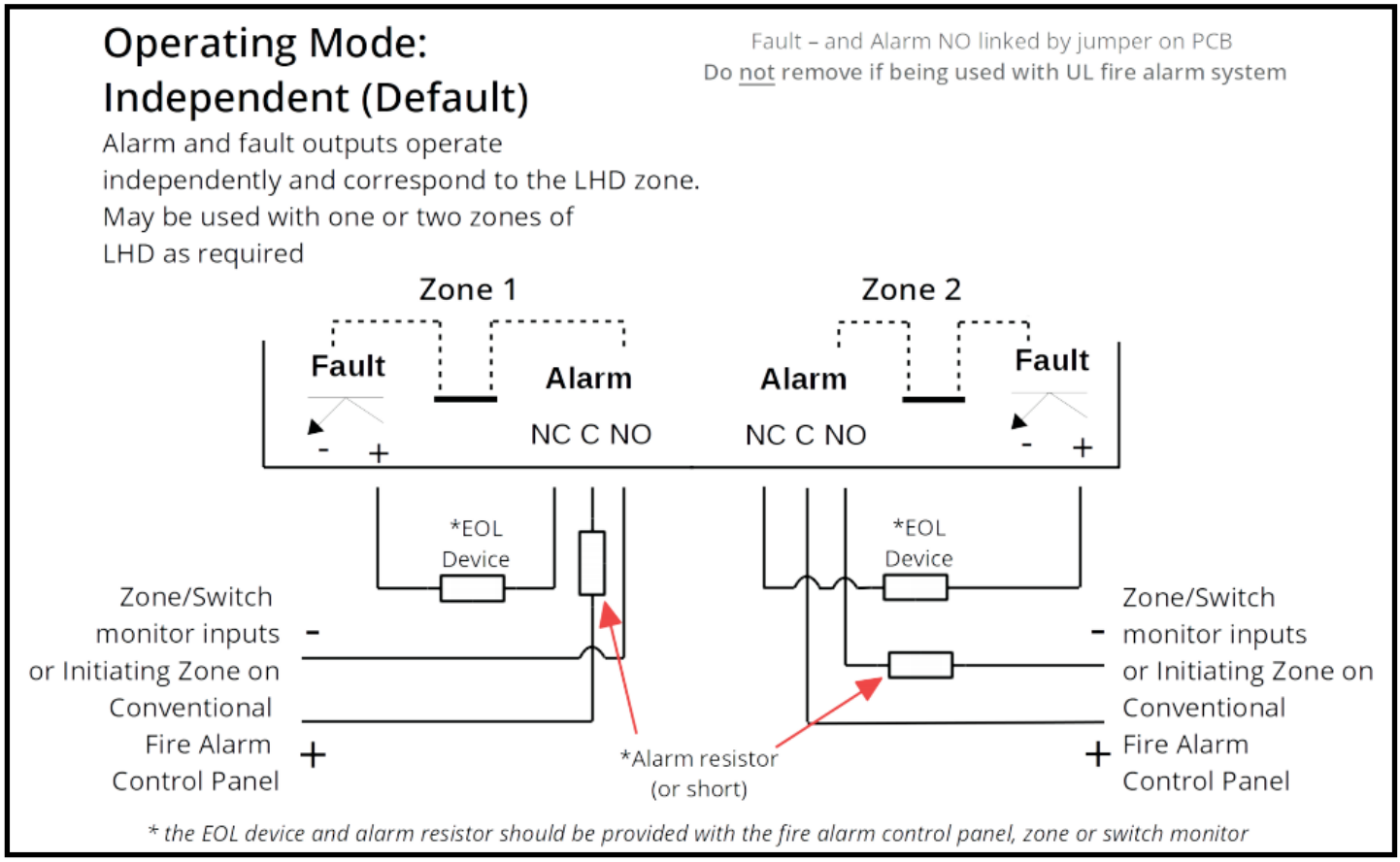
Figure 1. Connection diagram for the LocatorPlus unit.

The unit is provided with a 1kohm end of line resistor in each zone input. If only one zone is required, leave the 1kohm resistor connected across the zone which is not in use. Otherwise the 1kohm resistor should be connected at the end of the Signaline FT or FT-R Linear Heat Detection cable.

Operating Modes

There are two operating modes for the Signaline LocatorPlus:

1. Independent – This is when the LocatorPlus is used as a two zone system. When a fault or overheat condition occurs on an LHD zone, the corresponding fault or alarm output respectively is triggered. The two zones operate independently and both sets of outputs should be connected to a fire alarm control panel. If the zone is not required leave the 1kohm resistor in the zone input terminals as supplied. In this mode, the two zones can either contain identical rated temperature LHD cables or two different rated temperature LHD cables, e.g. a 68°C in zone 1 and a 105°C in zone 2.



Operating Modes (cont.)

2. Interlock – this mode is for applications which require a fail-safe guarantee that an alarm is only triggered when an overheat condition has been detected. This mode may also be known as coincidence detection. In this case, the same rated temperature LHD cable should be attached to both zones of the LocatorPlus. The alarm output is only activated when both LHD cables trigger an alarm due to an overheat condition. If one LHD cable zone input registers an alarm but the second does not, the alarm output will not be activated. This is to prevent an alarm if a mechanical or other issue has triggered one LHD cable and not an overheat condition.

Only use Zone 1 fault and alarm outputs in Interlock mode.

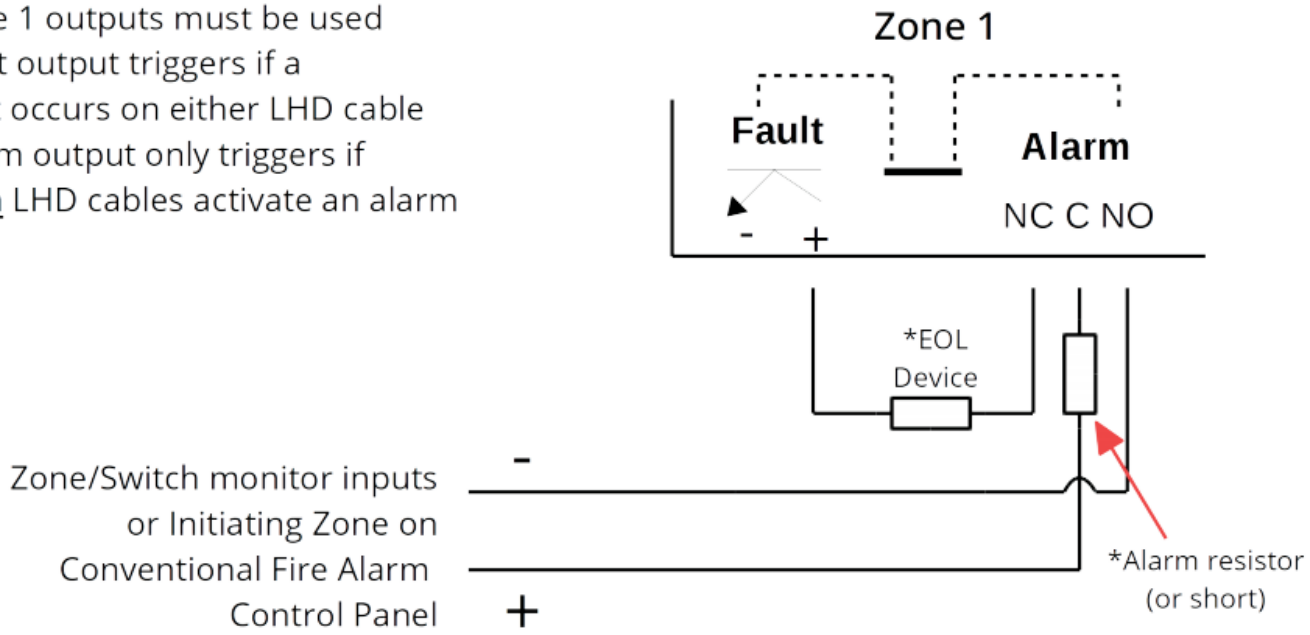
⇒ Two linear heat detectors with the same temperature rating must be used and a minimum of two linear heat detectors must be installed in each protected space.

⇒ The spacing between detectors should be less than 0.7 times the rated linear spacing, in accordance with National Fire Alarm Code, NFPA 72. See Signaline installation instructions for spacing details.

Operating Mode: Interlock

Zone 1 outputs must be used
Fault output triggers if a
fault occurs on either LHD cable
Alarm output only triggers if
both LHD cables activate an alarm

Fault – and Alarm NO linked by jumper on PCB
Do not remove if being used with UL fire alarm system



** the EOL device and alarm resistor should be provided with the fire alarm control panel, zone or switch monitor*

Commissioning

1. After wiring the unit up (see wiring diagram) power up the device. Device will show screen including software revision number.

2. If the unit is being setup for the first time the following options will be shown. If the unit has previously been installed the display will automatically cycle through the options, showing the stored settings.

3. After the initial title screen the next screen will show a menu with three options: Load Configs, New Configs, and Self Test. On a previously configured device, after 10s of no button press the device will automatically proceed to loading saved configs.

4. If “Load Configs” is selected or no button has been pressed after 10s on a previously configured device, the screen will show “Loading Saved Configs”. The previously saved parameters will then be displayed.

5. Select the operating mode. (see “Operating modes” for more detail. **Independent**: the two zones operate independently of each other (default). **Interlock**: Both fault outputs activate when a fault occurs on either zone 1 or zone 2. Both alarm outputs activate only when both LHD zones trigger an alarm.

6. Select the cable type connected to Zone 1 (68°C/88°C/105°C/185°C)

7. Select the cable type connected to Zone 2 (68°C/88°C/105°C/185°C)

8. If leader cable is connected between the linear heat detection cable and the LocatorPlus for this zone, press the Select button and select Yes. Press the Set button to continue.

9. The controller will then ask if the zone is ready to be calibrated. The leader cable must be connected to the LocatorPlus and shorted out at the end where it connects to the START of the LHD cable. Once this is done press the Set button.

10. The LocatorPlus will display the voltage drop across the leader cable. Remove the short from the leader cable and connect it to the START of the LHD cable as normal.

11. If the Linear Heat Detection cable is connected directly to the LocatorPlus then select No and press the Set button to continue.

See next page for steps 12-25

Commissioning (cont.)

12. Select whether you would like the alarm outputs for both zones to be latching. If set to Yes, then if an alarm is triggered the unit will either require the power supply to be interrupted (min. 10s) or the Set button to be pressed to reset to normal once the alarm conditioned has been cleared.

13. Select whether the Modbus RTU output should be enabled. If this is not enabled then proceed to step 17.

14. Select required Modbus type, either RTU or ASCII

15. Set the Modbus address of this unit. (1 - 247)

16. Cycle through the possible Baud Rates for the Modbus RTU output. (1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200).

17. Select the number of data bits for the Modbus RTU output. (7 or 8)

18. Select the number of stop bits for the Modbus RTU output. (1 or 2).

19. Select the parity for the Modbus RTU output. (even/odd/none).

20. Once the unit has been commissioned the display will show the zone status. In normal operation the display will show OK for each Zone. In Interlock mode the display will show “Zone 1: OK Zone 2: OK” to indicate the zones are linked and an alarm is only transmitted if both zones are triggered.

21. If an alarm condition occurs, the LocatorPlus automatically calculates the distance along the cable to the trigger point and first displays this value in metres.

22. The display alternates showing the distance along the cable to the trigger point in metres and in feet.

23. The unit monitors for relay faults on the Linear Heat Detection Cable. If a fault occurs but the relay does not switch state (due to a faulty core for example), the display will show FAULT on the corresponding line.

24. The unit monitors for interference faultswhen the input may be changing between alarm, OK and fault conditions, for example, too rapidly. In this case an I/F fault is displayed on the corresponding zone. Check all cable terminations are securely fastened and for other sources of noise.

25. The unit monitors for cable faults (open circuit) and ground faults (where one conductor of Signaline may be touching bare metal). An open circuit will be displayed as ‘fault’ ,ground faults as ‘gnd fault’.

Two-wire RS-485 Modbus RTU Communications

The Signaline LocatorPlus includes a two wire RS-485 Modbus output which can be enabled to output the status of each zone of Digital Linear Heat Detection Cable. The LocatorPlus Modbus output supports the Modbus RTU protocol and the following functions:

⇒ Function code 4 (Read Input Registers)

The request for reading the input registers should be constructed in the following manner:

⇒ Address of first register to be read (16-bit)

⇒ Number of registers to read (16-bit)

The LocatorPlus will respond in the following manner:

⇒ Number of bytes of register values to be read (8-bit)

⇒ Register values (16-bits per register)

The LocatorPlus stores the information for each zone of the Signaline FT and FT-R cable in the following format:

Register	Description	PossibleValues
0	Zone 1 status	-1 or 65535=fault on zone 0=zone ok 1-32767=distance in metres to trigger point
1	Zone 2 status	-1 or 65535=fault on zone 0=zone ok 1-32767=distance in metres to trigger point
2	Zone 1 cable type	1=68°C, 2=78°C, 3=88°C, 4=105°C, 5=185°C
3	Zone 2 cable type	1=68°C, 2=78°C, 3=88°C, 4=105°C, 5=185°C

If the start address plus the requested number of registers exceed 4, the LocatorPlus will return an ILLEGAL DATA ADDRESS error.

If the request contains a function code other than those supported the LocatorPlus will return an ILLEGAL FUNCTION error.

Resetting the Signaline LocationPlus Unit

WARNING: This procedure will erase ALL stored settings and reset the SignalineLocatorPlus unit back to its factory default state. The cable types, leader cable calibration, latching output selection and Modbus setup will all require selecting after this procedure.

To reset the Signaline LocatorPlus unit back to the factory state, when the unit is powered up and in normal operation (see step 15 in the Commissioning procedure), press and hold the SET and SELECT buttons for a minimum of 10 seconds continuously. While the SET and SELECT buttons are held down the power LED will flash quickly to confirm this procedure is about to take place. After approximately 10 seconds, the unit will restart and return to step 1 in the Commissioning procedure.

Signaline Linear Heat Detection Cables

Refer to the Signaline FT/FT-R Installation Notes for further information on the following Signaline Heat LocatorPlus compatible products.

Signaline FT-68

Signaline FT-68-R

Signaline FT-88

Signaline FT-88-R

Signaline FT-105

Signaline FT-105-R

Signaline FT-185-R

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