SIGNALINE HEAT

LocatorPlus-EN

Installation Manual

CE   UL EU

Contents

Please read this instruction leaflet thoroughly before commencing installation.

Key Points

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

⇒   The Signaline LocatorPlus-EN must be installed in accordance with BS 5839-1:2017 (or country equivalent) and IEC 60364 and authorities having jurisdiction.

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

⇒   Only use Signaline FT-EN Linear Heat Detection cable with the Signaline LocatorPlus-EN.

⇒   Test the Signaline FT-EN Linear Heat Detection cable before connecting it to the Signaline LocatorPlus-EN using a multimeter.

⇒   Ensure the end of line resistor (3.6kohm) is securely connected at the end each Signaline FT-EN Linear Heat Detectioncable.

⇒   If only one zone is required leave the end of line resistor (3.6kohm) 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 Signaline FT-EN Linear Heat Detectioncable and any other cable in or out of the unit.

⇒   **Do not exceed the maximum operating voltage of the Signaline LocatorPlus-EN (36Vdc).**

⇒   **Do not connect lengths of Signaline FT-EN Linear Heat Detectioncable in 'T' connections or spurs.**

Signaline LocatorPlus-EN Overview

The Signaline LocatorPlus-EN is a dual zone module for monitoring up to two zones of Signaline FT-EN linear heat detector 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 Signaline FT-EN 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/ASCII output.
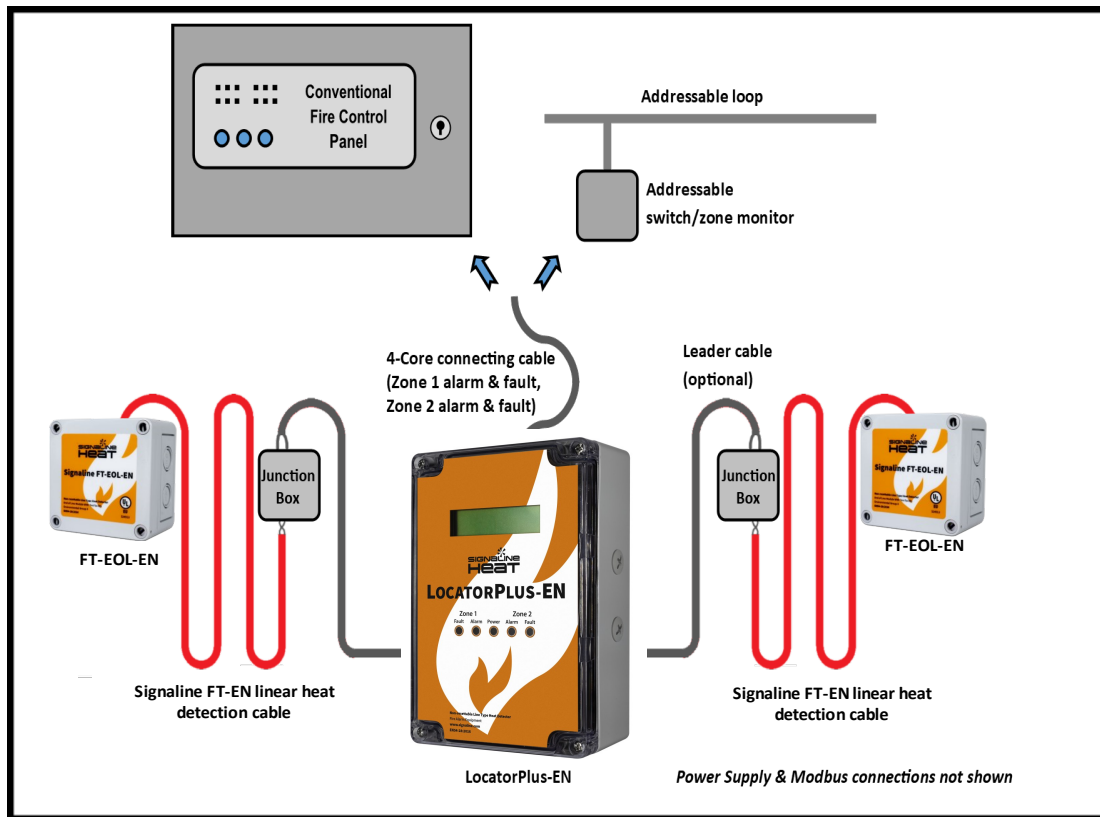

Fig 1. Typical system configuration

Product Specification

Model	Signaline LocatorPlus-EN
Approvals	EN54-28:2016 (UL-EU-01128-CPR)
UL file number	S24913
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
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 Class B zones of Signaline FT-EN Linear Heat Detection cables
Zone length	1m to 1000m (3,280ft)
End of Line resistor	3.6kohm (included)
Short circuit current	0.5mA
Max voltage	5V
Outputs	
Communications	Two wire RS-485 Modbus RTU/ASCII
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, 62.5V*A
Fault	2x Optoisolated phototransistor output (resistive, common)
	Max V *35Vdc*
	Max Current *80mA*
	Max Power Dissipation *150mW*

Installation

The Signaline LocatorPlus-EN allows accurate location of an alarm point along a length of Signaline FT-EN Linear Heat Detection cable. It continuously monitors up to two zones of Signaline FT-EN Linear Heat Detection cable for a fault (open circuit) or an alarm (overheat or fire condition). Due to the wide range of applications that Signaline FT-EN 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 where an alarm has occurred. Using the Signaline LocatorPlus-EN, 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/ASCII output also outputs the current state of both zones. See the section "Two-wire RS-485 Modbus RTU/ASCII Communications" for more detail.

There are two primary configurations of the Signaline LocatorPlus-EN (see Fig. 1):

 1) The Signaline FT-EN Linear Heat Detection cable can be connected directly to the Signaline LocatorPlus-EN

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

Connection Diagram
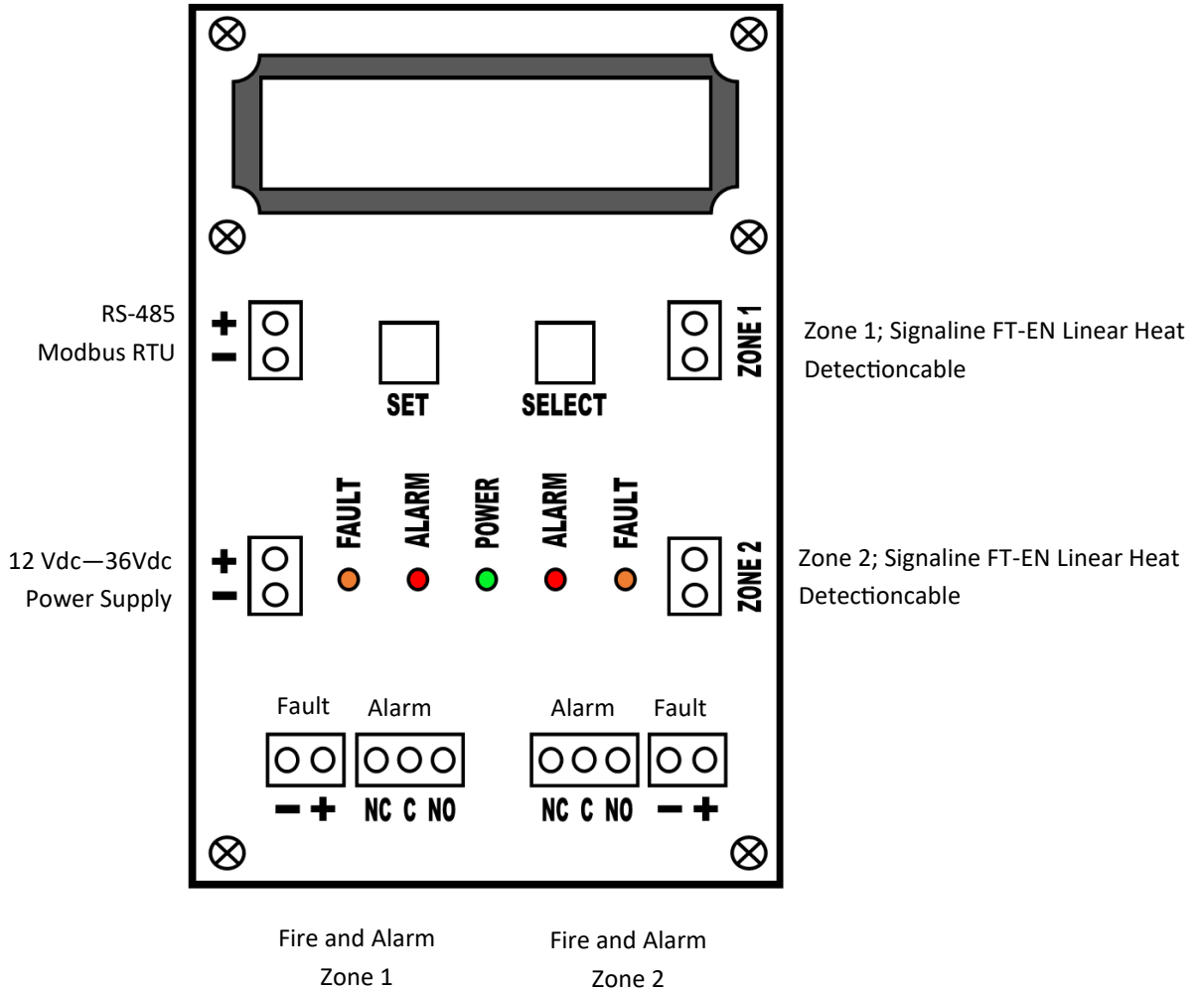
Fig. 2. Connection diagram for the Signaline LocatorPlus-EN

Fig 2. shows the connections diagram for the Signaline LocatorPlus-EN

The unit is provided with a 3.6kohm end of line resistor in each zone input. If only one zone is required, leave the 3.6kohm resistor connected across the zone which is not in use. Otherwise the 3.6kohm resistor should be connected at the end of the Signaline FT-EN Linear Heat Detection cable.

Operating Modes

There are two operating modes for the Signaline LocatorPlus-EN:

1. Independent (see Fig. 3) – This is when the Signaline LocatorPlus-EN is used as a two zone system. When a fault or overheat condition occurs on a zone of Signaline FT-EN Linear Heat Detection cable, 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 3.6kohm resistor in the zone input terminals as supplied.

In this mode, the two zones can either contain identical temperature rated Signaline FT-EN Linear Heat Detection cables or two different temperature rated Signaline FT-EN cables, e.g. Signaline FT-78-EN in zone 1 and a Signaline FT-88-EN in zone 2.

Fig. 3. Typical Schematic for independent operating mode
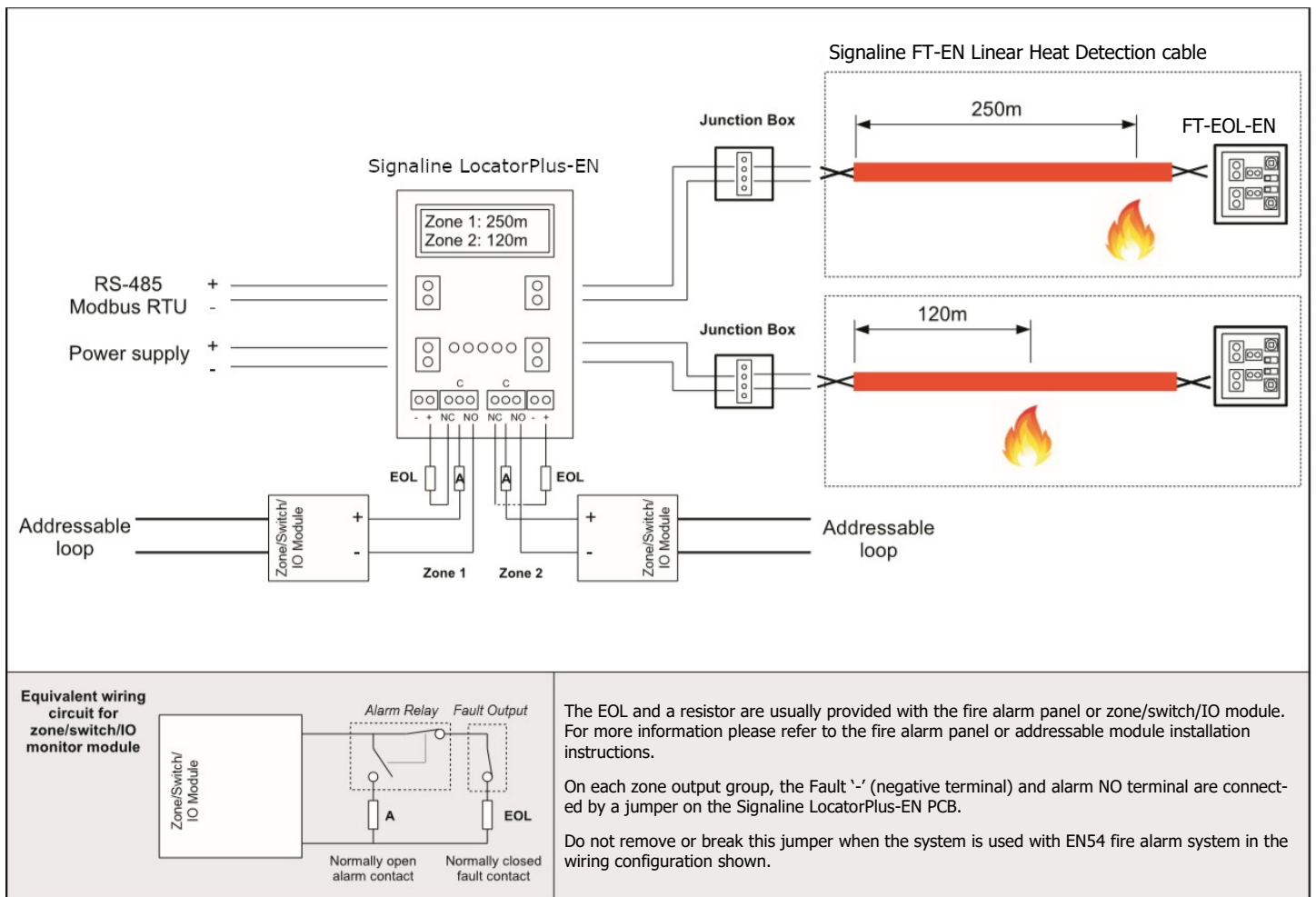
Operating Modes (cont.)

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 temperature rated Signaline FT-EN Linear Heat Detection cable should be attached to both zones of the Signaline LocatorPlus-EN. The alarm output is only activated when both zones of Signaline FT-EN Linear Heat Detection cable trigger an alarm due to an overheat condition. If one zone of Signaline FT-EN Linear Heat Detection cable 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 Signaline FT-EN cable and not an overheat condition.

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

⇒   Two zones of Signaline FT-EN linear heat detector cables with the same temperature rating must be used and must be installed in each protected space.

In interlocking mode, the 2 zones of Signaline FT-EN Linear Heat Detection cable are intended to be installed in close proximity to one another such that if a fire or overheat condition occurs, both cables will activate.

The EOL and a resistor are usually provided with the fire alarm panel or zone/switch/IO module. For more information please refer to the fire alarm panel or addressable module installation instructions.

On each zone output group, the Fault '-' (negative terminal) and alarm NO terminal are connected by a jumper on the Signaline LocatorPlus-EN PCB.

Do not remove or break this jumper when the system is used with EN54 fire alarm system in the wiring configuration shown.

Fig. 4. Typical Schematic for interlocking operating mode

Leader Cable

In certain applications it may be desirable or necessary to use non sensing leader cable between the Signaline LocatorPlus-EN and the Signaline FT-EN linear detection cable.

For example, if the Signaline LocatorPlus-EN unit is located some distance away from the protected area. This may be required if the expected ambient temperature range, or other environmental conditions, where the Signaline FT-EN Linear Heat Detection cable is to be used is greater than the maximum ambient temperature range for the Signaline LocatorPlus-EN.

Please refer to steps 8, 9 and 10 within the '**Commissioning'** section for further details.

The maximum length of leader cable that can be used per zone is dependent upon the leader cable diameter.

The following is a guideline for typical cable sizes and maximum length:

Leader Cable Size	20 AWG (16x0.2mm or 0.8mm dia, copper)
Max Leader Cable Length	1000m

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 Signaline LocatorPlus-EN:

⇒ 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 unlikely event that the Signaline LocatorPlus-EN malfunctions after encountering a static discharge correct operation of the unit can be restored by interrupting power to unit for a brief period (approximately 10 seconds).

Setup information can be verified by following the steps in the '**Commissioning**' section.

In the event of the setup information being corrupted the unit should be reset following the '**Resetting the Signaline LocatorPlus-EN**' procedure.

Dimensional Drawings and Mounting Specification

The Signaline LocatorPlus-EN is intended to be wall-mounted. 4 holes should be drilled according to the mounting dimensions given in Fig. 5.

The corresponding mounting holes on the unit can be found by removing the lid of the device. The mounting holes are located adjacent to the lid screw positions.

Suitable screws for the type of wall the Signaline LocatorPlus-EN is to be mounted on will need to be provided for separately.

The maximum screw head diameter is 7mm and the maximum screw thread diameter is 4mm.
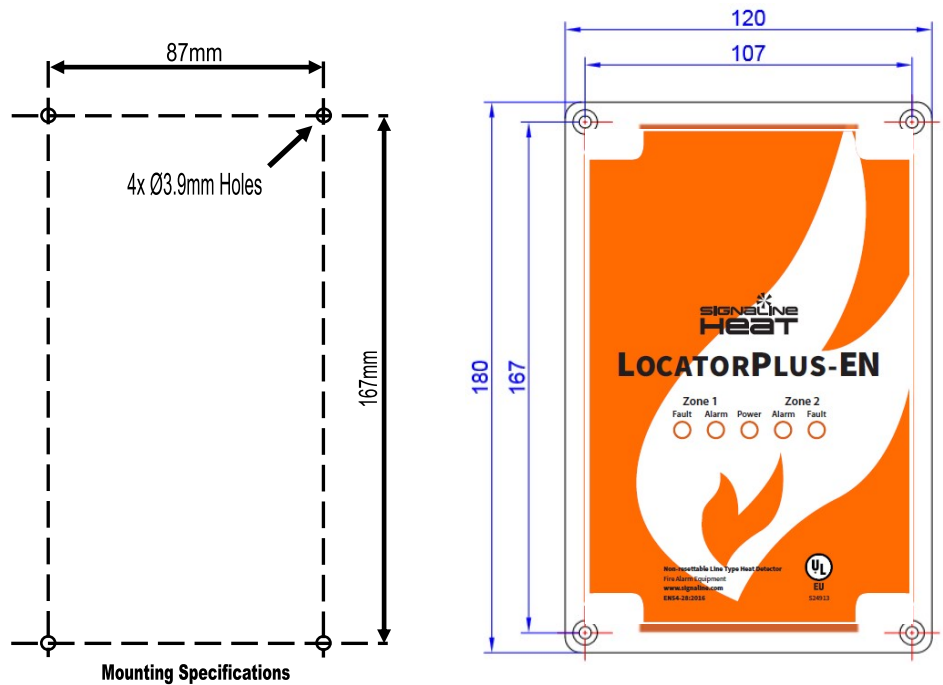

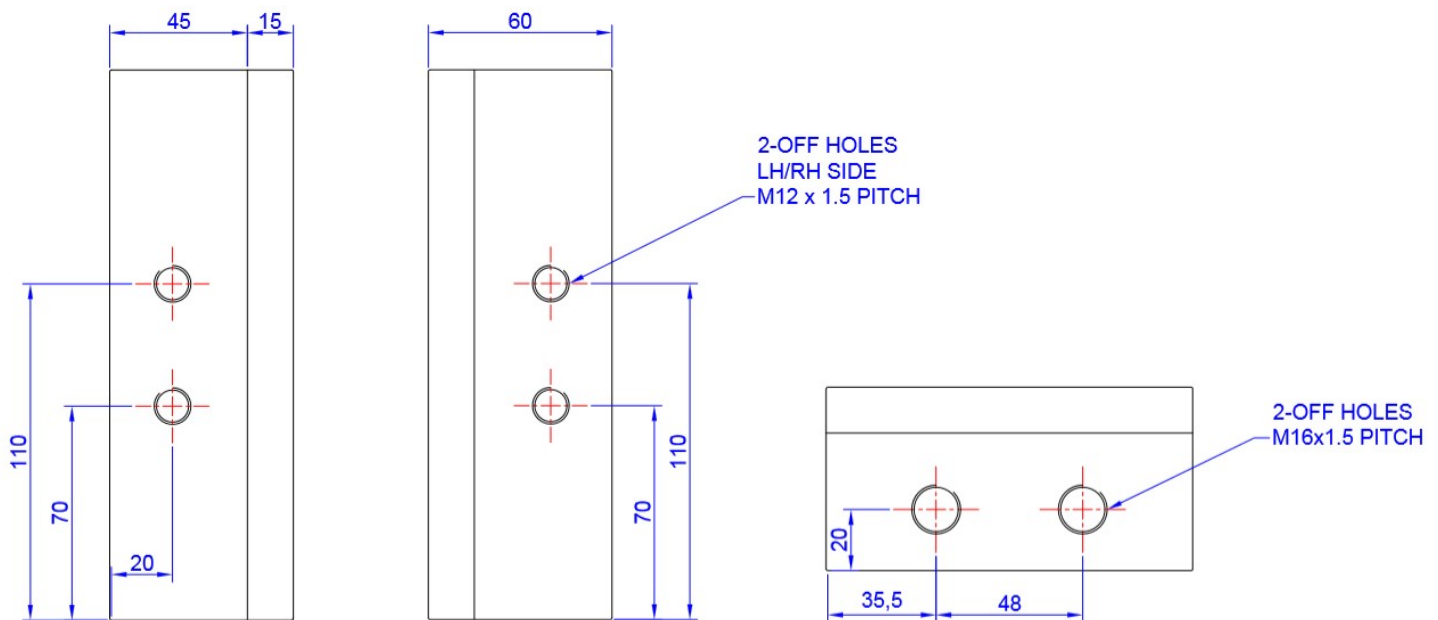Fig. 5. Mounting specification for Signaline LocatorPlus-EN

Fig. 6. Mounting specification for Signaline LocatorPlus-EN

Commissioning

1. After wiring the unit up (see '**Connection Diagram'** section) 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 (step 3 and onwards). 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 Signaline FT-EN Linear Heat Detectioncable zones trigger an alarm.

6. Select the relevant operating programme for Zone 1 based on the below table;

Alarm (Activation) Temperature	Cable Set up
68°C Signaline FT-68-EN	T068-V10-A045
78°C Signaline FT-78-EN	T078-V10-A045
88°C Signaline FT-88-EN	T088-V10-A065

7. Select the relevant operating programme for Zone 2 based on the same table as in step 6.

8. If a leader cable is connected between the Signaline FT-EN Linear Heat Detection cable and the Signaline LocatorPlus-EN and/or the cable is installed in a hazardous area and an IS barrier is being used, voltage drop must be measured by the Signaline LocatorPlus-EN to ensure correct operation and accurate distance location. With the leader cable and/or IS barriers and the Signaline FT-EN linear heat detector cable connected to the Signaline LocatorPlus-EN zone, short out the connection at the **start** of the Signaline FT-EN linear heat detector cable. Select "Yes" and press the Set button to continue.

9. If 'Yes' in step 8, the Signaline LocatorPlus-EN will then ask if the zone is ready to be calibrated. The leader cable/IS barrier must be connected to the Signaline LocatorPlus-EN and securely shorted out at the point where it connects to the start of the Signaline FT-EN Linear Heat Detection cable. Once this is done press the Set button.

10. The Signaline LocatorPlus-EN will display the voltage drop across the leader cable. If necessary, press SELECT to calibrate again. The Signaline LocatorPlus-EN unit will display the updated voltage drop in mV (milli-volts). The displayed value should be equal to the approximately the loop resistance in ohms from the Signaline LocatorPlus-EN, with the short in place, divided by eight. Once the voltage drop has been confirmed correct, press SET to continue. Finally, remove the short from the start of the Signaline FT-EN Linear Heat Detection cable.

11. If the Signaline FT-EN Linear Heat Detection cable is connected directly to the Signaline LocatorPlus-EN then select No and press the Set button to continue. *See next page for steps 12-27*

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 Signaline LocatorPlus-EN will either require the power supply to be interrupted (min. 2s) or the Set button to be pressed to reset to normal once the alarm conditioned has been cleared.

13. Select whether the Modbus 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/ASCII output. (2400, 4800, 9600, 19200, 38400, 57600, 115200).

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

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

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

Normal Operation

20. Once the unit has been commissioned, the display will show the zone status. In normal operation the display unit in independent mode will show "Zone 1: OK Zone 2: OK".

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.

Fault Alarm Conditions

21. If an alarm condition occurs, the Signaline LocatorPlus-EN 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. If an alarm condition occurs but the relay does not switch state (due to a coil failure for example), the device will go into relay fault.

24. The unit monitors for interference faults when 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 (for example open circuit). An open circuit will be displayed as FAULT

26. In interlocking mode, the alarm outputs are only activated when both zones of Signaline FT-EN Linear Heat Detection cables are activated. If one cable activates but not the other the display will show the distance to the alarm on the activated zone and the corresponding alarm LED will flash slowly.

27. In interlock mode, if both Signaline FT-EN Linear Heat Detection cables go into an alarm, the alarm outputs will be activated and the display will show the distance to the alarm for each zone. The zone 1 and zone 2 alarm LEDs will light continuously.

Tel: +44(0)1252 725257

Email: sales@lgmproducts.com

Revision 2 (2023)

Web: www.signaline.com

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ISO 9001:2015 certified

Address: LGM Products Ltd, Unit 3 Quantum Business Park, Beacon Hill Road, Hampshire, GU52 8EA

United Kingdom

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Testing & Verification

1. If self test mode is selected the device will first load the saved configs then proceed to cycle through normal operation, alarm and fault. This is to allow the installer/maintenance engineer verify that the unit is corrected to an external system correctly. The screen will flash "SELF TEST/MODE" every few seconds.

2. In self test mode the device cycles between normal operation, alarm and fault every approx. 8 seconds. In normal operation the display will show ok. The alarm relays will be off and the fault output normally conducting (on).

3. In self test mode and alarm condition the display will show alarm. The alarm relays will be on. After approx. 8 seconds the unit will go into fault condition.

4. In self test mode and fault condition the display will show fault. The fault outputs will stop conducting (off). After approx. 8 seconds the unit will return to normal condition. To exit self test mode, press and hold both SET and SELECT buttons for 10s or more until the device resets.

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Email: sales@lgmproducts.com   Web: www.signaline.com   ISO 9001:2015 certified

Address: LGM Products Ltd, Unit 3 Quantum Business Park, Beacon Hill Road, Hampshire, GU52 8EA

United Kingdom

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Two-wire RS-485 Modbus RTU/ASCII Communications

The Signaline LocatorPlus-EN includes a two wire RS-485 Modbus output which can be enabled to output the status of each zone of Signaline FT-EN Linear Heat Detection cable. The Signaline LocatorPlus-EN Modbus output supports the Modbus RTU/ASCII 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 Signaline LocatorPlus-EN will respond in the following manner:

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

⇒ Register values (16-bits per register)

The Signaline LocatorPlus-EN stores the information for each zone of the Signaline FT-EN Linear Heat Detection cable in the following format:

Register	Description	Possible Values
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 = T068-V10-A045 (Signaline FT-68-EN) 2 = T078-V10-A045 (Signaline FT-78-EN) 3 = T088-V10-A065 (Signaline FT-88-EN)
3	Zone 2 cable type	1 = T068-V10-A045 (Signaline FT-68-EN) 2 = T078-V10-A045 (Signaline FT-78-EN) 3 = T088-V10-A065 (Signaline FT-88-EN)

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

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

Resetting the Signaline LocationPlus-EN Unit

WARNING: This procedure will erase ALL stored settings and reset the Signaline LocatorPlus-EN 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-EN unit back to the factory state, when the unit is powered up and in normal operation (see step 20 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. The settings are only erased if the menu option "New Configs" is selected.

The Signaline LocatorPlus-EN is part of the Signaline family of products.
To see our full range please visit www.signaline.com

For product support, contact us at technical@lgmproducts.com

Or call 01252 725257 to speak to our sales team