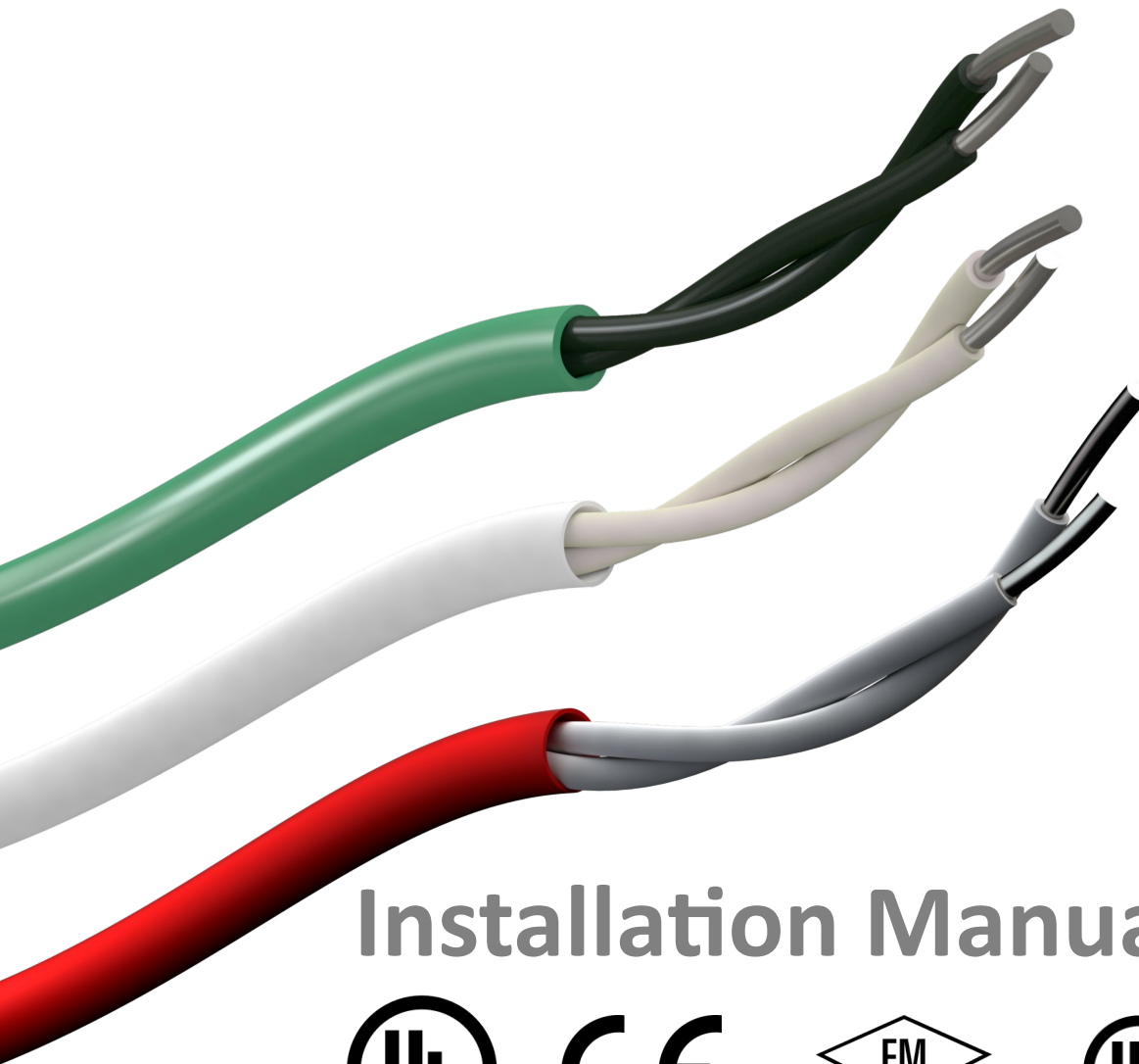




SIGNALINE HEAT

Signaline FT, FT-R and FT-X

Linear Heat Detection



Installation Manual



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Revision 2 (2025)

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Please read this instruction leaflet thoroughly before commencing installation.



Key Points

- ⇒ Install the Signaline linear heat detection cable in compliance with local and national installation regulations.
- ⇒ Signaline linear heat detection cable must be installed in accordance with NFPA 70 & 72, NEC 760 (National Electric Code), and the requirements of the Authorities Having Jurisdiction.
- ⇒ Support the detection cable at intervals of 1m (3ft) to 1.5m (5ft).
- ⇒ Before installation, test the detection cable using a multimeter.
- ⇒ Ensure the maximum ambient temperature rating of the detection cable is not exceeded during storage or normal operation.
- ⇒ Verify that the detection cable is installed at or below the maximum approved spacing.
- ⇒ Ensure the detection cable does not come into direct contact with any material that could transfer heat onto it.
- ⇒ A silicone pad should be placed between the fixing clip and the Linear Heat Detection cable.
- ⇒ Make sure all cable glands are securely tightened to create a moisture-proof and secure seal around the detection cable.
- ⇒ Avoid allowing the Signaline detection cable to come into contact with any material that acts as a heat sink, as this may delay activation in alarm situations.
- ⇒ Do not exceed the maximum operating voltage of the detection cable (48V DC).
- ⇒ Do not connect two lengths of detection cable with different activation temperatures.
- ⇒ Do not connect fixed temperature cable lengths in 'T' connections or spurs.
- ⇒ Do not paint the detection cable.
- ⇒ Do not place the detection cable under excessive tension.
- ⇒ Do not bend the detection cable at right angles; the minimum bend radius is 2" (50mm).
- ⇒ Avoid exposing the detection cable to mechanical damage that could lead to false activation.
- ⇒ Avoid installing the detection cable in areas with heavy traffic where it may be crushed.



General Overview

Signaline FT Digital Linear Heat Detection Cable uses fixed temperature detection technology to provide a simple and effective method for sensing temperature changes. The cable offers reliable overhear protection across a wide range of applications and environments, including tunnels, cable trays, warehouses, escalators, and other areas where fire risks may be concealed from view.

The digital linear heat detection cable can be directly connected to a single zone of a conventional fire alarm control panel. Alternatively, when used with an addressable zone/switch monitor, it can be seamlessly integrated into an addressable loop.

Signaline FT Digital Linear Heat Detection Cable consists of a pair of twisted, low-resistance, tri-metallic conductors sheathed in advanced temperature-sensitive polymers. When the cable reaches its activation temperature, the two twisted cores fuse together. A fire-triggering resistor connected to the input interface, along with a single core of linear heat cable, ensures an alarm is triggered at the main fire panel (see schematic).

Detection Temperatures

- ⇒ 68°C (155°F)
- ⇒ 88°C (190°F)
- ⇒ 105°C (221°F)
- ⇒ 185°C (365°F)
- ⇒ 230°C (446°F)

Signaline LocatorPlus

The Signaline LocatorPlus, a UL864 10th edition approved Digital Interface Monitor Module, offers enhanced functionality when used with the Signaline FT cable. It can simultaneously monitor up to two zones of LHD cable, providing separate fault and alarm outputs for each zone.

A built-in display shows the status of each zone, including the exact distance (in meters and feet) to the alarm point if an alarm is triggered. Additionally, the module features an RS-485 Modbus RTU output, allowing seamless integration with PLC or SCADA systems.

Signaline FT-EOL

The Signaline FT-EOL End-of-Line Unit has been designed to effectively terminate up-to two zones of Signaline Linear Heat Detection cable in a secure, weatherproof enclosure. Furthermore, the built in switches for testing a fault and alarm condition allow the integrity of the whole system to be functionally checked in situ, providing comprehensive testing and maintenance of the system.



General Overview

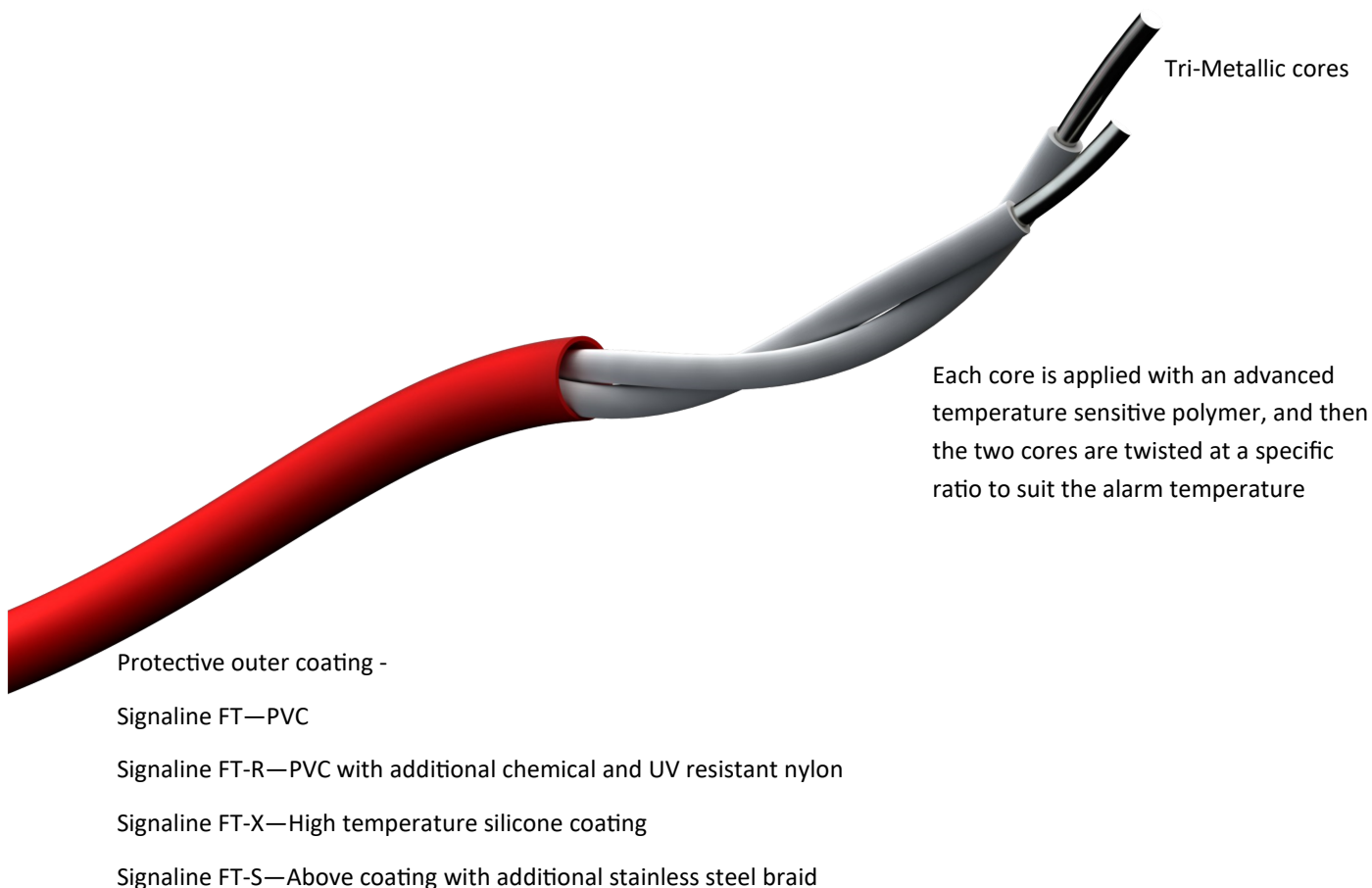


Fig. 1 Construction of Signaline FT Linear Heat Detection cable (optional nylon coating applied to models with '-R' suffix, stainless steel out braiding applied to models with suffix '-S')



Technical Data

Model Numbers -

Product Code	Part	Description	Colour
CSSIGFT001	FT-68	Fixed Temp. 68°C Heat Sensing Cable	Red
CSSIGFT005	FT-68-R	Fixed Temp. 68°C Heat Sensing Cable Resistant Nylon Coated	Black
CSSIGFT009	FT-68-S	Fixed Temp. 68°C Heat Sensing Cable and SS braid	Steel
CSSIGFT002	FT-88	Fixed Temp. 88°C Heat Sensing Cable	White
CSSIGFT006	FT-88-R	Fixed Temp. 88°C Heat Sensing Cable Resistant Nylon Coated	Black
CSSIGFT012	FT-88-S	Fixed Temp. 88°C Heat Sensing Cable Stainless Steel Braid	Steel
CSSIGFT003	FT-105	Fixed Temp. 105°C Heat Sensing Cable	White
CSSIGFT007	FT-105-R	Fixed Temp. 105°C Heat Sensing Cable Resistant Nylon Coated	Black
CSSIGFT013	FT-105-S	Fixed Temp. 105°C Heat Sensing Cable Stainless Steel Braid	Steel
CSSIGFT004	FT-185-R	Fixed Temp. 185°C Heat Sensing Cable Resistant Nylon Coated	Red
CSSIGFT008	FT-185-S	Fixed Temp. 185°C Heat Sensing Cable Stainless Steel Coated	Steel
CSSIGFT011	FT-230-S	Fixed Temp. 230°C Heat Sensing Cable Stainless Steel Braided	Green
CSSIGFT010	FT-230-X	Fixed Temp. 230°C Heat Sensing Cable Green Rubber Coated	Steel

Electrical Specification

Parameter	Value
Maximum Voltage Rating	30V AC, 42V DC
Resistance	~100 Ω /km (29 Ω /kft) per leg
Velocity of Propagation	~55%
Capacitance	88 – 150 pF/m (26 – 45 pF/ft)
Inductance	540 – 1050 nH/m (165 – 320 nH/ft)

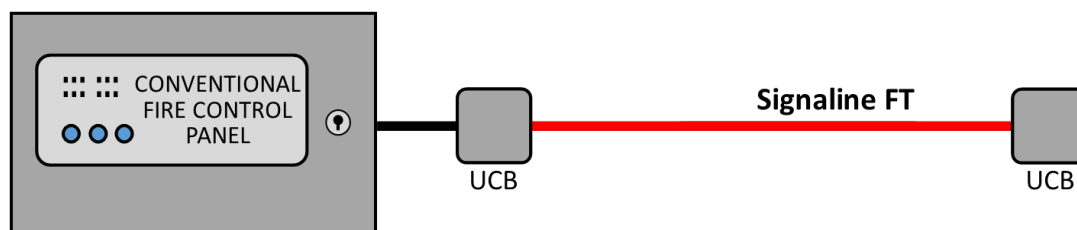


Material and Dimensions

Parameter	Specification
Material	Overall insulated, twisted pair of tri-metallic cores
Diameter (all values include tolerance of $\pm 0.12\text{mm}$ / $\pm 0.005\text{"}$)	
PVC Coating	3.60mm (0.142")
With additional Nylon coating	4.50mm (0.177")
With additional Stainless Steel Braid	4.10mm (0.161")
With additional Nylon Coating & Stainless Steel Braid	5.08mm (0.200")

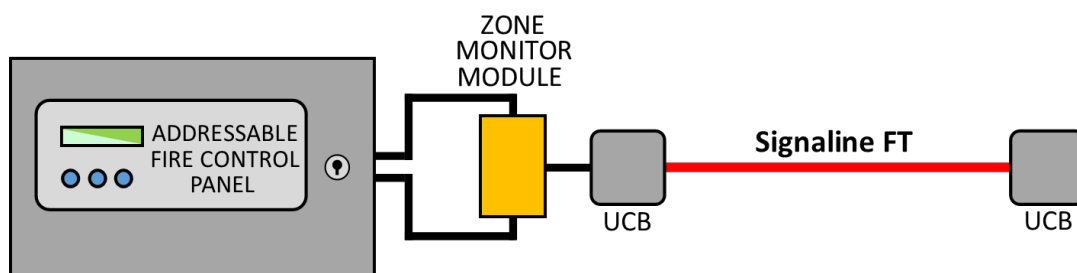
Typical System Configuration—Conventional

Signaline FT Linear Heat Detection (LHD) cable should be connected to the initiating device circuit of a conventional fire alarm control panel. If the protected area is located at a distance from the control panel, a leader cable can be used to bridge the gap. To ensure a secure and waterproof electrical connection, a Signaline UCB junction box should be used when connecting the leader cable to the linear heat detection cable.



Typical System Configuration—Addressable

When used in an addressable system, Signaline FT Linear Heat Detection (LHD) cable should be connected to the addressable loop via a switch or zone monitor. The LHD cable does not require external power. If the protected area is located at a distance from the addressable switch or zone monitor, a leader cable can be used to bridge the gap. To ensure a secure and waterproof electrical connection, a Signaline UCB junction box should be used when connecting the leader cable to the linear heat detection cable.



Typical System Configuration—Locatorplus

For installation of Signaline FT Linear heat detection cables with the LocatorPlus please refer to the Signaline Locatorplus manual which can be downloaded from www.signaline.com or contact sales on sales@lgmproducts.com to request a copy.



Installation

Leader Cable

An approved type of leader cable, preferably fire rated cable, should be used between the fire alarm control panel/addressable input module and the Signaline UCB.

It is recommended that leader cable with the following minimum cross sectional area (CSA) per conductor is used when using the maximum length of Signaline FT Linear Heat Detection cable. Consult with the authority having jurisdiction and the fire alarm control panel manufacturer for further information.

Recommended Maximum Leader Cable Length and CSA for copper conductors (with maximum length of Signaline FT Linear Heat Detection cable 1000m/3,280ft)

0.8 mm² (18AWG) — Up to 1,000m (3,280ft)

Low Temperature Installation Considerations

Signaline FT Linear Heat Detection cable is suitable for use in ambient temperatures down to -40°C (-40°F). Such conditions occur in cold storage freezer warehouses and outdoors for example. Take special care when installing Signaline FT Linear Heat Detection cable in low ambient temperatures or for use in low temperature conditions careful consideration of the conditions and environment should be undertaken.

Wherever possible the Signaline FT Linear Heat Detection cable should not be installed when the ambient temperature is below -10°C (14°F). The materials within the Signaline FT Linear Heat Detection cable will become less flexible and are more prone to damage. If the ambient temperature is likely to drop significantly after installing the Signaline FT Linear Heat Detection cable take into account linear shrinkage of the cable when attaching support brackets. The Signaline FT Linear Heat Detection cable can shrink in length by 12% at -40°C (-40°F).

Installation Hardware

- The detection cable must be adequately supported to prevent sagging. Ideally, supports should be placed every 1m (3ft) and no more than 1.5m (5ft) apart. Additional supports may be needed around corners and transition areas.
- When securing the cable with clips (or equivalent), ensure they are not overtightened to avoid crushing the cable. The cable should be held firmly without deformation.
- Avoid excessive tension on the cable, keeping it below 50N, and always maintain a minimum bend radius of 50mm (2").
- If using metal fixing clips, a neoprene, epdm or silicone pad should be placed between the clip and the cable, especially if the clip is exposed to sunlight or attached to equipment that may transfer heat. All Signaline clips come complete with this.
- Whenever possible, install the linear heat detection cable in one continuous run with minimal splicing.
- When pulling the cable from a reel, always use a reel stand. Do not pull the cable off the reel vertically while the reel is stationary, as this can cause twisting and damage.
- In cases where recommended support spacing is not practical, a guide wire may be necessary. Use a stainless steel wire of approximately 2mm diameter, ensuring it is suitable for the span required.
- Signaline UCB is the recommend connections and junction boxes and comes complete with strain relief connectors that provide dust and moisture protection (IP65 or higher).



Fig 2. example fixing methods



Area Protection

- Signaline FT Linear Heat Detection (LHD) cable is ideal for detecting overhear or fire conditions across large areas, such as warehouses.
- When installing, ensure there is a minimum gap of 20mm between the cable and the ceiling. This allows hot gases from a fire event to reach the cable and trigger an alarm.
- Follow the recommended maximum support spacings (see previous page) and securely attach the cable to ceilings or beams.
- For ceilings up to 9m (30ft) high, the maximum spacing between cable runs should be as per the table below.
- For ceilings over 9m (30ft) high, all spacing values should be halved to ensure optimal detection performance.
- The distance between a detection cable run and walls/partitions should also be halved based on the values provided in the table. (i.e for UL/cUL spacing the distance between the first run of cable and the wall should be 5m)

Action Temperature	UL/cUL Spacing	FM Spacing
68°C (155°F)	10m (35ft)	9m (30ft)
88°C (190°F)	10m (35ft)	9m (30ft)
105°C (221°F)	10m (35ft)	7.5m (25ft)

Please see fig.3 for routing diagram on following page

NB; FT-185-R and FT-230-X should not be used for area protection, these cables are for special application only.

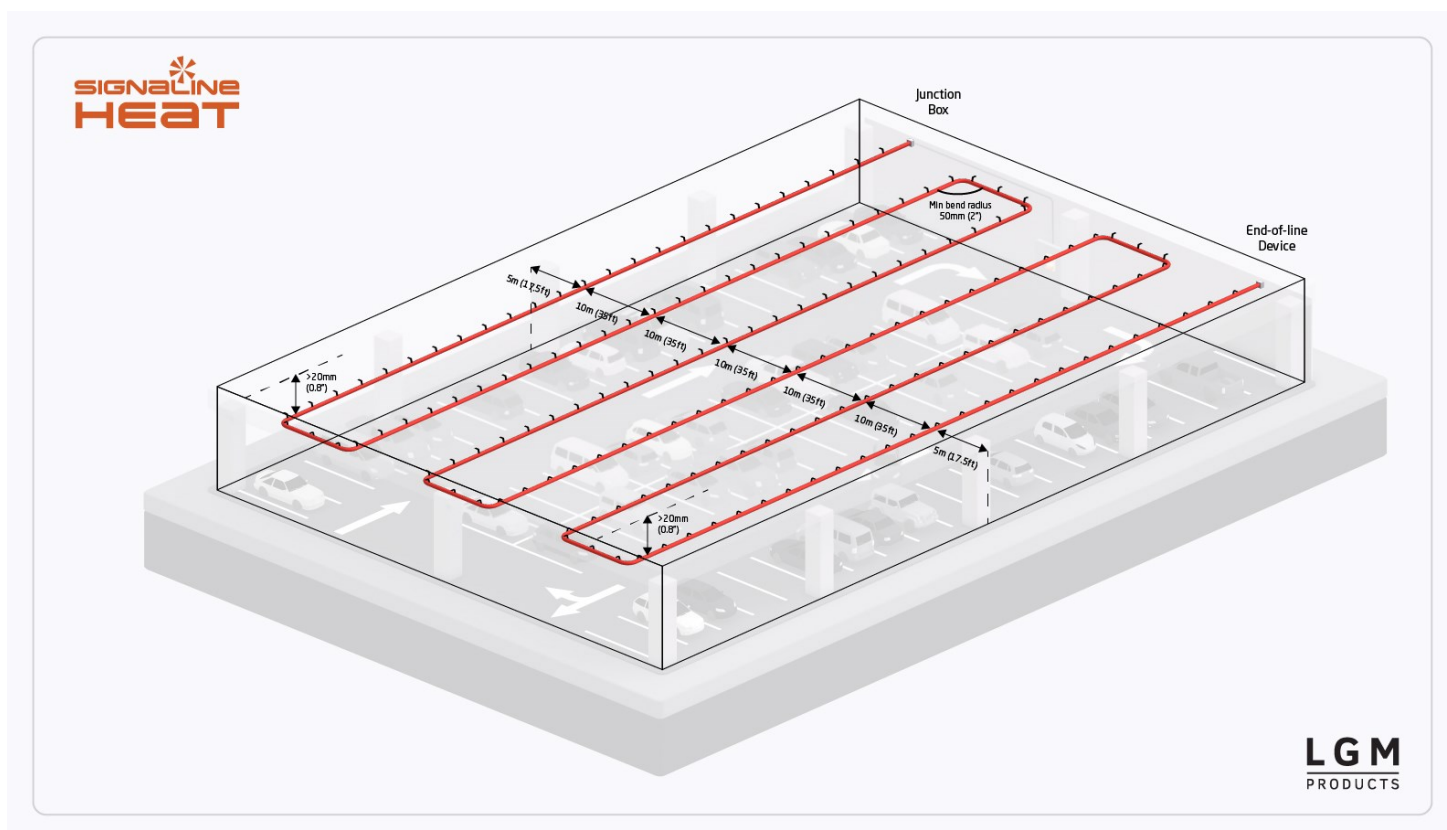


Fig 3. Cable routing and spacing for typical application



Signaline FT Linear Heat Detection Cable – Routine Maintenance & Testing

Regular maintenance and inspections should be carried out to ensure the Signaline FT Linear Heat Detection (LHD) cable remains fully operational and undamaged.

Visual Inspection

- Check that all support brackets and installation components are secure and in good condition.
- Inspect the cable for any damage to the outer or inner insulation.

Electrical Testing

To verify the integrity of the circuit, disconnect the LHD cable from the fire alarm control panel or addressable switch monitor and measure the resistance across the conductors. The measured resistance should equal the end-of-line resistance plus approximately 100Ω/km per leg.

Reattach the LHD cable to the control panel or switch monitor for in-circuit testing: Shorting the End-of-Line (EOL) device should trigger an alarm. Disconnecting either leg from the EOL device should trigger a fault condition.

Functional Testing

Signaline FT Fixed Temperature LHD cable is non-restorable, meaning any section that activates in an alarm must be cut out and replaced. Therefore, functional testing is not typically performed on installed cable.

If testing is required, use leftover LHD cable from installation:

- Attach a 1m (3ft) section of spare cable between the end of the LHD run and the end-of-line device.
- Apply heat using a suitable device until the action temperature (including tolerances) is reached—this should trigger an alarm.
- Remove the test section before restoring the system to normal operation.

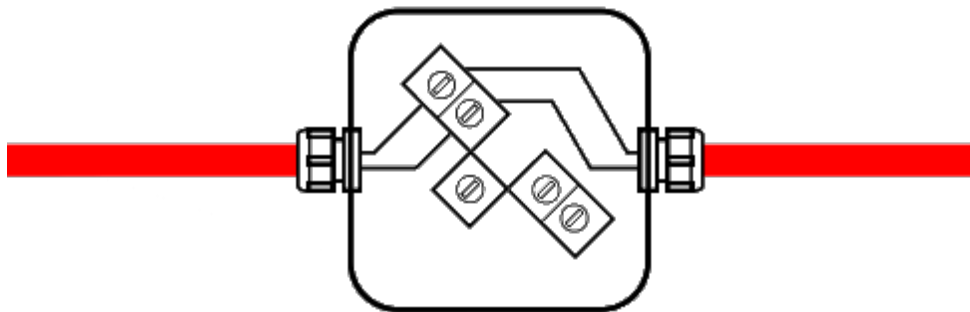
Alternatively the Signaline FT-EOL comes complete with functional alarm and fault test buttons. For further details of this product please see www.signaline.com.



Splicing and reconnecting the cable

If Signaline FT linear heat detection cable gets damaged or has triggered due to an overheat condition, the section can be removed and a new section spliced in its place.

To do this the Signaline UCB should be used to create a secure connection between the cut lengths. Please see below diagrams for simple schematics or refer to the Signaline UCB manual for full details.





Chemical Resistance chart

Signaline FT linear heat detection is designed for use in harsh conditions. The cables have good resistance to most airborne chemicals and moisture.

In chemically harsh environments it is recommended to use the nylon coated cable.

Below is a simple chart of common chemicals and the outer coatings resistance to them.

Key—

- Poor resistance
- ** Average resistance
- *** Average to good resistance
- **** Good resistance
- ***** Excellent resistance

Chemical	PVC	Nylon
Ammonia, Liquid	*****	***
Butane	*****	*****
Copper Nitrate	*****	*****
Fuel Oils	*****	*****
Gasoline	**	*****
Hydrofluoric Acid	*	*
Kerosene	*****	*****
Diesel Fuel	*****	*****
Acetic Acid	**	*



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

Or call 01252 725257 to speak to our sales team

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