

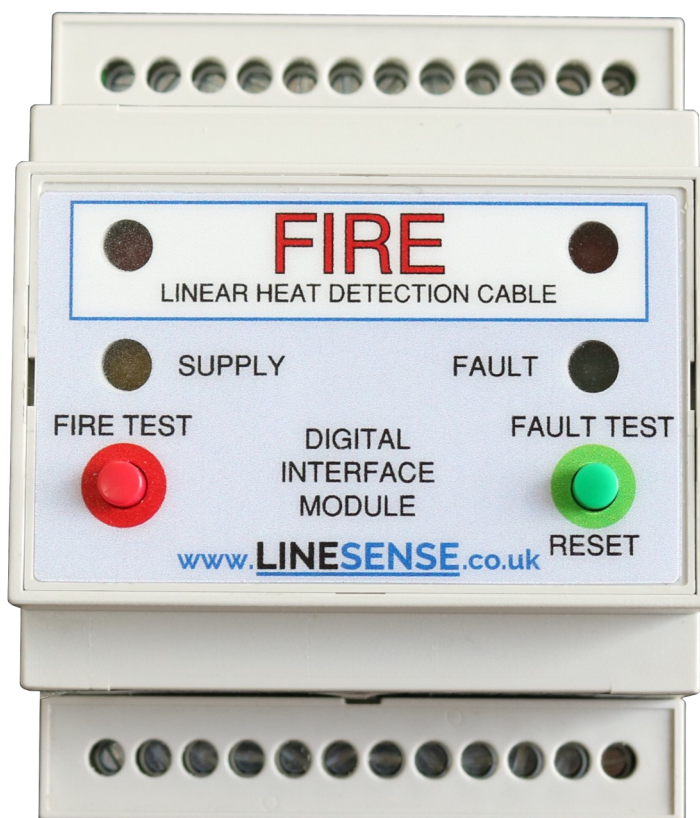
DIM

Digital Interface Module

LINESENSE

Fire Detection Ltd

www.Linesense.co.uk



MANUAL INSTALLATION - COMMISSIONING

Contact Details:

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Issue	Change	Date	Remarks
1	Introduction	January 2017	
2	Page 6 schematic amended	February 2017	
3	Notes added.	April 2018	

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1. - Introduction

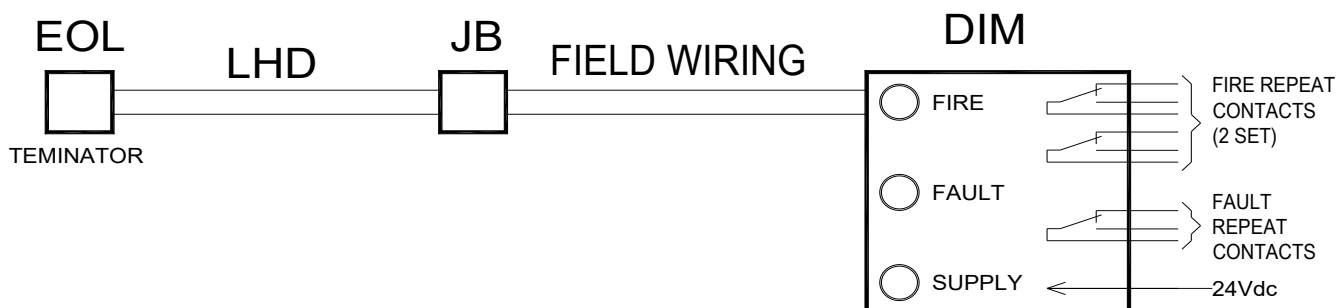
The Digital Interface Module (DIM) monitors the Linesense Digital Linear Heat Detection (LHD) cable for both Fire and Fault (open circuit) conditions. By the use of an additional series resistor in the field junction box, it can also monitor for a short circuit fault on the field wiring.

With the ability to monitor up to 5,000m of LHD for both Fire and Fault conditions the DIM enhances any fire detection capability. When used with Intrinsically Safety barriers it can be used for hazardous area applications.

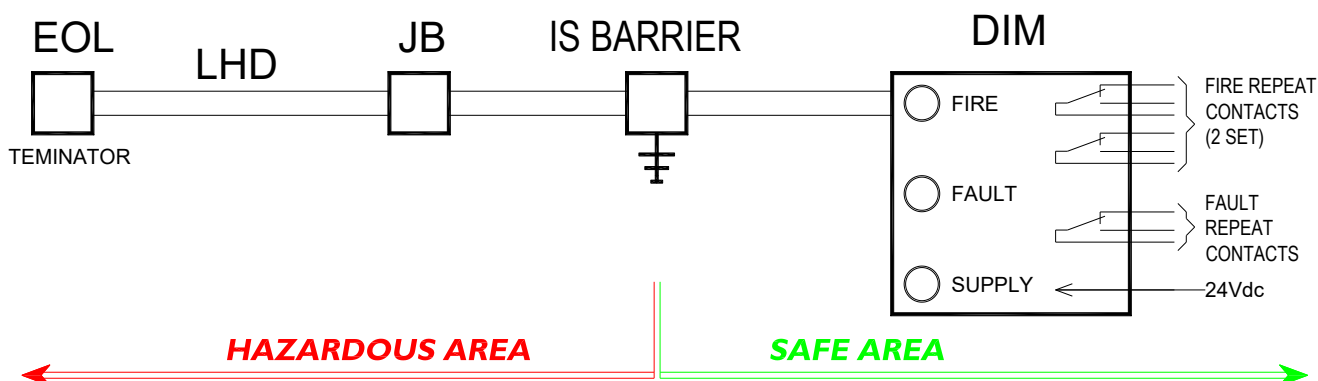
The DIM has volt free relay outputs for Fire and Fault which can be used for connecting directly into a conventional fire alarm panel or addressable interface module.

As well as having Fire and Fault indicators built in, it has two pairs of solid state outputs for driving remote LED indicators for Fire and Fault.

Typical Installation



Hazardous area Installation



2. Certifications

FM Factory Mutual - Linear Heat Detection (LHD) cable.

3. Technical Features

Specifications.

Electrical.

Operating voltage :	21 - 30 VDC
Operating Current	
Normal :	25 mA (Fault relay energised)
Fire Alarm (max) :	56 mA

Indicators :	Fire - Red 2 x off.
	Fault - Yellow
	Power - Green

Outputs

Fire :	2 x VFCO relays, 1.0 amp 24 VDC / 120 VAC
Fault :	1 x VFCO relays, 1.0 amp 24 VDC / 120 VAC
Remote indicator outputs :	4 x 100 mA

Inputs :	Reset / Fault test
	Remote Indicators lamp test.

Maximum length of LHD :	5,000m
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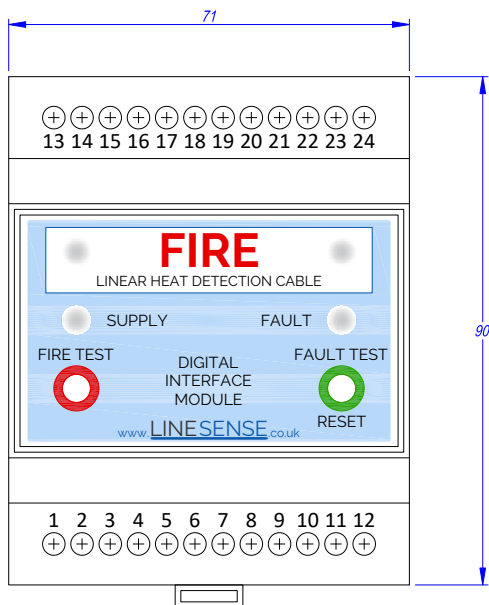
Mechanical

Dimensions :	H90 x W71 x D58 mm (DIN Rail version)
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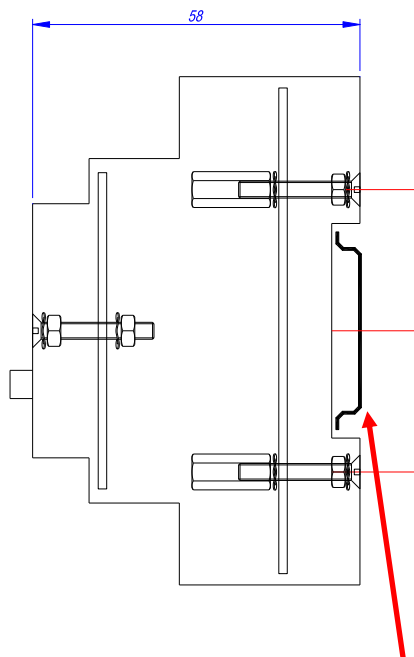
Ordering Information

Part Number	Description
52101-001	DIM Digital Interface Module
53101-001	EOL Junction Box for DIM - Polycarbonate
53101-003	EOL Junction Box for DIM - SS316
53101-012	EOL Junction Box for DIM with internal test switches - Aluminium
53101-013	EOL Junction Box for DIM with test switch - SS316
53101-014	EOL Junction Box for DIM with test switch - ABS

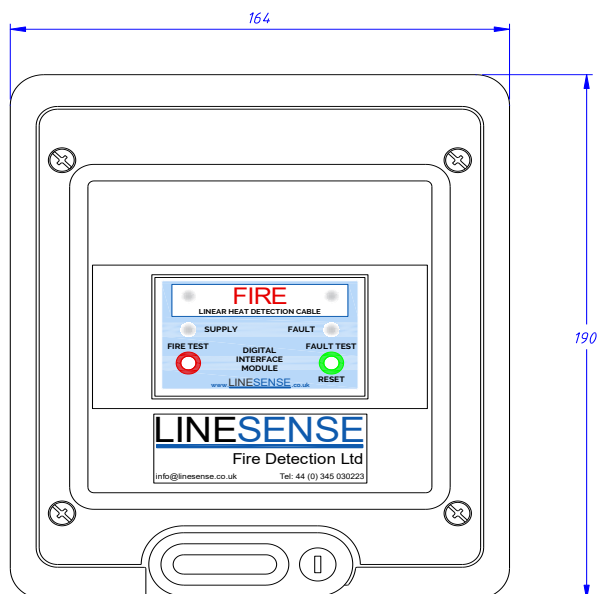
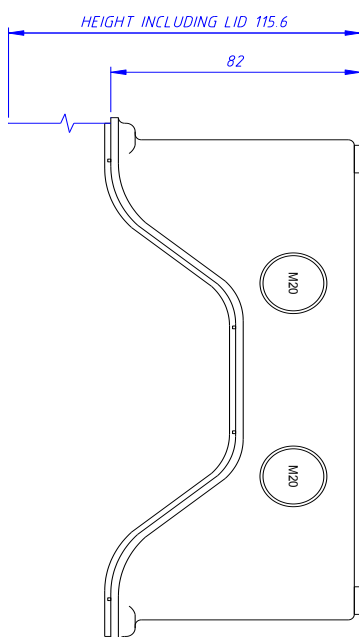
4. Mechanical Installation.



DIN Rail mounting version



DIN Rail
35mm Symmetrical.



Optional Polyester Enclosure

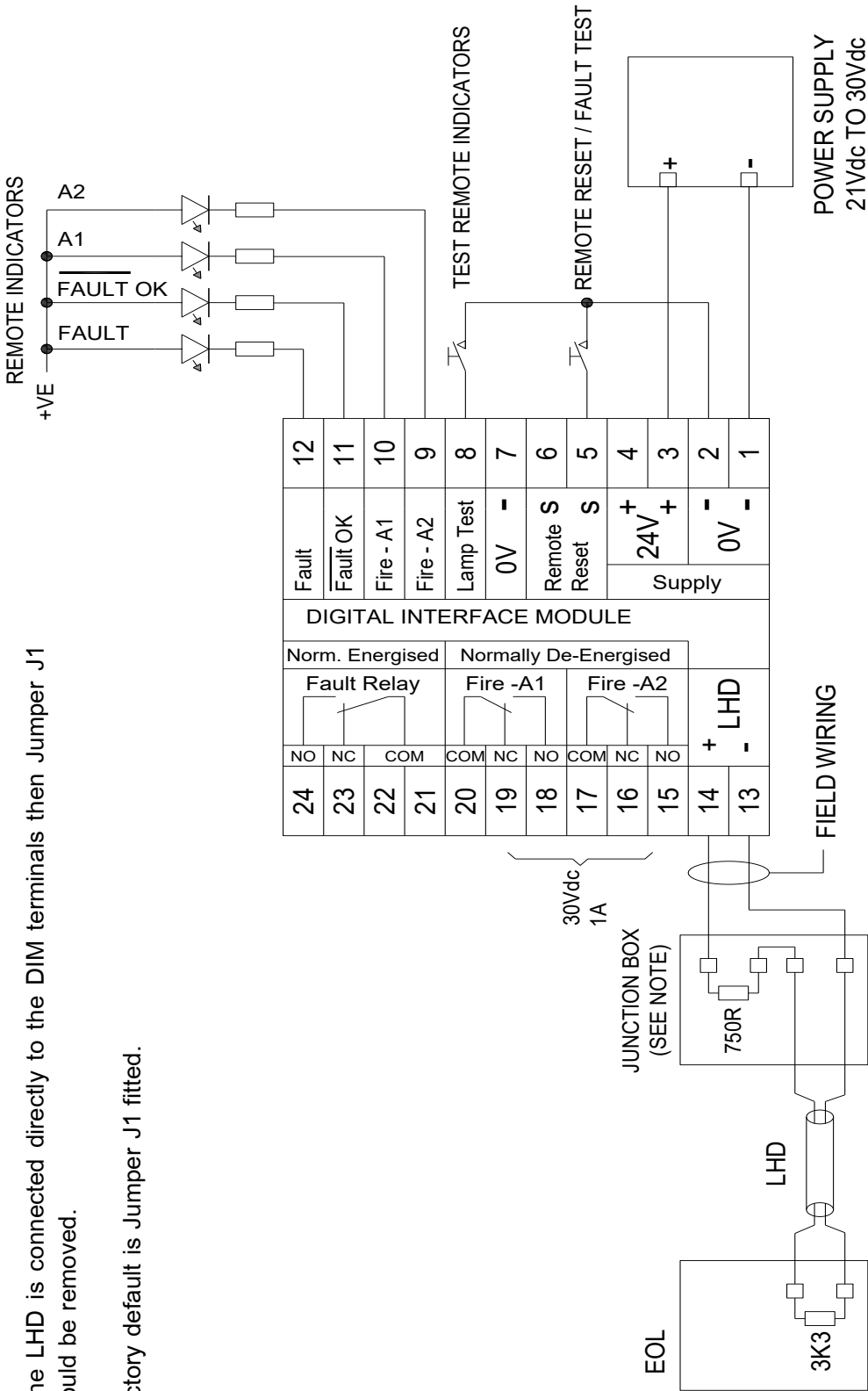
5. Electrical Installation.

Note: Field wiring short circuit monitoring.

The DIM has the ability to monitor for a short circuit on the interposing field wiring prior to the LHD cable. To do this place a 750R resistor in series with the LHD in the field junction box and insert Jumper J1 on the DIM circuit board.

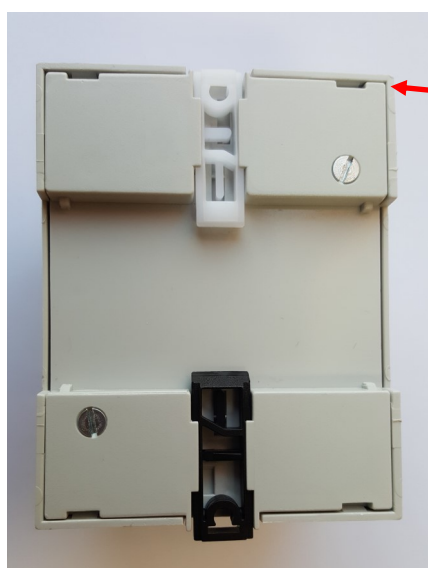
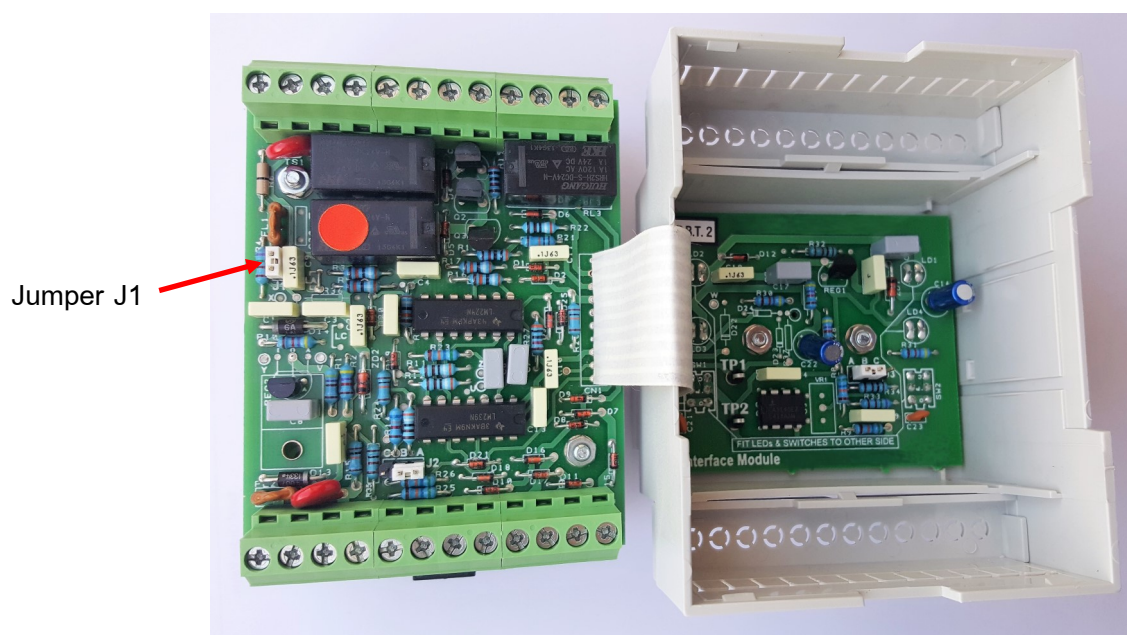
If the LHD is connected directly to the DIM terminals then Jumper J1 should be removed.

Factory default is Jumper J1 fitted.



Jumper J1 location

Jumper J1 on the PCB is accessed by removing the base from the main housing. This is done by gently inserting a screw driver into the sockets and releasing the four locking tabs.



6. Hazardous Areas

The LHD may be installed in an Hazardous Area when connected via a suitable Intrinsically Safe Barrier. This ensures that under fault conditions the LHD circuit has insufficient electrical energy to produce a spark initiated explosion. Both Barrier and DIM module must be located in a 'Safe Area' or 'Explosion Proof' enclosure.

Each Barrier type specifies maximum parameters for cable located in the Hazardous Area. These parameters are:- Capacitance (C), Inductance (L) & Inductance to Resistance Ratio (L/R). The whole of the hazardous area circuit, both LHD and interposing cable, must comply in all three aspects.

For use with the DIM Linesense requires a Dual Channel Shunt Diode AC Barrier, 15V - 150mA - 124R per channel. MTL765 or MTL7765 by Measurement Technologies Ltd.

The C-L-L/R parameters for the barrier depend on the configuration and 'gas group'. When considered together with the LHDC & interposing cable specification they will determine the compliance of an installation and/or define maximum cable lengths.

COMBINED CHANNEL CONFIGURATION

Whilst the supply 0V must be maintained within a few volts of earth to avoid barrier leakage currents, by employing both channels of the barrier the circuit is isolated from earth at the IS Barrier, thus avoiding multiple earth points on Fire Panel signalling systems such as addressable loops.

EXAMPLE: The parameters for the MTL7765 in a combined channel configuration for a group IIC gas are:

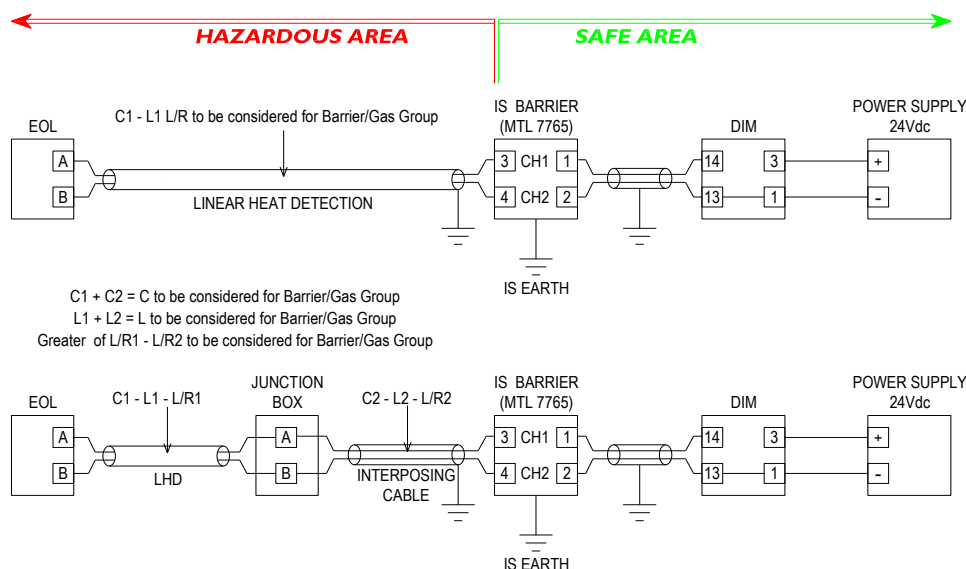
Maximum Capacitance - $C=0.58\mu\text{F}$

Maximum Inductance - $L=0.32\text{mH}$

Maximum Inductance to Resistance Ratio - $L/R=22\mu\text{H}/\text{ohm}$.

Linesense Model H8040N (68°C) LHD has $C = 130\text{pF}/\text{m}$, $L = 1.3\mu\text{H}/\text{m}$, $L/R = 6.5\mu\text{H}/\text{ohm}$.

With no interposing field cable the predominating factor in this case is inductance which limits the LHD length to 246m ($0.32 / 0.0013$).



SINGLE CHANNEL CONFIGURATION

Another arrangement is a single channel circuit which permits greater lengths of LHD to be installed.

The configuration below shows one side of the LHD circuit “returned to earth”.

EXAMPLE : The max parameters for the MTL7715 for a group IIC gas are :-

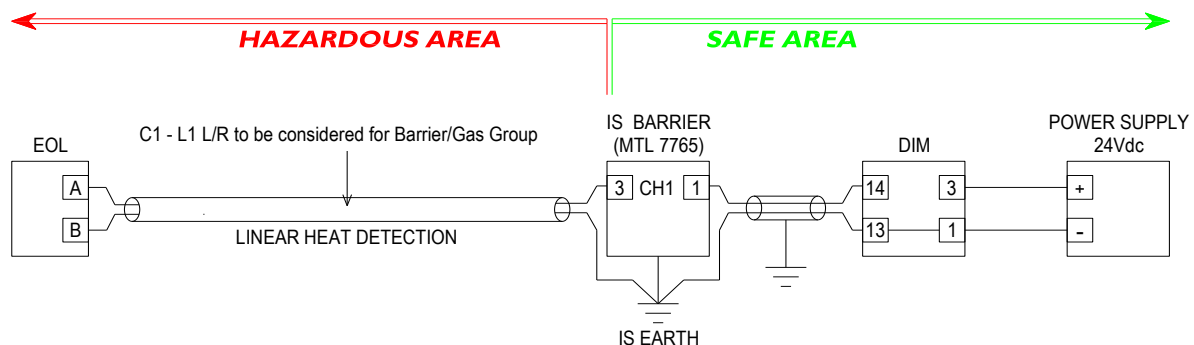
Maximum Capacitance - $C=0.58\mu\text{F}$

Maximum Inductance - $L=1.45\text{mH}$

Maximum Inductance to Resistance Ratio - $L/R=66\mu\text{H}/\text{ohm}$.

Linesense Model H8040N (68°C) LHD has $C = 130\text{pF}/\text{m}$, $L = 1.3\mu\text{H}/\text{m}$, $L/R = 6.5\mu\text{H}/\text{ohm}$.

With no interposing cable the predominating factor in this case is inductance which limits the LHD length to 1115m ($1.45/ 0.0013$).



The above information is a guidance note. National / Local Regulations, Standards and Barrier Specifications **MUST** take precedence in any system design and implementation.

Ensure enclosure earth stud should be suitably grounded with a recommended minimum 10mm² cable.

6. Operation

Normal	LHD & Supply Voltage Normal <ul style="list-style-type: none"> Green Supply LED on. Fire & Fault LEDs off Remote Fire & Fault Indicator outputs - Off, (Not Fault / OK output - On) Fire relays A1 & A2 - De-energised Fault relay - Energised
Fault	LHD Open Circuit <ul style="list-style-type: none"> Yellow 'Fault' LED - On Fault relay - De-energised Remote Fault Indicator output - On (remote Not Fault / OK output - Off)
Fire	LHD Activated (short circuit due to Fire) <ul style="list-style-type: none"> Red Fire LEDs - On Fire relays A1 & A2 - Energised Remote Fire Indicator outputs A1 & A2 - On
Fire Test	Fire Test push-button operated <ul style="list-style-type: none"> Red Fire LEDs, Fire relays and Fire indicator outputs latch on as for Fire above.
Fault Test / Reset	Fault Test & Reset push-button operated <ul style="list-style-type: none"> A LHD Fault condition is simulated during push button operation. Non-latching. Remote Fault indicator output - On (remote Not Fault / OK output - Off) Red Fire LEDs, Fire relays A1 & A2 and remote Fire indicator outputs reset.
Remote Fault Test / Reset	Remote Fault Test / Reset input activated <ul style="list-style-type: none"> As per Fault Test / Reset above
Remote Indicator Test	Remote Lamp Test input activated <ul style="list-style-type: none"> Remote Fire Indicator outputs A1 & A2 - On Remote Fault Indicator - On Remote Not Fault indicator - On

Notes

1. For LHD cables with low alarm temperatures, physical signs of operating may not always be obvious when inspected.
2. Always store the LHD cable in a clean dry location. Storage temperatures not to exceed the maximum ambient rating of the cable.
3. Where cable ties and clamps are used to fix the LHD in place, ensure they are not over tightened to prevent damage.
4. Installation should always be in accordance with this manual, local codes and regulations. While every precaution has been taken during the preparation of this manual to ensure the accuracy of its contents, Linesense assumes no responsibility for errors or omissions.

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700-701	Zener Barrier type MTL 7765

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