

Linear Heat Detector Interface & Fire Zone Monitor



The module is designed to monitor a length of Analogue Linear Heat Detection Cable (LHDC) for both an elevated temperature (fire) condition, and Fault status (open circuit & short circuit).

The unit is designed such that it may be configured to operate in a 'two wire' mode that emulates the operation of Conventional Smoke & Heat Detectors. The unit may therefore be directly interfaced with fire control panels by connection to Fire Zone Trigger Circuits.

Signalling of fire and fault status by means of volt free contacts may also be realised when a separate 24Vdc supply is connected.

The primary features of the control units are:-

- Operable from two wire fire panel Trigger Circuits.
- Analogue address loop interfacable - Line Powered.
- Adjustable alarm set point.
- Fault monitoring of LHDC for both open and short circuit conditions.
- LED indication of Fire, Fault & Supply status.
- Selectable latching / auto-reset operation.
- Test & Reset push-buttons.
- Volt free contact outputs for Fire & Fault conditions.
- Resettable after safe Heat Test.

The unit is operated in conjunction with a length of Analogue Linear Heat Detection Cable (LHDC) and an 'End Of Line' (EOL) terminator, supplied by Patol. The LHDC is a coaxial cable which may be installed in considerable lengths whilst maintaining the ability for the monitoring unit to provide early warning of 'hot spots' and fire conditions on short sections of the overall zone length. Reference should be made to the (separate) data sheet on the Linear Heat Detection Cable for specification of it's performance and ambient withstand. See page .

There are three principle modes of supply & signalling operation :-

Figure 1 shows a typical minimum system where a discrete 24Vdc supply is employed.

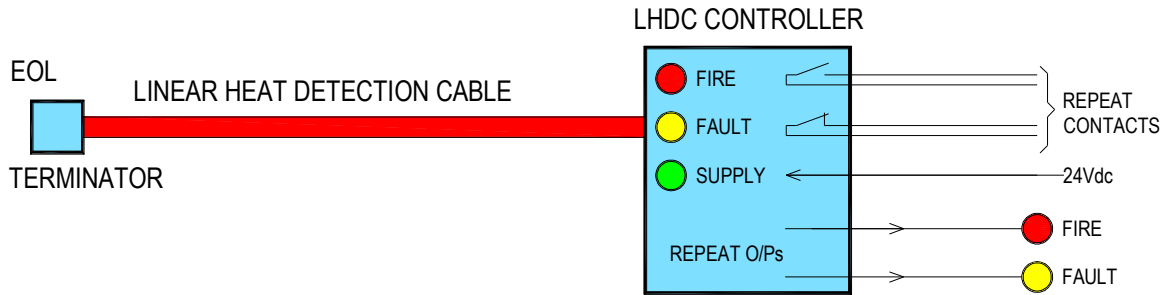
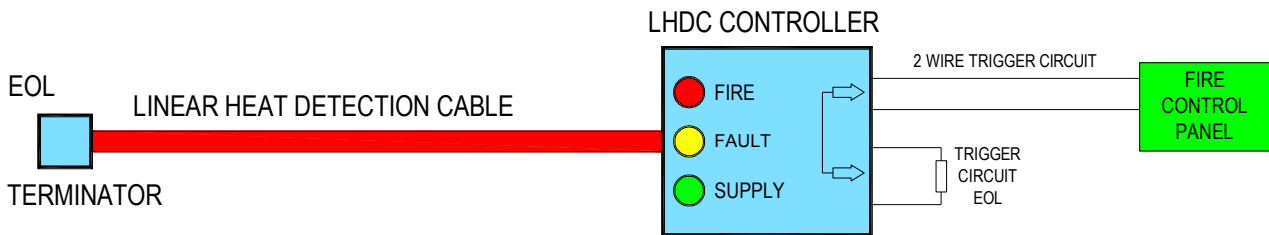
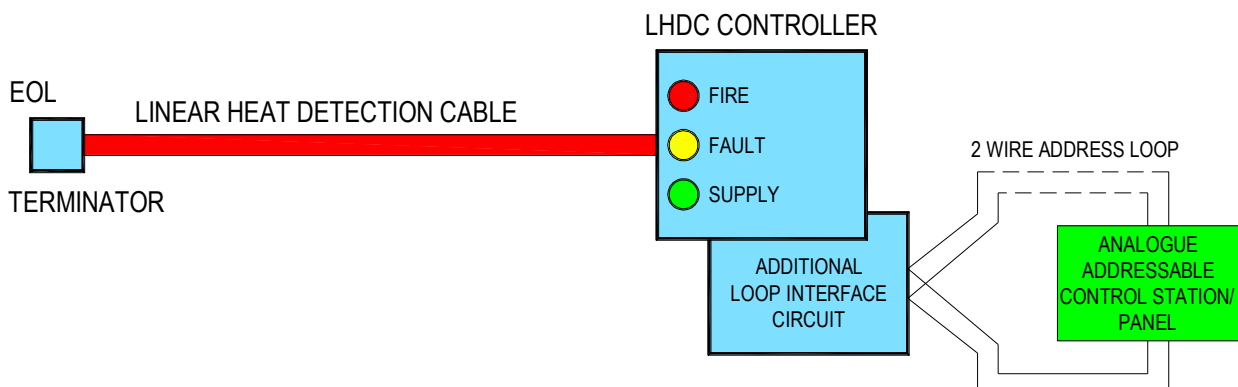


Figure 2 shows a simple configuration with the unit directly connected to a fire panel trigger circuit.

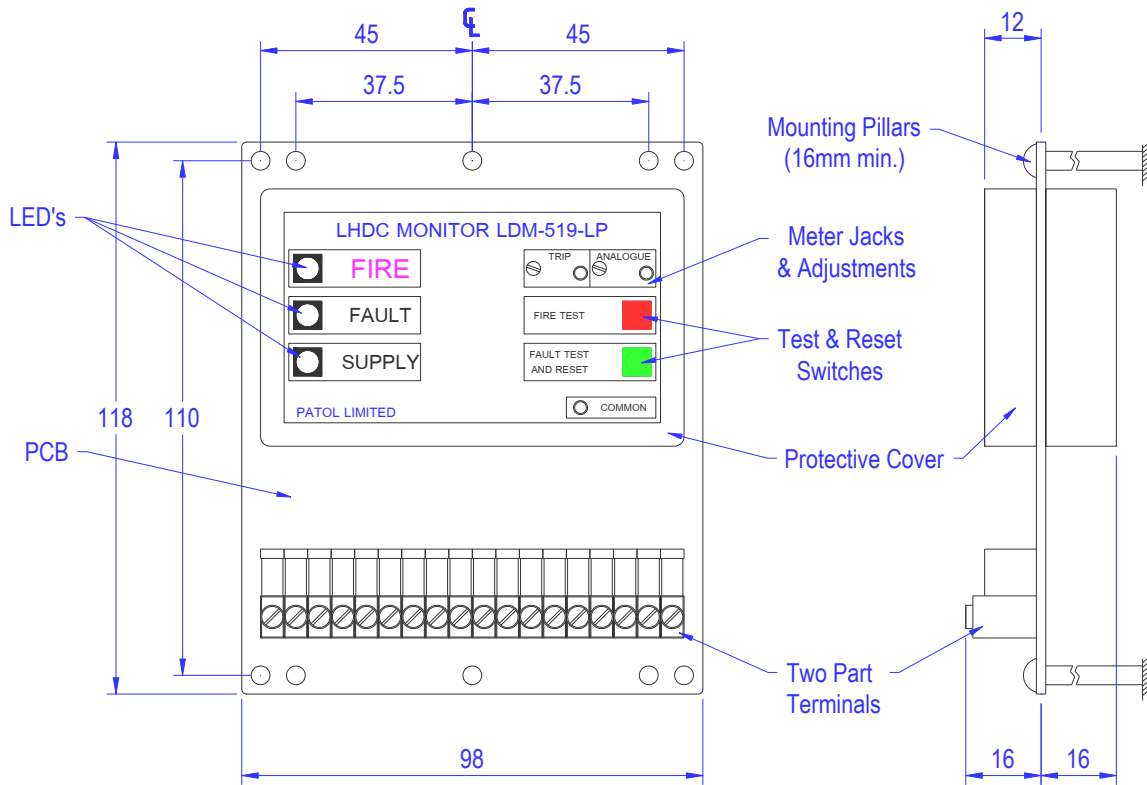


Note: Multiple LDM-519 modules may be configured on a 'trigger circuit'. Units may also be inter-mixed with other devices such as 'point' heat and smoke detectors.

Figure 3 shows the configuration when an integral LOOP interface module is fitted.



Module Arrangement



Connections

Outputs		Fire Load/Remote		Supply 0V		Fault Loop		Supply 24V		Fire Contact			Fault Contact			LHDC	
FIRE	FAULT	-	+	-	-	-	+	+	+	[Switch]			[Switch]			S	C
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

Notes:

- When directly connected to a 'trigger circuit' the *Supply +ve (24V)* terminals are used. In this mode the required 'trigger circuit' supply should be greater than 13V. See application data and specification following.
- Cased units with integrated analogue addressable LOOP INTERFACE circuits have separate terminals for LOOP connection.

Operational Specification

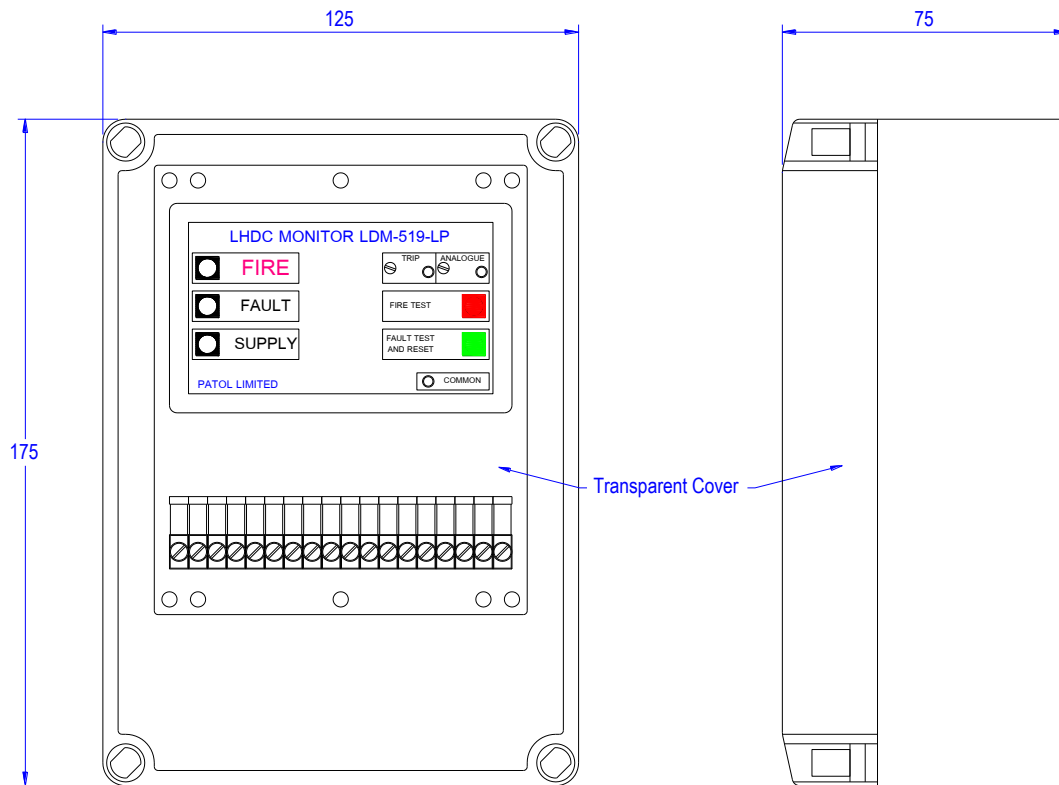
Voltage:	13-30 Vdc (2 wire Mode)	Current-Fire	1.2 mA (2 wire mode) **
	20-30 Vdc (Relay Mode)		< 10 mA (with fire relay) **
	> 5.5 Vdc - Latched Fire		< 20 mA (with both relays)
	< 4.0 Vdc - Reset	** Plus user defined Fire (trigger) load.	

Current-Normal	< 250 μ A (2 wire mode) *
	< 10 mA (with fault relay)

* Plus user defined monitoring current.

Current-Fault	< 300 μ A
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Relay Contacts	1 A @ 24 Vdc / 120 Vac
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Enclosure

- Rating :- IP 66
- Lid :- Clear Transparent
- Material:- Polycarbonate
- Base:- Grey RAL 7035
- Material:- Polycarbonate

Installation and Unit Configuration

- 1 Introduction to Operating Modes
The unit has two principle modes of operation:-

- 1.1 Line powered (Low Power)

In this mode the unit obtains its supply solely from a two wire Trigger Circuit or Address Loop Interface Module, and signals to the associated Fire Panel (via this circuit) in a similar manner to a conventional smoke or heat detector.

When operated in this mode the unit's relays are disabled.

- 1.2 Direct Powered

In this mode the unit derives its supply directly from a 24Vdc power circuit.

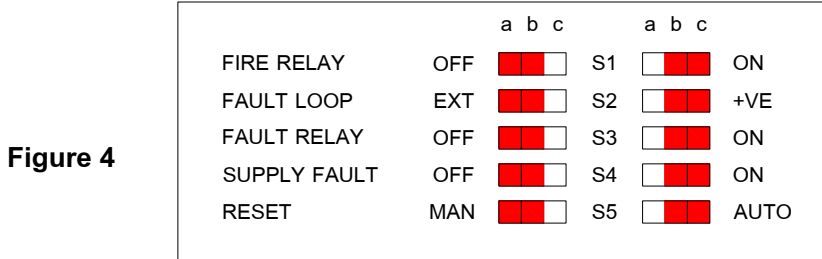
The unit's relays are enabled, and signalling of Fire & Fault conditions is by means of volt free contacts.

The unit has additional 24V switched Fire & Fault outputs which may only be used when the module's relays are enabled.

Installation and Unit Configuration cont.

2 Configuration Jumpers/Selectors

The unit is fitted with five jumpers/selectors (S1 to S5), the positioning of which determine the operational parameters of the unit. The jumpers are accessible from the front of the module, and detailed on the label to the rear. (Figure 4)



Appropriate jumper/selector settings are shown in the following sections.

3 Line Powered operation - Basic

Figure 5 shows a typical configuration

In normal conditions the *Monitor* resistor at terminals 6 & 7 is presented across the trigger circuit "End Of Line" resistor.

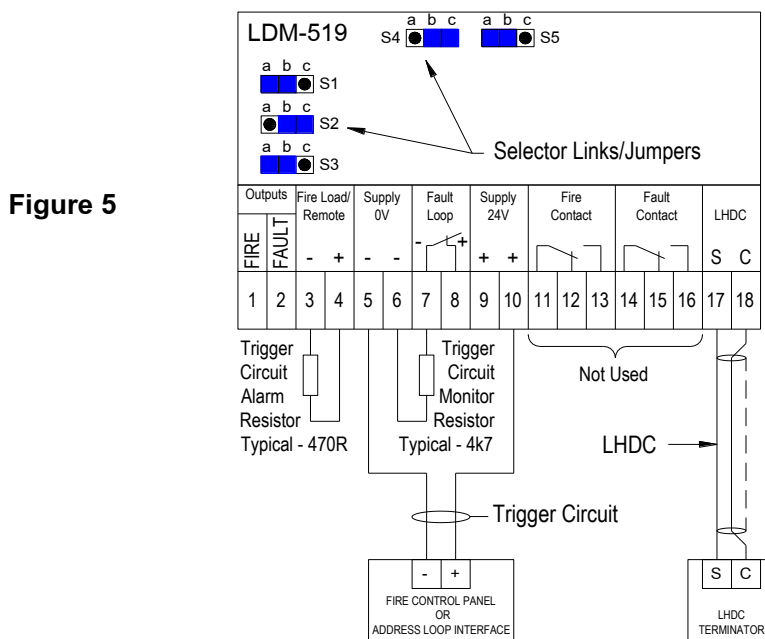
If a LHDC fault is detected the *Monitor* resistor is switched out, and the current drawn from the trigger circuit drops to less than 250µA.

A fault is also signalled if the trigger circuit voltage is too low for correct operation of the unit. (Enabled by S4)

If a Fire condition is detected the *Alarm* resistor at terminals 3 & 4 is presented to the trigger circuit.

Actual *Alarm* and *Monitor* resistor values must be selected as appropriate to the Fire Panel or Address Loop Interface.

The repeat signal relays are disabled in Line Powered mode, by means of selectors S1 and S3, and the contacts at terminals 11 to 16 are not employed.

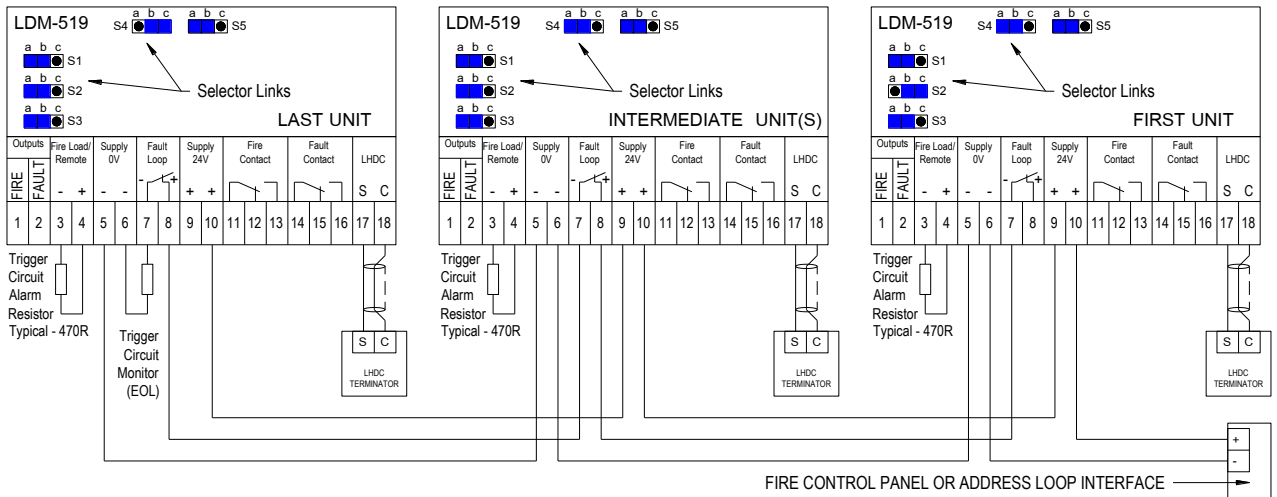


Installation and Unit Configuration cont.

4 Line Powered operation - Multiple

Two or more LDM-519 units may be configured to operate from a single trigger circuit whilst maintaining fault monitoring and signalling. It is necessary to set the jumpers for the first, last and intermediate unit(s) (as shown in Figure 6)

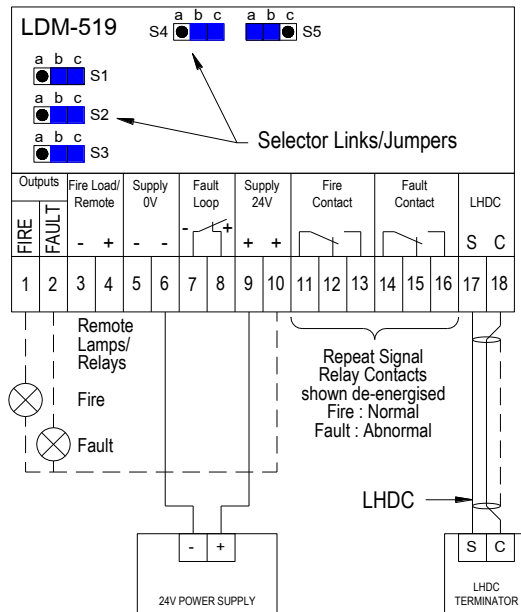
Figure 6



5 Direct powered Operation.

Figure 7 shows a typical configuration

Figure 7



The relays are enabled by the correct positioning of selectors S1 and S3

S2 must be set as shown for correct fault relay signalling.

The Fire relay is normally de-energised.

The Fault relay is normally energised. Remote 24Vdc lamps, LED's or Relay coils may be operated by connections at terminals 1 & 2 as shown.

6 Auto Reset.

The unit may be configured for non latching operation by setting S5 to position b to c. This is not normally recommended when the unit is in line (trigger circuit) powered.

Commissioning

- 1 Isolate any of the commissioning zones

- 2 Zero Level Adjustment
 - 2.1 Disconnect LHDC
 - 2.2 Connect the End-of-Line resistor directly to the LHDC Monitor/Controller so that the LHDC is out of circuit.
 - 2.3 Connect the voltmeter probes between the "COMMON" or "COM" terminal and the "LHDC ADJUST" terminal. This may alternatively be labelled "LHDC" or "ANALOGUE".
 - 2.4 Adjust the "LHDC ADJUST" (or "LHDC" or "ANALOGUE") potentiometer until the voltmeter reads 0v.
 - 2.5 Operate the "Fire Test" pushbutton and note whether the voltmeter indicates a positive or negative voltage swing. Operate the "Reset" pushbutton to return to the normal condition

- 3 Setting Single Alarm/Trip Level
 - 3.1 All Alarm/Trip level adjustments must be set to the same polarity as indicated by the "Fire Test" operation in step 1.5
 - 3.2 Connect the voltmeter between the "COMMON" or "COM" terminal and the "TRIP", "A1" or "A1 TRIP SET" terminal as appropriate.
 - 3.3 Adjust the "TRIP" ("A1" or "A1 TRIP SET") potentiometer to the required trip level determined from the Analogue LHDC Data Sheet D1167.

- 4 System Start-up
 - 4.1 Re-connect the LHDC to the circuit.
 - 4.2 After switch on, allow the system to settle for a period of at least 2 hours.
 - 4.3 Ensure the LHDC Monitor/Controller is in a normal state with no faults or alarms indicated.
 - 4.4 If reassurance is desired, measure the voltage between the "COMMON" (or "COM") terminal and the "LHDC ADJUST" (or "LHDC" or "ANALOGUE") terminal. The voltage indicated should be appropriate for the zone length and actual ambient temperature according to the graph in the Analogue LHDC Data Sheet D1167.
 - 4.5 Ensure the LHDC Monitor/Controller correctly indicates a Fire Alarm when the "Fire Test" push-button is operated and that it returns to the normal condition once reset.
 - 4.6 All alarm and extinguishing functions may now be enabled.

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