Signaline SKM-95

Instruction Manual

LGM PRODUCTS LTD
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Version 2.1

Contents

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1.0 General/Product Features

- The Signaline SKM-95 is a linear heat detector controller
- The maximum length of cable per controller is 300m
- Temperature increases are detected along the entire cable length
- The controller will accept the following cables:
  - Signaline HD, for use in general applications
  - Signaline HD-R, resistant to oils, chemicals and UV light
  - Signaline HD-S, exceptional mechanical protection
- The system is easy and economical to install
- The alarm indicator is in accordance with DIN 14 623
- Approved to DIN/EN 54 pt5 Class C
- The VdS approved certificate No. is G203077

The sensor cable system is an early warning fire detection system when used with the Signaline SKM-95 controller. It can be used to detect fires and over heats on conveyor belts, cable trays or tunnels. For detection in open areas it can be mounted on the ceiling or also be mounted directly above a cable tray.

The sensor cable will self adjust to ambient conditions. It is also unaffected by steam, dust, chemicals (HD-R), or smoke thereby reducing the likelihood of false alarms which can happen with traditional fire detection.

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1.0 General/Product Features

Signaline Analogue Heat Sensing Cable System

1) Controller type SKM-95
2) End of line box for SKM-95 (included)
3) Sensor cable
   - standard (Signaline HD)
   - with Rilsan coated (Signaline HD-R)
   - with Stainless Steel protective braiding (Signaline HD-S)

Sensor Cable Construction

The cable is made of an inner and an outer conductor, the outer conductor is tinned copper braid. The insulation between both conductors is made from a plastic material with a negative temperature coefficient, which means with increasing temperature, the insulation resistance decreases.

In the end of line unit, at the end of the sensor cable, the sensor cable is connected with a defined resistor of 3K6 Ohm. Therefore, the whole system is always monitored for wire breakage (open circuit) and short circuit. A break or a short circuit on one of these conductors causes a fault alarm.

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2.0 Technical Data

Detector

Operating Voltage	Loop powered
Current consumption standby	<2 mA
Current consumption alarm	3.2 mA
Operating protocol	Apollo XP95
Isolator voltage	ca. 14V
Parallel indicator (external)	-Ub max. 10mA
Fire relay contact	N/A
Fault relay contact	N/A
Temperature range	-25°C to +45°C

Indicators

• Fire Alarm	red LED
• Operation	no indication
• Malfunction	yellow LED
Dimensions Controller	110 x 110 x 65 mm
Weight	270g
Color	grey, RAL 9002
Ingress Protection	IP65
Dimensions end of line box W/H/D	80 x 80 x 52 mm

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2.0 Technical Data

Heat Sensing Cable

Signaline HD

- Red outer sheath
- Plastic coaxial conductor
- 3.25 mm sensor cable diameter
- 1.6 Kg per 100 metres

Signaline HD-R

- Black nylon outer sheath (Rilsan)
- plastic coaxial conductor
- 4.00 mm sensor cable diameter
- 3.0 Kg per 100 metres

Signaline HD-S

- Stainless steel outer braid
- Red sheath
- Plastic coaxial conductor
- 4.20 mm sensor cable diameter
- 3.75 Kg per 100 metres

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3.0 Installation Notes

The Signaline SKM-95 Controller connected to the Signaline sensor cable should be mounted in the area requiring protection. The controller and cable are designed and certified in conformity with VdS and EN 54 pt5. Local fire regulations may vary, particularly outside Europe. Always conform to your local fire regulations.

The cable is not to be installed 6 metres higher than the protected area. The sensor cable must be installed as per *Figure 1*. It is important to make sure that the distance between the wall and the sensor cable is at least 0.5 metres. This also applies when laying parallel to beams. Crossing of ceiling beams is possible, but the length of sensor cable on the beams should not be longer than 10% of the overall cable length.

Before you install the sensor cable system, make a sketch drawing of the area which will be monitored and mark out the proposed layout. The sensor cable must be laid out in accordance with BS, EN, DIN or your local regulations. The following points should be adhered to:

- The sensor cable should not have any contact with a material which cools the cable because this causes an alarm delay
- Laying on sharp objects and crushing the cable is to be avoided so that the outer insulation of the sensor cable is not damaged

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3.0 Installation Notes

- When connecting two lengths of sensor cable use a Signaline Universal Connector Box (Signaline UCB) available from your local Signaline distributor.

- The minimum bend radius for Signaline Analogue Heat Sensing Cables are as follows:
  - HD - 5mm
  - HD-R - 18mm
  - HD-S - 20mm

- It is not advisable to mount Signaline Analogue Heat Sensing Cables in direct contact with a surface. Please see www.signaline.com for suitable fixing solutions. See *Figure 3* for an example of a fixing solution.

- The distance between the fixing clips should not exceed 1m.

- Mounting the sensor cable near objects which radiate heat must be avoided. These could be powerful light sources, steam pipes, heaters or similar and may cause false alarms.

- The end of line box must be mounted in the same zone as the controller.

- The end of line box should, where possible, be mounted at a height of 1,80m (+10cm/-20cm) and marked with a sign.

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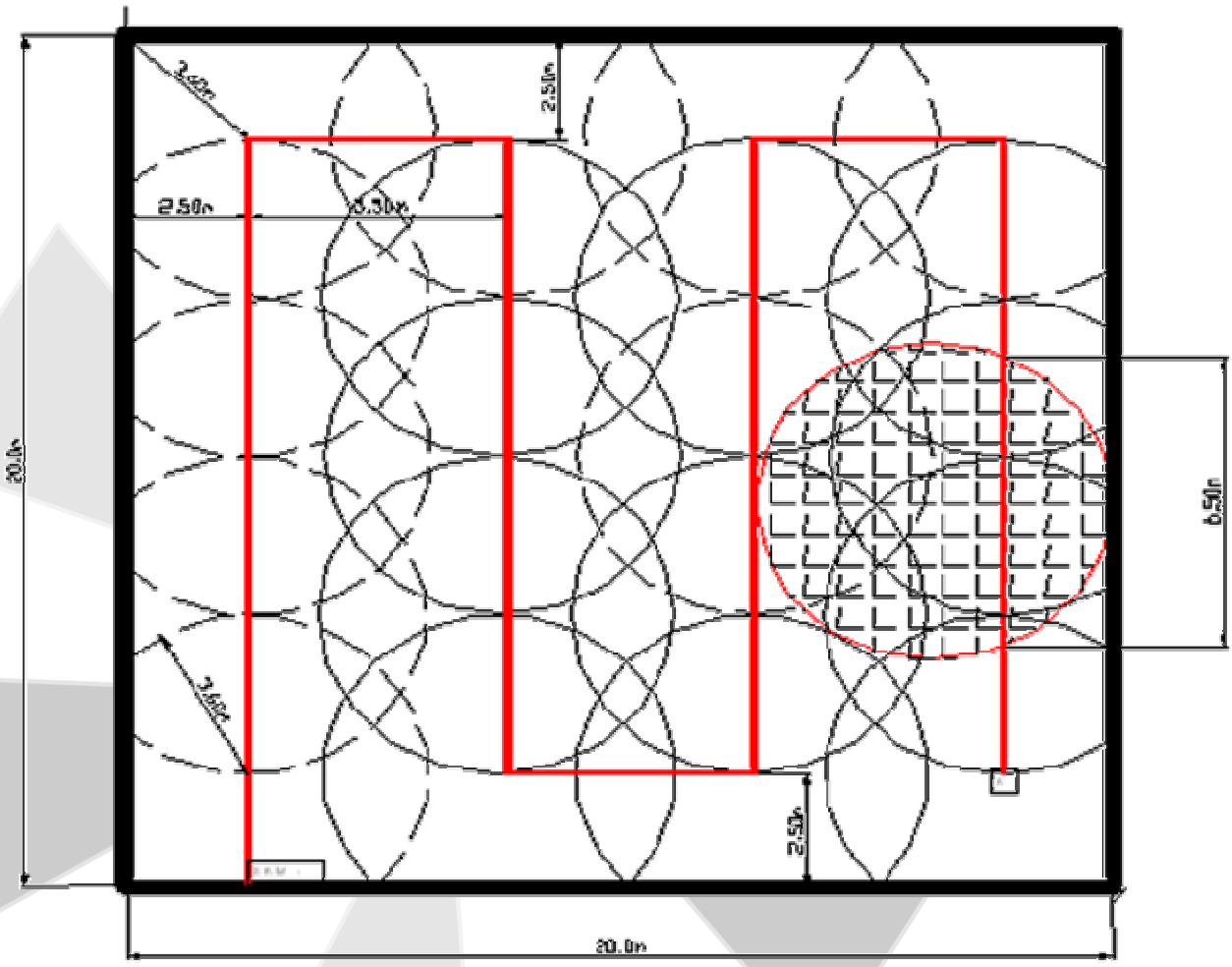
3.1 Complete Monitoring in Accordance with EN54 pt5

Figure 1 demonstrates a detection system which is in accordance with EN54 pt5 for 5 metres of sensor cable. It is important to make sure that from every point of the monitored area at least 5 metres of sensor cable is located within a radius of 3.6m.

Figure 1



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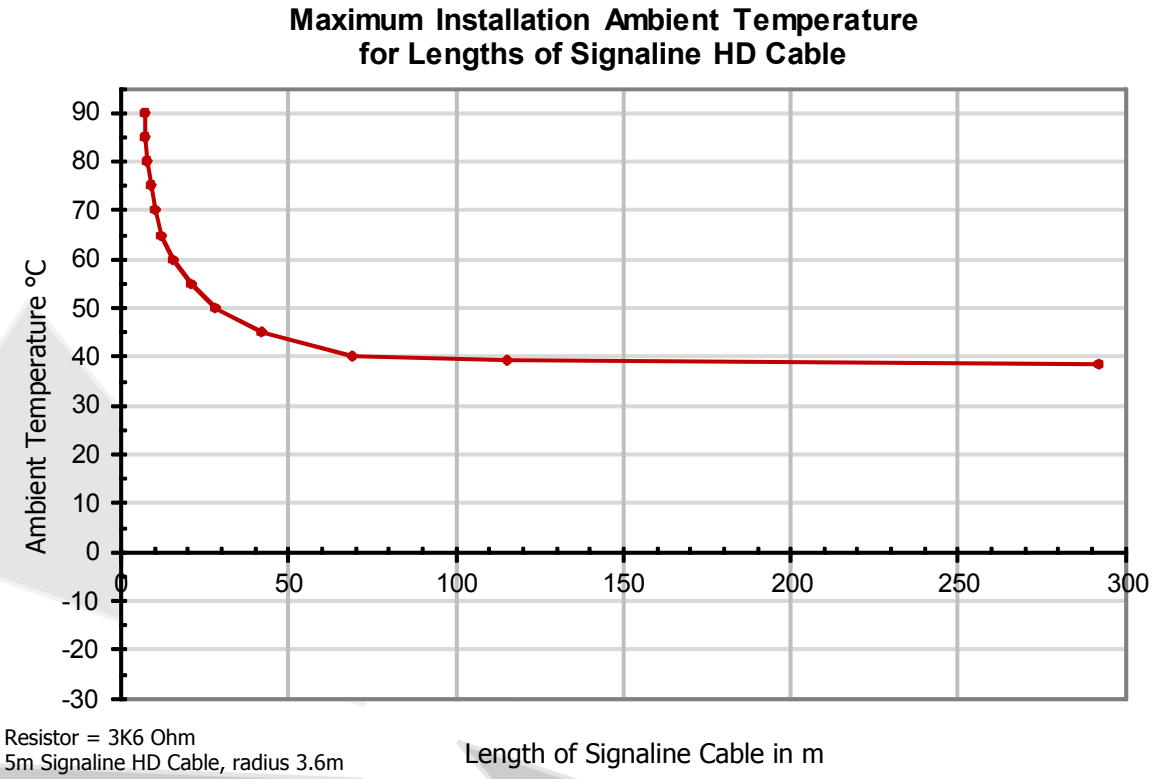
3.2 Maximum Cable Length

The Figure below shows the maximum allowed cable length dependent on the maximum ambient temperature

Figure 2



An alarm will be detected when 5 metres of sensor cable is heated between 84°C and 100°C. If a large length of Signaline Analogue Heat Sensing Cable is heated then the alarm temperature will be proportionally lower.

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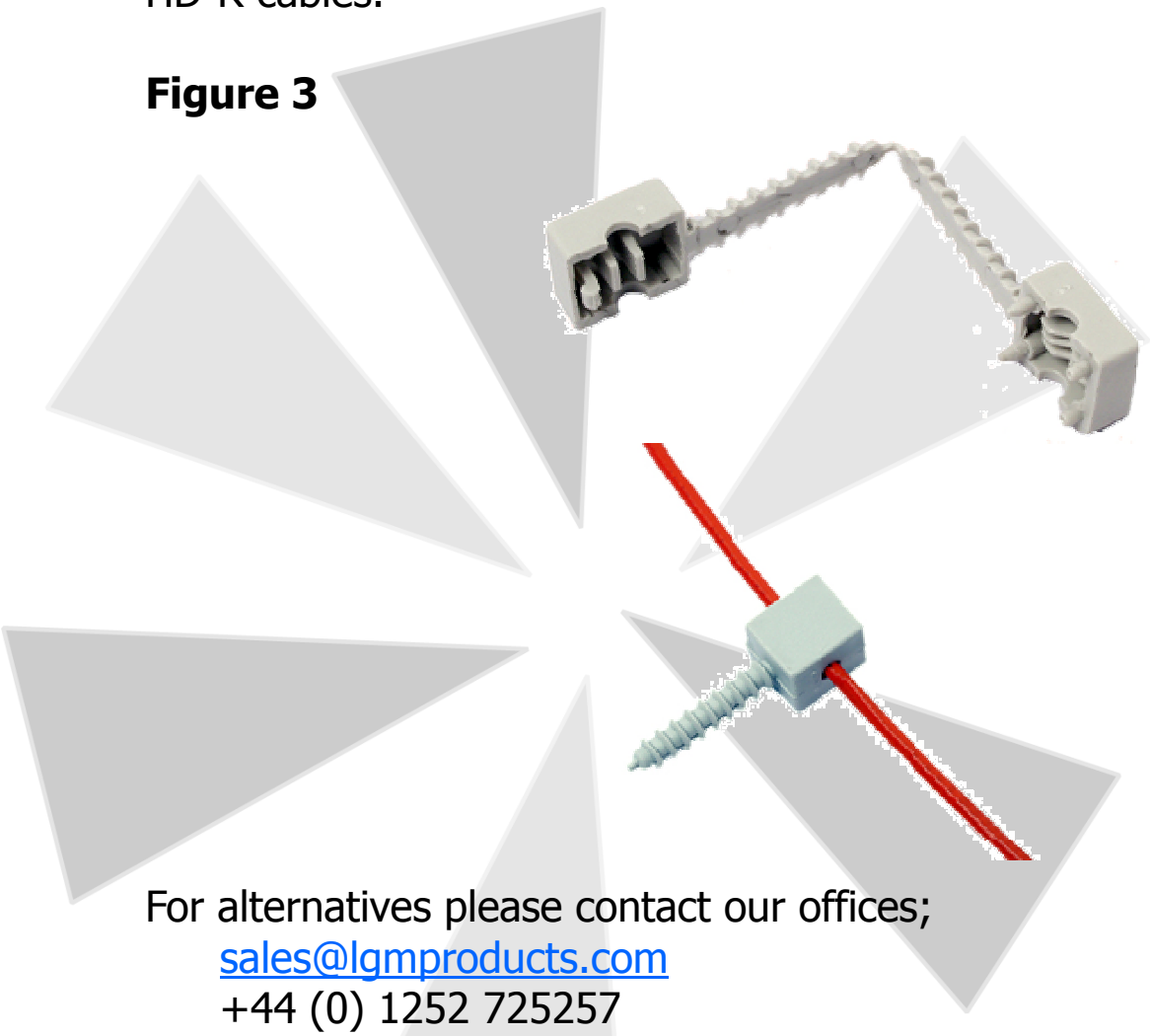
4.0 Assembly Tools

To attach the sensor cable to the protected area you can use different clips depending on your application. The cable should be at least 5mm away from the ceiling.

The K clip is simple and easy to install, allowing lower installation time and cost. Simply drill a 6mm Ø hole, click the cable in place, and plug it in. K clips can be used with Signaline HD and Signaline HD-R cables.

Figure 3



For alternatives please contact our offices;

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5.0 Control Unit Indicators

The indicators for alarm and fault alarm are visible through the clear cover on the controller housing.

The alarm indicator is compliant with DIN 14 623

Figure 4

- When there is no LED illuminated the Signaline SKM-95 Controller is operational
- If there is a yellow LED then the Signaline SKM-95 Controller has a fault
- When the red LED is illuminated then the Signaline SKM-95 controller is indicating a fire

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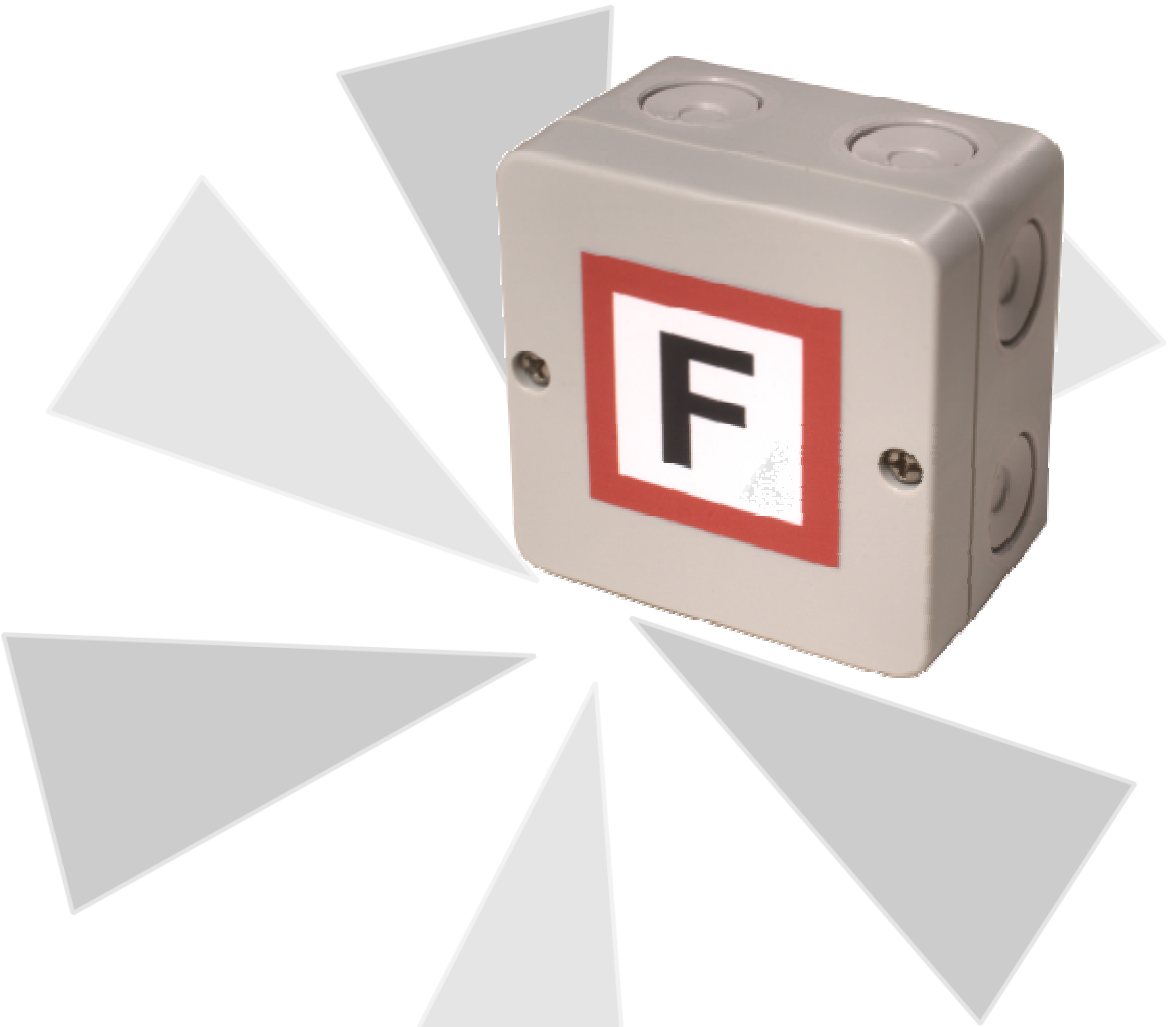
5.1 End of Line Unit

Signaline SKM-95 End of Line Unit

In the end of line unit (*Figure 5*) you will find a 3K6 Ohm resistor. This is used for monitoring incase of a cable break or short circuit. There is no setup required for this unit

Figure 5



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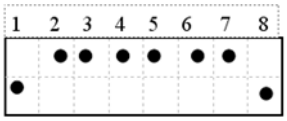
6.0 Address Codes and Wiring



Address/Switch position:
ON = 0 OFF = 1, use switch 8 to test alarm

1234567	1234567	1234567	1234567
1=1000000	33=1000010	65=1000001	97=1000011
2=0100000	34=0100010	66=0100001	98=0100011
3=1100000	35=1100010	67=1100001	99=1100011
4=0010000	36=0010010	68=0010001	100=0010011
5=1010000	37=1010010	69=1010001	101=1010011
6=0110000	38=0110010	70=0110001	102=0110011
7=1110000	39=1110010	71=1110001	103=1110011
8=0001000	40=0001010	72=0001001	104=0001011
9=1001000	41=1001010	73=1001001	105=1001011
10=0101000	42=0101010	74=0101001	106=0101011
11=1101000	43=1101010	75=1101001	107=1101011
12=0011000	44=0011010	76=0011001	108=0011011
13=1011000	45=1011010	77=1011001	109=1011011
14=0111000	46=0111010	78=0111001	110=0111011
15=1111000	47=1111010	79=1111001	111=1111011
16=0000100	48=0000110	80=0000101	112=0000111
17=1000100	49=1000110	81=1000101	113=1000111
18=0100100	50=0100110	82=0100101	114=0100111
19=1100100	51=1100110	83=1100101	115=1100111
20=0010100	52=0010110	84=0010101	116=0010111
21=1010100	53=1010110	85=1010101	117=1010111
22=0110100	54=0110110	86=0110101	118=0110111
23=1110100	55=1110110	87=1110101	119=1110111
24=0001100	56=0001110	88=0001101	120=0001111
25=1001100	57=1001110	89=1001101	121=1001111
26=0101100	58=0101110	90=0101101	122=0101111
27=1101100	59=1101110	91=1101101	123=1101111
28=0011100	60=0011110	92=0011101	124=0011111
29=1011100	61=1011110	93=1011101	125=1011111
30=0111100	62=0111110	94=0111101	126=0111111
31=1111100	63=1111110	95=1111101	
32=0000010	64=0000001	96=0000011	

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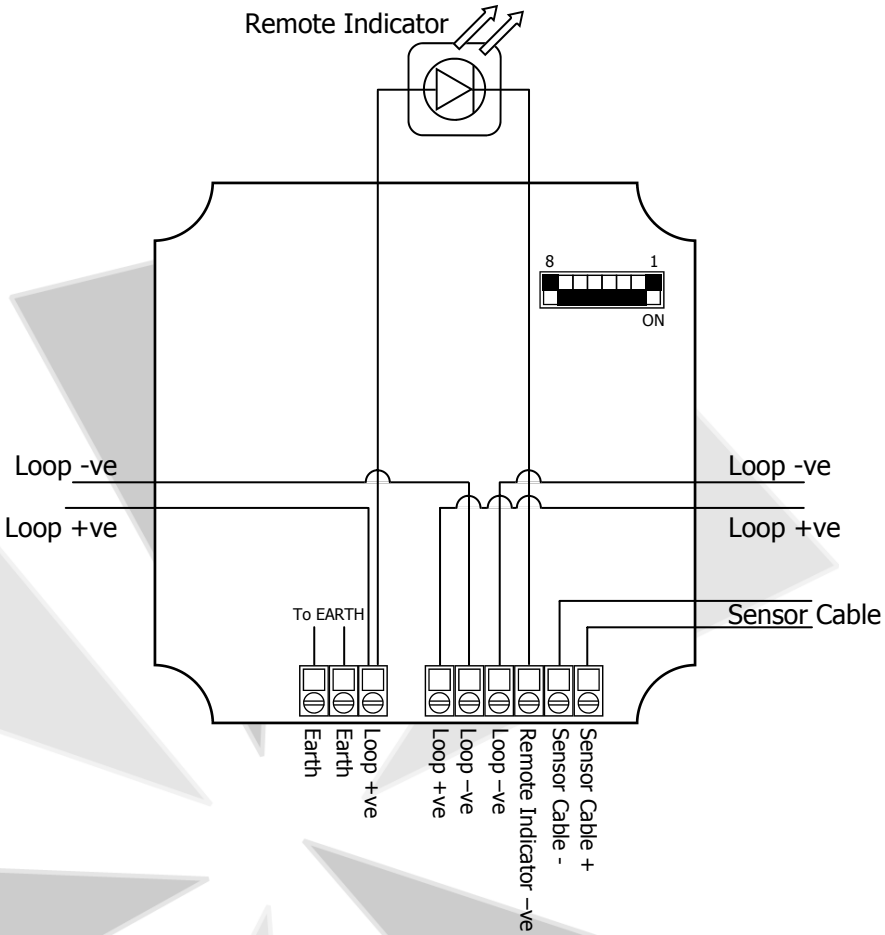
6.0 Address Codes and Wiring

Connect the cable as shown in *Figure 6* below.

Figure 6



How to test the alarm

- Use dip switch 8
- Change the EOL resistor to a 2K Ohm resistor in place of the 3K2 Ohm resistor. Reset the 3K2 Ohm resistor after test

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7.0 Testing the System

Loop Device Recognition

Most Apollo XP95 or Discovery compatible panels should recognize the SKM-95 controller as an Apollo XP95 heat detector. Some panels recognise the SDKM-95 controller as an Apollo XP95 High Temperature Heat detector.

Simulated Test

The controller will simulate a fire condition if the when address switch 8 is moved to the ON position

Heat Test

Using a hot air gun, heating 5 metres of sensor cable to 100°C (max. 115°C) will raise an alarm. When the cable has cooled, the controller may be reset.

IMPORTANT NOTE: If the sensor cable is heated up to 150°C or more then that part of the cable cannot be used any more and should be replaced.

WARNING: Obtain permission of the site safety manager before starting live heat tests. Live heat tests MUST NOT be conducted in a designated hazardous area or when the Signaline HD sensor cable forms part of an intrinsically circuit.

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8.0 Calculating the Installed Length of Sensor Cable

If the total length of an installed sensor cable is not know, it is possible to be calculated with the help of a multi-meter. For this then both wires of the sensor cable should be clamped together in the end of line unit. The resistance of the cable should then be measured at the other end. The sensor cable has a resistance of 0.2 Ohms per metre.

The cable length is calculated as follows:

$$\text{Length in metres} = \frac{\text{resistance (Ohms)}}{0.2\ (^{W}/_{m})}$$

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9.0 Installing Sensor Cable in a Car Park

Figure 7

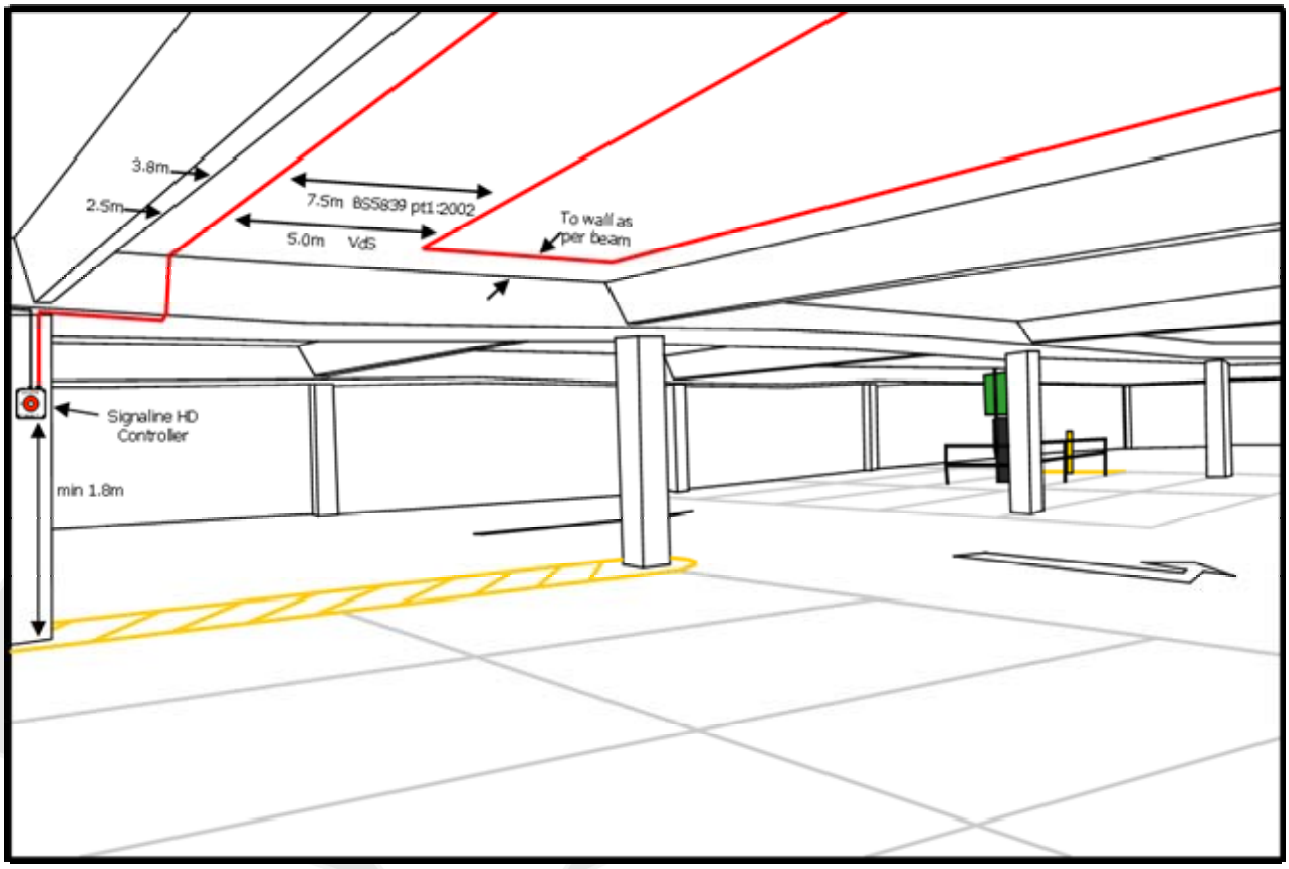

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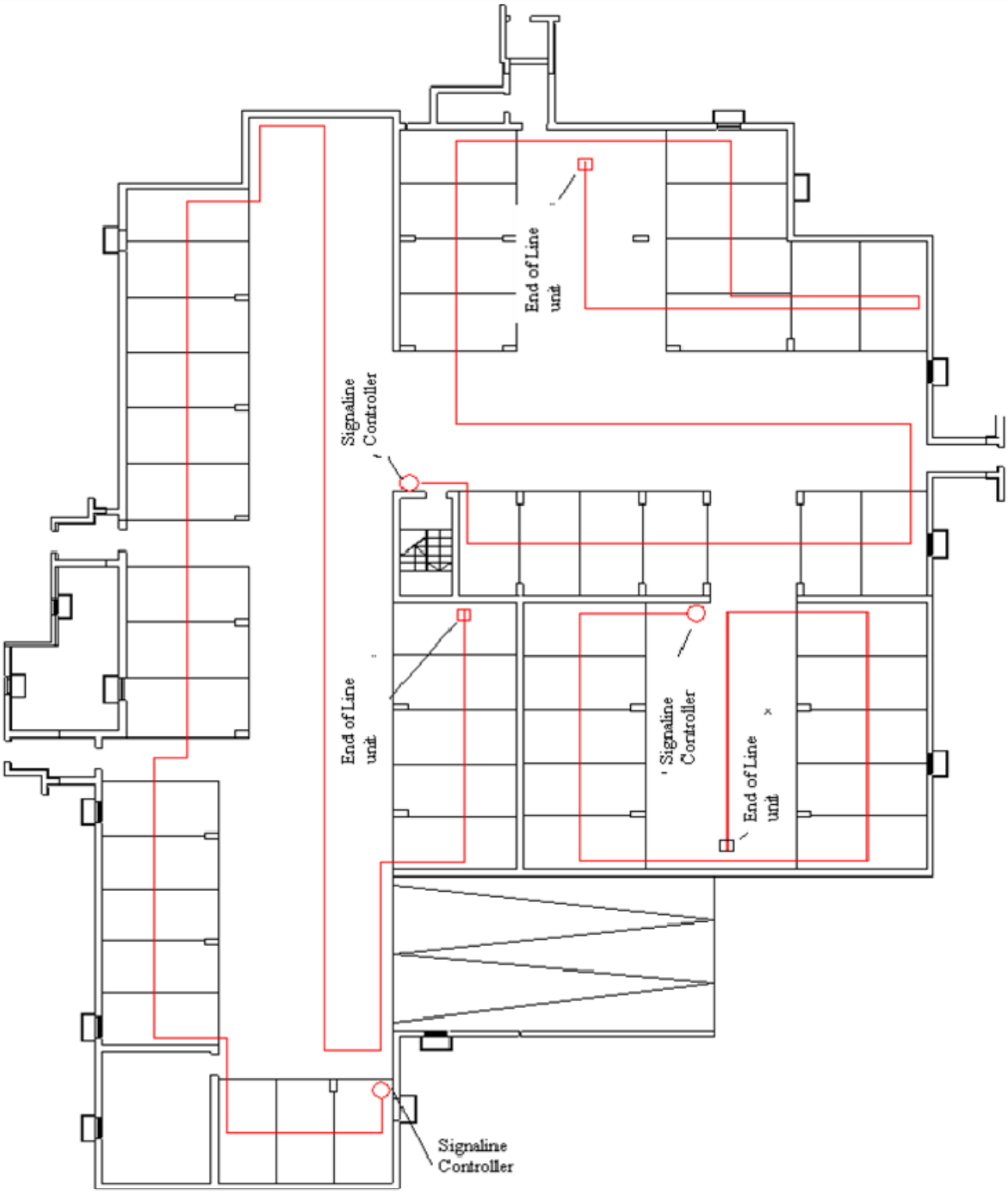
Figure 8



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10.0 Troubleshooting

Error	Possible Solution
Yellow LED alight	Is there a short circuit on the loop? Is the end of line box connected? Is the cable broken? +/- reversed loop? Is the cable crushed or too tightly bent?
Controller is not detected or address not found	Is the address correctly set on the dip switches? Do two devices have the same address? Is the controller in an isolated part of the loop? Fault on the panel?

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