**LINEAR HEAT DETECTION (LHD)**

**Linesense Digital Linear Heat Detection** cable is a simple and reliable product providing uninterrupted detection along its length.

The sensing cable is formed from a pair of twisted steel conductors each with temperature sensitive insulation and then an overall outer sleeve. When the temperature sensitive insulation reaches its predetermined alarm temperature the two conductors short together providing the digital alarm signal.

The cable can be connected to any unit capable of monitoring a switched or digital alarm signal, i.e. Conventional fire panel, addressable switch monitor unit or PLC. The fire detection capability can be enhanced when the LHD is used in conjunction with the Digital Location Interface (DLI).

LHD cable is classified as a “simple device” and so with the use of suitable Intrinsically Safe (IS) barriers to limit the energy to a safe level, it can be used in hazardous areas.

The LHD cable can be cut to length as required and with it’s ease of installation and low maintenance it provides a cost effective solution where project expenditure requires to be kept at a minimum.

Having a fixed alarm temperature, the operation of the digital LHD is unaffected by changes in the ambient temperature.

The Linesense Linear Heat Detection cable has the widest range of Alarm temperatures 68°C to 240°C

<table>
<thead>
<tr>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple switch / digital alarm operation</td>
</tr>
<tr>
<td>Continuous uninterrupted sensing along the total length of the element.</td>
</tr>
<tr>
<td>Fixed alarm temperature. Unaffected by changes in ambient temperature.</td>
</tr>
<tr>
<td>Compatible with switch monitoring units and conventional alarm panels.</td>
</tr>
<tr>
<td>Suitable for use in Hazardous areas using safety barriers.</td>
</tr>
<tr>
<td>Widest range of alarm temperatures 68°C to 240°C</td>
</tr>
<tr>
<td>Simple maintenance free installation.</td>
</tr>
<tr>
<td>Small diameter and bend radius.</td>
</tr>
<tr>
<td>FM Approved</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conveyors / bearing protection</td>
</tr>
<tr>
<td>Escalators, moving walkways.</td>
</tr>
<tr>
<td>Petro-chemical storage tanks, rim seal protection</td>
</tr>
<tr>
<td>Cable tunnel / tray protection</td>
</tr>
<tr>
<td>Road and rail tunnels</td>
</tr>
<tr>
<td>Road and rail motor compartments</td>
</tr>
<tr>
<td>Electrical switch gear &amp; transformers</td>
</tr>
<tr>
<td>Refrigerated rooms and cold stores.</td>
</tr>
<tr>
<td>Building fascia’s, exteriors under eaves</td>
</tr>
<tr>
<td>Motor and pump overheat detection.</td>
</tr>
<tr>
<td>Dirty and dusty environments.</td>
</tr>
</tbody>
</table>
LINEAR HEAT DETECTION (LHD)

H8040N 68°C
- Alarm temperature: 68°C Nominal
- Max amb temperature: 45°C
- Min operating temperature: -40°C
- Min installation temperature: -15°C
- Pt No. 51100-068

H8045N 85°C
- Alarm temperature: 85°C Nominal
- Max amb temperature: 45°C
- Min operating temperature: -40°C
- Min installation temperature: -15°C
- Pt No. 51100-085

H8028 105°C
- Alarm temperature: 105°C Nominal
- Max amb temperature: 70°C
- Min operating temperature: -30°C
- Min installation temperature: -0°C
- Pt No. 51100-105

H8069 176°C
- Alarm temperature: 176°C Nominal
- Max amb temperature: 105°C
- Min operating temperature: -49°C
- Min installation temperature: -0°C
- Pt No. 51100-176

H9650 240°C
- Alarm temperature: 240°C Nominal
- Max amb temperature: 200°C
- Min operating temperature: -50°C
- Min installation temperature: -20°C
- Pt No. 51100-240

See individual data sheets for further details.
H8040N
LINEAR HEAT DETECTION (LHD)
(68°C, 155°F Nominal)

Features

- Simple digital switch operation
- Continuous sensing along the total length of the element.
- Fixed alarm temperature. Unaffected by changes in ambient temperature.
- Compatible with switch monitoring units and conventional alarm panels.
- Suitable for use in Hazardous areas using safety barriers.
- Chemical & water resistant
- Rugged and durable construction.
- Simple maintenance free installation.
- Small diameter and bend radius.
- FM Approved,

General

The simple and proven technology of digital Linear Heat Detection (LHD) cable, makes it a product of choice for difficult and challenging applications where other technologies struggle to work.

With its ease of installation and low maintenance it also provides a cost effective solution where project expenditure requires to be kept at a minimum.

The sensing cable is formed from a pair of twisted steel conductors each with temperature sensitive insulation and then an overall Nylon outer sleeve. When the temperature sensitive insulation reaches its predetermined alarm temperature the two conductors short together providing the digital or switched signal.

The cable can be connected to any unit capable of monitoring a switched signal, i.e. Conventional fire panel, addressable switch monitor unit or PLC.

The nylon outer sleeve of the H8040N offers good chemical and water resistance, allowing it to be deployed in harsh and dirty environments.

Applications

- Conveyors / bearing protection
- Escalators, moving walkways.
- Petro-chemical storage tanks, rim seal protection
- Cable tunnel / tray protection
- Road and rail tunnels
- Road and rail motor compartments
- Electrical switch gear & transformers
- Refrigerated rooms and cold stores.
- Building exteriors under eaves
- Motor and pump overheat detection.
- Dirty and dusty environments.
H8040N
LINEAR HEAT DETECTION (LHD)
(68°C, 155°F Nominal)

Specifications.
Alarm temperature : 68°C
Max amb temperature : 45°C
Min operating temperature : -40°C
Min installation temperature : -15°C

Mechanical
Outside Diameter : 3.35mm
Colour : Black.
Number of cores : 2
Core diameters : 0.9mm
Core colours: Black and red.
Minimum bend radius : 50mm (Cold store 100mm)
Weight : 18Kg/Km on the reel.
(weight of reel typically 2Kg)

Electrical
Resistance : 100 ohms / Km @ 20°C
Capacitance : 45 pF to 130 pF
Inductance : 0.74 μH to 1.3 μH
Voltage rating : 110vdc 1amp

Time to detect small flame : 5 sec (Flame touching)

Ordering Information
Part Number Description
51100-068 H8040N sensing cable 68°C Alarm temperature
Black Nylon outer sleeve. (ordered by the meter)

Optional
52100-001 DLI-2K Digital Location Interface 2Km
52100-002 DLI-10K Digital Location Interface 10Km
52101-001 DIM Digital Interface Module DIN rail mounted.
53000-001 Portable test oven 1m
H8045N
LINEAR HEAT DETECTION (LHD)
(85°C, 185°F Nominal)

General
The simple and proven technology of digital Linear Heat Detection (LHD) cable, makes it a product of choice for difficult and challenging applications where other technologies struggle to work.

With its ease of installation and low maintenance it also provides a cost effective solution where project expenditure requires to be kept at a minimum.

The sensing cable is formed from a pair of twisted steel conductors each with temperature sensitive insulation and then an overall Nylon outer sleeve. When the temperature sensitive insulation reaches its predetermined alarm temperature the two conductors short together providing the digital or switched signal.

The cable can be connected to any unit capable of monitoring a switched signal, i.e. Conventional fire panel, addressable switch monitor unit or PLC.

The nylon outer sleeve of the H8045N offers good chemical and water resistance, allowing it to be deployed in harsh and dirty environments.

Features
- Simple digital switch operation
- Continuous sensing along the total length of the element.
- Fixed alarm temperature. Unaffected by changes in ambient temperature.
- Compatible with switch monitoring units and conventional alarm panels.
- Suitable for use in Hazardous areas using safety barriers.
- Chemical & water
- Rugged and durable construction.
- Simple maintenance free installation.
- Small diameter and bend radius.
- FM Approved,

Applications
- Conveyors / bearing protection
- Escalators, moving walkways.
- Petro-chemical storage tanks, rim seal protection
- Cable tunnel / tray protection
- Road and rail tunnels
- Road and rail motor compartments
- Electrical switch gear & transformers
- Refrigerated rooms and cold stores.
- Building exteriors under eaves
- Motor and pump overheat detection.
- Dirty and dusty environments.
Specifications.
Alarm temperature : 85°C
Max amb temperature : 45°C
Min operating temperature : -40°C
Min installation temperature : -15°C

Mechanical
Outside Diameter : 3.35mm
Colour : Black.
Number of cores : 2
Core diameters : 0.9mm
Core colours: Black and red.
Minimum bend radius : 50mm (Cold store 100mm)
Weight : 18Kg/Km on the reel.
(weight of reel typically 2Kg)

Electrical
Resistance : 100 ohms / Km @ 20°C
Capacitance : 45 pF to 130 pF
Inductance : 0.74 µH to 1.3 µH
Voltage rating : 110vdc 1amp

Time to detect small flame : 5 sec (Flame touching)

Ordering Information
Part Number Description
51100-085 H8045N sensing cable 85°C Alarm temperature
Black Nylon outer sleeve. (ordered by the meter)

Optional
52100-001 DLI-2K Digital Location Interface 2Km
52100-002 DLI-10K Digital Location Interface 10Km
52101-001 DIM Digital Interface Module DIN rail mounted.
53000-001 Portable test oven 1m
H8028
LINEAR HEAT DETECTION (LHD)
(105°C, 221°F Nominal)

General
The simple and proven technology of digital Linear Heat Detection (LHD) cable, makes it a product of choice for difficult and challenging applications where other technologies struggle to work.

With it’s ease of installation and low maintenance it also provides a cost effective solution where project expenditure requires to be kept at a minimum.

The sensing cable is formed from a pair of twisted steel conductors each with temperature sensitive insulation and then an overall PVC outer sleeve. When the temperature sensitive insulation reaches it’s predetermined alarm temperature the two conductors short together providing the digital or switched signal.

The cable can be connected to any unit capable of monitoring a switched signal, i.e. Conventional fire panel, addressable switch monitor unit or PLC.

The PVC outer sleeve of the H8028 offers good UV resistance allowing it to be deployed in external applications.

Features
- Simple digital switch operation
- Continuous sensing along the total length of the element.
- Fixed alarm temperature. Unaffected by changes in ambient temperature.
- Compatible with switch monitoring units and conventional alarm panels.
- Suitable for use in Hazardous areas using safety barriers.
- UV resistant PVC outer sleeve.
- Rugged and durable construction.
- Simple maintenance free installation.
- Small diameter and bend radius.
- FM Approved,

Applications
- Conveyors / bearing protection
- Escalators, moving walkways.
- Cable tunnel / tray protection
- Road and rail tunnels
- Road and rail motor compartments
- Electrical switch gear & transformers
- Refrigerated rooms and cold stores.
- Building exteriors under eaves
- Motor and pump overheat detection.
- Dirty and dusty environments.
**Specifications.**

- **Alarm temperature:** 105°C
- **Max amb temperature:** 70°C
- **Min operating temperature:** -30°C
- **Min installation temperature:** 0°C

**Mechanical**

- **Outside Diameter:** 4.25mm
- **Colour:** Black.
- **Number of cores:** 2
- **Core diameters:** 0.9mm
- **Core colours:** Black and red.
- **Minimum bend radius:** 50mm (Cold store 100mm)
- **Weight:** 25.0Kg/Km on the reel.
  (weight of reel typically 2Kg)

**Electrical**

- **Resistance:** 100 ohms / Km @ 20°C
- **Capacitance:** 45 pF to 130 pF
- **Inductance:** 0.74 µH to 1.3 µH
- **Voltage rating:** 110vdc 1amp

**Time to detect small flame:** 12 sec (Flame touching)

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>51100-105</td>
<td>H8028 sensing cable 105°C Alarm temperature Black PVC outer sleeve. (ordered by the meter)</td>
</tr>
</tbody>
</table>

**Optional**

- **52100-001**  DLI-2K Digital Location Interface 2Km
- **52100-002**  DLI-10K Digital Location Interface 10Km
- **52101-001**  DIM Digital Interface Module DIN rail mounted.
- **53000-001**  Portable test oven 1m
General

The simple and proven technology of digital Linear Heat Detection (LHD) cable, makes it a product of choice for difficult and challenging applications where other technologies struggle to work.

With its ease of installation and low maintenance it also provides a cost effective solution where project expenditure requires to be kept at a minimum.

The sensing cable is formed from a pair of twisted steel conductors each with temperature sensitive insulation and then an overall PVC outer sleeve. When the temperature sensitive insulation reaches its predetermined alarm temperature the two conductors short together providing the digital or switched signal.

The cable can be connected to any unit capable of monitoring a switched signal, i.e. Conventional fire panel, addressable switch monitor unit or PLC.

The PVC outer sleeve of the H8069 offers good UV resistance allowing it to be deployed in external applications.

Features

- Simple digital switch operation
- Continuous sensing along the total length of the element.
- Fixed alarm temperature. Unaffected
- Compatible with switch monitoring units and conventional alarm panels.
- Suitable for use in Hazardous areas using safety barriers.
- UV resistant PVC outer sleeve.
- Rugged and durable construction.
- Simple maintenance free installation.
- Small diameter and bend radius.
- FM Approved.

Applications

- Conveyors / bearing protection
- Escalators, moving walkways.
- Cable tunnel / tray protection
- Road and rail tunnels
- Road and rail motor compartments
- Electrical switch gear & transformers
- Refrigerated rooms and cold stores.
- Building exteriors under eaves
- Motor and pump overheat detection.
- Dirty and dusty environments.
H8069
LINEAR HEAT DETECTION (LHD)
(176°C, 349°F Nominal)

Specifications.
Alarm temperature : 176°C
Max amb temperature : 105°C
Min operating temperature : -40°C
Min installation temperature : 0°C

Mechanical
Outside Diameter : 4.35mm
Colour : Black.
Number of cores : 2
Core diameters : 0.9mm
Core colours: Black and Black/White.
Minimum bend radius : 50mm (Cold store 100mm)
Weight : 21.0Kg/Km on the reel.
(weight of reel typically 2Kg)

Electrical
Resistance : 100 ohms / Km @ 20°C
Capacitance : 45 pF to 130 pF
Inductance : 0.74 μH to 1.3 μH
Voltage rating : 110vdc 1amp

Time to detect small flame : 20 sec (Flame touching)

Ordering Information
Part Number Description
51100-176 H8069 sensing cable 176°C Alarm temperature
Red PVC outer sleeve. (ordered by the meter)

Optional
52100-001 DLI-2K Digital Location Interface 2Km
52100-002 DLI-10K Digital Location Interface 10Km
52101-001 DIM Digital Interface Module DIN rail mounted.
53000-001 Portable test oven 1m
H9650
LINEAR HEAT DETECTION (LHD)
(240°C, 464°F Nominal)

Features

- Simple digital switch operation
- Continuous sensing along the total length of the element.
- Fixed alarm temperature. Unaffected by changes in ambient temperature.
- Compatible with switch monitoring units and conventional alarm panels.
- Suitable for use in Hazardous areas using safety barriers.
- Chemical & water resistant Fluoropolymer outer sleeve.
- Rugged and durable construction.
- Simple maintenance free installation.
- Small diameter and bend radius.
- FM Approved

General

The simple and proven technology of digital Linear Heat Detection (LHD) cable, makes it a product of choice for difficult and challenging applications where other technologies struggle to work.

With its ease of installation and low maintenance it also provides a cost effective solution where project expenditure requires to be kept at a minimum.

The sensing cable is formed from a pair of twisted steel conductors each with temperature sensitive insulation and then an overall Fluoropolymer outer sleeve. When the temperature sensitive insulation reaches its predetermined alarm temperature the two conductors short together providing the digital or switched signal.

The cable can be connected to any unit capable of monitoring a switched signal, i.e. Conventional fire panel, addressable switch monitor unit or PLC.

The Fluoropolymer outer sleeve of the H9650 offers excellent chemical and water resistance, allowing it to be deployed in harsh and dirty environments.

Applications

- Conveyors / bearing protection
- Escalators, moving walkways.
- Petro-chemical storage tanks, rim seal protection
- Cable tunnel / tray protection
- Road and rail tunnels
- Road and rail motor compartments
- Electrical switch gear & transformers
- Refrigerated rooms and cold stores.
- Building exteriors under eaves
- Motor and pump overheat detection.
- Dirty and dusty environments.
Specifications.
Alarm temperature : 240°C
Max amb temperature : 200°C
Min operating temperature : -50°C
Min installation temperature : -20°C

Mechanical
Outside Diameter : 3.5mm
Colour : White.
Number of cores : 2
Core diameters : 0.9mm
Core colours: Black and white.
Minimum bend radius : 50mm (Cold store 100mm)
Weight : 24.0Kg/Km on the reel.
(weight of reel typically 2Kg)

Electrical
Resistance : 100 ohms / Km @ 20°C
Capacitance : 45 pF to 130 pF
Inductance : 0.74 μH to 1.3 μH
Voltage rating : 110vdc 1amp

Time to detect small flame : 20 sec (Flame touching)

Ordering Information
Part Number Description
51100-240 H9650 sensing cable 240°C Alarm temperature
White Fluoropolymer outer sleeve. (ordered by the meter)

Optional
52100-001 DLI-2K Digital Location Interface 2Km
52100-002 DLI-10K Digital Location Interface 10Km
52101-001 DIM Digital Interface Module
53000-001 Portable test oven 1m
End Of Line (EOL) units are used in conjunction with the Interface modules to terminate the Linear Heat Detection (LHD) cable and contain the appropriate EOL component or device. This allows the modules to monitor the LHD for any open circuit fault conditions.

Units fitted with test switches allow the alarm system to be tested for Fire and Fault conditions without the need for destructive use of any LHD.

The units are available in a number of different materials to suit different applications and environments.

**Pt Number** | **End Of Line units for** | **Digital Location Interface (DLI) modules.**
---|---|---
53100-001 | **Polycarbonate (PC) box.** | Suitable for most applications. Supplied with 1 x PG 7 cable gland. IP66. Dimensions 120 x 80 x 57 mm

53100-003 | **316 Stainless Steel box.** | Suitable for harsh environments. Supplied with 1 x M16 stainless steel cable gland. IP 65. Dimensions 126 x 126 x 80 mm.

53100-012 | **Aluminium box with internal test switches.** | Suitable for harsh environments. Supplied with an internal switches for testing Fire and Fault, 1 x PG 7 cable gland. IP66. Dimensions 75 x 80 x 57 mm

53100-013 | **316 Stainless Steel box with external key switch.** | Suitable for harsh environments. Supplied with an external key switch for testing Fire and Fault, 1 x M16 cable gland. IP65. Dimensions 126 126 x 80 mm

53100-014 | **ABS box with external key switch.** | Supplied with an external key switch for testing Fire and Fault, 1 x PG 7 cable gland. IP66. Dimensions 120 x 120 x 80 mm
<table>
<thead>
<tr>
<th>Pt Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>53101-001</td>
<td><strong>Polycarbonate (PC) box.</strong> Suitable for most applications. Supplied with 1 x PG 7 cable gland. IP66. Dimensions 120 x 80 x 57 mm</td>
</tr>
<tr>
<td>53101-003</td>
<td><strong>316 Stainless box.</strong> Suitable for harsh environments. Supplied with 1 x M16 stainless steel cable gland. IP 65. Dimensions 126 x 126 x 80 mm</td>
</tr>
<tr>
<td>53101-012</td>
<td><strong>Aluminium box with internal test switches.</strong> Suitable for harsh environments. Supplied with an internal switches for testing Fire and Fault, 1 x PG 7 cable gland. IP66. Dimensions 75 x 80 x 57 mm</td>
</tr>
<tr>
<td>53101-013</td>
<td><strong>316 Stainless Steel box with external key switch.</strong> Suitable for harsh environments. Supplied with an external key switch for testing Fire and Fault, 1 x M16 cable gland. IP65. Dimensions 126 x 126 x 80 mm</td>
</tr>
<tr>
<td>53101-014</td>
<td><strong>ABS box with external key switch.</strong> Supplied with an external key switch for testing Fire and Fault, 1 x PG 7 cable gland. IP66. Dimensions 120 x 120 x 80 mm</td>
</tr>
</tbody>
</table>
Linesense provide the following selection of fixings and clips to retain the Linear Heat Detection (LHD) cable in place. Fixings should be placed at intervals of no more than 1.2m apart.

<table>
<thead>
<tr>
<th>Pt Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>700-600</td>
<td>Cable Tie - length 200mm</td>
</tr>
<tr>
<td>700-602</td>
<td>Cable Tie - length 300mm</td>
</tr>
<tr>
<td>700-608</td>
<td>Neoprene insulating protection sleeve 40mm Provides protection to the sleeve of the LHD cable when fixing with cable ties and recommended where sharp edges are likely to cut the insulation.</td>
</tr>
<tr>
<td>700-611</td>
<td>Knock on edge clip (side) 2 to 3mm MS Galvanised. Ideal for installing LHD onto girders, metal beams and steel work. Neoprene sleeve not included.</td>
</tr>
<tr>
<td>700-612</td>
<td>Knock on edge clip (side) 3 to 7mm MS Galvanised.</td>
</tr>
<tr>
<td>700-613</td>
<td>Knock on edge clip (side) 8 to 13mm MS Galvanised.</td>
</tr>
<tr>
<td>700-614</td>
<td>Knock on edge clip (side) 14 to 20mm MS Galvanised.</td>
</tr>
<tr>
<td>700-616</td>
<td>Edge / Knock on clip (top) 1.5 to 6mm Neoprene sleeve not included.</td>
</tr>
<tr>
<td>700-636</td>
<td>Pipe Clip 35 x 80mm. Designed to suit all pipe sizes and to be attached to pipe by using cable ties. Neoprene sleeve not included.</td>
</tr>
</tbody>
</table>
## Cable Fixings

<table>
<thead>
<tr>
<th>Pt Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>700-620</td>
<td>“T” Clip (Suitable fixing, 4mm dia or size 8 screw). Plastic. Used as a general fixing and spacer for flat surfaces, ceilings or walls. Keeps the LHD away from surfaces which may act as a heat sink.</td>
</tr>
<tr>
<td>700-632</td>
<td>“V” clip with neoprene insulating pad. Typically used for installing LHD cable beneath cable trays.</td>
</tr>
<tr>
<td>700-633</td>
<td>“L” bracket 70 x 20mm SS Can be used with knock clips to space the LHD cable away from surface.</td>
</tr>
<tr>
<td>700-634</td>
<td>“L” Bracket 210 x 20mm SS Can be used with knock clips to space the LHD cable away from the surface.</td>
</tr>
<tr>
<td>700-635</td>
<td>Universal support bracket 70 x 20mm SS</td>
</tr>
<tr>
<td>700-637</td>
<td>Universal support bracket 200 x 20mm SS</td>
</tr>
<tr>
<td>700-639</td>
<td>“P” Clip with neoprene insulator.</td>
</tr>
</tbody>
</table>

It is recommended that fixings should be placed at intervals of no more than 1.2m apart. Where cable ties are used they should be used in conjunction with a neoprene sleeve and not over tightened to prevent damage to the outer sleeve of the LHD. Minimum bend radius of digital LHD is 50mm (100mm in cold store environments). Local regulations should always be adhered to.
Floating roof storage tanks commonly contain highly flammable products with the potential for catastrophic fires. If the fire is not detected early it can cause significant loss of plant, down time of production and in severe situations even risk to life. These can have a large financial or environmental impact.

The main cause of fires is the ignition of flammable vapours leaking from a worn or damaged rim seal. Early detection of the incipient fire is paramount for any fire suppression measures preventing the growth and spread of the fire.

The design and size of storage tanks can differ with each operator and site, requiring a flexible solution to meet individual needs. With its ease of installation and low maintenance digital Linear Heat Detection (LHD) provides a cost effective answer. The LHD cable can be cut to length as required and a single cable can protect the largest of storage tanks.

Linear Heat Detection cable is a simple and reliable product providing uninterrupted detection along its length ensuring the complete circumference of the rim seal is protected.

The sensing cable is formed from a pair of twisted steel conductors each with temperature sensitive insulation and then an overall outer sleeve. When the temperature sensitive insulation reaches it’s predetermined alarm temperature the two conductors short together providing the digital or switched signal.

The cable can be connected to any unit capable of monitoring a switched signal, i.e. conventional fire panel, addressable switch monitor unit or PLC.

LHD cable is classified as a “simple device” but suitable safety barriers must be used to provide the Intrinsically Safe (IS) protection required for the system in hazardous areas.

Having a fixed alarm temperature, the operation of the digital LHD is unaffected by changes in the ambient temperature.
When a failure occurs on a rim seal there is the potential for flammable vapours or product to escape. Should there then be a source of ignition then a fire may ensue. To detect the fire as early as possible LHD cable is installed at or close to the rim seal.

Linesense provide a selection of fixings and clips to retain the Linear Heat Detection (LHD) cable in place. Fixings should be placed at intervals of no more than 1.2m apart.

Where cable ties are used they should be used in conjunction with a neoprene sleeve and not overtightened to prevent damage to the outer sleeve of the LHD.

**Suggested Fixing Configurations.**

1. Bracket fitted directly at the weather seal.

2. Bracket fitted to foam dam wall.

**Automatic Cable Reeler and Retractable Cables**

Electrical connection between the roof and the tank rim can be made using the ATEX approved automatic cable reeler or retractable cable.

The Automatic cable reeler is installed at the tank rim and connected to a junction box on the roof. As the roof rises and falls the reeler compensates for the change and winds cable in and out as required.

Alternatively Linesense provides coiled retractable cables which require to have a junction box mounted at the rim and another fixed on the roof top.

**Typical wiring schematic.**
Fires on conveyor belt systems are commonly caused by the friction of the belt on seized idlers and rollers or from bearings overheating. In addition the product being transported may already be on fire. The situation becomes even more dangerous because a conveyor belt has the ability to spread a fire over long distances. Linesense digital Linear Heat Detection (LHD) offers a cost effective fire detection solution.

Today’s conveyors can be found in a multitude of applications and environments; it can be a short conveyor moving waste material in a recycling centre, or transported over many kilometres of open countryside or carrying coal in a mine. Linesense digital LHD is suitable where Standard detection methods would find it difficult to work. Areas where it could be exposed to the effects of wind and rain or high levels of dirt and dust. Environments where other detectors require additional measures to prevent dust blocking sample points or obscuring optics. The long term reliability of digital LHD reduces the need for increased maintenance or holding stock of costly consumable spares.

With the distances that some conveyors transport material reaching many kilometres in length, LHD offers a flexible cost effective solution no matter the size and type of environment.

The sensing cable is formed from a pair of twisted steel conductors each with temperature sensitive insulation and then an overall outer sleeve. When the temperature sensitive insulation reaches its predetermined alarm temperature the two conductors short together providing the digital or switched signal. The cable can be connected to any unit capable of monitoring a switched signal, i.e. conventional fire panel, addressable switch monitor unit or PLC.

The fire detection capability can be enhanced when the LHD is used in conjunction with the Digital Location Interface (DLI). Conveyors can be many kilometres long, so identifying where a fire is located helps speed up decisions.

The DLI has the ability to monitor up to 2,000m or 10,000m of LHD (depending on the unit selected) for both Fire and Fault conditions, when activated it identifies the location of the alarm. The distance in meters is displayed on the 3½ digit LCD and allows for appropriate action to be taken.
Possible causes of conveyor fires can be:

- A pulley seizing due to mechanical failure. The friction of the belt running over the pulley can generate sufficiently high temperatures to ignite the belt or material being transported resulting in a fire.
- Bearings overheating.
- Ignition of the product being transported. Examples being,
  a) Shredding of waste wood for Biomass power stations may cause sparks leading to a fire in the wood prior to being conveyed.
  b) Powder River Basin (PRB) coal used in power stations has a high probability of self igniting.
- Fires in product spillage to the sides of the conveyor belt.

The layout and makeup of the conveyors will determine how the LHD is installed and configured. System design should consider:

- LHD cable to be installed close to the bearings of the pulleys and idlers to detect overheating.
- LHD cable to be installed above the conveyor belt to detect any static fires on the belt.
- A length of LHD is also recommended below each side of the conveyor to detect spillage fires
- Local fire regulations.
- Suppression or water deluge zones.

Linesense provide a selection of fixings and clips to retain the Linear Heat Detection (LHD) cable in place. Fixings should be placed at intervals of no more than 1.2m apart.

Where cable ties are used they should be used in conjunction with a neoprene sleeve and not over tightened to prevent damage to the outer sleeve of the LHD.
Cable trays typically consist of a number of individual cables closely packed together, should an overheat situation occur it can easily evolve into a fire. If this is not detected early it can cause significant loss of plant, down time of production, and in severe situations even risk to life. All of these can have a large financial impact.

Cable trays can be located in areas where access is either difficult or restricted: service tunnels, vertical risers and ladder racking. Where cable is run in external environments standard detection methods can find it difficult and challenging to work. With it’s ease of installation and low maintenance Digital Linear Heat Detection (LHD) provides a cost effective solution.

The sensing cable is formed from a pair of twisted steel conductors each with temperature sensitive insulation and then an overall outer sleeve. When the temperature sensitive insulation reaches it’s predetermined alarm temperature the two conductors short together providing the digital or switched signal.

The cable can be connected to any unit capable of monitoring a switched signal, i.e. conventional fire panel, addressable switch monitor unit or PLC.

The fire detection capability can be enhanced when the LHD is used in conjunction with the Digital Location Interface (DLI)

The DLI has the ability to monitor up to 2000m of LHD for both Fire and Fault conditions, when activated it identifies the location of the alarm. The distance in meters is displayed on the 3½ digit LCD and allows for appropriate action to be taken.

By installing test switches in each zone along the application length, periodic maintenance tests can be carried out to simulate Fire and Fault conditions without the need to replace any cable. Alternatively Linsense have within our range a 1m test oven which can be used to test a sample of the LHD to confirm operation.
The layout and makeup of the cable trays will determine how the Linear Heat Detection (LHD) cable is installed and configured. System design should consider:

- Physical barriers.
- Zones for alarms and extinguishing.
- Size and spacing of cable trays.
- Local fire regulations.

The use of mounting brackets and clips allows for ease of access to the cable tray for site maintenance or additional cable laying and helps prevent the LHD from being trapped under cables and being damaged.

Linesense provide a selection of fixings and clips to retain the LHD cable in place. Fixings should be placed at intervals of no more than 1.2m apart.

Where cable ties are used they should be used in conjunction with a neoprene sleeve and not over tightened to prevent damage to the outer sleeve of the LHD, alternatively “P” clips can be fixed to the bracket ends.

The following are guidelines only:

- LHD cable should be installed no more than 200mm above the cable tray to permit access to the tray without affecting operating effectiveness.
- Where there is a number of trays above each other, “V” clips can be used to suspend the LHD over the tray beneath.
- A length of LHD is also recommended to be fitted beneath the lowest tray to protect against any rubbish or debris fire.
- A single run of LHD should be used for a cable tray <600mm wide. If greater than 600mm additional cable should be used.
- By mounting the LHD on brackets positioned in line with the cable tray, it minimises any variation in distance that the LHD may be from a hot spot.
Fire detection in tunnels should be considered as essential. A fire within the confined spaces of a tunnel can quickly produce intense levels of heat, smoke and toxic gases leading to structural damage and loss of life.

Road, rail and service tunnels in general terms are benign structures being constructed from non-flammable materials, however the vehicles and systems which use them have the potential to cause major fires. Vehicles can carry hundreds of litres of highly flammable fuels or containers full of combustible goods and material; electrical systems and power cables can malfunction and overheat or something as simple as the build-up of rubbish can be ignited by a discarded cigarette.

Fire detection in tunnels is essential to provide as much time as possible for the evacuation of people to safe areas and to allow suppression systems to contain the fire and smoke.

Tunnels require a reliable system that can detect even when there are high levels of dust and pollutants or when exposed to the effects of air movement produced by the flow of traffic or forced air ventilation. All of which may cause standard detectors to false alarm or fail to detect, but have little effect on the function of Linear Heat Detection (LHD) cable.

The simple design and long term reliability of Linesense digital LHD means it does not require additional measures that other detectors would need to prevent dust blocking sample points or obscuring optics. This reduces the need for increased maintenance or holding stock of costly consumable spares.

Linesense cable is formed from a pair of twisted steel conductors each with temperature sensitive insulation and then an overall outer sleeve. When the temperature sensitive insulation reaches its predetermined alarm temperature the two conductors short together providing the digital or switched signal.

The cable can be connected to any unit capable of monitoring a switched signal, i.e. conventional fire panel, addressable switch monitor unit or PLC.

The fire detection capability can be enhanced when the LHD is used in conjunction with the Digital Location Interface (DLI). Tunnels can be many kilometres long, so identifying where a fire is located helps speed up decisions.

The DLI has the ability to monitor up to 2,000m or 10,000m of LHD (depending on the unit selected) for both Fire and Fault conditions, when activated it identifies the location of the alarm. The distance in meters is displayed on the 3½ digit LCD and allows for appropriate action to be taken.
The layout and makeup of the tunnel will determine how the LHD is installed and configured. System design should consider:

- LHD cable to be installed above the centre of each lane or rail track.
- LHD cable to be installed in service tunnels.
- LHD cable to be installed along cable trays.
- Local fire regulations.
- Size of each zone with respect to detection, suppression or water deluge. Each zone can be protected by an individual run of LHD connected to an interface module or switch monitor unit.

Linesense provide a selection of fixings and clips to retain the Linear Heat Detection (LHD) cable in place. Fixings should be placed at intervals of no more than 1.2m apart.

Where cable ties are used they should be used in conjunction with a neoprene sleeve and not over tightened to prevent damage to the outer sleeve of the LHD.

Cable should be mounted using “Tee” clips ensuring that at least a 25 mm spacing from surface to prevent the structure from acting as a heat sink and slowing detection.