SYSTEM 3400

(with 34000 Devices)

ANALOGUE ADDRESSABLE FIRE DETECTION AND ALARM SYSTEM

Applications Manual

Version 3.4X

13499-22 Issue 2.1

October 1998

Gent Limited
Waterside Road
Hamilton Industrial Park
Leicester, LE5 1TN
Tel: 0116 2462000
Telex: 342367 Fax: 0116 2462300

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	Sounders - siting
	Interfaces
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Network Design	**Networked Panels**
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	Sensors, MCPs,Sounders
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Preface

The update issue 2.1 of the Applications Manual contains information on the service request interface. The second issue coovered products such as the single channel interface, loop powered zone module, beam sensor, A4 mimic panel and Repeat Sounder. The new issue also includes a general update.

The first issue covered products compatible with version 3.3X software. The manual is a guide to be read in conjunction with the recommendations in *BS5839:Part 1:1988,* which is the *code of practice for Fire detection and alarm system for buildings.* Where appropriate the site specific project specification should also be read.

Associated Documents

13499-24 Commissioning Manual for System 3400 (with 34000 devices)
13499-23 Installation Manual for System 3400 (with 34000 devices)
13499-26 Operating Manual for System 3400 (with 34000 devices)
13563-011 GENT Supervisor Operator's Manual

Conventions

NOTE: *A note highlight important text that is normally hidden in the main text.*

CAUTION: *A caution is given to prevent damage to equipment.*

WARNING: *A warning is given to advise of dangerous conditions that may result in injury or death.*

Issue Record

Section	Issue	Date	Comments
Prelims	2	1/98	This second issue covers design of system
1 to 60	2	1/98	3400 (with 34000 devices) and network system
Appendices	2.1	10/98	3500 products that are compatible with version
Parts	7	1/98	3.4X software.
Phone	2	1/98	SRI product data sheet update

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Customer feedback

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Thanks

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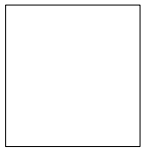

Technical Publications
Gent Limited
Waterside Road
Leicester
LE5 1TN

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Standards - System Design

BS5839 Conformance

Refer to *British Standard BS5839 Part 1: Fire detection and alarm systems for buildings, Code of practice for system design, installation and servicing.*

Protection of property

Siting Detectors

See also, part on *Sensors - Siting*.

- ☐ For a Type P1 system every part of the building should be suitably protected. For this purpose, each effectively enclosed space should be considered separately.
- ☐ Areas covered by a Type P2 system should be separated from unprotected areas by a fire-resisting construction.
- ☐ Voids not more than **800 mm** deep need not be protected unless fire can spread through them from one to the other.
- ☐ Lavatories and water closets need not have independent coverage if cover is provided in a common lobby.
- ☐ Where rooms are divided by partitions or storage racks reaching to within **300 mm** of the ceiling, each section should be protected separately.
- ☐ Shafts for elevators, lifts, hoists, escalators, enclosed chutes through floors and stairways should be protected by detectors at the top of the shaft and within **1.5m** of openings on to each floor.
- ☐ Where an escalator or staircase has a sloping ceiling, a detector may need to be sited on that ceiling.
- ☐ Enclosed staircases should be protected by detectors on each main landing within the staircase.
- ☐ Lantern lights should be protected by a detector unless they are less than **800 mm** in height above the ceiling and are not used as ventilation.
- ☐ Extra detectors may be needed to cope with structural features within a room. Consideration must be given to possible adverse air flows when air conditioning and ventilation systems are in use.
- ☐ If a detector is concealed, it may be desirable to provide a remote visible indication of its operation.
- ☐ Detectors should not be mounted less than **500 mm** from any wall or partition.

- Detectors should not be mounted less than **500 mm** from any obstruction to the flow of hot gases or smoke towards them. Other isolated obstructions such as light fittings do not normally obstruct the flow of smoke.
- Care should be taken in siting to ensure that adverse conditions such as high levels of shock or vibration are not encountered.
- Normally, smoke detectors should not be sited in kitchens, bathrooms, shower rooms or similar situations where conditions are liable to cause unwanted alarms.

Protection of life

In circumstances where a particular early warning of fire is necessary for the safety of life, automatic fire detectors should be installed in combination with a manually-operated fire alarm system.

Detectors may also be needed:

- To compensate for a reduction or low level of supervision.
- Where the occupants are specially vulnerable owing to age, illness or unfamiliarity with the building.
- Where it is impracticable to provide structural separation to stop the spread of fire products.

The level to which additional protection is provided will depend on the individual building requirements. A Type L3 system provides the first level of protection and should give warning to the occupants in time for them to use the escape routes before they are blocked by smoke. The coverage area should therefore include both escape routes and adjacent rooms.

To protect these circulation areas detectors must be installed:

- In corridors, passageways and circulation areas.
- In rooms (other than toilets) opening directly on to any staircase.
- At the top of any staircase.
- On landing ceilings, at vertical intervals not exceeding **10.5m** below the top of any staircase.
- At the top of lift shafts, hoists, ducts etc.
- At each level external to lift shafts, hoists, ducts etc.

Note that:

- Only smoke detectors which are as far as possible sensitive to all types of fire should be used.
- Heat detectors should not be used in circulation areas.

- Spacing should be as for property protection, but the extension to the spacing for corridors under **5m** wide may be used only if smoke detectors are sited in all adjoining rooms.
- Additional detectors may be needed to operate fire doors or extinguishing systems.
- Consideration should be given to the provision of smoke detectors in sleeping accommodation.

A Type L2 system is the second level of protection where all the most vulnerable life and fire risk areas are covered by automatic detectors in addition to those area covered by a Type L3 system. These risks normally fall into two categories:

- Those in which the normal occupants are especially vulnerable to fire starting in their vicinity.
- Those having a particularly high probability of ignition and from which fire or fire products could spread to affect the building occupants.

Examples of areas where this extra protection should be considered include sleeping accommodation, day accommodation, store rooms, kitchens and service ducts.

Full protection is obtained by the third level, a Type L1 system in which all areas in the building are covered by automatic detectors.

Siting Manual Call Points

See also, part on *MCPs - Positioning.*

All MCPs should conform to BS5839 : Part 2 and sited in an:

- In conspicuous and well-lit positions against a contrasting background so that they can be seen easily.
- **1.4m** above floor level so that nobody has to travel more than **30 metres** to reach one
- on floor landings of staircases
- on all escape routes and exits to the open air.

Sounders

See also, part on *Sounders - Positioning.*

All fire alarm sounders within a building should have similar sound characteristics - except in areas of high background noise where specialised high-performance sounders may be needed.

Bells or electronic sounders are normally suitable with sirens or high-performance electronic sounders in high noise areas.

When selecting the type of alarm, consideration must be given to any possible confusion with other alarm signals, conflicting background noises, and restrictions on the total current consumption permissible on each alarm circuit.

> ***NOTE:*** *In general the fire alarm sounders* ***must not*** *be used for any other purpose, with the established exception of* ***class changes*** *in schools where coded signals of not more that five seconds duration can be used.*

Public address equipment

Public address equipment can be used to give warning of fire, subject to certain conditions. Visual alarm signals should be considered in special circumstances for use in conjunction with alarm sounders.

EMC Compliance

These guidelines should be followed to meet the requirements of the **EMC directive** in force within the **European Union**, to prevent the **reception** and **emission** of electromagnetic interference into and out of the analogue addressable fire detection and alarm system.

Code of practice

The installer must follow *BS7671: 1992 Requirements for Electrical installations, IEE wiring regulations 16th edition* if installation is in the United Kingdom, UK.

Cables

The following cables have been tested against EMC directives for use with fire detection and alarm applications
(see also the Choosing Cable sections for further information):

☐ For loop circuit, battery connection and master alarm circuit wiring:

- Mineral Insulated Copper Cable (MICC)
- FIRETUF OHLS Cable type: FTZ2E1.5 and FTZ4E1.5
- Raydex CDT FG950
- Cavicel SpA Firecel SR114 - distributed by Cables Britain
- AEI Cables FIRETEC
- BICC Pyrotenax FLAMESIL FRC
- Datwyler LIFELINE
- Alcatel cable PYROLON E - distributed by Winstonlead
- Huber & Suhner RADOX FR

☐ For *network interface* to *network interface* or *control panel* to *network interface* wiring:

- Mineral Insulated Copper Cable[1] (MICC)
- Belden Cable No 9729 (UL Style 2493)
- Armoured Cable[2].
  By armouring the Belden Cable No 9729 (UL Style 2493)

In the UK, the guidance of BS5839: Part 1 should also be followed.

Cable Separations

The cables of the fire detection and alarm system and other systems should usually be separated by at least **160 mm**, unless dedicated conduit or ducting is being used.

In the UK there is additional guidance provided in a document reference *Recommended cable separations to achieve electromagnetic compatibility in buildings* obtainable from the Electrical Contractors Association.

[1.] The Mineral Insulated Copper Cable should be used for fire resistant applications.

[2.] The cable manufacturer cannot guarantee the cable specification if it is armoured.

Earth continuity

All earth connection points should be clean to provide a good electrical conductivity path.

To maintain the earth continuity:

- ☐ all earth leads and fittings provided should be installed
- ☐ the loop cable screen must be connected through each system device on the loop, whether the earth is connected or not.

See also Cable termination

> ***NOTE:*** *Do not use any part of building structure for earthing.*

A **zinc coating** is provided around the termination point, on the inside of an equipment metal enclosure. This provides a good electrical conductivity path for cable earth termination.

There are **copper fingers** fitted to the control and indicating equipment to fill the gap between enclosure and cover. The fingers provide a shield against electromagnetic and radio frequency interferences.

Mains Supply

The mains supply to mains operated equipment should enter the enclosure by a dedicated entry, which is the closest to the mains connection points.

Cable termination

Use only cable manufacturers recommendations for cable termination.

The wires between the termination point and terminals should be **short** and as straight as possible.

Where Mineral insulated cable (MICC) is being used:

- ☐ use only **galvanised finish junction boxes** for installation of alarm and detection devices
- ☐ use brass locknut with zinc plated lock washer to secure gland to the metal enclosure.

> ***NOTE:*** *The EMC tests were conducted using the items detailed above. Whilst other equipment may be used, there is* ***no guarantee*** *that the system will remain* ***EMC compliant****.*

There is no need to use earth tail seals when terminating mineral insulated cable, providing there is good earth continuity between gland and enclosure.

When using Firetuf cable, the earth drain wire should be fitted to the earth point nearest the cable entry, with a length not exceeding **50 mm**.

Board fixings

During installation a check should be made to ensure all board fixing screws inside equipment enclosure are fully tightened, the screws maintain earth continuity path between the board and its metal enclosure.

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LVD Compliance

Guidelines for compliance with the requirements of the Low Voltage Directive (LVD)

Introduction These guidelines should be followed to meet the *requirements for the safety of Information Technology equipment, including electrical business equipment - BS EN 60950: 1992.*

Products All 3400 Panels.

Guidelines

☐ Ensure the EMC Compliance Guidelines are followed.

☐ Each of the Fire Alarm equipments' fused spur units must be fed from a dedicated switch or protective device at the local mains supply distribution board. If a single pole disconnect device is used (on Live Side) then the Neutral (N) should be clearly labelled.

☐ Cable Glands should be used on the equipment for the mains supply cable.

☐ Unused knockouts that have been removed, should not be left open.

☐ Mains supply cable shall:

- If rubber insulated, be of synthetic rubber and not lighter than ordinary tough rubber sheathed flexible cable according to designation H05 RR-F.
- If polyvinyl chloride (PVC) insulated and for equipment having a mass exceeding 3kg, be not lighter than ordinary polyvinyl chloride sheathed flexible cable, to designation H05 VV-F or H05 VVH2-F2.
- Include, in the case of **Class 1 Equipment,** a green/yellow protective earthing conductor electrically connected to the protective earthing terminal within the equipment and connected to the protective earthing contact of the plug, if any.
- Have conductors with cross sectional areas of not less than 0.75mm.

NOTE: *For rated currents of up to 3A, a nominal cross sectional area of 0.5mm^2 is permitted provided the length of the cord does not exceed 2m.*

NOTE: *It is also recommended (not an LVD requirement) that the mains cable to any part of the fire alarm system equipment is fire resistant, eg MICC or Firetuif OHLS.*

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LPC Certification

An LPC certified system should only include components that have been LPC certified. If it is necessary to include non-certified equipment, such equipment should be clearly identified as not certified in any project specification.

An LPC certified system MUST include a zonal mimic panel *(model no 13460-02V3)*

Control Equipment

The following control equipment is LPC certified:

- ☐ 1-4 loop control panel *(model no 13404-12V3+)*
- ☐ Zonal mimic panel *(model no 13460-02V3)*

Sensors

The 34000 sensors may be configured via the control panel to operate in one of a number of states. The operating state defines the conditions under which the sensor will have identified a fire. Changing the states changes the sensitivity of a sensor. When using combination sensors, the states allow individual sensing elements to be ignored. Sensors may be configured to conform to LPC regulations by using the following states:

Sensor	LPC approved states	Meaning
Optical Heat sensor or Optical heat sensor sounder	Detection to meet BS445: Part 7 (for Smoke) BS5445:Part 5 (for Heat): **State 0** **State 8** **State 12** **State 13**	 Medium smoke sensitivity, grade 2 heat Smoke sensing with delay, grade 2 heat Grade 1 heat (only) Grade 2 heat (only)
Heat sensor	Detection to meet BS5445 : Part 5: **State 0** **State 1**	 Grade 2 Grade 1
Ionisation sensor	Detection to meet BS5445 : Part 7: **State 0**	 Default sensitivity

MCPs

Use only:

- ☐ Standard version *(model no 34800)*

Sounders

Use either:

- ☐ Sounder *(model no 34202 or 34203)*
- ☐ Combined Optical heat sounder *(model no 34770)*

Sensors - Selection

Sensor type

Optical Effective in monitoring visible smoke from slow smouldering fires

Heat Effective in monitoring high energy fires, even with little or no smoke

Ionisation Effective in monitoring smoke and the invisible products generated by fast burning, high energy fires

Beam Effective in monitoring visible smoke from slow smouldering fires over long distances (up to 100 metres)

Flame Effective in monitoring carbon-based, free burning fires

Dust cover Each 34000 sensor, except beam sensor, is supplied with a dust cover. The cover is fitted during installation to prevent dust and dirt from building work reaching the fire sensor.

Optical Heat (Sounder)

variant

☐ Optical Heat sensor - 34710

☐ Optical Heat Sounder - 34770

(also available in a duct monitoring enclosure - 34760)

(also available as a combined Heat sounder - 34780)

This combination provides a truly general purpose sensor. As well as operating as two standalone sensors, it will also react to the presence of smoke and heat at the same time.

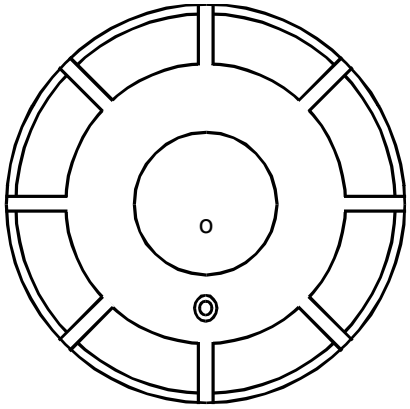

Figure 5-1 Optical heat sensor

cd12

This sensor is particularly well suited to work with the *time block and time slot* facility. Individual heat and smoke sensing elements to be disabled or desensitised during working hours. This maximises fire detection but reduces the risk of false alarms. It allows the sensor to be used in environments where conventional smoke detection would not be considered suitable.

applications Potential applications include:

- ☐ Most furnished locations like offices, reception area and meeting rooms
- ☐ the *optical heat sounder* is particularly suitable for applications in **hotel bedrooms** when set up for sensor-sounder operation.

siting Avoid siting combined optical/heat sensors in:

- ☐ steamy, dusty or smoky environments (timed switching to reduce optical sensitivity may be used where these conditions only exist at particular times of day - however, such conditions will still require frequent sensor cleaning)
- ☐ direct line of sight of an infra-red source. e.g. tungsten or high intensity arc lights

Heat Sounder - 34780

This combination provides a general purpose applications in areas where smoke sensing is not required. It is a good alternative to smoke sensors where the environment is subject to constant levels of smoke or dirt. The 34780 may be configured to respond at different sensitivity grades and rates. Potential applications include:

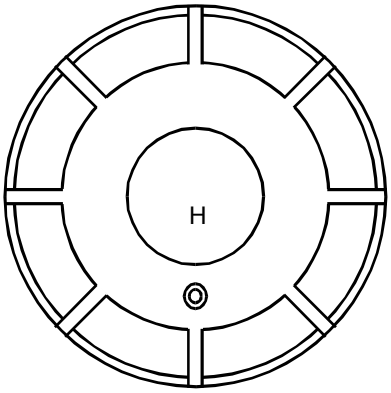

Figure 5-2 Heat sounder
cd13-1

applications

- ☐ Student accommodation where smoke detection may cause false alarm
- ☐ Bedrooms where there is no legal requirements protect life

Heat - 34720

(also available environmentally protected - 34729)

The heat sensor is a good alternative to smoke sensors where the environment is subject to constant levels of smoke or dirt. The 34720 may be configured to respond at different sensitivity grades and rates. Potential applications include:

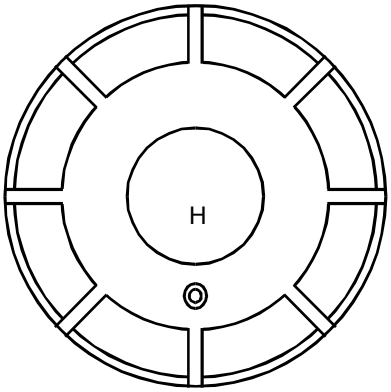

Figure 5-3 Heat sensor
cd13-2

applications

- ☐ boiler rooms
- ☐ busy kitchens

Ionisation - 34730

The ionisation sensor is a useful alternative where fires are likely to include invisible products of combustion. Potential applications include:

- ☐ solvent stores

A mixture of optical and ionisation sensors can be used to ensure comprehensive coverage in areas of high value. Potential applications include:

- ☐ computer rooms

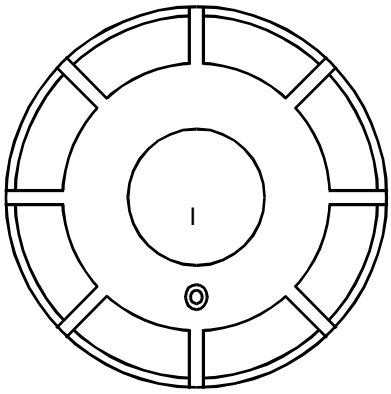

Figure 5-4 Ionisation sensor

cd13

Beam - 34740

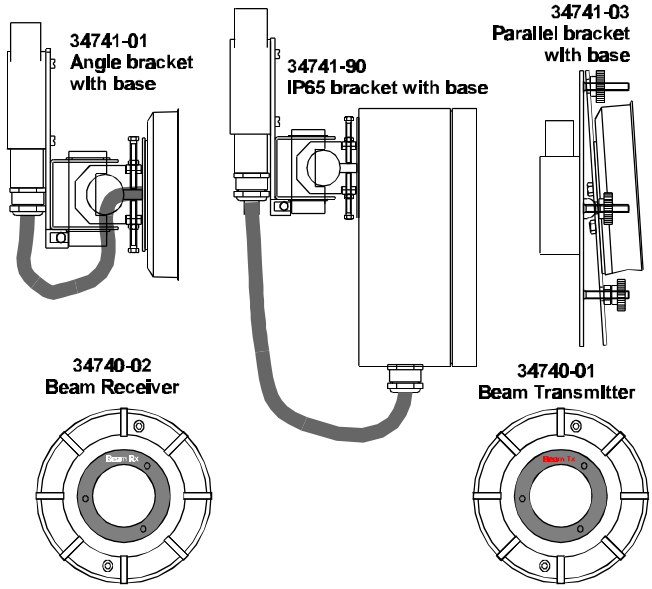

Figure 5-5 Beam sensor pair and brackets

cdm76

Beam sensors are suitable for monitoring paths of up to 100m. A transmitter is mounted on a solid surface and aligned with a receiver, similarly mounted at the other end of the path. Applications include:

- ☐ corridors
- ☐ warehouses
- ☐ ceiling voids
- ☐ hangars
- ☐ large open shopping areas

siting Avoid siting beam sensors in:

- ☐ close to heaters or boilers. Heat shimmer and the effect of a thermal barrier will interfere with the detection capability of the sensors.
- ☐ areas where the beam passes through glass.

- ☐ area likely to be obscured by other fixings, e.g. light fittings, trunking and racking systems.
- ☐ in locations likely to be affected by sunlight shining directly into the receiver.

Problem areas to check:

- areas used by cranes, fork lift trucks or people. Any obscuration of the beam will prevent the sensor functioning normally.

Flame detector - 07012-31

> ***NOTE:*** *This is a conventional flame detector, to be connected to the fire system via a mains powered fire alarm interface unit.*

The conventional flame detector is suitable for mounting on high ceilings where a point-type sensor becomes insensitive and impracticable to mount. The flame detector can be mounted on a wall to monitor an area of floor.

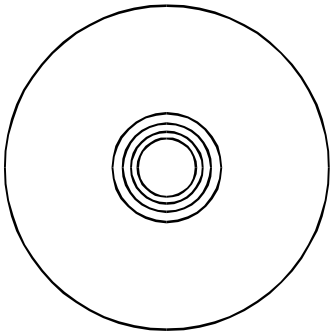

Figure 5-6 Flame detector
cd131

applications

Potential applications include:

- ☐ churches
- ☐ shopping malls
- ☐ large department stores

> ***NOTE:*** *Flame detectors are unable to detect smouldering fires, they should therefore be used in specialist applications or to supplement smoke sensors.*

siting

Avoid siting flame detectors in the following:

- ☐ where it might receive sunlight reflected from a slowly revolving fan.
- ☐ where it might receive sunlight reflected from water or through branches of a tree.
- ☐ where it might receive sunlight that passes through vertical or venetian blinds that could move in a breeze etc.

Duct sensors - 34760

The duct sensor is designed to sense smoke in air conditioning ducts. The duct sensor is fixed to the outside of a duct and has two probes that protrude in the duct and are positioned across the air flow.

The sensor is fitted with a standard 34710 combined optical/heat smoke sensor.

A remote led is supplied for use with this product.

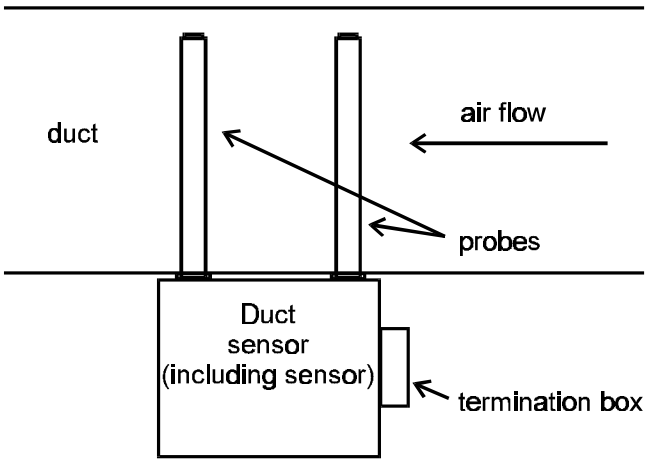

Figure 5-7 Duct sensor
cd17

siting Avoid siting duct sensors:

- ☐ where air will be diluted from multiple sources
- ☐ near fans
- ☐ near bends, inlets and outlets (within 3 x duct width from sensor)
- ☐ near obstructions causing turbulence.

Semi-Flush fixing - 19279-01

Ceiling-mounted sensors may be semi-flushed to improve their aesthetic appearance.

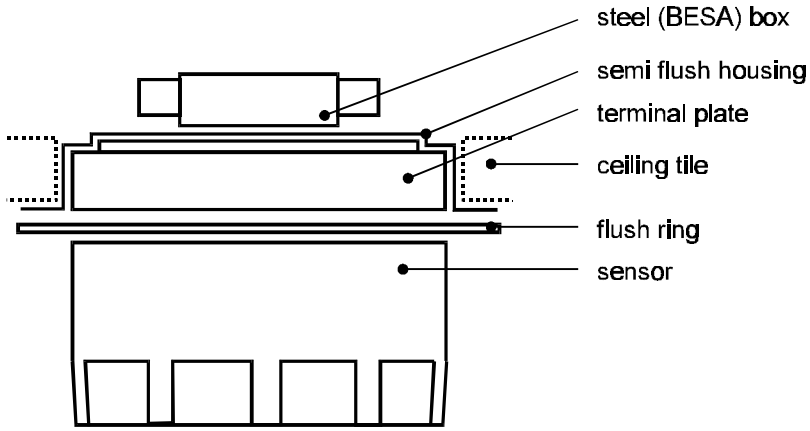

Figure 5-8 Flush fixing sensors
cd4

Sensor Trim Ring - 19279-10

Sensors may be mounted using the Sensor Trim Ring which enables the sensors to be mounted onto low grade ceilings quickly and without the need for cutting accurate holes. Also on refurbishments there is no need to repair or replace ceiling material when the sensors are replacing larger diameter sensors.

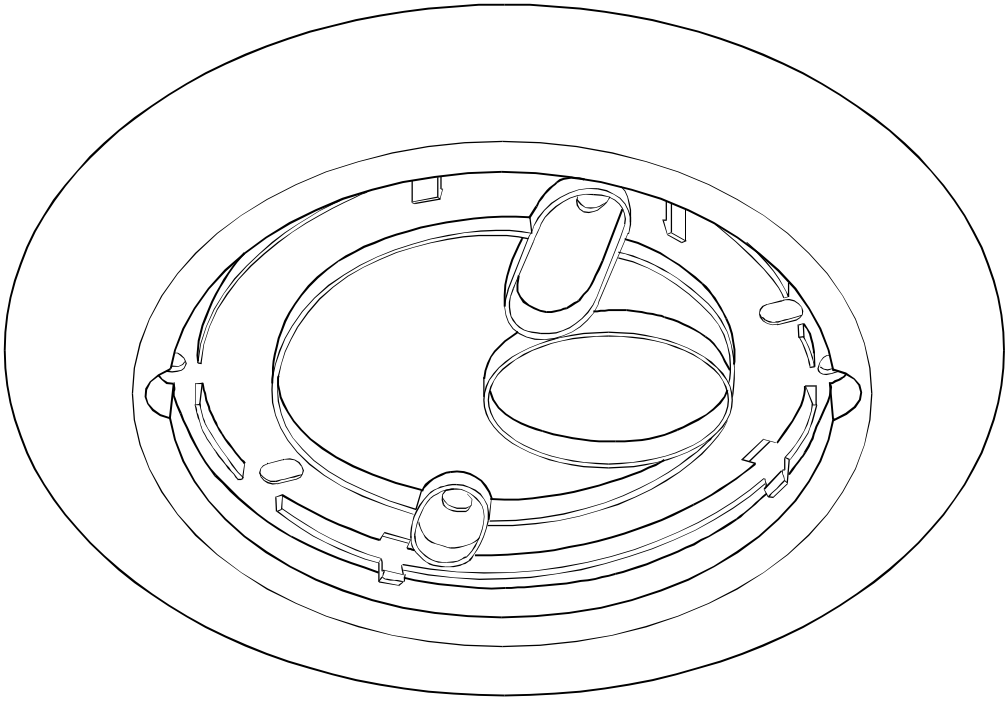

Figure 5-9 Sensor Trim Ring
cdn94

Terminal plates

There are two terminal plates available:

- Standard three terminal plate 34700 - connections L1, L2 aand 0v.

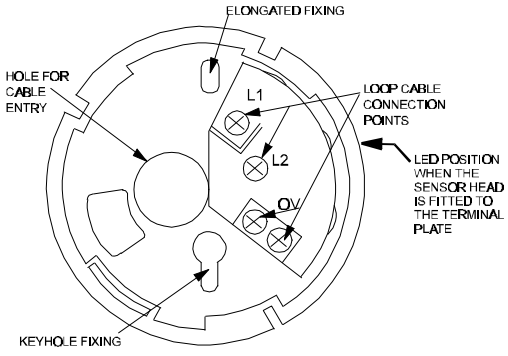

Figure 5-10 Terminal plate

fl112

- Four way terminal plate 34704 - as for the 34700 terminal plate but with a fourth terminal and a shorting link. This terminal plate is used with the Remote LED Optical heat sensor 34710-RL and the Monitored line Optical Heat sensor 34710-ML (Chinese market only).

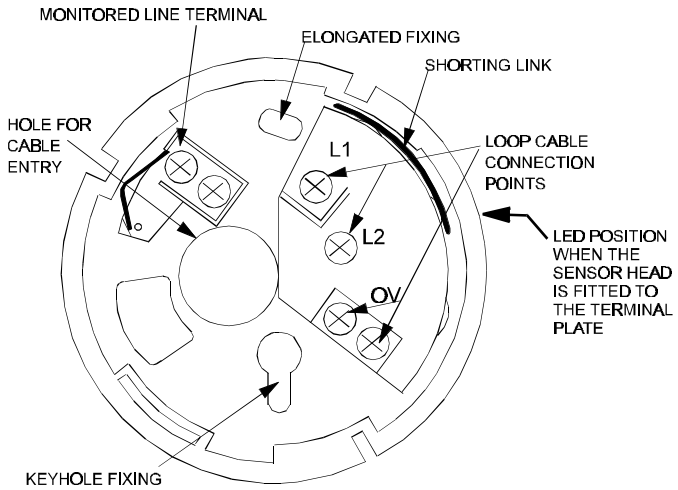

Figure 5-11 Four way terminal plate

cdn276

NOTE: *The 34710-RL heat sensor must be used with the 3400 remote LED part number 13449-01 (see terminal plate product data sheet.*

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Sensors and MCPs - Siting

See **Appendix A** for information on **Environmental considerations**
See also **Appendix B** for information on **equipment** for installation in **Hazardous areas**.

Smoke sensors

The sensor siting design rules aim to satisfy the requirements of BS5839 Part 1:1988, if in doubt refer to the standard. This section refers to point sensors and does not include beam sensing which is covered in a separate section, *Beam sensors*.

Siting (horizontal)

Maximum dimensions

- ☐ Area covered by 1 sensor: **100 m^2**.
- ☐ Distance between any part of the wall and the nearest sensor: **7.5 m.**
- ☐ Distance between sensors: **15 m.**

Minimum dimensions

- ☐ Distance between sensor and wall: **0.5 m.**
- ☐ Distance between sensor and obstruction to the flow of smoke or hot gases: **0.6 m.**

Layout

Flat horizontal ceilings

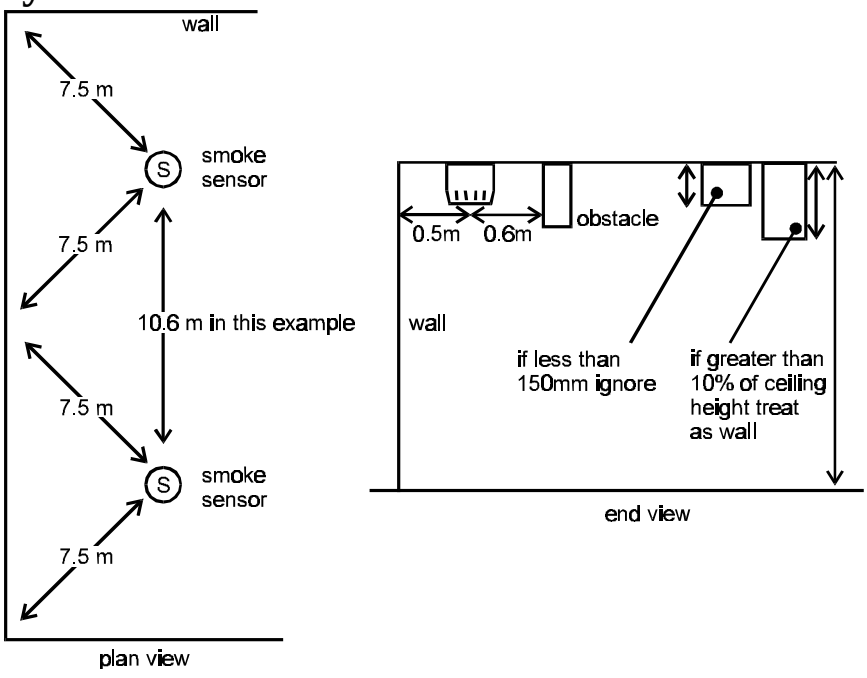

Figure 6-1 Smoke sensors under flat ceiling
cd30

Corridors

Sensors in corridors may generally be spaced more widely.

- ☐ this is NOT applicable to life safety applications unless all adjoining rooms have smoke detection
- ☐ this is NOT applicable to corridors greater than 5 metres wide

Sensors may be placed at horizontal distances extended up to 50% of the difference between the actual corridor width and 5 metres (see table).

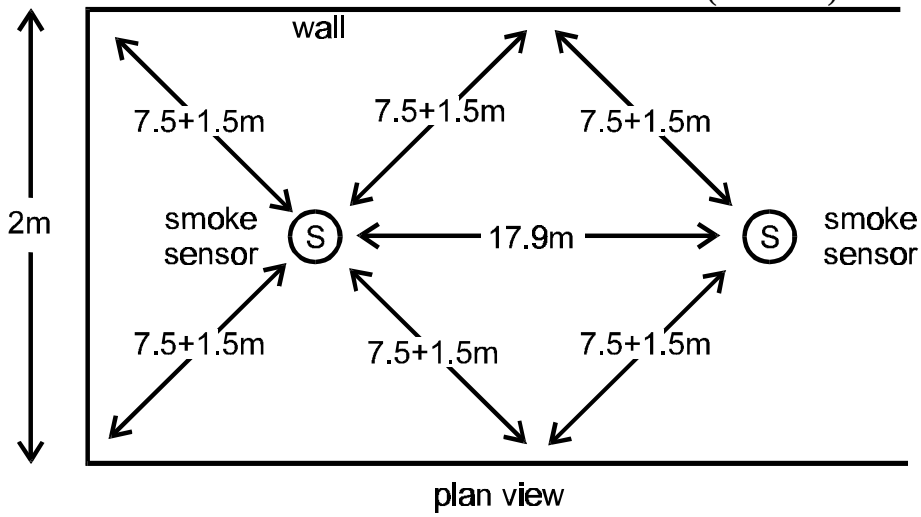

Figure 6-2 Smoke sensors in 2m corridor

cd31

Corridor width (metres)	Maximum spacing between smoke sensors (metres)
1.2m	18.8m
1.6m	18.3m
2.0m	17.9
2.4m	17.4
2.8m	17.0
3.2m	16.5
3.6m	16.0
4.0m	15.5
4.4m	15.0
4.8m	14.4

Pitched roofs

A row of sensors should be installed along the apex of any pitched roof or north-light roof.

Smoke sensors should be not more than **600 mm** from the apex of the roof.

Horizontal spacing between sensors may be extended when used under pitched roods. The horizontal distance may be extended by up to 1% for each degree of slope of the roof (relative to horizontal).

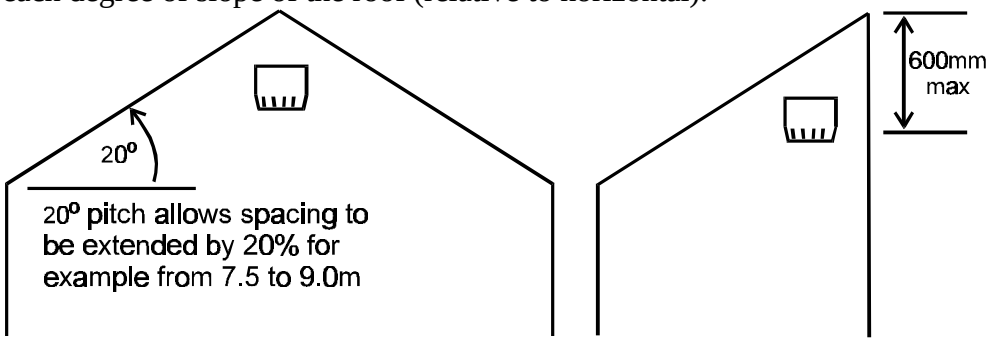

Figure 6-3 smoke sensors under pitched roof

cd32

Heights

Maximum heights of sensors are dependant on the **response** available in the event of fire:

- ☐ A - general applications
- ☐ B - automatic link to a manned centre and the fire brigade response is normally within 5 minutes

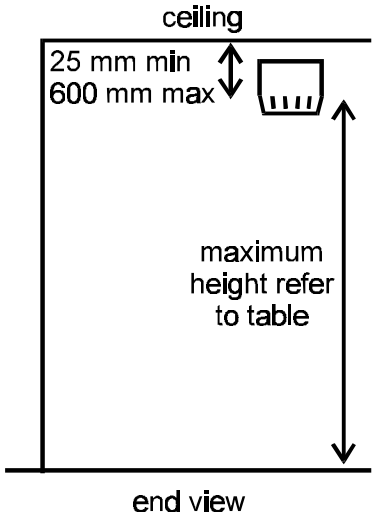

Figure 6-4 Smoke sensor height

cd33

Response A		Response B	
general	extended limits	general	extended limits
10.5m	12.5m	15.0m	18.0m

Table showing maximum heights of sensors above the floor.

Extended limits apply to ceilings that form less than 10% of the ceiling area of a room.

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Heat sensors

Siting (horizontal)

The sensor siting design rules aim to satisfy the requirements of BS5839:Part1:1988, if in doubt refer to the standard.

Maximum dimensions

Area covered by 1 sensor: **50 m^2.**

Distance between any part of the wall and the nearest sensor: **5.3 m.**

Distance between sensors: **10.6 m.**

Minimum dimensions

Distance between sensor and wall: **0.5 m.**

Distance between sensor and obstruction to the flow of smoke or hot gases: **0.6 m.**

Layout

Flat horizontal ceilings

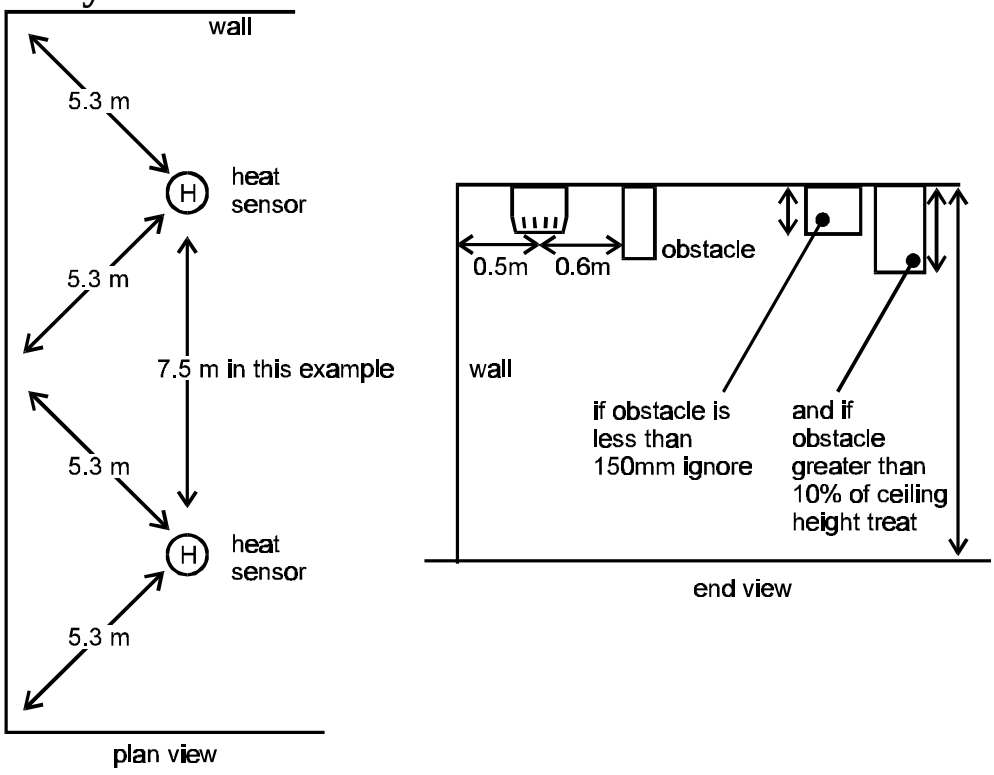


Figure 7-1 Heat sensors under ceiling
cd34

Corridors

Sensors in corridors may generally be spaced more widely.

- ☐ this is NOT applicable to life safety applications unless all adjoining rooms have detection.
- ☐ this is NOT applicable to corridors greater than 5 metres wide

Sensors may be placed at horizontal distances extended up to 50% of the difference between the actual corridor width and 5 metres (see table).

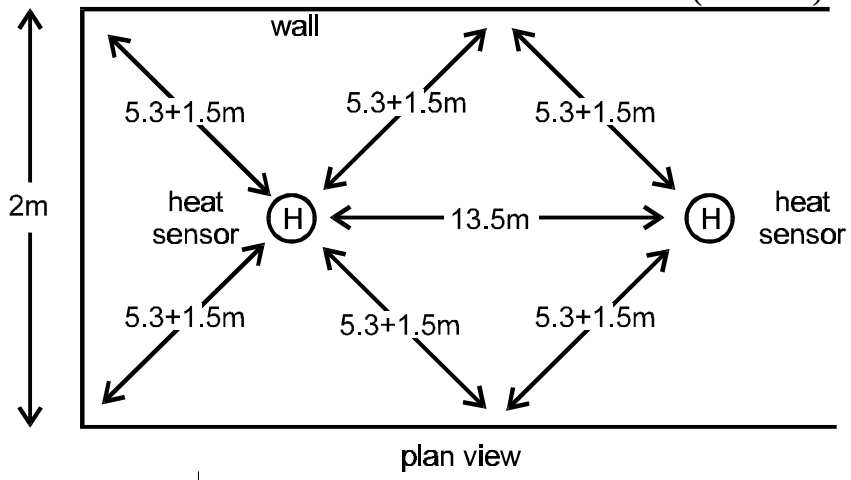


Figure 7-2 Heat sensors in 2m corridor

cd35

Corridor width	Maximum spacing between heat sensors (metres)
1.2	14.4
1.6	14.0
2.0	13.5
2.4	13.0
2.8	12.5
3.2	12.0
3.6	11.5
4.0	10.9
4.4	10.3
4.8	9.7

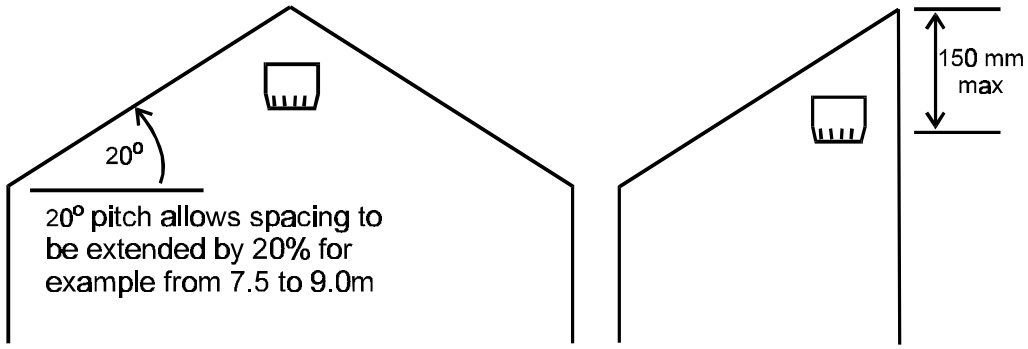
Pitched roofs

A row of sensors should be installed along the apex of any pitched roof or north-light roof.

Heat sensors should be not more than 150 mm from the apex of the roof.

Horizontal spacing between sensors may be extended when used under pitched roofs. The horizontal distance may be extended by up to 1% for each degree of slope of the roof (relative to horizontal).

Figure 7-3 Heat sensor height



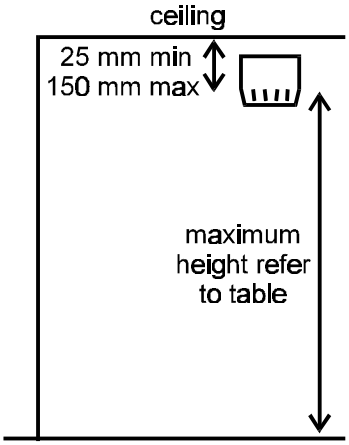
cd19

Heights

Maximum heights of sensors are dependant on the response available in the event of fire:

- ☐ A - general applications
- ☐ B - automatic link to a manned centre and the fire brigade response is normally within 5 minutes

Figure 7-4 Heat sensor height



cd120

end view

	Response A		Response B	
Sensitivity	**general**	**extended limits**	general	**extended limits**
grade 2	7.5	10.5	12.0	17.0
grade 1	9.0		13.5	
high temp	6.0	10.5	10.5	15.0

Table showing maximum heights of sensors above the floor.

NOTE: *Extended limits apply to ceilings that form less than 10% of the ceiling area of a room.*

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Beam sensors

Siting

Siting

The beam diameter is 3 centimetres. There should be no obstacles within the beam path.

sensor type	path length	configuration states
Type 3	2m to 30m	2 or 3
Type 3	>30m to 100m	0 or 1

NOTE: *Beam sensors must be mounted on a SOLID SURFACE. Do not fix sensors to cladded panelling.*

Spacing

Beam pairs can be spaced at intervals of up to 14 metres. The maximum spacing away from an end wall is 7 metres (minimum 0.5 metres, for 3 metres of beam length).

(although British Standards allow spacings of 15 and 7.5 metres, the Gent beam sensor is specified as above)

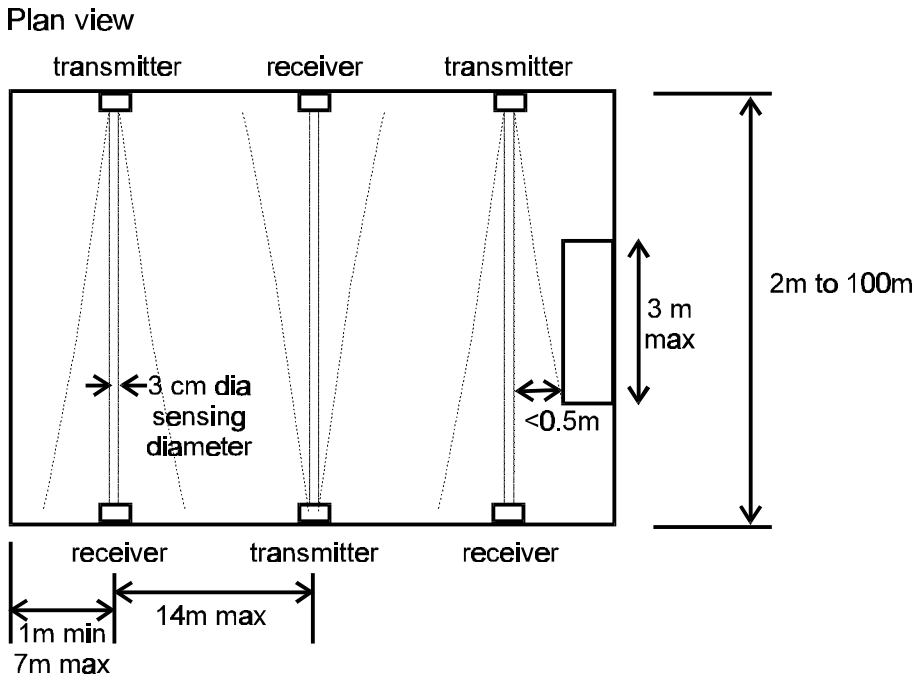


Figure 8-1 Beam sensor siting

Pitched roof

When using beam sensors below pitched ceilings the spacing of the sensor pair below the apex may be extended. The spacing may be extended to 14 metres plus 1% for each degree of slope.

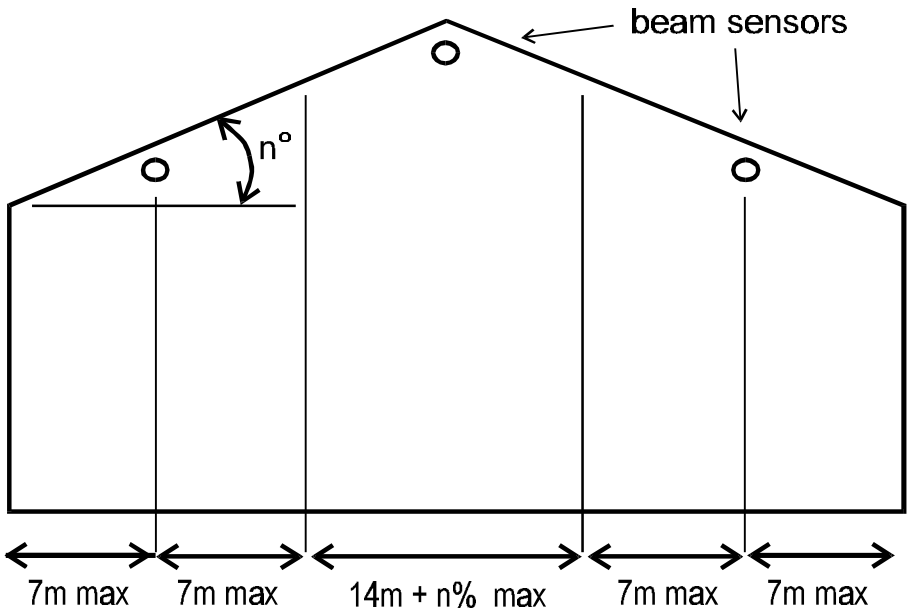
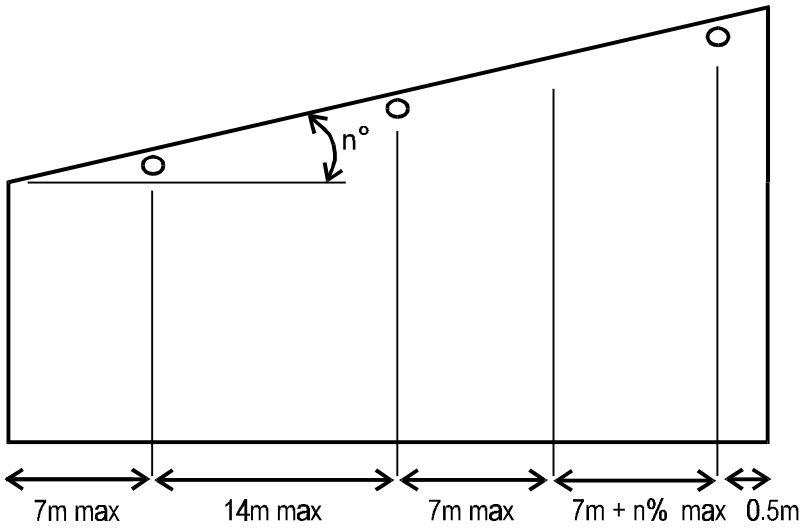


Figure 8-2 Beam sensor under pitched roof

cd36



cd20

Height

The maximum height for a pair of beam sensors above the floor is normally 25 metres. This can be extended to 40 metres if rapid fire brigade attendance is available.

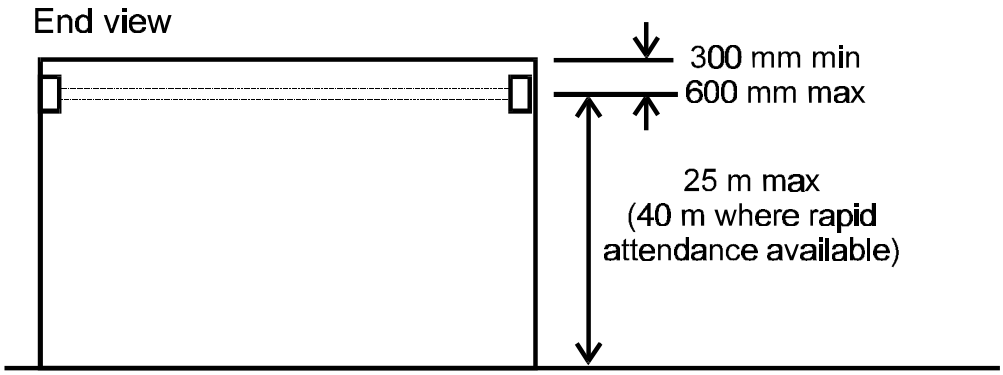


Figure 8-3 Beam sensor height

- ☐ The distance from the ceiling should be between 300 mm and 600 mm.
- ☐ The maximum range of a beam sensor is 100 metres.

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Duct sensors

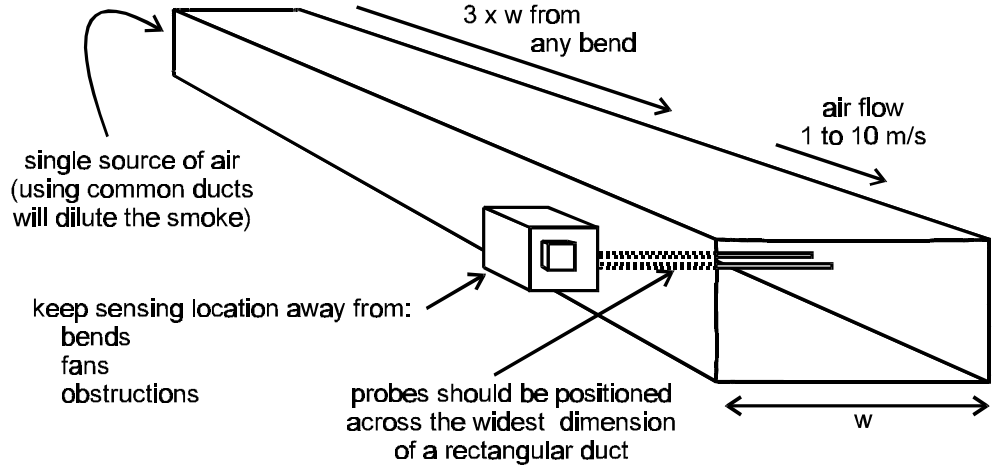

Figure 9-1 Duct sensor location

The duct sensor works because the air passing a pair of correctly aligned probes, creates a pressure differential. The pressure differential creates a flow of air through the external duct sensor which incorporates a standard optical /heat sensor.

Dilution Dilution will cause the sensor to become less sensitive to smoke. Dilution will occur if the source of air is from more than one place. Avoid siting the duct sensor on a common duct.

Turbulence Turbulence will effect the pressure differential between the probes and may prevent the sensor sampling the air. Turbulence is often caused by:

- fans
- inlets and outlets
- corners (keep a distance of 3 times the duct width from any bend)
- obstructions

Sampling The sampling volume will be proportional to the length of the probes. Keep the probe length as long as possible. Position the probes to cross the greatest dimension of the duct. If the probe length is reduced, additional holes will need to be drilled in the probes.

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Manual Call Points (MCPs)

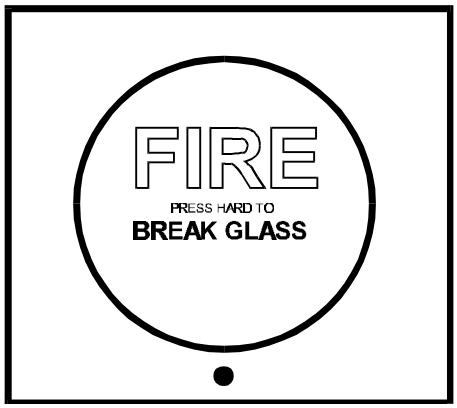

Figure 10-1 MCP

cd76

Choosing MCPs

There are 2 parameters that will effect the choice of MCP:

- ☐ Operating method (normally break glass)
- ☐ Operating environment

Positioning

MCPs should be sited:

- ☐ In conspicuous and well-lit positions against a contrasting background so that they can be seen easily.
- ☐ **1.4m** above floor level so that nobody has to travel more than **30 metres** to reach one
- ☐ on floor landings of staircases
- ☐ on all escape routes and exits to the open air.

Operating method

Most MCPs operate on a simple break glass principle, but there are 3 methods available:

- Break glass
- Lift cover, then break glass
- Key operated

Environment

The standard MCPs are designed for use indoors and are rated to **IP40.**

The water resistant version is rated to **IP54.**

The environmentally protected versions are rated to **IP55.**

(IP ratings are estimated)

Fixing

All MCPs are designed for either flush or surface mounting. They include a surface mounting box but not a back box.

Refer to *Standards, BS5839* section

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Sounders -siting

Choosing sounders

Where applicable the combined 34770 and 34780 sensor/sounder will reduce the complexity and cost of wiring.

The stand-alone 34202 & 34203 sounder and the 34770 & 34780 combined sensor/sounder use only a single address on the loop.

Sound output

The primary parameter of a sounder is its sound output. The system 34000 sounders include 2 types:

- Combined sensor/sounder rated at 85 dBA at 1 metre for use in bedrooms (34770 & 34780)
- Stand-alone sounder rated at 100 dBA at **1 metre** (34202 / 34203). The sound output may be reduced by adjustment.

dB ratings: Sound levels (sound pressure levels) are normally quoted in decibels (dBA). The sound level from a sounder is normally quoted at a distance of **1 metre** from the sounder. The sound level will reduce by 6dB every time the distance from the sounder is doubled.

angle: Sound levels (sound pressure levels) are normally quoted on-axis, i.e. directly in-line with the middle of the sounder. This is normally the loudest position. In order to assess the sound level at any particular point it is necessary to allow for the distance from the sounder AND the angle off-axis.

Environment

The standard sounders are designed for use indoors and are rated to IP30. The stand-alone sounder is also available as an environmentally protected version with an IP55 rating.

All IP ratings are estimated

Flush fixing sensor sounder

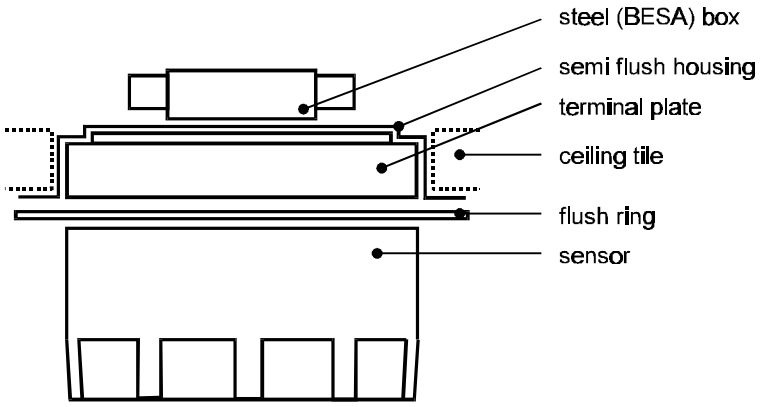

Figure 11-1 Flush fitting a sensor sounder

cd4

The combined sensor/sounder may be semi-flush fitted. If semi-flush fitted the sound level rating will be affected.

Positioning sounders

BS5839 has no specific recommendations for spacing alarm devices but there is a minimum sound level requirement of

- 65dB(A) or 5dB(A) above any noise likely to persist for a period longer than 30 seconds, whichever is greater.
- If the fire alarm system needs to wake sleeping people then the minimum sound level at the bedhead, with all doors shut is 75bB(A).

These requirements will affect the number and siting of alarm sounders within a particular building. Account must be taken of the effect on the sound of doors, walls, ceilings and floors. As a guide to design, most single doors will cause a 20dB(A) drop in sound levels and solid doors such as fire doors can reduce levels by 30dB(A) or greater.

Sound level for Type L and M systems

In Type L and Type M systems the minimum sound levels must be produced in all 'occupiable parts' of the building. Occupiable parts include restricted areas such as service ducts where people could be working on occasion. As audible alarms are essential for the protection of life, a minimum of two independent sounders must always be provided to guard against the failure of one. A minimum of one sounder should be provided in each fire compartment.

Sound level for Type P

In Type P systems the minimum sound levels shown above must be produced in the areas required to summon fire fighting assistance. A sounder should also be provided close to the control and indicating equipment and there should be one outside direct services to the correct entrance. In practice, most fire detection and alarm systems involve elements of both property and life protection. Most systems should therefore meet all the above requirements.

Combined 34770 & 34780 sensor/sounder

The 34770 combined sensor/sounder is normally used in rooms where people will be sleeping. In this application it is necessary to have a sound level at the bedhead of 75 dBA. To achieve this the sounder/sensor is normally positioned on the ceiling as shown in the diagram.

The application assumes the following:

- ceiling height of 2.6 metres
- bed height of 0.6 metres

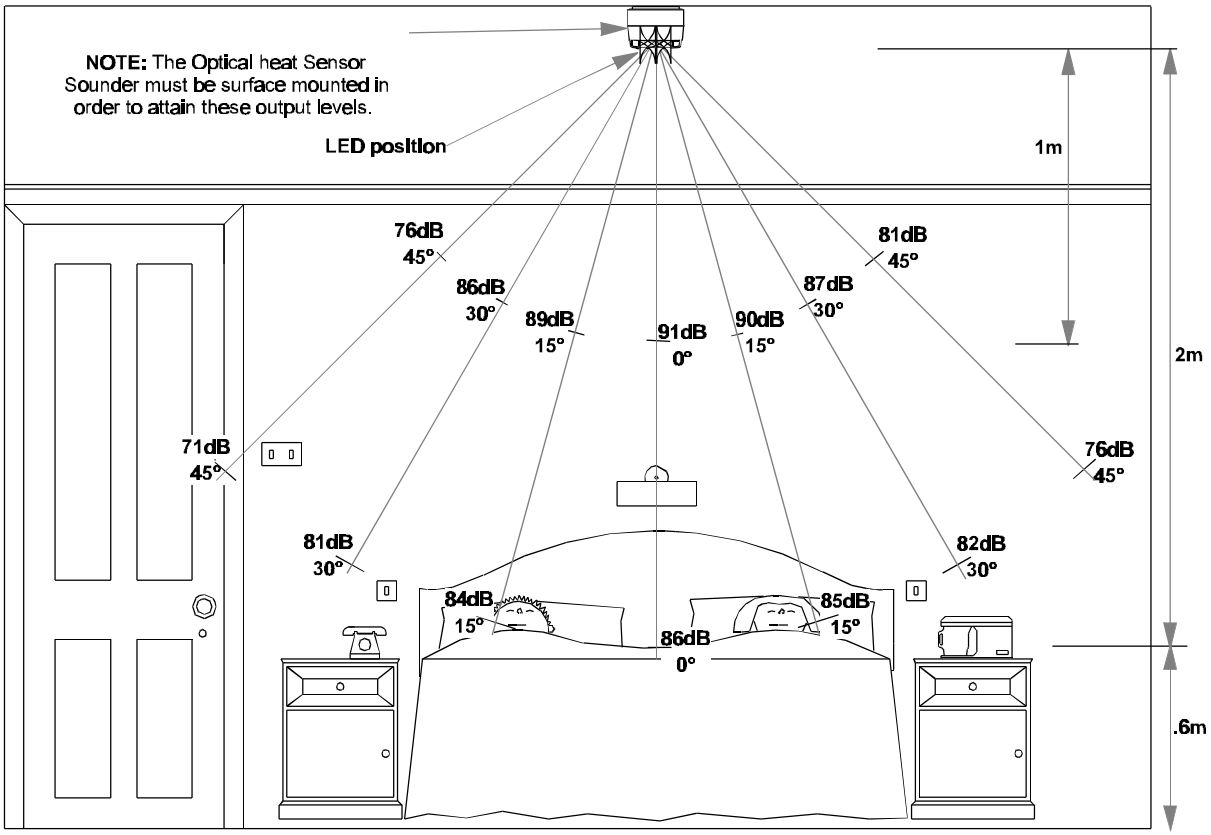

Figure 11-2 Sound output of a sensor sounder

fl157

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Interfaces to other equipment

Conventional detector and sounder circuits

Mains-powered interface

The 34440 interface operates from a mains power supply and incorporates its own battery-backed power supply.

It has 4 channels each may be configured as a conventional detector zone (input) or sounder (output) circuit.

The 34440 interface is typically used to replace a conventional fire alarm control panel.

The interface provides a 24 Vdc (nominal) output rated at 250 mA.

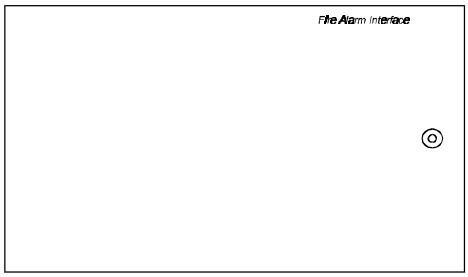

Figure 12-1 Mains powered interface
cdn197

Detection zones

A zone will accept conventional detectors and MCPs. The maximum load per zone 'input' circuit is 2 mA. Each zone is monitored for:

- ☐ Fire (from manual call point)
- ☐ Fire (from conventional detector)
- ☐ Open circuit fault
- ☐ Short circuit fault

Monitoring conforms to BS5839 by detecting a manual call point activation if a detector is removed.

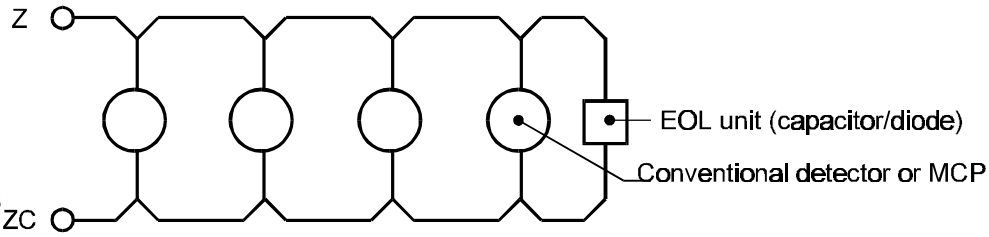

Figure 12-2 Zone (Input) circuit
cd23

Each zone requires an end-of-line unit (capacitor/diode), supplied.

There is a single compatibility switch within the interface that sets the detector/MCP characteristics for any channels configured as inputs. The characteristics have been set to provide compatibility with various manufacturers' detectors.

NOTE: *The detector compatibility has been set for common detectors. The performance of the setting should be verified with the particular detectors being used.*

The following settings are available:

- ☐ Gent — 7600 range
- ☐ Apollo / Hochiki — Series 20 tested / CD range tested
- ☐ Menvier — Series 700 tested
- ☐ Nittan — NH-G Series tested
- ☐ Notifier — EC range (without resistor fitted to base) tested
- ☐ Thorn — Series 300 tested

NOTE: *On certain older sites, older type detectors and mcps place a short circuit across the zone when in fire. In order that these shorts are detected as fires and not short circuits, rotary switch position 'F' must be used.*

NOTE: *Where **other manufacturers** manual call points are used on the interface input circuit, then a **3.9V zener diode** must be in **series** with the **call point contacts**.*

Sounder sectors

A sector will accept conventional sounders and door holders etc.

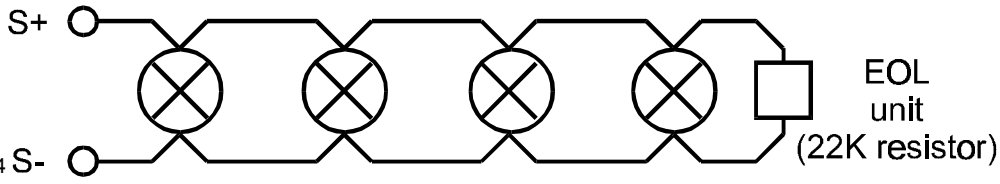

Figure 12-3 Sector (output) circuit

The maximum total load for all sectors on a single 34440 interface is **500 mA** (each sector is individually fused at **800 mA**).

Sectors are monitored for:

- ☐ Open circuit fault
- ☐ Short circuit fault

Each sector requires an end-of-line device (**22K resisto**r), supplied.

Loop Powered Zone Module

The 34410 **Loop Powered Zone Module** is a single channel device which can accept up to **20 conventional detectors.**

There is no limit to the number of **MCPs** which may be connected to the module provided that a 3.9V zener or 470R resistor is connected in series with the MCP contacts.

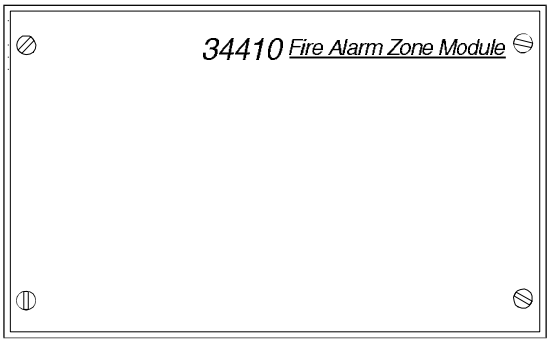

Figure 12-4 Loop Powered Zone Module
cdn103

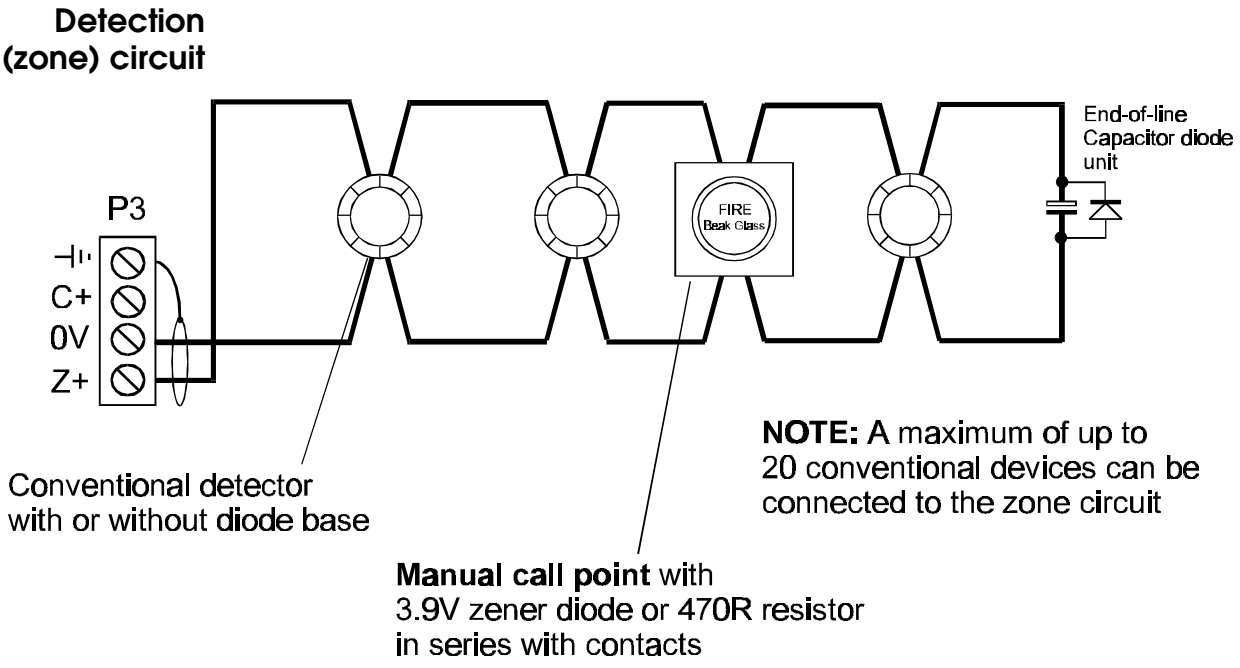

Figure 12-5 Detection Zone Circuit
cdm40

NOTE: *An end-of-line capacitor unit must be connected to the end of the detection (zone) circuit.*

NOTE: *The 3400 system is unable to distinguish between a* **fire input** *from* **manual call points and detectors** *connected to the zone circuit of the loop powered zone module.*

NOTE: *Due to the voltage drop across the diodes, the number of diode bases that can be connected to the zone module* **is limited to 5.**

The following detectors are compatible:

- ☐ Gent 7600 range including 07012-31 flame detector, provided
  1. The flame is the only device connected to the zone.
  2. The EOL is fitted directly to the flame detector and is housed in the base
- ☐ Menvier 700 series (Ionisation and Optical)
- ☐ Apollo series 60 (Ionisation)
- ☐ Apollo series 30 (Ionisation and rate of rise)
- ☐ Hochiki SLK-E Optical
  SIH-E Ionisation
  Comb Heat
  DFE-90E Fixed Temp
- ☐ Nittan 2KC Optical smoke
- ☐ System Sensor 1151E
  4451E
- ☐ Notifier SD-651E
- ☐ Thorn MR601/AFA1706 Optical
  MR601T/AFA1705 High Performance Optical
  MD611/AFA1704
  MD601/AFA1702<R>

Conventional fire alarm systems

Existing conventional 24V dc fire alarm systems may be interfaced to 3400 systems using a 34440 mains-powered interface.

Anti-knit circuit

The circuit shown below includes an anti-knit circuit that prevents the 2 fire alarm systems locking each other in the alarm state.

Parts required:

- mains-powered interface *(model no 34440)*
- 24V dc relay *(model no 19104-52)*
- 24V dc timer *(model no 19106-02)*
- zener diode *(model no 4104-042)*
- 2 x diode units
- zone end-of-line and sector end-of-line devices for existing fire alarm system (if monitored).

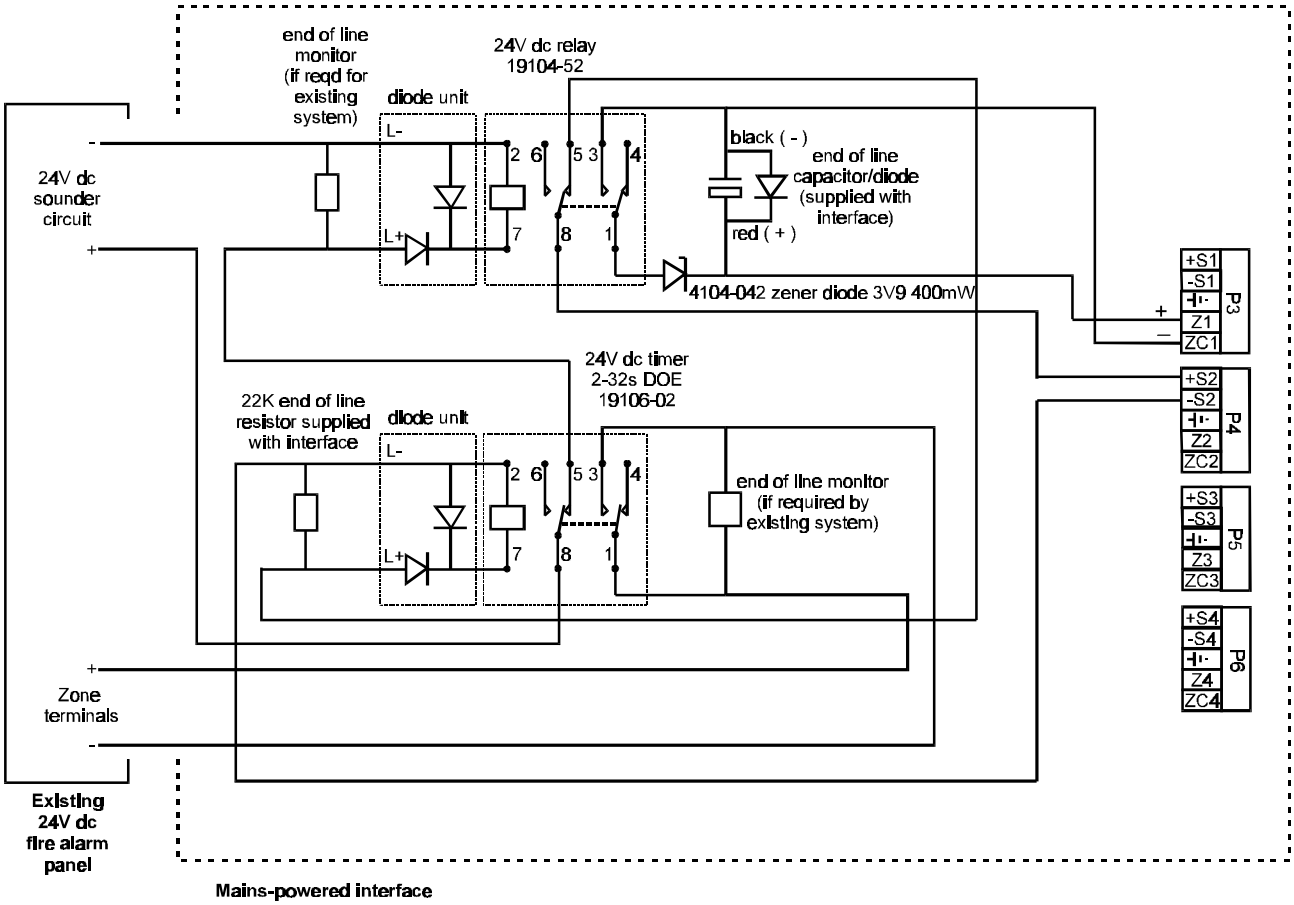

Figure 13-1 Interface to conventional fire alarm system
cdn201

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Fixed extinguishing

Fixed extinguishing interface

Fixed extinguishing is achieved by using a Fixed Extinguishing panel *(model no 3295)* connected to a FE Loop-powered Interface *(model no 34460)* on the 3400 system.

This configuration provides the following features:

- full compliance with BS7273
- monitoring of the manual release switch of the extinguishant system by the 3400 system
- monitoring of faults on the fixed extinguishant system by the 3400 system
- fully monitored interface connections

Wiring

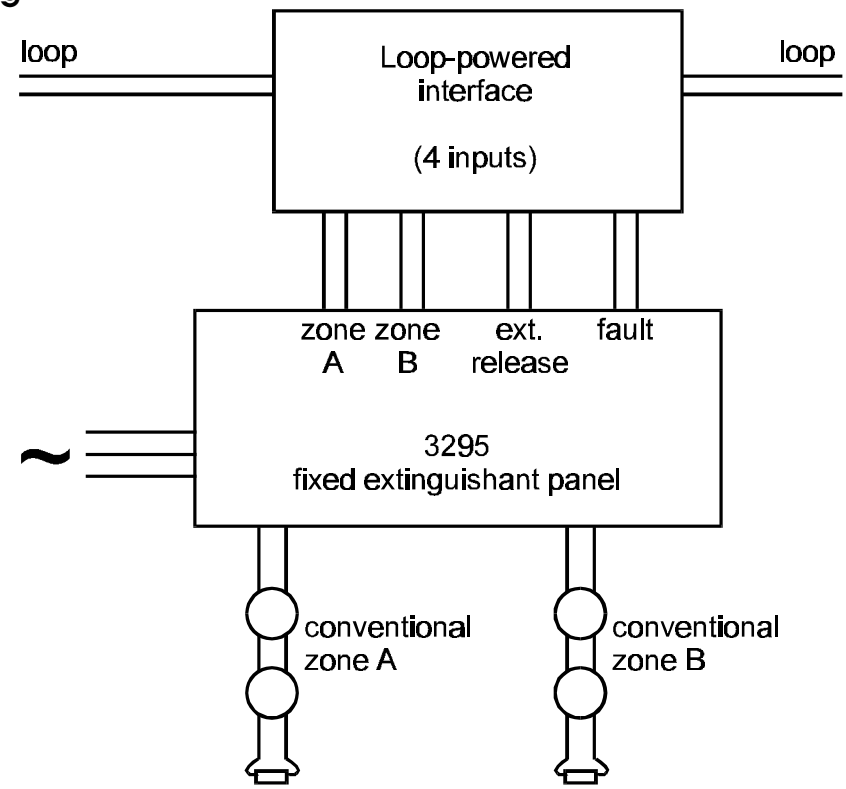

Figure 14-1 Fixed extinguishant system wiring

cd26

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Sprinkler systems

Sprinkler flow switches may be interfaced to the fire alarm system so that sprinkler operation will initiate a fire alarm.

Where stabilised water supplies are not available the sprinkler flow switches can momentarily operate due to surges of water pressure . To prevent this causing unwanted alarms a delay circuit must be included:

Sprinkler flow switch with stabilised water supply - This may be connected directly to either type of 34000 interface.

Sprinkler flow switch without stabilised water supply & 34440 mains-powered interface - requires a time delay circuit

Sprinkler flow switch without stabilised water supply & 34450 loop-powered interface - use delay feature incorporated in 34450

34440 mains-powered interface

Sprinkler flow switches may be normally open or normally closed.

If the sprinkler flow switch is to be used without a stabilised water supply, use a delay circuit, see following diagram.

The input circuit to the 34440 interface must include an end-of-line unit (shown dotted).

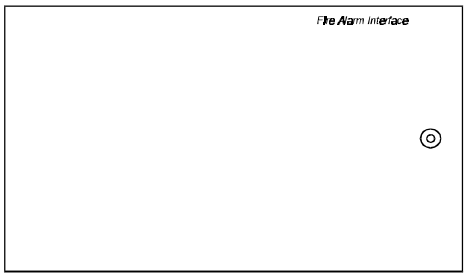

Figure 15-1 Mains powered interface

cdn197

Delay circuit

Equipment required:

Mains powered interface, one channel *(model no 34440)*
10 second delay module
Zener diode, 3V9, 400 mW *(model no 4101-042)*
End-of-line (capacitor/diode) unit (supplied with interface)

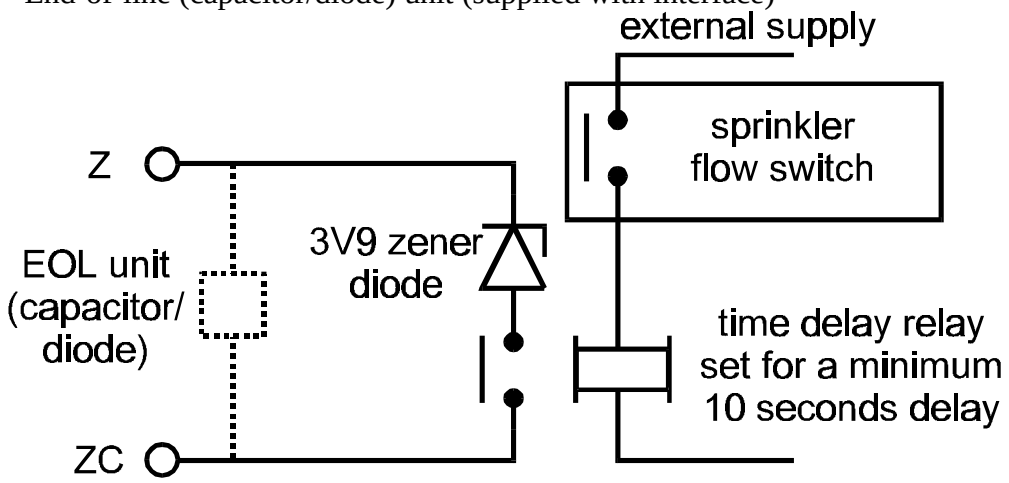

Figure 15-2 Connection for unstable water supply

cd8

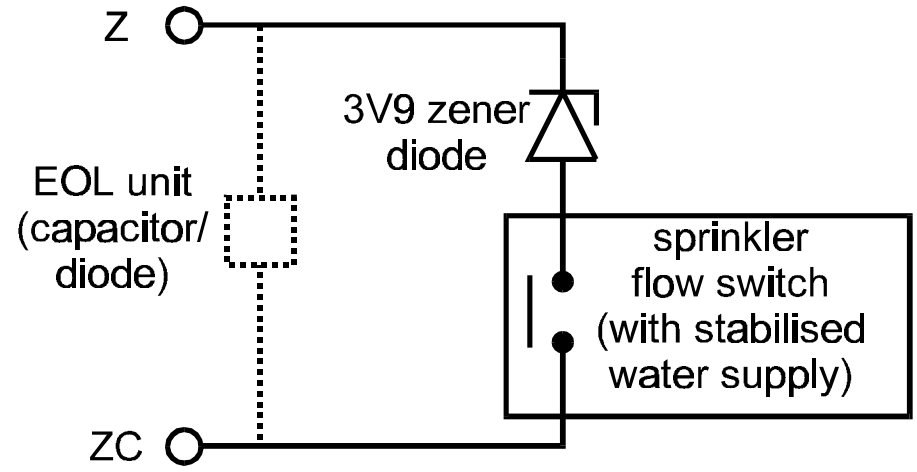

Figure 15-3 Connections for stable water supply

cd9

34450 loop-powered interface

The 34450 interface operates directly from the loop power supply and does not use mains power. It has 4 channels. Any of the channels may be configured as an input and used for the sprinkler system.

The sprinkler flow switch should be connected directly to a line module (19245-05) which can be mounted inside the interface enclosure or externally.

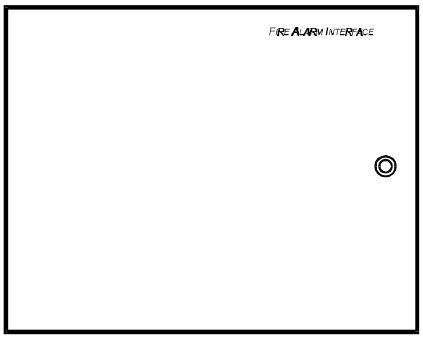

Figure 15-4 Loop powered interface

cd27

The 34450 interface may be configured to include a **10 second delay**, specifically designed for use with sprinkler flow switches. Each input may be configured for normally open or normally closed circuit operation.

Wiring

Equipment required:

Loop-powered interface, one channel *(model no 34450)*
Line module *(model no 19245-05)*

☐ Maximum cable length between 34450 and line module is 100m. There is a maximum of 1km line module monitoring cable per loop.

34415 Single Channel Interface

The 34415 interface operates directly from the loop power supply and does not use mains power.

The sprinkler flow switch should be connected to a line module (19245-05). The interface should then be configured using the switch inside the interface as a single input device with a **30 second delay.**

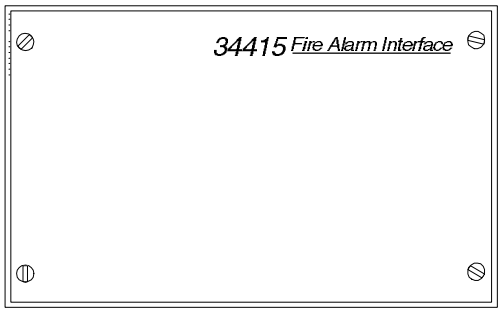

Figure 15-5 Single Channel Interface

cdn102

Fireman's key switches

Loop-powered interface

> ***NOTE:*** *This feature utilises a supervisory type input that is only available on version 3+ systems.*

A fireman's key switch is typically used by a fireman, in the event of a fire, to control plant such as air conditioning or to disable lifts.

The 34450 interface operates directly from the loop power supply and does not use mains power. It has 4 channels. Any of the channels may be configured as an input and used for a fireman's key switch.

The simplest way of achieving this is to use a key-switch door.

Existing key switch

Equipment required:

Loop-powered interface, one channel *(model no 34450)*
Line module *(model no 19245-05)*

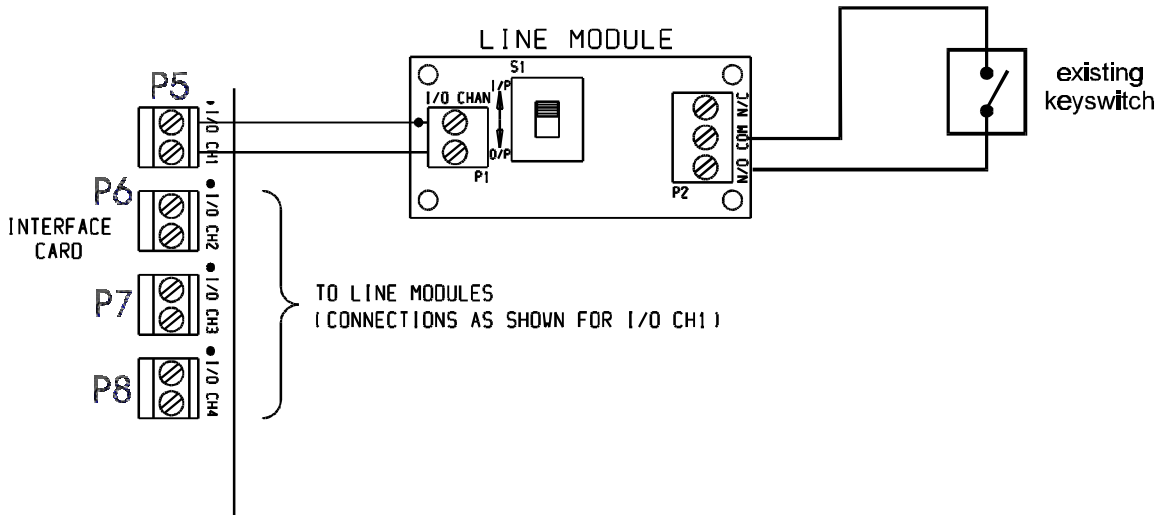

Figure 16-1 Fireman's keyswitch connection

cd28

Key switch door

A 34454 key switch door replaces the standard door of a 34450 interface. It has positions for mounting up to **4 - 2way keyswitches**. A maximum of up to **2-3way keyswitches** can be fitted to the door.

A 2-way key switch is able to activate a single interface channel, on and off. A 3-way key switch is able to activate either one of two interface channels, ON (a), OFF and ON (b). The 3-way key switch therefore utilises two interface channels.

The 2-way key switch incorporates an LED to indicate the 'ON' position. The 3-way key switch incorporates 2 LEDs to indicate both 'ON' positions.

Equipment required:

Loop-powered interface, one channel *(model no 34450)*
4-way key switch door *(model no 34454)*
2 or 3-way key switch *(model no 19245-02 or -03)*

The key switch is connected internally and does not require a line module.

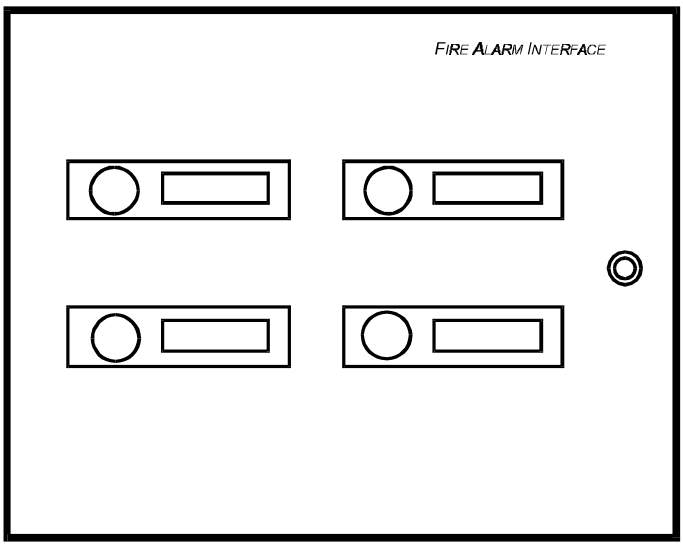

Figure 16-2 Loop powered interface with keyswitch door
cd3

Disable keyswitches

Loop-powered interface

The disable key is typically used on a day to day basis for disabling some part of the fire alarm system. This might be used to inhibit sounder circuits, for example during public performances in a concert hall, or may be used to inhibit or reduce the amount of smoke sensing in occupied areas during the day.

The 34450 interface operates directly from the loop power supply and does not use mains power. It has 4 channels. Any of the channels may be configured as an input and used for a disable key switch.

The simplest way of achieving this is to use a key switch door although a separate or existing key switch may be used instead.

Existing key switch

Equipment required:

Loop-powered interface, one channel *(model no 34450)*
Line module *(model no 19245-05)*

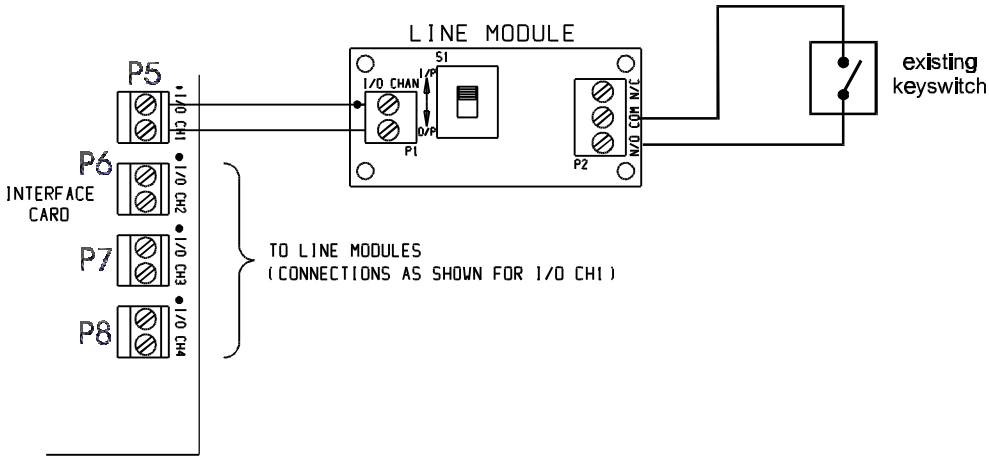

Figure 17-1 Disable keyswitch

Key switch door

A 34454 key switch door replaces the standard door of a 34450 interface. It has positions for mounting up to 4 key switches.

A 2-way key switch is able to activate a single interface channel, on and off. A 3-way key switch is able to activate either one of two interface channels, on (a), off and on (b). The 3-way key switch therefore utilises two interface channels.

The 2-way key switch incorporates an LED to indicate the ‘on’ position. The 3-way key switch incorporates 2 LEDs to indicate both ‘on’ positions.

Equipment required:

Loop-powered interface, one channel *(model no 34450)*
4-way key switch door *(model no 34454)*
2 or 3-way key switch *(model no 19245-02 or -03)*

The key switch is connected internally and does not require a line module.

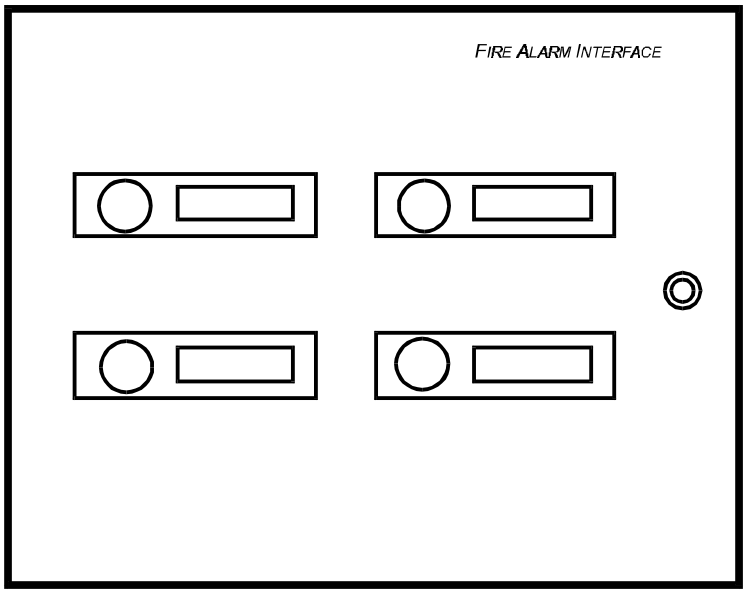

Figure 17-2 Loop powered interface with keyswitch door
cd3

Door release mechanisms

Door release mechanisms are powered directly from the mains supply or by a dedicated power supply. This supply is wired via an interface relay to release the doors in the event of fire.

Single channel interface

The output relay of the 34415 single channel interface is used to provide the switching required for the door release mechanism.)

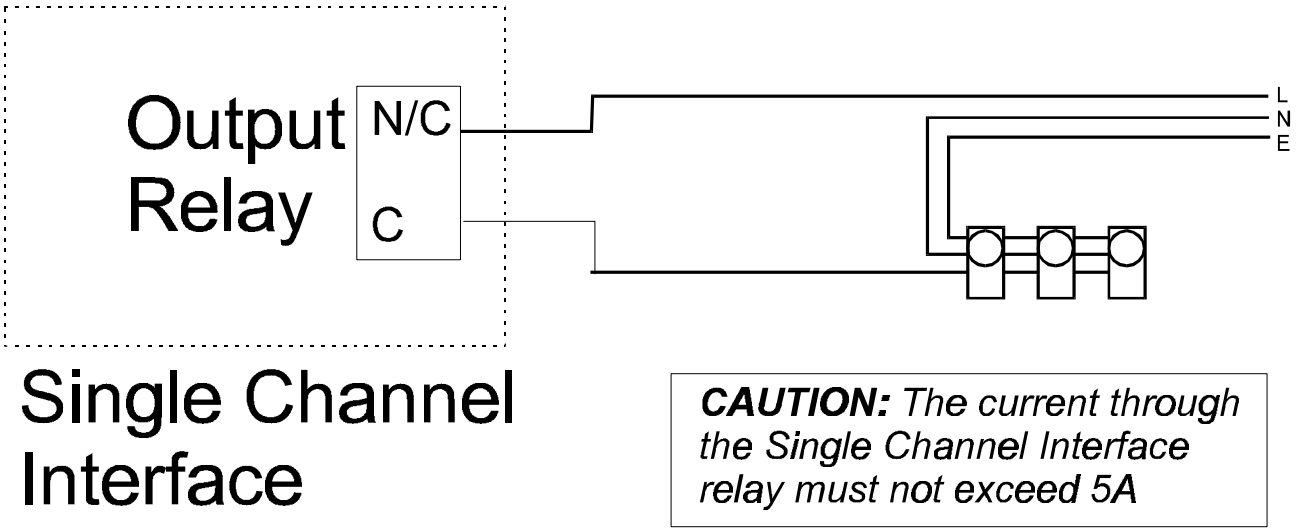

Figure 18-1 Door release interface circuit

cdn242

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Manned centre link

A manned centre link enables the fire alarm control panel to initiate an automatic telephone call to a fire station or other facility. The type of link used will depend on the requirements of the centre and locally available options.

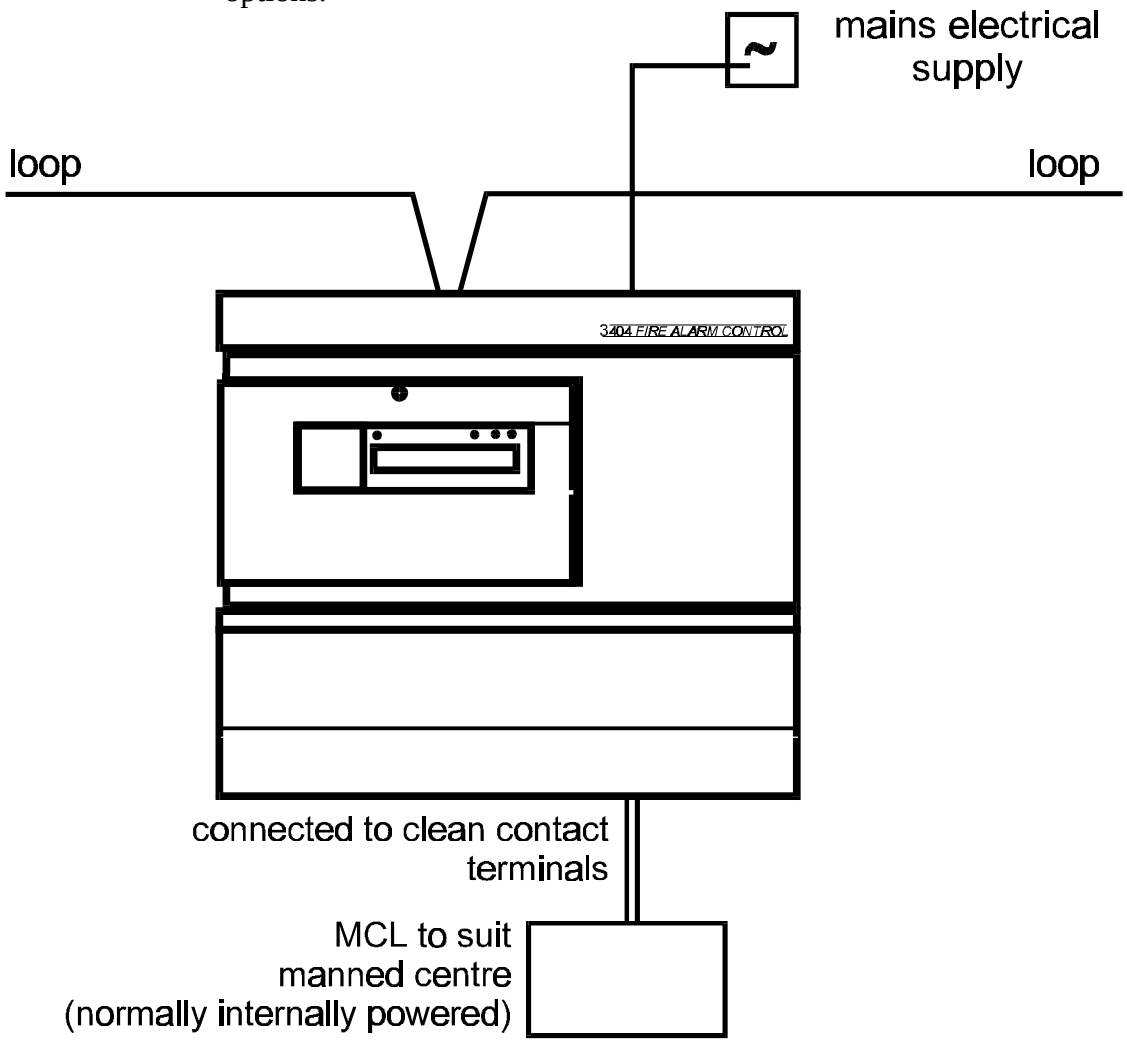

Figure 19-1 Manned centre link connections

cd1

NOTE: The Clean Contact terminals are located adjacent to the Master Alarm terminals

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Large alarm loads

Where a 24V- alarm circuit at a control panel or interface unit output circuit is required to drive a large alarm load than it may be necessary to use relay drivers.

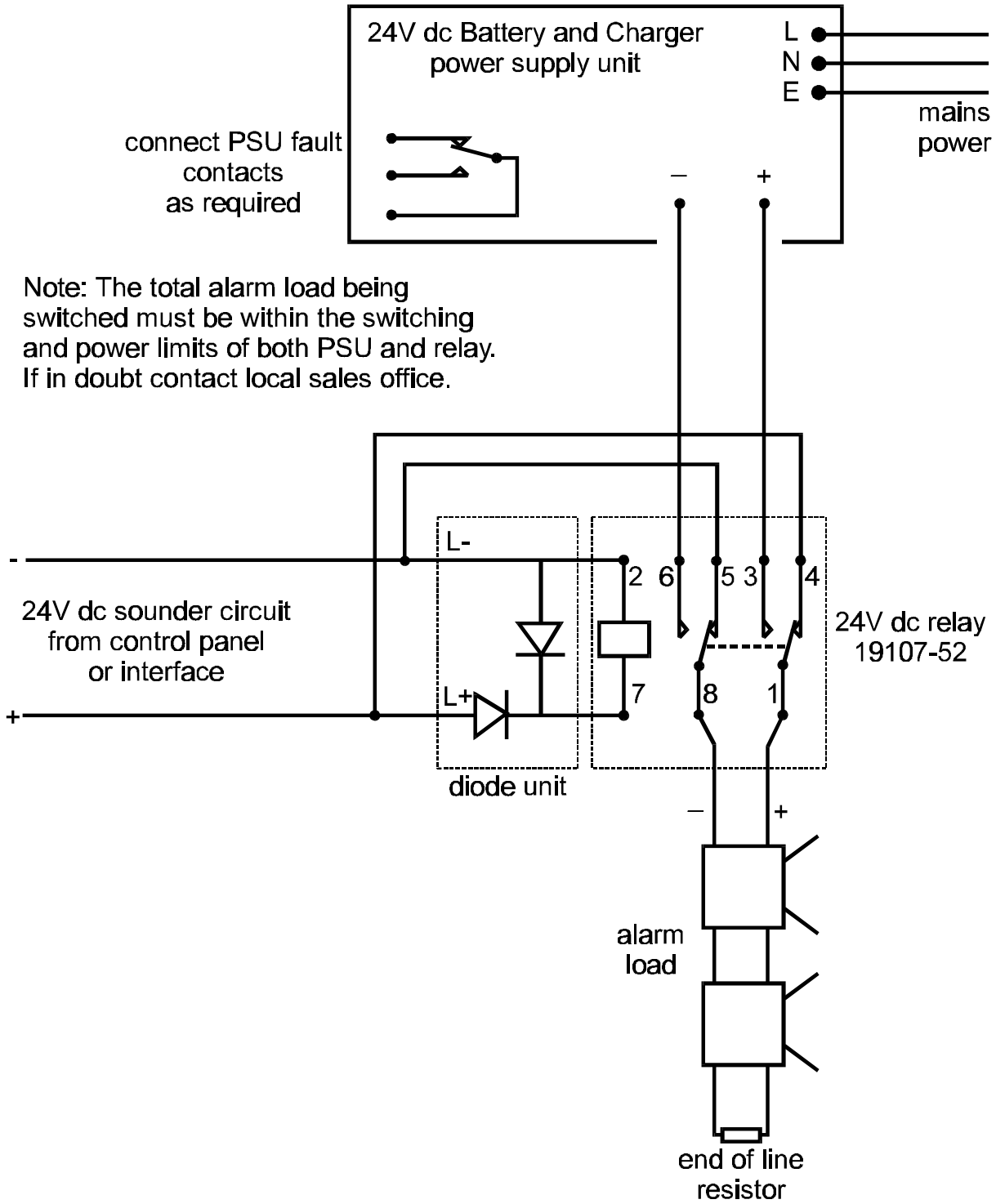

Figure 20-1 Connection of large sector load cd2

NOTE: *The 24Vdc battery and charger unit should be monitored for fault via a suitable interface input eg 34415.*

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Building management systems

The 3400 fire alarm system may be interfaced to a Trend building management system.

The 3400 system links to a special Trend network interface via a serial connection from a 13532-50 universal communications IO card.

The 3400 system may comprise a single control panel or a network of control panels (and terminal nodes).

Fires, Faults and Warnings on the 3400 system are presented to the Trend network and directed to the appropriate supervisory computer (via the Public Switched Telephone Network if necessary). At the supervisory computer the fire alarm calls are handled in the same way as any other call.

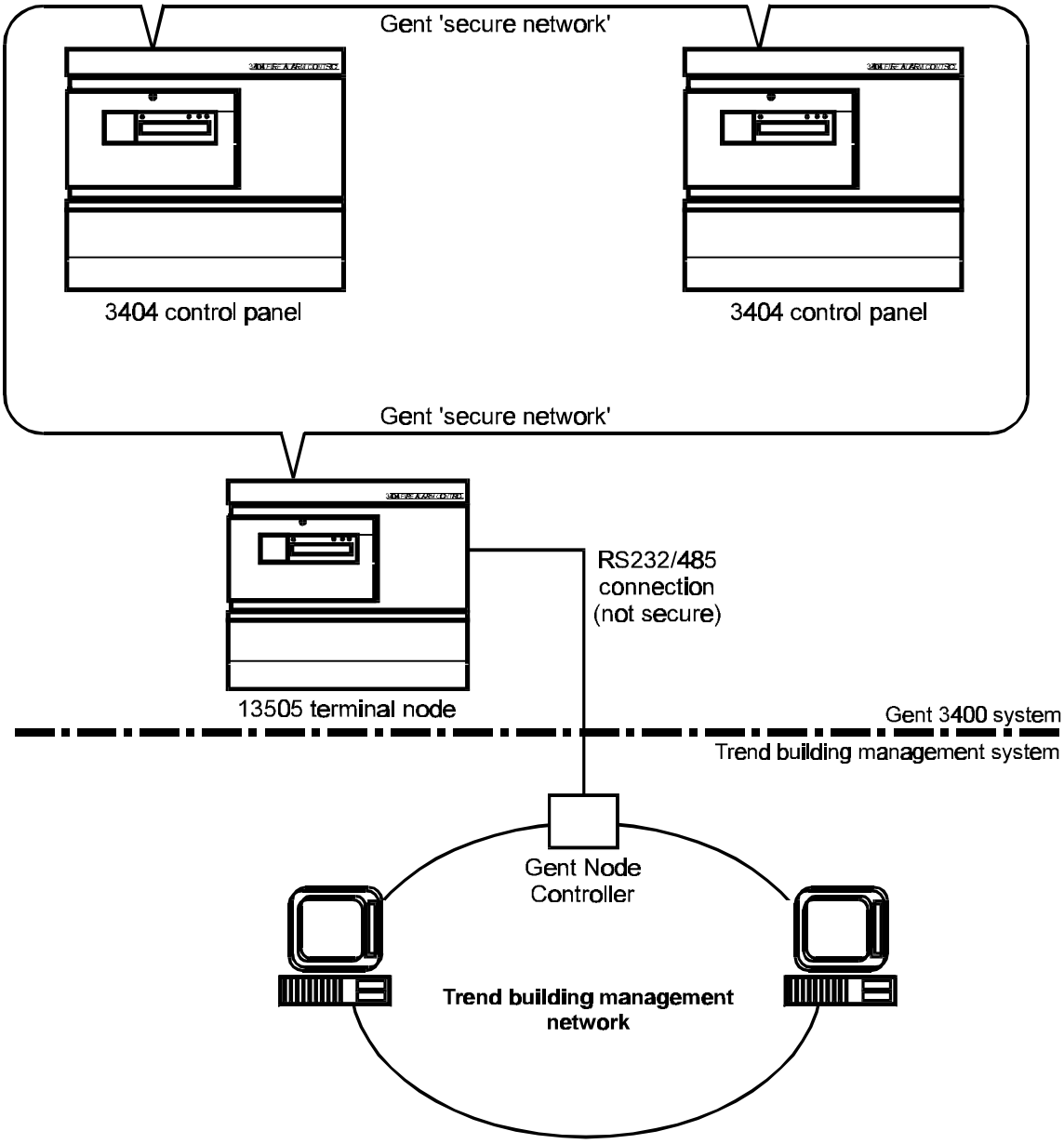

Figure 21-1 Connection to Trend system

cd29

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Loops

Cable length

The maximum length of cable that may be included in a loop, including sub-loops and spurs is 1km. The cable should have a total intercore capacitance of less than **0.5 microfarads** and a total series resistance (single core) of less than **13 ohms.**

Maximum number of outstations

Addresses The maximum number of outstation addresses available on each loop is 200.

Loading Each loop has a limited amount of power to drive devices. The loading effect of devices is shown in the following table. Each loop is capable of supplying **1000 load** units.

Logical constraints In addition there are further logical constraints, due to the control logic. These constraints are shown in the following table.

Device	Load (1000 max)	Logical constraint
34202/3 & 34213 sounder	25	40
34440 mains-powered interface	3	8
34450 & 34460 loop-powered interfaces	2	30
34410 Loop Powered Zone Module	10	100
34415 Single Channel Interface	10	100
34701 T-breaker	1	200
34702 & 34703 slave units	1	100‡
34710, 34720, 34729, 34730 sensors	1	200
34760 Duct sensor (also needs a slave LED)	1	50‡
34770 & 34780 sensor/sounder	8	125
* 34740 beam sensor pair	5	16
34777 Repeat Sounder	8	125
348XX range manual call point	1	200
34624 A4 Mimic Control Unit	3	32
* 13450/13460 repeat/mimic/ zonal mimic panels	3	32

The maximum number of devices on a loop is limited to **200.**

‡ Installations prior to **March 1996** have a maximum of 10 slave units.

Spurs

Spurs are commonly used to connect a small isolated group of sensors and manual call points to the main loop.

Limitations

A spur should not cover more than the equivalent of one zone as defined by BS5839:Part 1.

Avoid connecting an interface unit, driving sounders, to a spur circuit. The interface could potentially be driving 4 circuits of sounders and it would not normally be acceptable to lose these due to a single wiring fault.

Sub-loops

Sub-loops are normally used for wiring floor voids or service ducts running parallel to the main loop.

A sub-loop should not cover more than the equivalent of one zone as defined by BS5839:Part 1.

Designing

A sub-loop must start from a device on the main loop and finish at another device on the main loop. These must be 3-way devices.

> **NOTE:** *A sub-loop must contain at least one device.*

A sub-loop may not connect to the main loop except at each end.

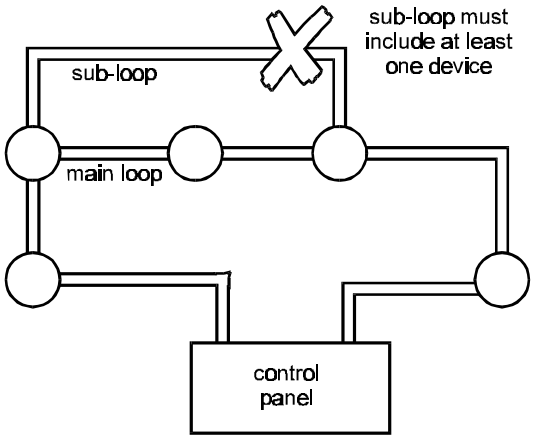
Connecting spur and sub loop circuit

A spur or subloop circuit is connected to the loop using a 3-way device. This is provided by:

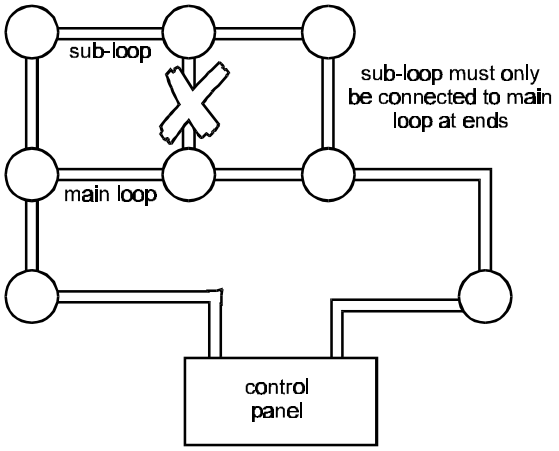
- ☐ 34701 T-breaker
- ☐ 34203 3-way sounder (34213 environmentally protected)
- ☐ 34440 mains-powered fire alarm interface
- ☐ 13450 repeat panel
- ☐ 13460-01 mimic panel
- ☐ 13460-02 zonal mimic panel

Connections not allowed

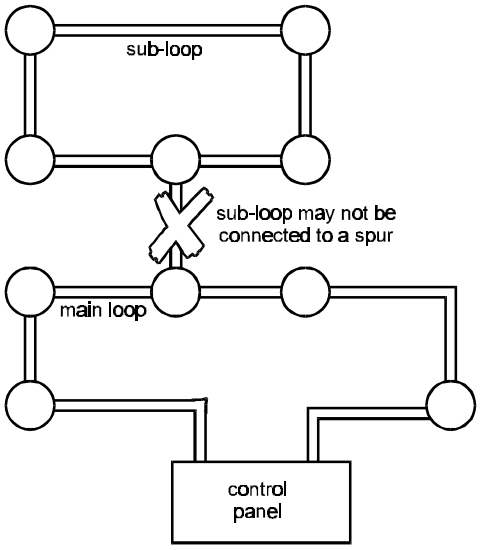
Figure 22-1 Loop circuit connections not permitted



cd111



cd112



cd113

Calculating the number of loops

Coverage The maximum area that any loop should cover is **10 000 square metres** of floor area of a protected site.

Future expansion The number of devices that can be connected to a loop is limited. Where possible allow for system expansion, use extra loops rather than fully load a loop.

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Choosing Loop circuit cable

see also choosing Network circuit cable

> ***CAUTION:*** *In countries where the European EMC directive is in force, only those cables detailed in the* ***EMC Compliance*** *part of this manual may be used.*

> ***NOTE:*** *The loop cable usage must not exceed* ***1Km.*** *This includes the cable usage on main loop and spur circuits.*

> ***NOTE:*** *Single pair cable must be used. It is* ***NOT*** *permissible to run mixed loops or outgoing and return pairs in a multi core cable.*

System 3400 loop cable carries both data and power supply and therefore its selection is important.

Specification

- ☐ Mineral insulated cable (MICC) to BS6207:Part 1 (EMC approved)
- ☐ Delta Crompton **FTZ2E1.5 FIRETUF OHLS** fire resistant data cable (EMC approved)
- ☐ Raydex CDT **FG950** (EMC approved)*
- ☐ Cavicel SpA **FIRECEL SR 114** (EMC approved)* distributed by Cables Britain
- ☐ AEI Cables **FIRETEC** (EMC approved)*
- ☐ BICC Pyrotenax **FLAMESIL FRC** (EMC approved)*
- ☐ Datwyler **LIFELINE** (EMC approved)*
- ☐ Alcatel cable **PYROLON E** (EMC approved)* distributed by Winstonlead
- ☐ Huber & Suhner **RADOX FR** (EMC approved)*
- ☐ Other cables to the following specification:
  - BS6387
  - no more than **2-cores**
  - a maximum of **0.5 µF** total intercore capacitance
  - a maximum of **13 ohm**s total per core
  - each core having no less than **1.5 mm^2** cross section area
  - inherent or through metal conduit screen for earth continuity in order to produce electrical protection and screening
  - having protection from heat and mechanical damage

- the cable screen must be **capable** of being earthed at each system device (outstation)

NOTE: *The cables marked * utilise laminated aluminium tape with a tinned drain wire for electrostatic screening. Under certain environmental conditions* ***galvanic action*** *may take place between the aluminium and the drain wire. This will severely* ***degrade EMC performance*** *as the foil to drain wire* ***impedance will increase****. Therefore these wires should be installed in line with* ***GENT installation instructions*** *and used* ***only*** *under environmental conditions as* ***specified by the manufacturer.***

A4 Mimic Display to Control Unit cable

☐ **Mineral insulated copper cable** (EMC Compliant)

50m maximum ***Mimic Pane*****l** ***to Remote Box*** cable distance

- The cable is to *BS6207: Part 1*
- fire resistance tested to *BS6387 categories CWZ*
- having continuous metal sheath encapsulation
- no more than 4- cores
- each core having **1.5mm^2** cross section area
- a **red** cover sheath (preferred for alarm applications)
- core to core capacitance **115pF/m**
- core to screen capacitance **205pF/m**

☐ **Delta Crompton FTZ4E1.5 FireTuf OHLS fire resistant cable** (EMC Compliant)

50m maximum ***Mimic Pane*****l** ***to Remote Box*** cable distance

- four core plus earth wire
- fire resistance tested to *BS6387 categories CWZ*
- each wire having **1.5mm^2** cross section area
- core to core capacitance **115pF/m**
- core to screen capacitance **205pF/m**

Panels

Hardware There are 2 fire alarm control panels in the 3400 range, a 4-loop panel and an 8-loop panel.

1-4 & 1-8 Loop control panels

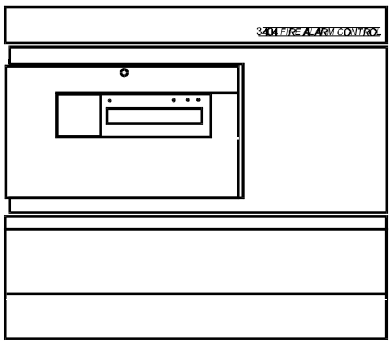

Figure 24-1 1-4 Loop Control panel

cd63

- ☐ 4-loop fire alarm control panel - 13404-12V3+
- ☐ 8-loop fire alarm control panel - 13408-12V3+
  - Wall mounted and floor standing options available

Each loop may accommodate up to 200 devices, although there are several restrictions that will in practice reduce the number.

A detailed explanation of how to calculate the maximum number of devices is given in the *Loops, Number of outstations* part of this manual.

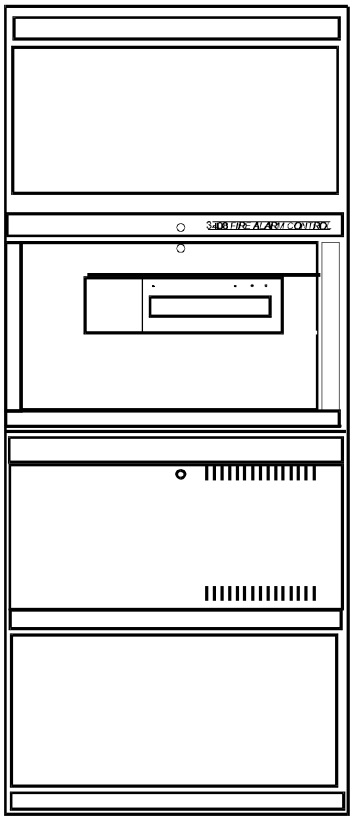

Figure 24-2 1-8 Loop control panel

cd62

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Control panel standby to 72 hours

4 loop control panel

Charger and battery cubicle

A standard 3404 control panel will provide a standby time of 24 hours with an additional full alarm load for 30 minutes. This may be extended to 72 hours of standby with an additional full alarm load for 30 minutes by adding extra batteries and a charger.

The charger and batteries should be mounted adjacent to each other. The maximum distance between them and the control panel is 20 metres.

Equipment required:

- 8 x 24 Ah batteries *(model no 05795-02)*
- 1 x battery cubicle *(model no 05906-06*
- 1 x charger *(model no 05216-24)*
- 1 x loop-powered interface *(model no 34450)*

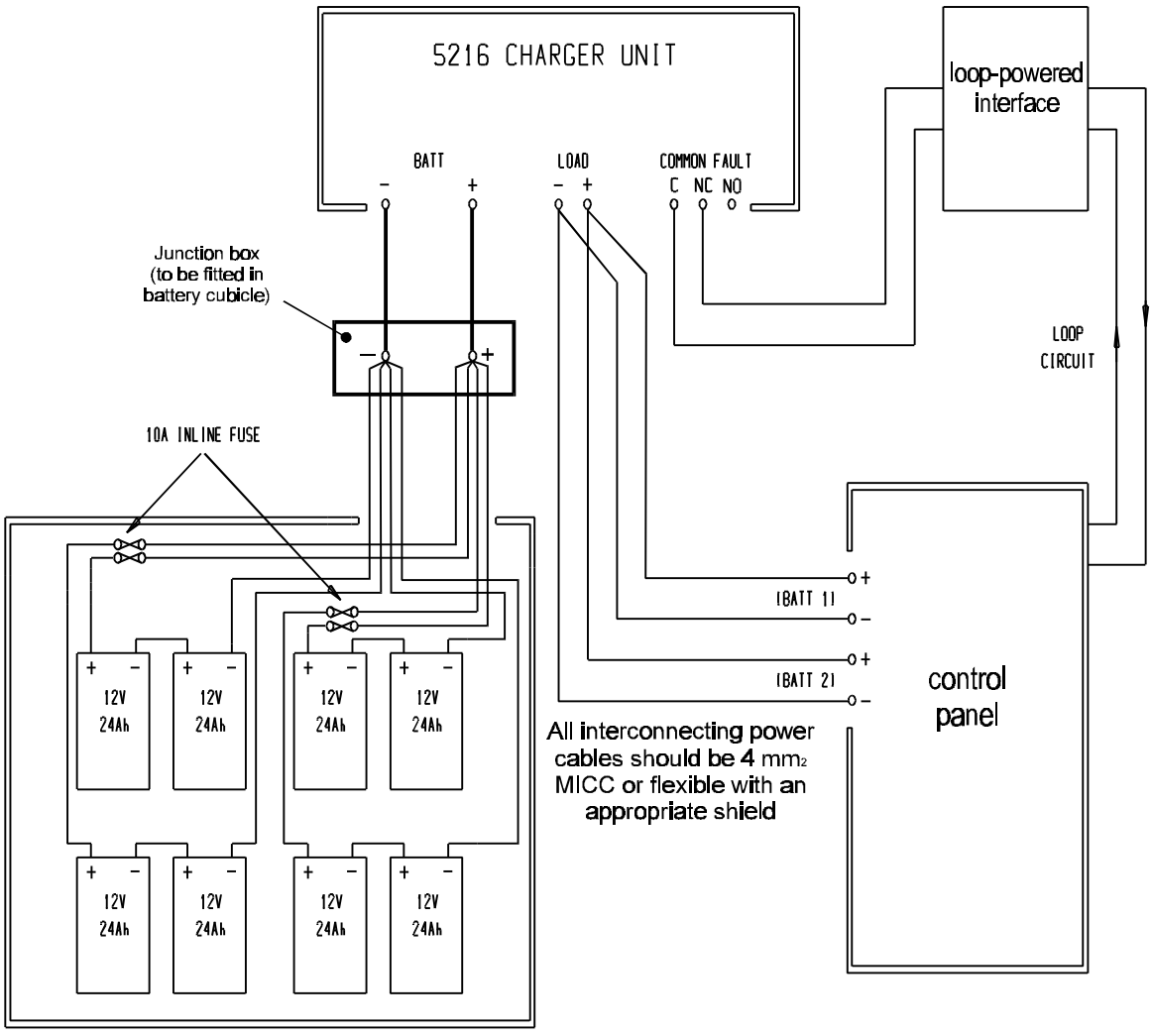

Figure 25-1 1-4 loop panel 72 hour standby

cd37

NOTE: *In order to achieve the* ***72 hour*** *standby, the* ***control panel power supply*** *needs to be modified. The modified power supply needs to be available for the commissioning stage.*

NOTE: *The extra batteries are instead of* ***not*** *as well as the batteries in the control panel*

8 loop control panel

2 chargers and 2 battery cubicles

A standard 3408 control panel will provide a standby time of 24 hours with an additional full alarm load for 30 minutes. This may be extended to 72 hours of standby with an additional full alarm load for 30 minutes by adding extra batteries and chargers.

The chargers and batteries should be mounted adjacent to each other. The maximum distance between them and the control panel is 20 metres.

Equipment required:

- 16 x 24 Ah batteries *(model no 05795-02)*
- 2 x battery cubicle *(model no 05906-06*
- 2 x charger *(model no 05216-24)*
- 1 x 3408 c/w mk III psu
- 1 x loop-powered interface *(model no 34450)*

NOTE: *In order to achieve the* ***72 hour*** *standby, the* ***control panel power supply*** *needs to be modified. The modified power supply needs to be available for the commissioning stage.*

NOTE: *The extra batteries are instead of* ***not*** *as well as the batteries in the control panel*

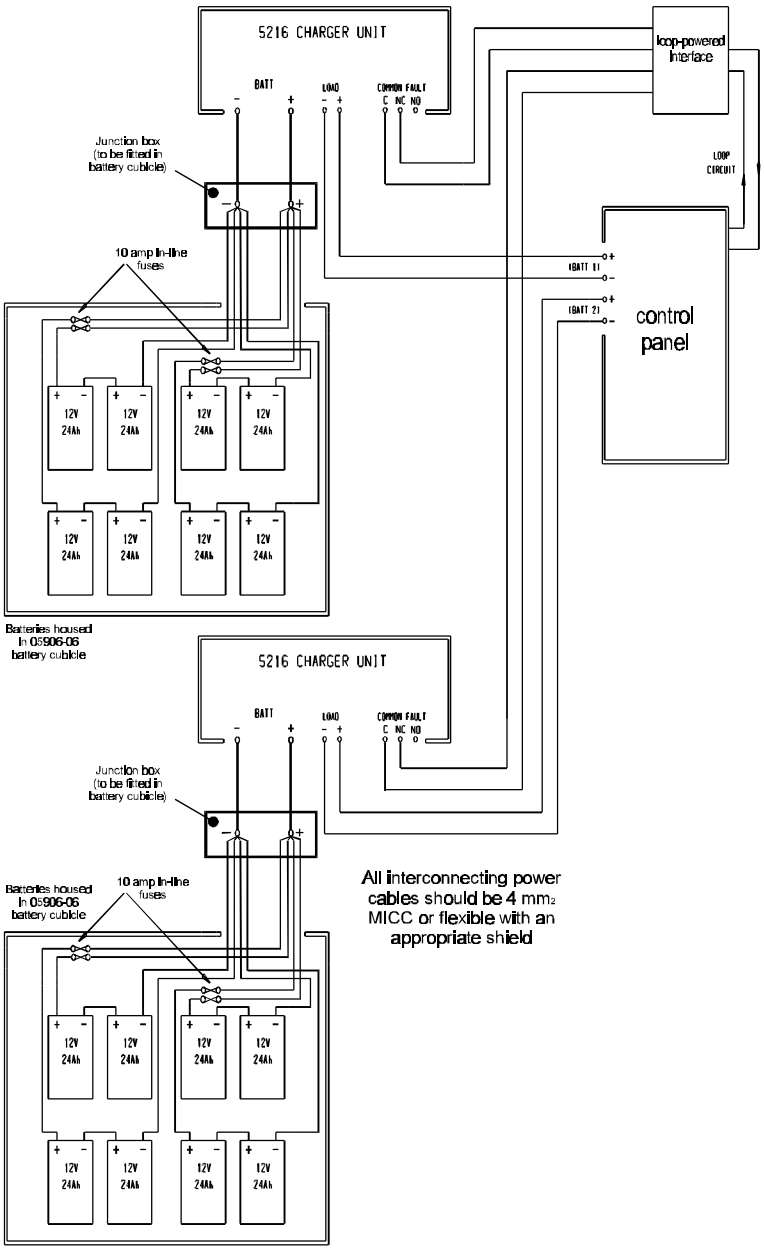

Figure 25-2 1-8 Loop panel 72 hours standby

cd38

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13450-01V3-02V3 Repeat panel

A repeat panel is connected directly to any loop of the main control panel. In addition it requires a mains supply to run its battery-backed power supply.

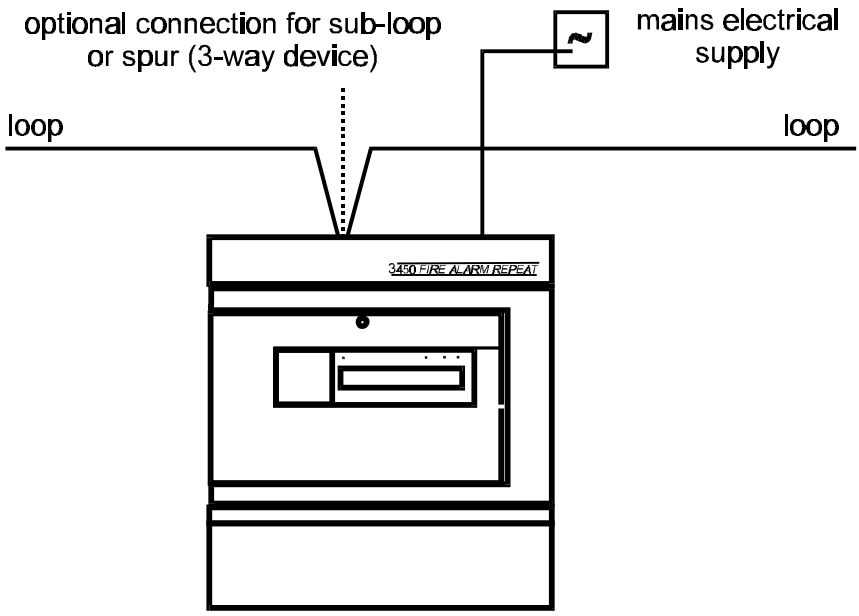

Figure 26-1 Repeat panel connections

cd39

13460-01V3 Mimic repeat panel

A mimic repeat panel is connected directly to any loop of the main control panel. In addition it requires a mains supply to run its battery-backed power supply.

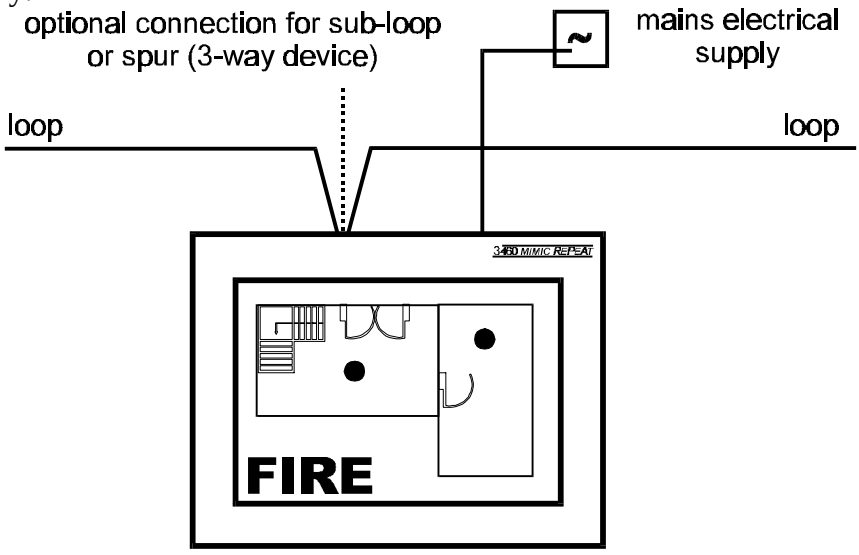

Figure 26-2 -Mimic panel connections

cd39

13460-02 Zonal mimic panel

A zonal mimic panel is connected directly to any loop of the main control panel. In addition it requires a mains supply to run its battery-backed power supply.

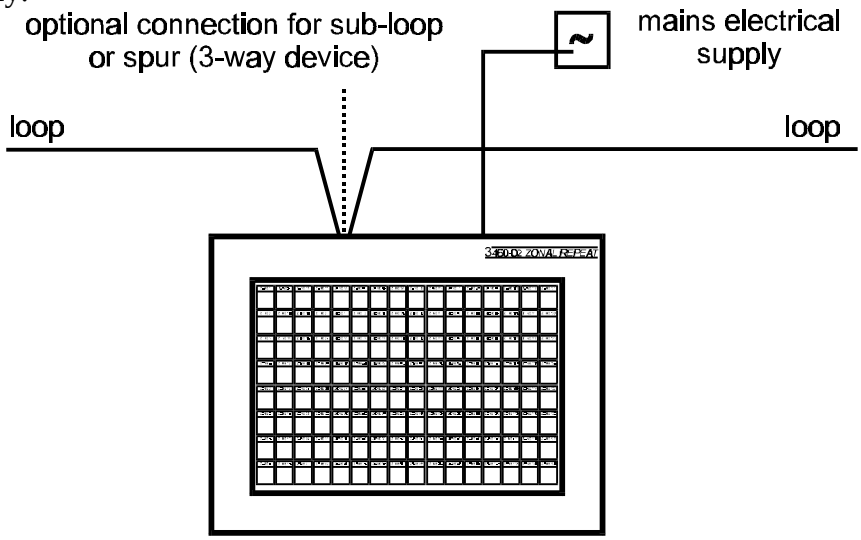

Figure 26-3 Zonal mimic panel connections

cd41

34604-XX A4 mimic panel set

The A4 mimic and control unit are connected directly to any loop of the main control panel.. It requires a mains supply to run its battery backed supply.

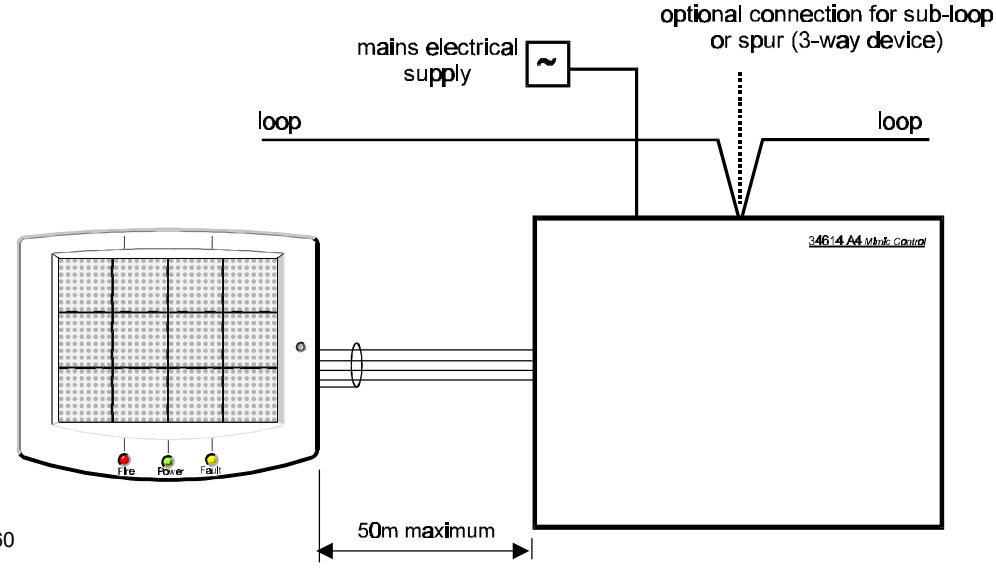

Figure 26-4 A4 mimic connections

cdm60

Networks of control panels

> ***NOTE:*** *The use of networks requires version 3+ control panels.*

Interconnecting control panels

Secure network

A Gent 'secure network' is used to interconnect a number of control panels. A network allows fire and other information to be passed between panels, it also allows an operator at one panel to control other control panels.

The secure network comprise a cable loop with isolation circuits at each panel, this allows a single cable fault to be totally isolated without affecting the network performance. In the event of multiple cable faults the secure network automatically reconfigures itself so that groups of panels that are still connected to each other still operate as individual networks.

The secure network is powered from the control panels and therefore will continue to operate in the case of a mains electricity failure.

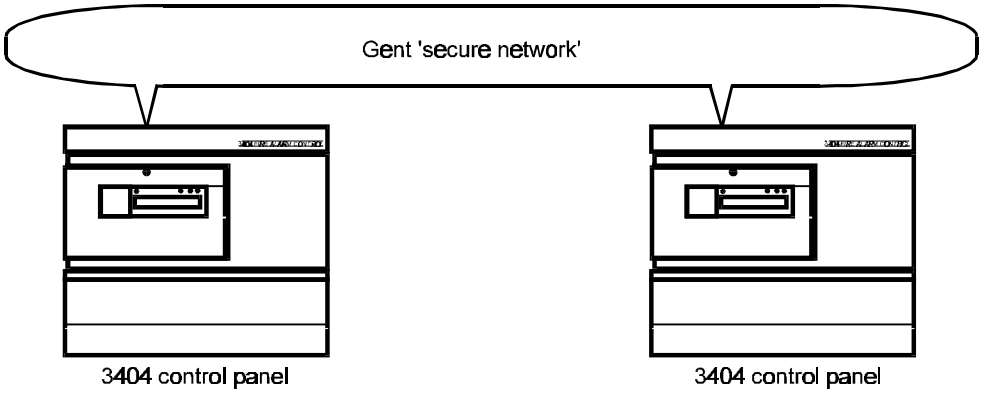

Figure 27-1 Secure network connections

cd91

What can be connected?

The following equipment may be connected to a secure network:

- ☐ 3404 fire alarm control panel
- ☐ 3408 fire alarm control panel
- ☐ 13505 terminal node

A terminal node is similar to a control panel except that it does not have facilities for connecting loops. This can be used in two ways:

- ☐ as a remote control panel for operator control, for example in a gate house
- ☐ as a panel for connecting a GENT Supervisor computer

Number of nodes

Up to a total of **31 control panels** and terminal nodes may be attached to a secure network.

Network connection

Each panel communicates with the network via a plug-in network card (13501-01). The network card is an optional item and should be ordered separately.

Maximum distance

The maximum distance between panels is limited by the cable between the two. Depending on the choice of cable, the link between any two panels may be up to **1200 metres.**

It is possible to effectively double the distance between 2 panels by adding an intermediary terminal node. However the terminal node will still require a mains voltage supply.

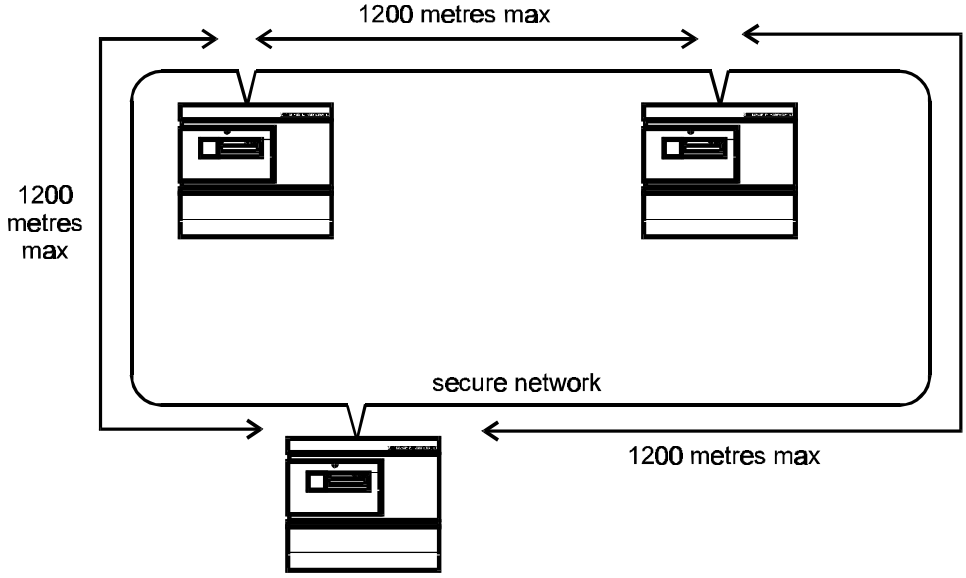

Figure 27-2 Secure network connections

In the event of Fault events

Fault information is displayed at networked control panels but the buzzer is not activated.

Fault information is displayed and buzzer activated at networked terminal nodes

Controlling a network from a 13505 terminal node

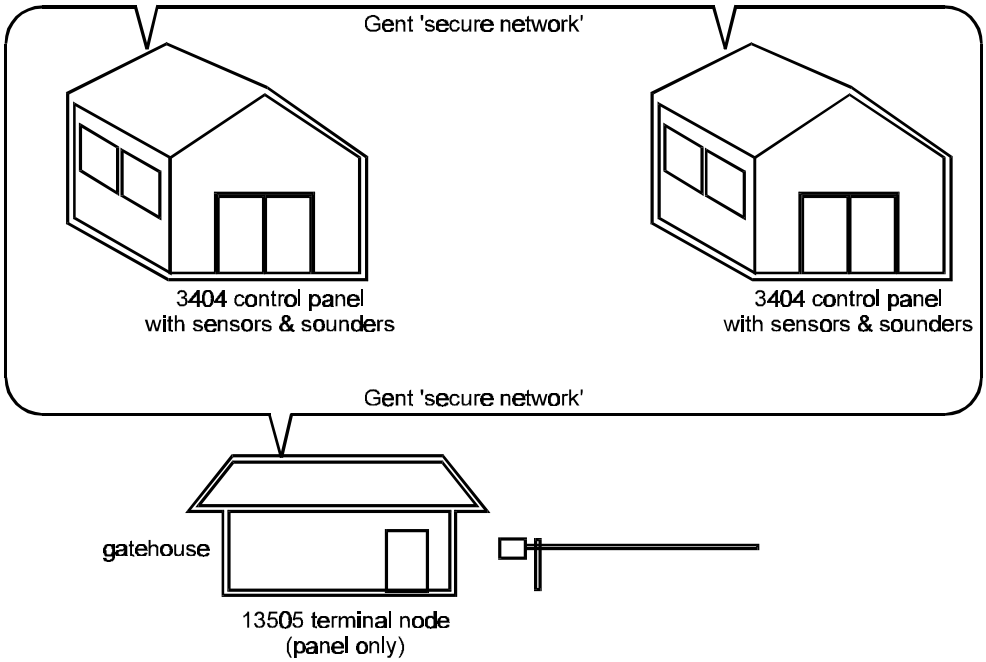

Figure 27-3 Gent secure network

The terminal node is useful in applications where operators need to be able to monitor and control a fire alarm system of one or more control panels from a remote location. The terminal node provides some of the user functionality of a normal 3404 or 3408 control panel, but without the loop drive circuitry.

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Choosing network cable

> ***CAUTION:*** *In countries where the European EMC directive is in force, only those cables detailed in the EMC Compliance part of this manual may be used.*

The cable used to interconnect networks MUST be one of the following:

Data Cables

☐ **Belden No 9729 (UL: Style 2493) EMC approved**

☐ **Huber & Schner Radox series FR communication cable**
1200m maximum ***Panel to Panel*** or ***Panel to Node*** cable distance

- Three core twisted triad screened
- 1.5mm^2 (7/0.42 stranded) conductors
- Nominal impedance 200ohms (1KHz)
- Capacitance between conductors 110pF/m (1KHz)
- Capacitance between screen to core 210pF/m (1KHz)
- Fire resistance tested to BS6387 category CWZ and IEC 331

☐ **Mineral insulated copper cable** (EMC Compliant)
800m maximum ***Panel to Panel*** or ***Panel to Panel*** cable distance.

- *BS6207: Part 1*
- **3 parallel** cores
- having continuous metal sheath encapsulating
- each core having **1.5mm^2** cross section area
- a **red** cover sheath (preferred for alarm applications)

☐ **Teflon jacketed Belden TR No. 89729**
1200m maximum ***Panel to Panel*** or ***Panel to Node*** cable distance
Both cables must have following characteristics:

- Two twisted pairs
- Each pair individually screened
- 24AWG (7 strands x 32 AWG)
- Low capacitance between conductors - 39.4pF/m at 1kHz
- Low capacitance conductor to screen - 72.2pF/m at 1kHz
- Temperature range -30^{o}C to +60^{o}C .
(Teflon jacketed cable 89729 up to 200^{o}C)

☐ **Belden Armoured equivalent** (EMC Compliant)

- This cable being a two pair cable to *BS5308:Part 1 (type 2)* $0.5mm^2$ (16/0.2mm).
  600m maximum ***Panel to Panel*** or ***Panel to Node*** cable distance.

☐ **Belden No. 9842 EIA RS485 Applications, O/A Beldfoil® Braid**
1200m maximum ***Panel to Panel*** or ***Panel to Node*** cable distance
Must have following characteristics:

- Two twisted pairs
- 24AWG (7 strands x 32 AWG) conductors
- Low characteristic impedance - 120 ohms
- Low capacitance between conductors - 42pF/m at 1kHz
- Low capacitance conductor to screen - 75.5pF/m at 1kHz

GENT Supervisor

Selecting a Supervisor software package

There are two computer systems available, the Textual package and the Graphics package. The Text Supervisor computer system is available with 2 basic textual package options:

- ☐ Information (allows access to information mode only)
- ☐ Configuration (allows access to all four modes)

The Graphics Supervisor computer system displays the Information in graphical form. The Graphics Supervisor must be connected to the Text Supervisor in order for the Graphics package to work.

Text Supervisor

Information The information mode is useful to **security personnel** and reception staff who require an indication of events. It is possible to customise the display of information to restrict the display to particular types of events.

The information mode does not allow the user to control any aspect of the fire alarm system.

Security The security mode provides information but also allows control of the fire alarm system. This is likely to be of use to **authorised personnel who are responsible for site evacuation.**

Engineering The engineering mode is likely to be of use to **engineers** who are responsible for day to day operation and maintenance of the fire alarm system. This mode allows parts of the system to be disabled.

Configuration The configuration mode allows the other text modes to be customised. This is likely to be of use to an **authorised person who is also responsible for the fire alarm system.**

Feature	*Information*	*Security*	*Engineering*	*Configuration*
information	✓	✓	✓	✓
sub-fault information				✓
fire alarm controls		✓	✓	✓
disable			✓	✓
back-up			✓	✓
configuration				✓

Text monitor Text is displayed by the GENT Supervisor Text computer on a colour monitor (super VGA 1024 x 768 colour 14" minimum).

Graphics Supervisor

Graphics

The graphics package provides a sophisticated representation of the location of events. The display comprises a set of images representing different parts of the site, which can provide a zoom-in effect.

Graphics monitor

Graphics are displayed by the GENT Supervisor Graphics computer on a colour monitor (super VGA 1024 x 768 colour 14" minimum) connected to the Text computer.

Maintaining fire alarm integrity

Terminal node

The Supervisor system utilises commercial computer equipment to provide information and control of the fire alarm system. Although there is an uninterruptible power supply option, this still does not bring the system up to the rigorous standards of a fire alarm system.

To be sure that the operator always has access to information and control even if the Supervisor system should fail, the Supervisor should be sited close to a terminal node (or control panel). The terminal node should be close enough for the operator to hear the buzzer and to see the primary indicators.

Display - Text package

Standby display

The screen during standby will display the *Gent Fire Detection & Alarm System* ‘home’ window.

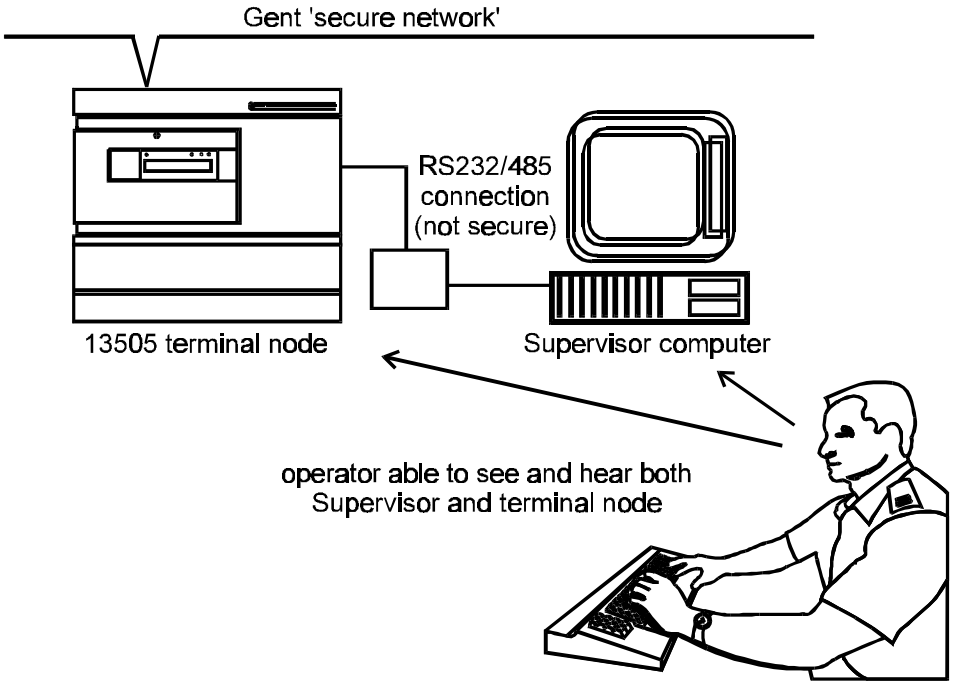


Figure 29-1 Positioning of Supervisor and control panel

Alternatively the ‘home’ window may be displayed in its minimised form.

In addition to the ‘Home’ window, it is possible to display a clock. The clock is digital, and is displayed in the bottom-left corner of the screen.

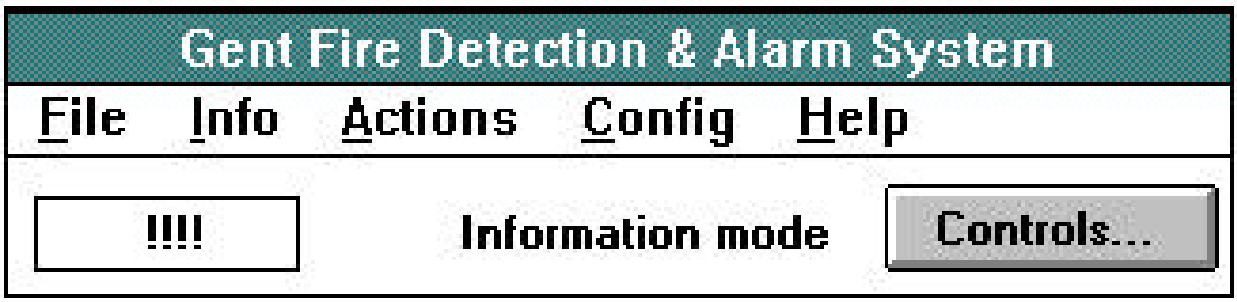


Figure 29-2 Home window

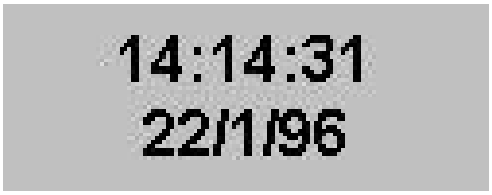
cp3

Figure 29-3 Minimised home window

cp13

Figure 29-4 Clock

cp11



Fire events display

Available to all text modes.

The *Gent Fire Detection & Alarm System* window is always displayed on the text screen.

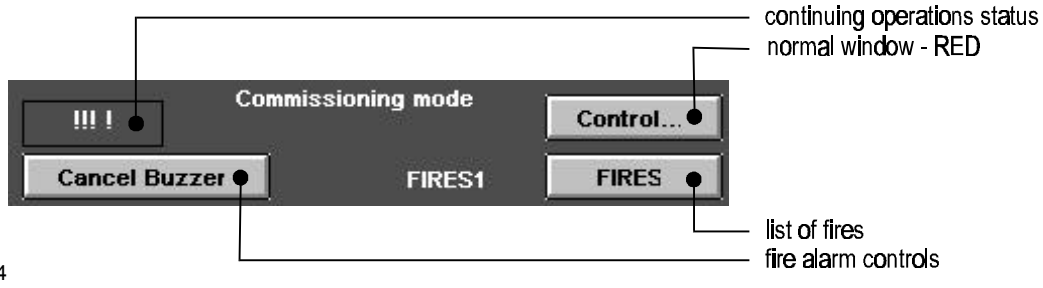


Figure 29-5 Home window turns red in the event of fire

cd94

Figure 29-6 Minimised home fire window

cp10

The background is normally white. In fire, the background colour changes to RED and a pop-up window appears, providing details of the fire.

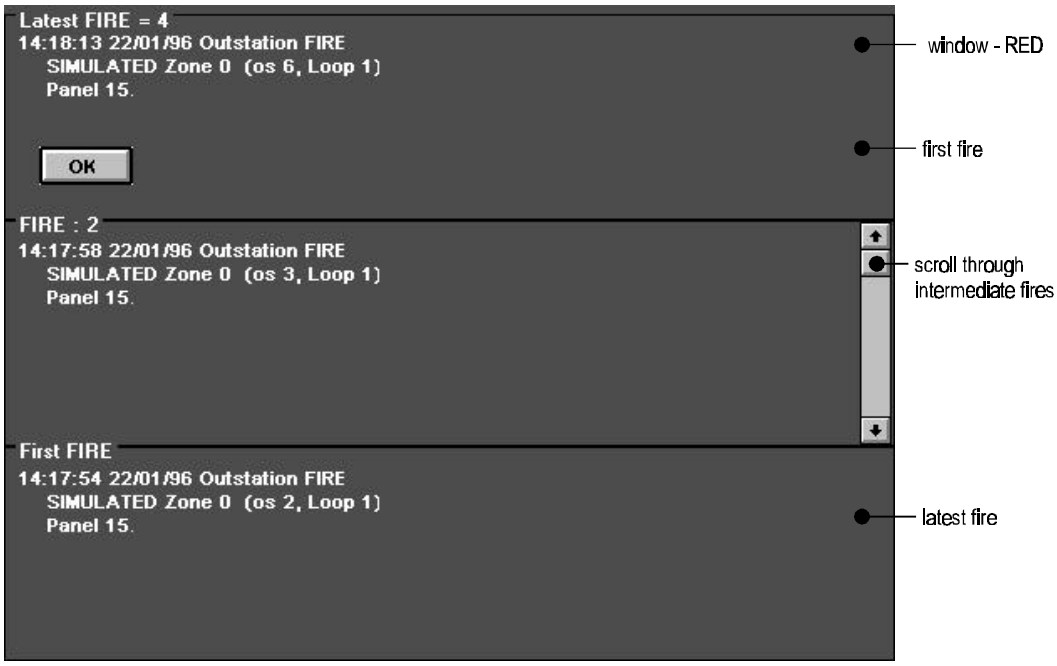


Figure 29-7 Fire event pop-up window shows details

cd95

Fault and warning display

Available to all text modes.

The Gent Fire Detection & Alarm System window is always displayed on the text screen. The background is normally white. During a fault condition, the background colour changes to YELLOW.

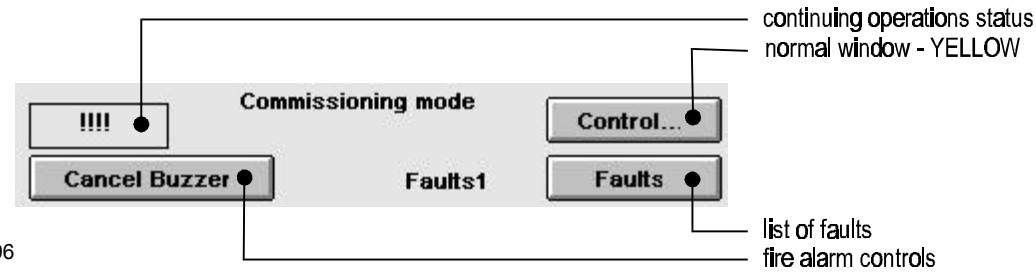


Figure 29-8 Home fault window

cd96

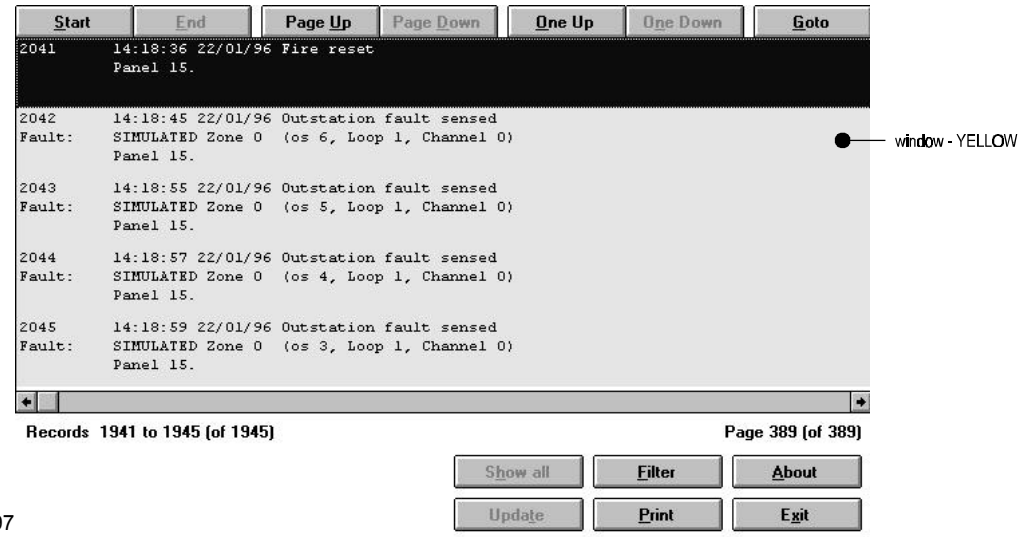


Figure 29-9 Multiple fault window

cd97

Supervisory and other event information display

Available to all text modes.

The Gent Fire Detection & Alarm System window is always displayed on the text screen. The background is normally white. In fire, the background colour changes to MAGENTA.

Display - Graphics package

The graphics display is provided by a separate computer connected to the Text supervisor. The graphics will not run if it is not connected to the Text computer

Building graphics

Graphics provide a diagrammatic representation of the buildings or group of buildings being protected. If a fire, or fault, event occurs the system will automatically zoom-in to the appropriate display, identify the exact location of the event.

The graphic images are designed by Gent with reference to the clients requirements and system installation drawings.

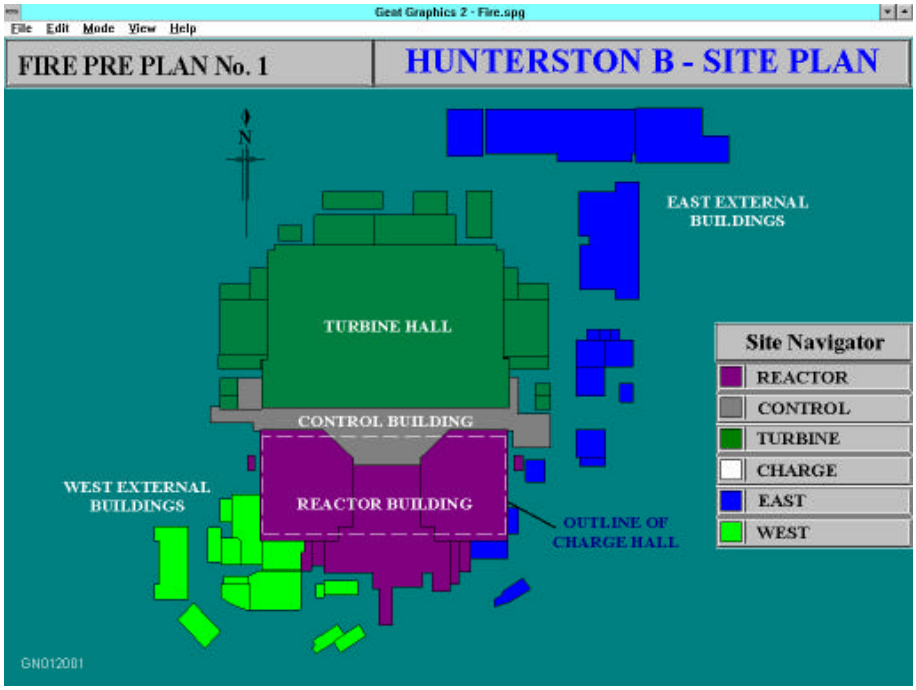


Figure 29-10 Display of site plan

cdn151

Fire event pop-up window shows detail

Configuration option for Supervisor

User configuration

User configuration covers those options that will be determined by local management preferences.

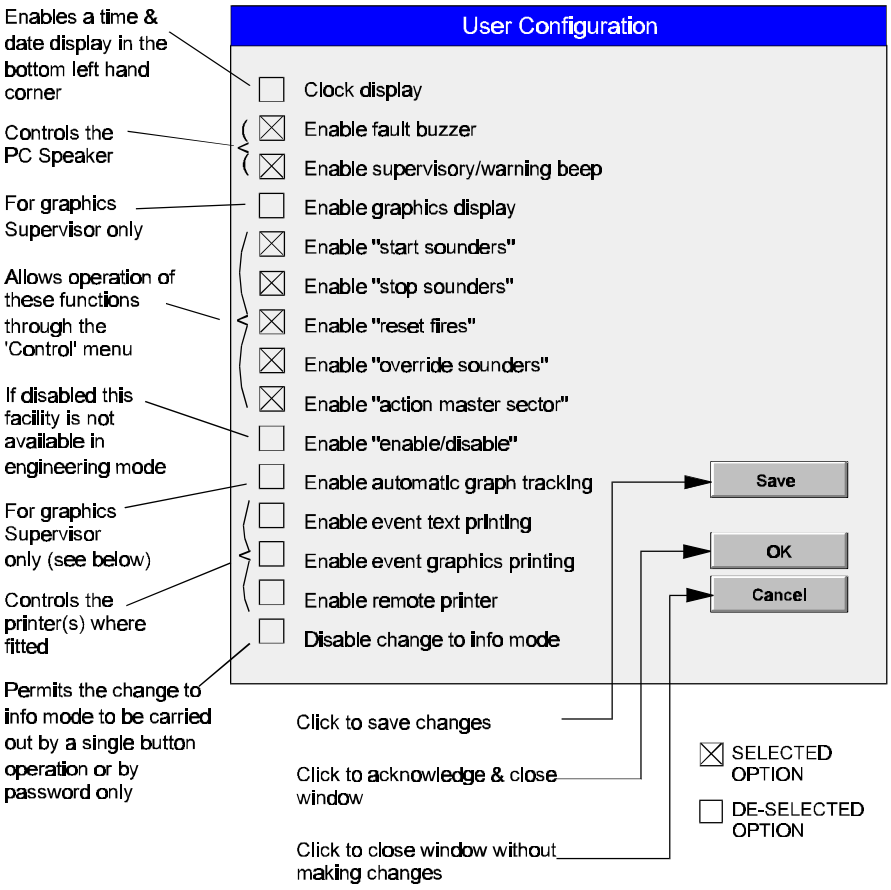


Figure 29-11 User configuration

fl254

Commissioning configuration

The commissioning configuration allows the commissioning engineer to set-up the system (this is not a user accessible functions).Passwords

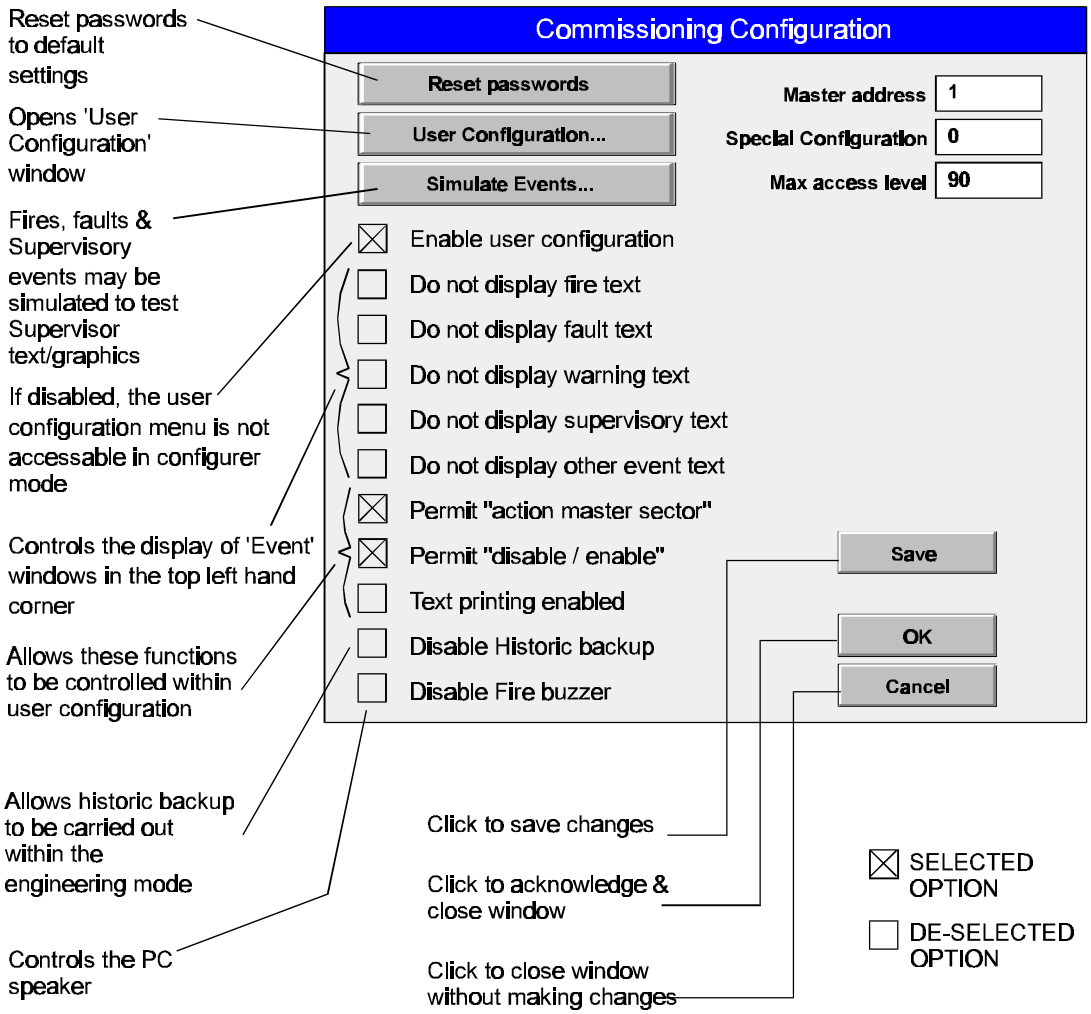


Figure 29-12 Commissioning configuraiton

fl253

Password

Password protection restricts unauthorised access to individual levels.

Figure 29-13 Password window

cp9

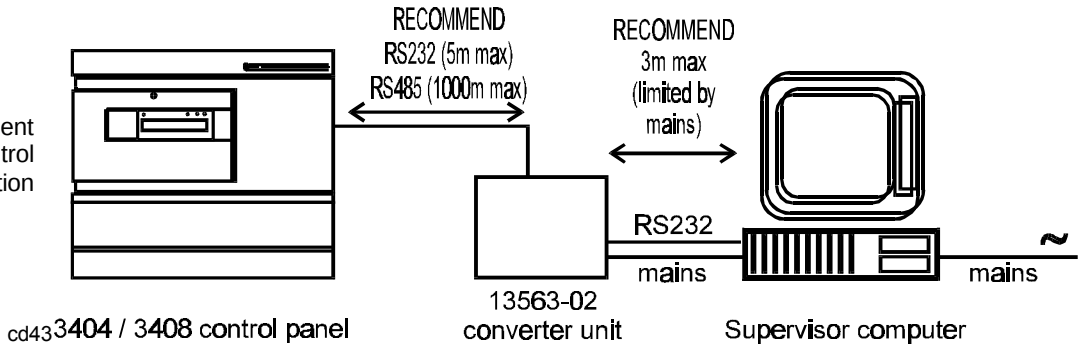
Supervisor Physical system

Connecting a GENT Text Supervisor computer

Single control panel

A GENT Text Supervisor computer can be connected to a 3404 or 3408 control panel. It connects via a plug-in IO card *(model no 13432-03V3)*. The data connection from the IO card is fed via a *(model no 13563-02)* converter unit to the Supervisor computer.

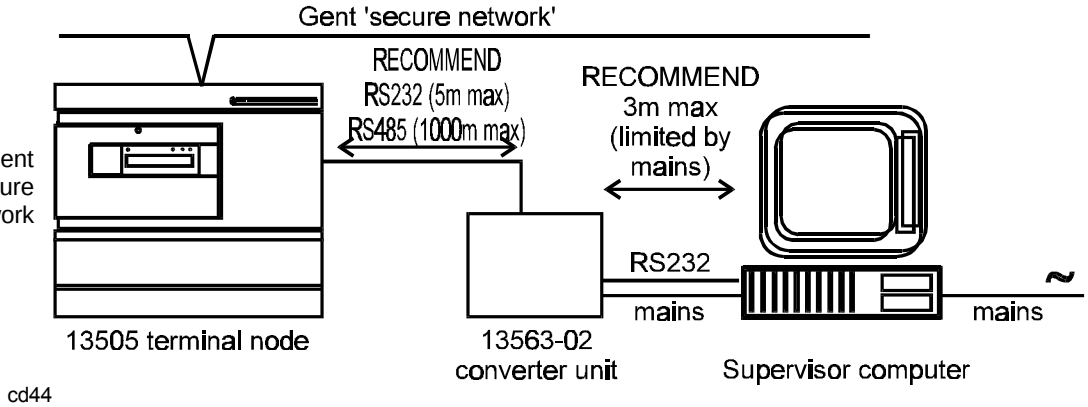
Figure 30-1 Gent Supervisor to control panel connection



Secure network

A GENT Text Supervisor computer can be connected to a secure network using a terminal node. It connects via a plug-in IO card *(model no 13432-03V3)*. The data connection from the IO card is fed via a *(model no 13563-02)* converter unit to the Supervisor computer.

Figure 30-2 Gent Supervisor to a secure network



cd44

2 secure networks

A Text Supervisor computer can be used in conjunction with 2 separate networks. Two terminal nodes are employed, one in each network. The data cables from the terminal nodes are both fed into a single 13563-02 converter unit.

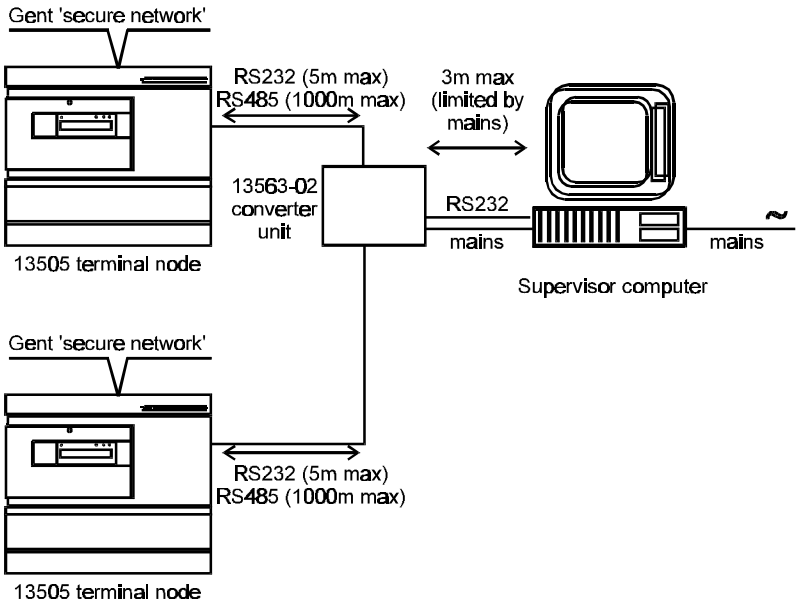


Figure 30-3 Gent Supervisor to a secure network

Modem

Modems allow the data link between the 13505 terminal node and the 13563-02 converter unit to be carried over a BT STD Keyline leased telephone line specifically for Alarm modem connection. If the distance between the modems is large STD Keyline 3 should be used. For advice on which specification to use contact BT.

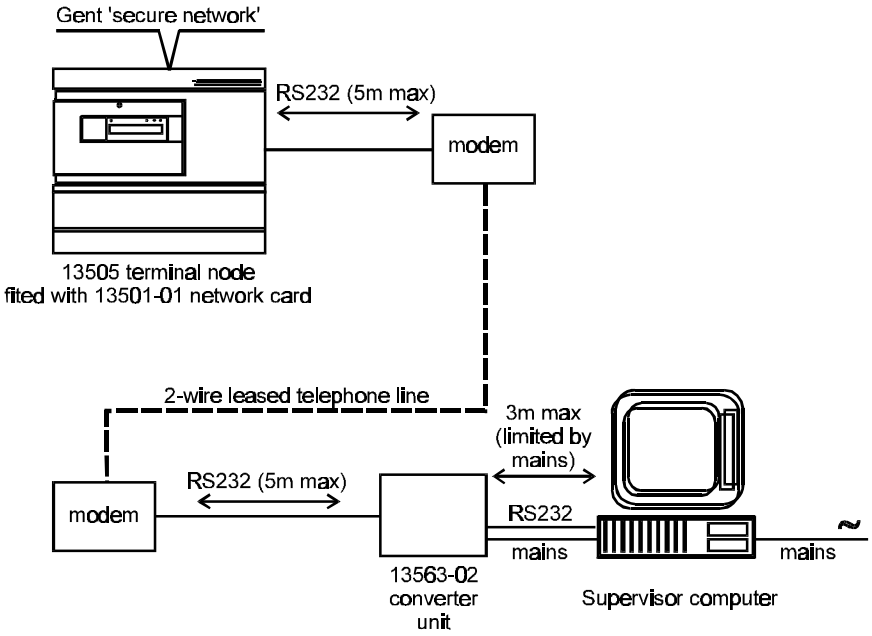


Figure 30-4 Supervisor to a secure network via modem

NOTE: *This configuration should not be used to monitor remote sites for the purpose of alerting fire services. An auto dialler to a manned centre should be used.*

Why use a 13563-02 converter unit

The 13563-02 converter unit is used to interface control panels and terminal units to Supervisor computer. It has 4 features:

- converts RS485 to RS232
- combines data from 2 networks, if required
- isolates the mains earth between the Supervisor computer and the control panels or terminal unit
- Reboots the system in the event of a communications loss between the supervisor and the fire alarm system in an attempt to re-establish connection.

Connecting a Gent Graphics Supervisor system

In some applications it may be desirable to display text and graphics. The method of achieving this is to use two separate Supervisor systems, a text system and a graphics system positioned next to each other.

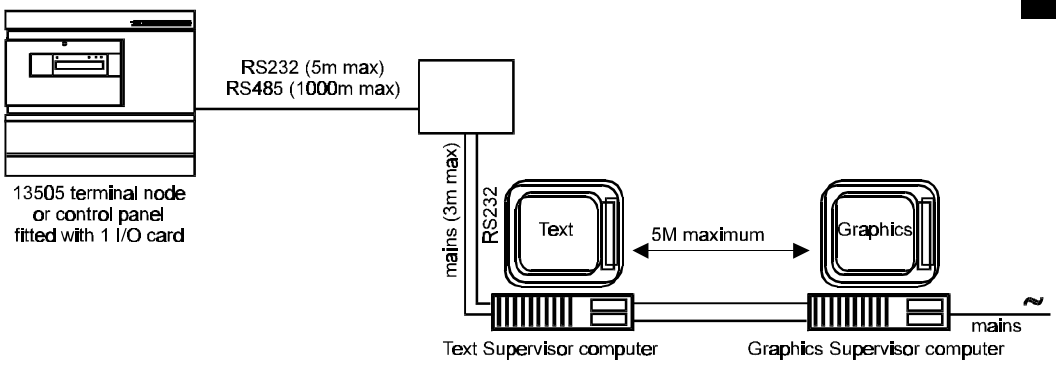


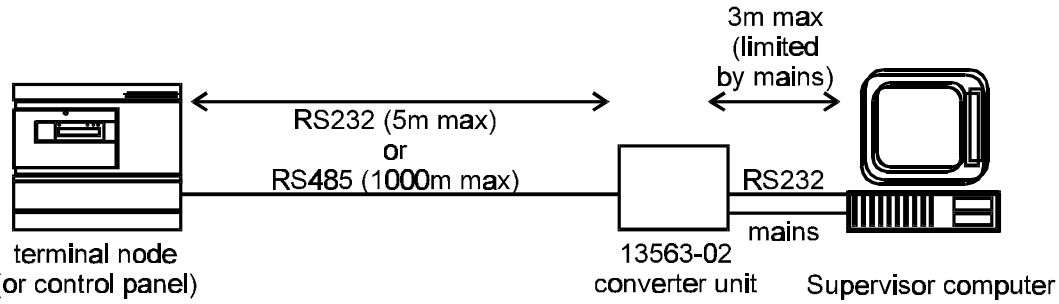
Figure 30-6 Graphics arrangement

cdn274

Extending computer connection from 5 metres to 1000 metres

The Supervisor computer is connected via an RS232 link to a 13563-02 converter unit. The RS232 link is limited in length to 5 metres. Normally the converter unit will be located next to the computer and therefore this limitation will not be a problem. The converter unit is then connected to the terminal node (or control panel) via a further data cable. This data cable may be another RS232 in which case it will similarly be limited to 5 metres. However this data cable may be configured as a RS485 link in which case the length will only be limited to 1000 metres.

Figure 30-5 Supervisor to a remote control panel



Extending computer connection via a leased telephone line

Modem refer to *using a modem* in this part of the manual.

Application of configurations

Labels

This function allows exact location of a fire to be displayed at a *control and indicating equipment*. A label may be assigned to each:

- ☐ Sensor - which can have up to 32 characters label.
- ☐ Manual call points - which will automatically create a prefix ‘MCP;’ and therefore can have up to 28 characters label.
- ☐ Each Input/Output channel - can have up to 32 characters label (A mains powered interfaces with input channels that has MCPs attached should have 28 characters label
- ☐ Alarm Sounder - which can have up to 32 characters label
- ☐ Control panel - which can have up to 32 characters label. Local panel name is used for displaying events on a Gent Supervisor.
- ☐ Group - which can have up to 32 characters label (fires generated by MCPs will be automatically prefixed ‘MCP;’, which limits the label length to 28 characters)
- ☐ Command build - can be up to 40 characters label

Up to 270 labels may be assigned to each loop, which allows for extra labels needed by interface units input and output lines.

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Sectors

- Maximum of 32 sector per loop.

The sector facility provides the basic configuration tool for associating sensors and sounders. It allows a selection of devices to be associated, so that, for example a sensor or MCP will cause local sounders to be activated in the case of a fire.

Assigning to Sectors

- Input devices (sensors, MCPs and input channels) may be assigned to **more than 1 sector.**
- An output device (alarm sounder or output channel) may only be assigned to **one sector only**.
- Loop powered interfaces are assigned to sectors as an outstation only ie. individual inputs and outputs cannot be separately assigned to different sectors.

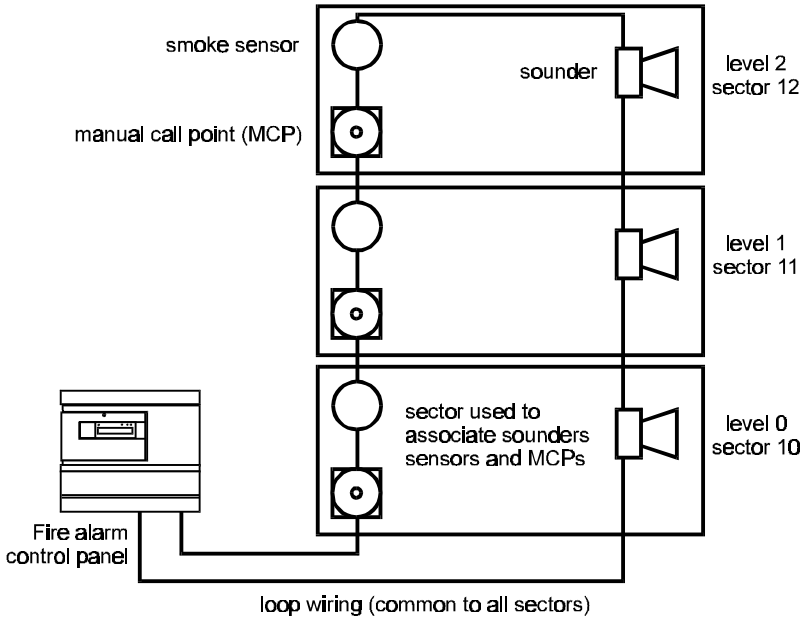


Figure 32-1 Sectoring

Sectors are used to associate sounders, sensors and MCPs for FIRE

cd98

Actioning Sectors

- A sector that is actioned ON will activate its alarm devices, such as interface outputs and alarm sounders.
- A sector can be configured to give one of 3 signals:
  - Signal 1 Alert (priority 3).
  - Signal 2 Evacuate (priority 2).
  - Signal 3 Continuous (priority 1).
- Sectors of the same number, but on different loops, operate independently of each other ie. Sector 1 Loop 1 has nothing to do with Sector 1 Loop 2.
- Sector linking cannot be ‘daisy chained’.

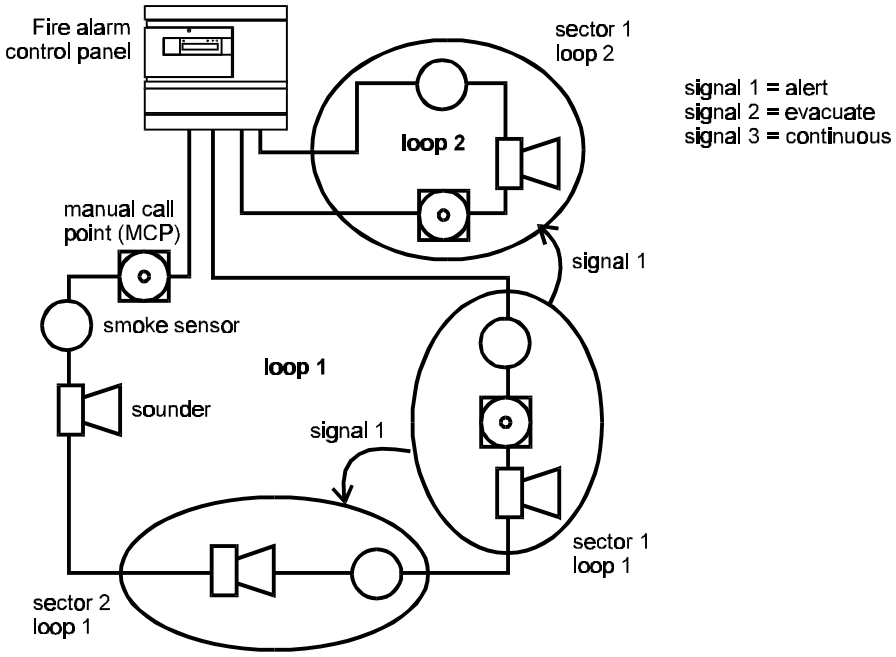
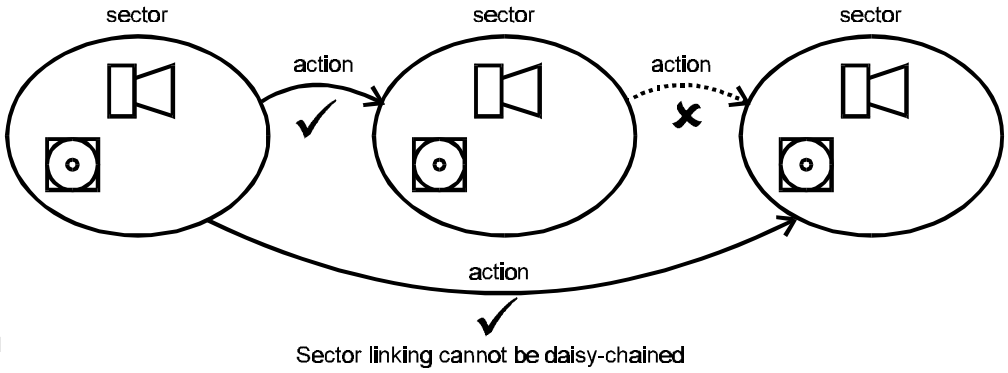


Figure 32-2 Actioning sectors

cd99

Action sector 2 on sector 1, signal 1
All sounders & outputs will operate in sector 2 to alert in the event



cd101

Sector linking cannot be daisy-chained

Operation with Sound, Silence and Reset

- Sectors 1-28 operate automatically with the ‘Sound Alarms’ and ‘Silence Alarms’ buttons.
- Sectors 29-32 are independent of the ‘Sound Alarms’ button, and are primarily used with the Fixed Extinguishing Interface.
- Sectors 1-28 may be configured for NO ACTION on the ‘Sound Alarms’ button. If a sector is configured in this way it will be silenced on operation of the **‘Reset’** button.

Default Fireplan

- The fire plan on power-up is known as ‘one out all out’. This is when all devices are assigned to sector 1. Any fire will operate all the interface outputs and alarm sounders.
- Fixed Extinguishing interfaces are assigned to sector 29 on initial power up. These WILL NOT operate at all unless configured.

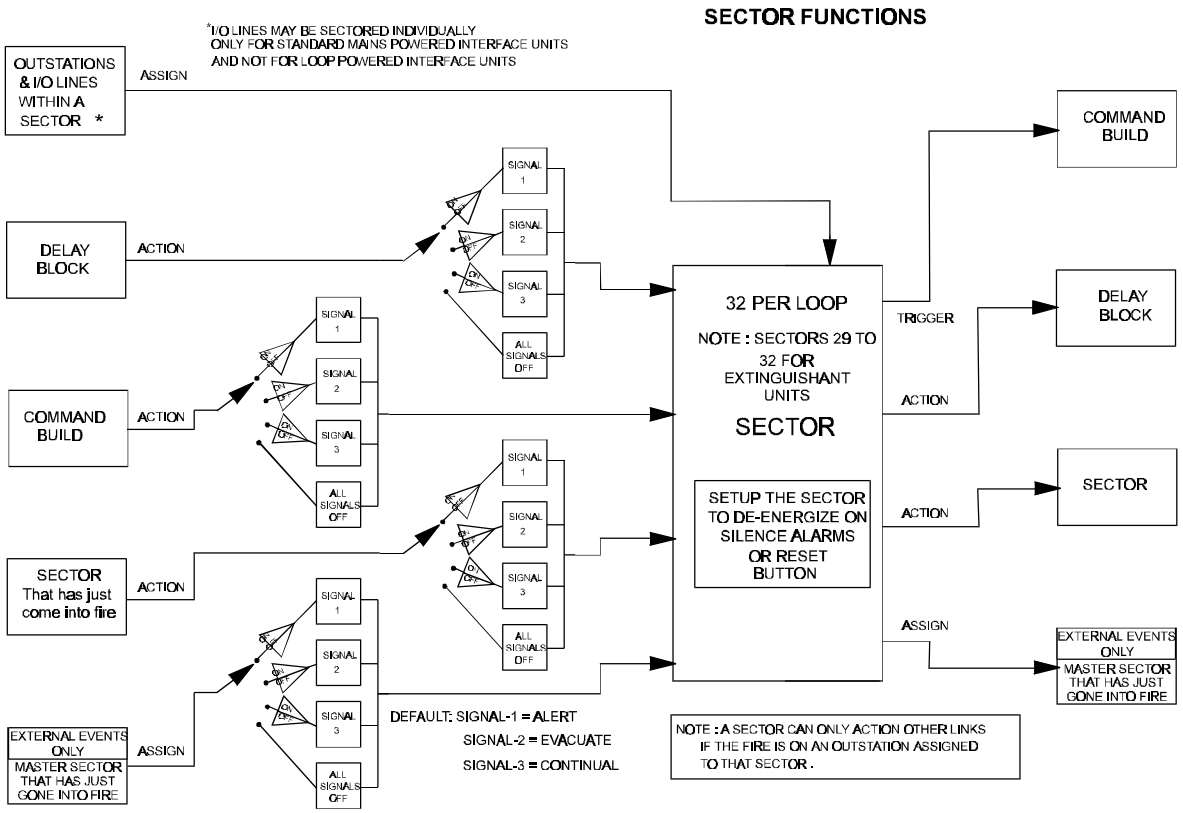


Figure 32-3 Sector functions
fl261

Flag set sector

When a sector is configured for flag set operation, a fire event from an optical heat sounder (OHS) in the sector will cause the local sounder to operate.

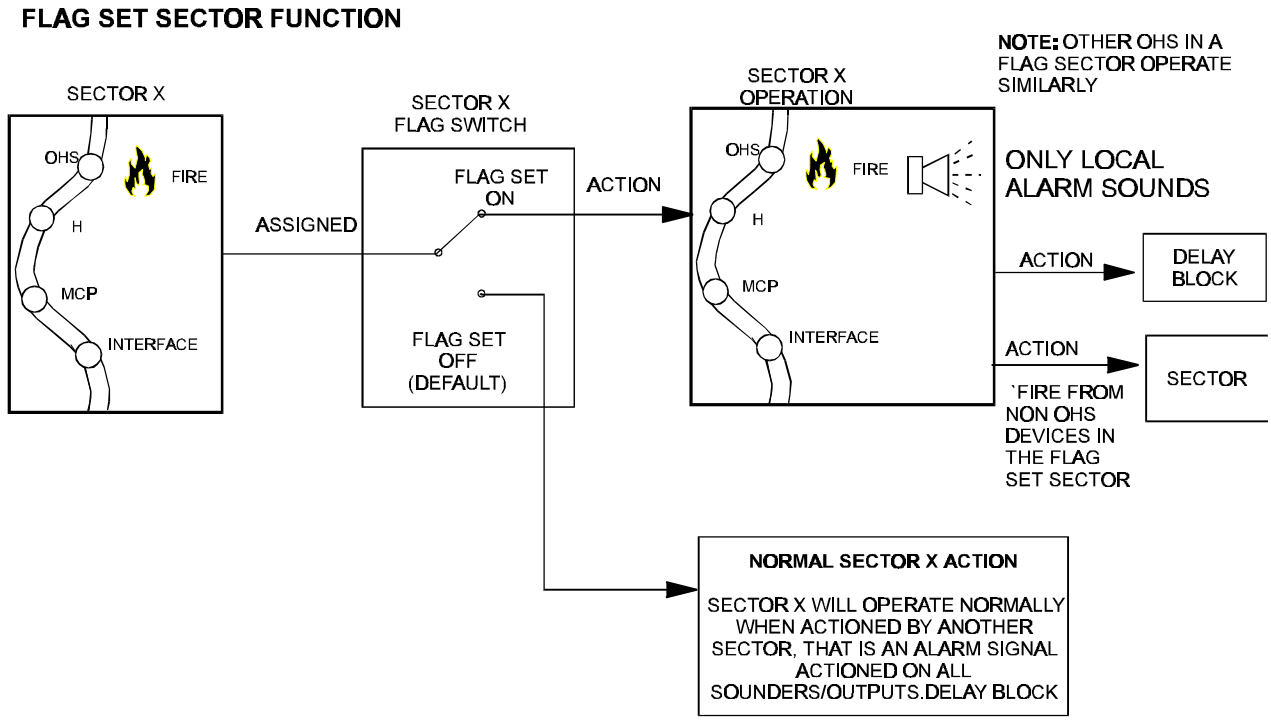


Figure 32-4 Flag set sector

fl262

Delay blocks

The delay function may be used in conjunction with sectors. Sectors may be configured so that the activation of one sector will cause the activation of another. A delay may be introduced between the activation of the two sectors.

- ☐ Maximum of 16 per panel.
- ☐ Delay time can be set between 4 seconds-10minutes, (in 4 second intervals).

Triggering delay blocks

A delay block may be triggered by :

- ☐ 1 or more sector on the local control panel.
- ☐ 1 or more master sectors (triggered by other control panels))
- ☐ Another delay block.
- ☐ Command build

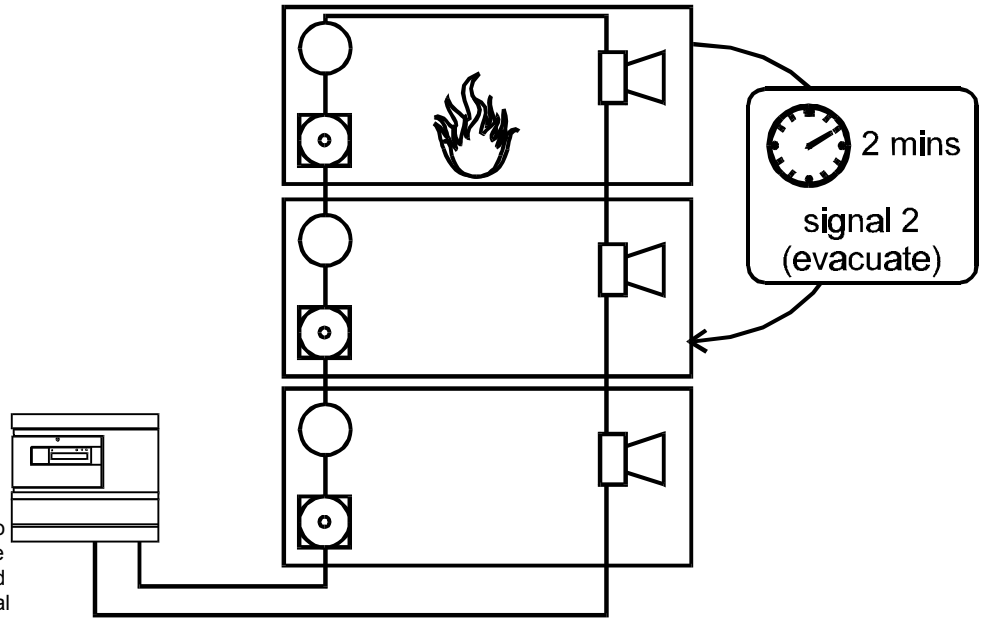


Figure 33-1 Delay block function

A Delay block allow sectors to action other sectors with a time delay and a specific sound signal

cd102

Actioning from delay blocks

- A delay block can action 1 or more sectors on the local control panel. Once the delay block is triggered and timed-out, all the sectors that are configured to it will activate.
- Each delay block must have a signal associated with it. When the delay block times-out, ALL the sectors will be activated with this signal. The 3 possible signals are:
  - Signal 1 Alert (priority 3).
  - Signal 2 Evacuate (priority 2).
  - Signal 3 Continuous (priority 1).

  If a sector is already activated when the delay block times-out, the higher priority signal takes effect.
- A delay block can also action another delayblock to create a ‘daisy chain’ effect.

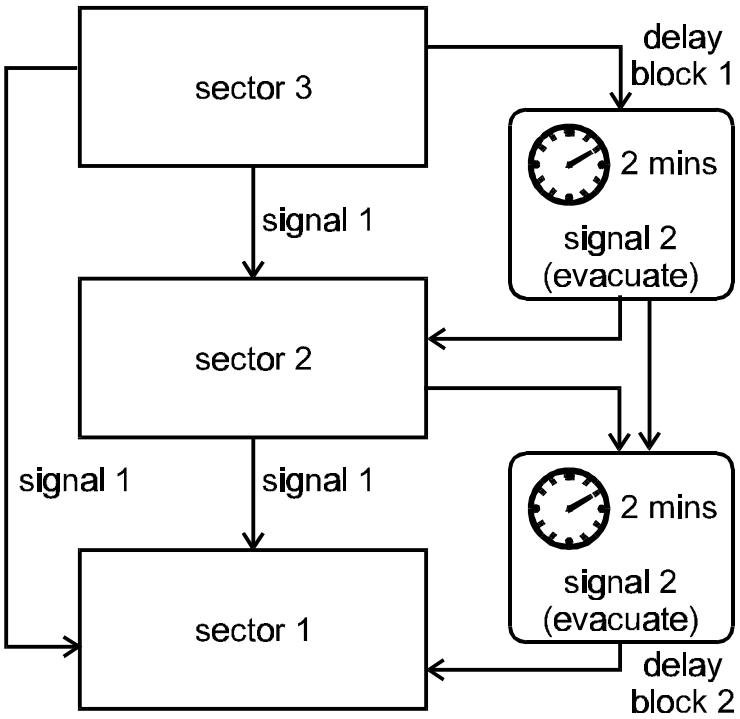


Figure 33-2 Using delay blocks

Using delay blocks and sectors

cd103

Operation with Silence Alarms

The ‘Silence alarms’ function will stop dead any triggered delay blocks.

Default configuration By default NO delay blocks are set up at all.

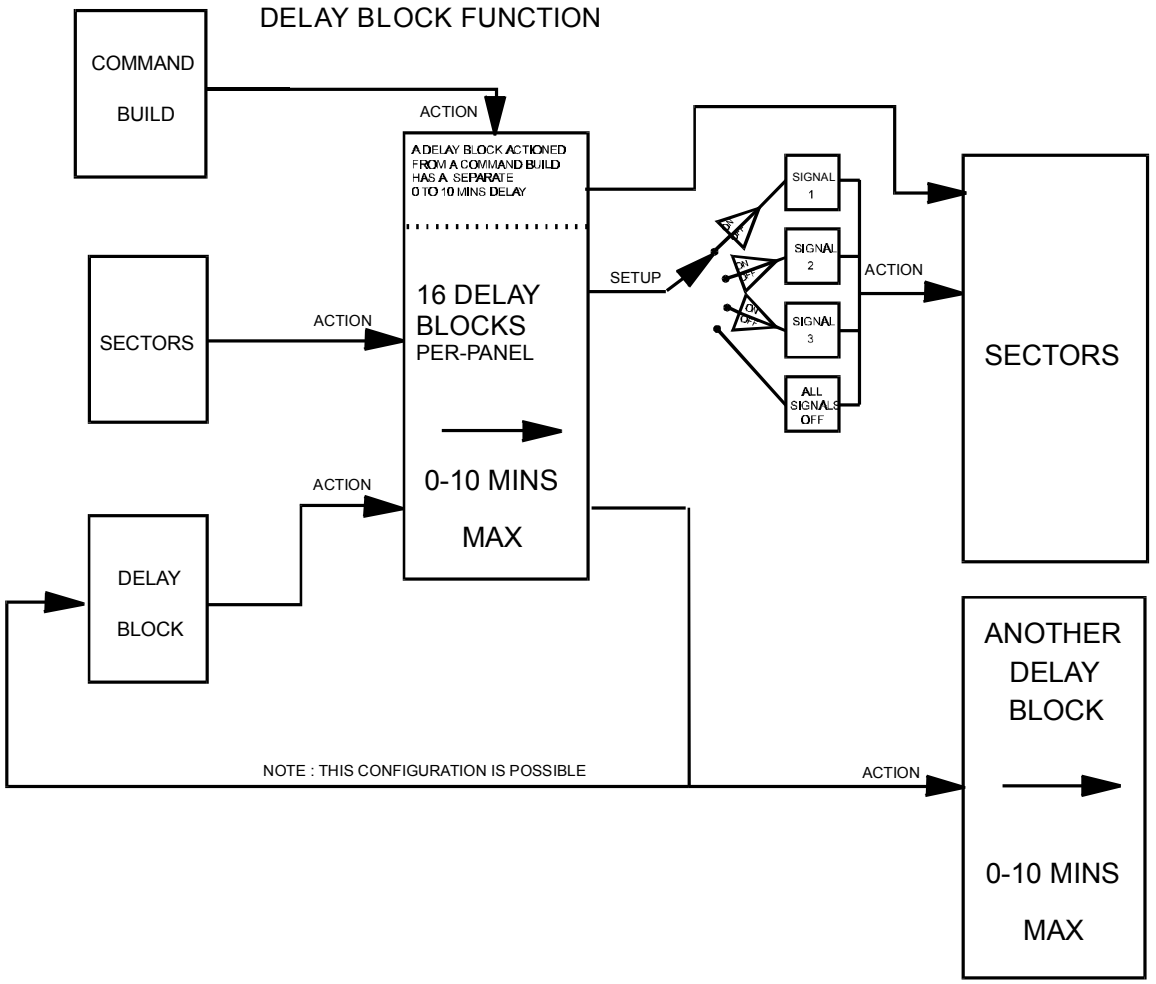


Figure 33-3 Delay block functions
fl263

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Time slots & Time blocks

What does it do?

- ☐ Changing of fire sensor states (e.g. Smoke/Heat to Heat only)
  - See product data sheets for details of sensitivity states.
- ☐ Disabling Group tasks
- ☐ Triggering of command builds

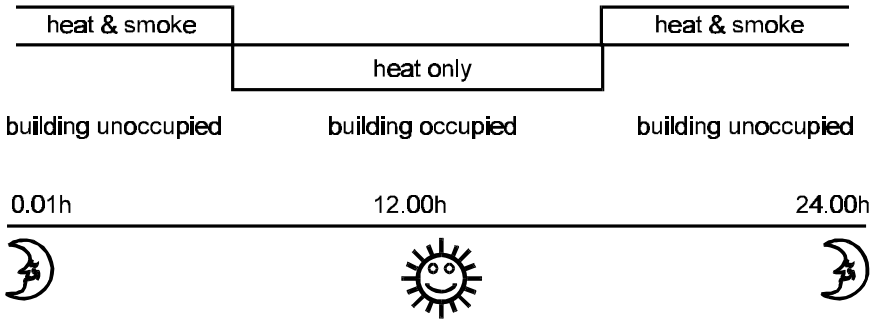

Figure 34-1 Time blocks and time slots
Using time blocks and time slots to change sensor states

cd104

Default By default all loop devices are assigned to function in their normal state continuously (24 hours a day, 7 days a week).

Time slots

- ☐ Comprise a start and finish time and a set of days. The times and days may be logically related using AND or OR operators.
- ☐ When TRUE it is in the ON state
- ☐ May be manually switched ON and OFF or by command builds (version 3+ only), immediately or after a delay of up to 24 hours.
- ☐ Maximum 16 time slot per control panel (may be shared by any number of time blocks).

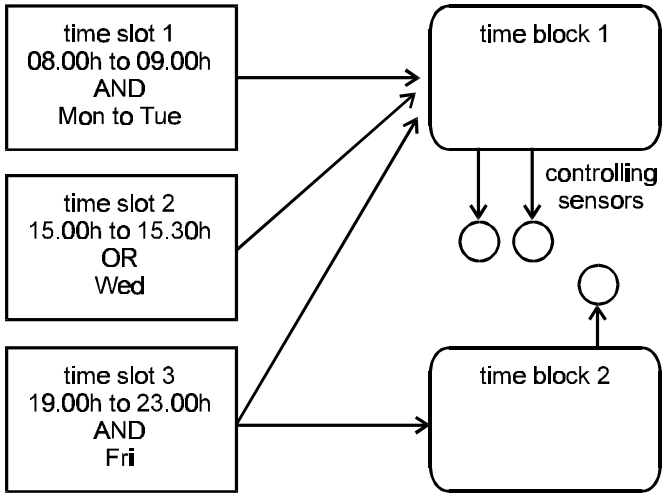

Figure 34-2 Time blocks and time slots
Using time blocks and time slots to control sensor states

cd105

NOTE: *If the control panel is in FIRE condition when a timeslot is switched ON, the Timeslots and Timeblocks DO NOT operate. They will operate once the fire has been RESET.*

Time blocks

- ☐ Each time block is made from a combination of up to 16 time slots.
- ☐ A time block is enabled if any of its time slots are ON.
- ☐ Each time block may control any number of sensors. Each sensor may only be controlled by one time block.
- ☐ When ENABLED
  - Any assigned sensors will be in their ENABLE STATE (which could be any one of the 15 possible states for that sensor).
  - Any linked Command Builds will be TRIGGERED.
- ☐ When DISABLED
  - Any linked Group tasks will be DISABLED.
  - Any assigned sensors will be in their DISABLE STATE (which could be any one of the 15 possible states for that sensor).
- ☐ Maximum of 15 time blocks per control panel (the 16th, TIME BLOCK 0, that is continuously ENABLED).
- ☐ Time block 0 is the default setting

TIMESLOTS & TIMEBLOCKS FUNCTIONS

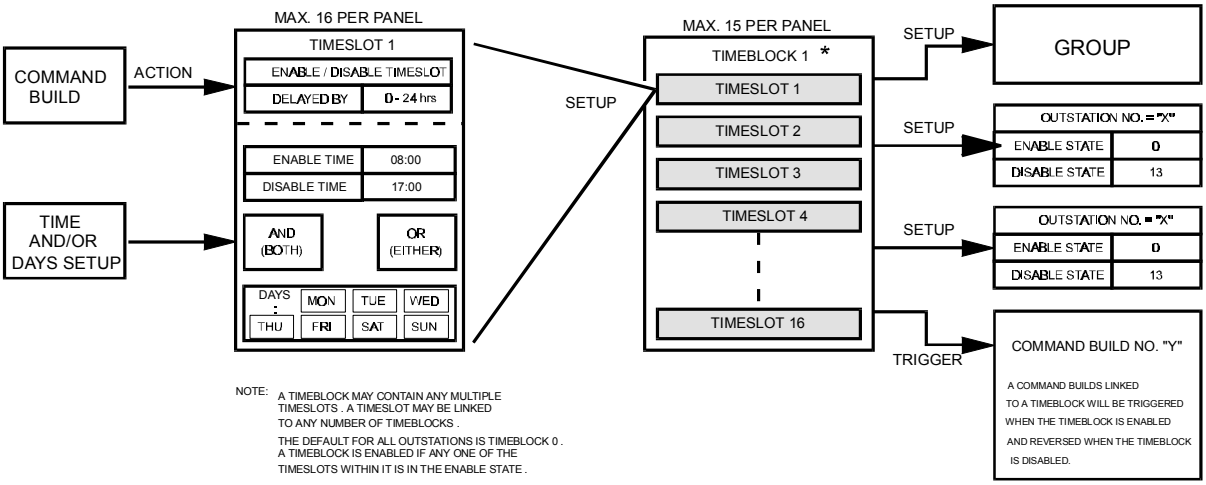

Figure 34-3 Time block and Time slot functions

cd73

Zones

- Maximum of 128 per panel.

Zones allow collections of input devices to be combined, for the following purposes:

- Sending FIRE information to mimic repeat and zonal mimic panels
- Sending FIRE and FAULT information to Supervisor graphics
- Allowing disabling of all sensors in a zone using a single line entry

Assigning to zones

- Zones may include the following devices:
  - Sensors
  - Manual call points
  - Interface unit inputs

> *NOTE: Individual interface channels MAY NOT be assigned separately to different zones.*

- Any device may only be associated with a single zone.
- A zone is limited to the local control panel but may include devices from any loop of that panel.

Default configuration

- Nothing is assigned to a zone by default.

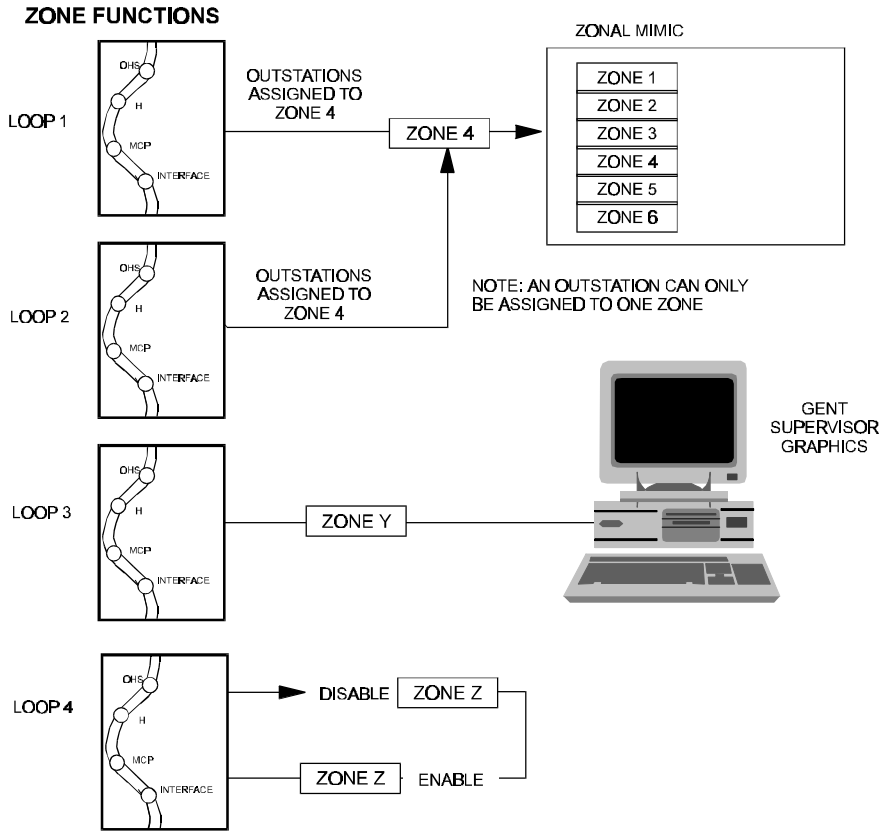

Figure 35-1 Zone functions

fl265

Sound Patterns

Default

The audible output of alarm sounders in a system are preconfigured with three different signals and these are applicable to all loops of a control panel.

- alert
- evacuate
- continuous
- (and OFF)

Any of these 3 sound outputs may be redefined. Each sound output pattern is defined in terms of frequency and timing.

> **NOTE:** *Most applications will use standard alarm outputs that are preset in the panel. Under exceptional circumstances the output will require re configuration.*

Frequency

The sounder may be driven with either of two frequencies:

- high - 910 Hz
- low -970 Hz
- (and OFF)

Timing

The sound pattern is repeated every 2 seconds. The pattern is defined by specifying an action every 250 ms through the pattern.

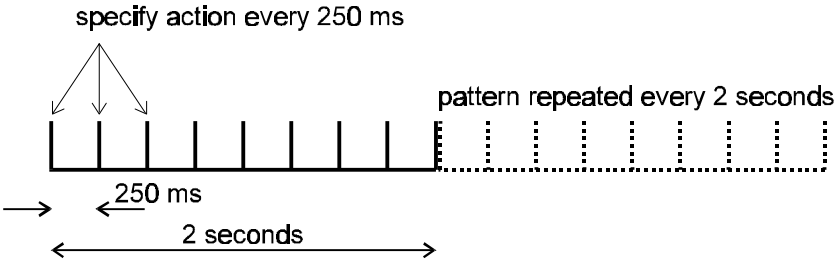

Figure 36-1 Sound pattern timing

The action may specify:

- Switch ON high
- Switch ON low
- Switch to high
- (No change)

The action may be specified to last for:

- 10 ms, 40 ms, 90 ms, 160 ms, 250 ms, 350 ms, 480 ms, 630 ms, 800 ms, 980 ms, 1.2 s, 1.4 s, 1.6 s, or 1.9 s

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Auxiliary Relays

The 2 auxiliary relays within each control panel may be individually configured.

Each may be configured to operate by any of the following:

- ☐ Sector Fire
- ☐ Fault
- ☐ Warning
- ☐ Any combination of the above

The relays may be configured to be either normally energised or normally de-energised. The normally energised option is normally used to provide a fail-safe configuration.

Delay The auxiliary relay operation may be delayed by up to 10 minutes in the event of a sector fire.

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Groups

- Maximum of 128 Groups per panel.

The Groups function have 2 distinct uses:

- To collect a combination of input devices together to display a common label (see *Group Labels*).
- To perform ‘Co-incidence detection’ i.e.. responding to different combinations of ‘fires’, ‘pre-fires’ and ‘super-fires’ (see *Co-incidence and Multi-level fire detection*).

Assigning to Groups

The following types of devices can be assigned to a group:

- Sensors.
- Manual call points.
- Interface units.

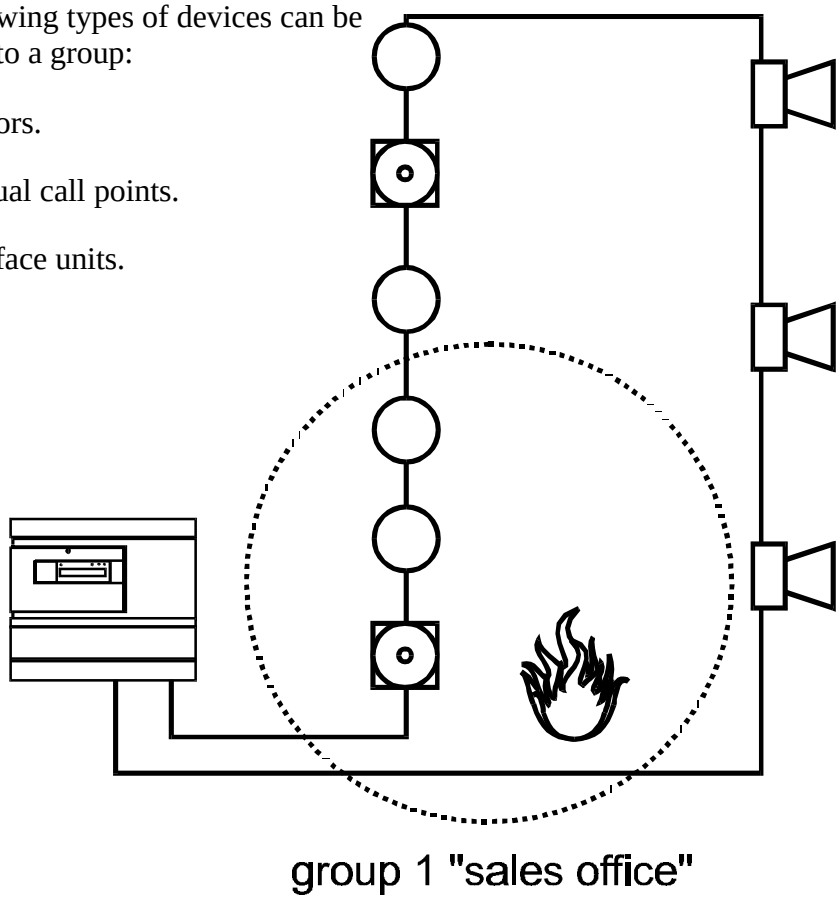

Figure 38-1 Group application
cd107

A group may include any combination of these devices, irrespective of which loop they are attached to, as long as they are all connected to the same control panel.

NOTE: *Individual interface channels MAY NOT be assigned separately to different zones.*

Group labels

Allows a single label to be assigned to a group of sensors, MCPs and input channels.

A group label may be up to 32 characters (however an MCP initiates a fire in a group the label will be prefixed by ‘MCP;’, which will reduce the label to 28 characters).

Displaying group labels

Group labels are used to control the way in which FIRE messages are displayed. Groups have the following modes:

- ☐ Display only the group label
- ☐ Display the individual label of the first device to trigger a fire event
- ☐ Display all individual device labels

Co-incidence & Multi-level fire detection

Normally a sensor will trigger an alarm if it detects a ‘fire’. The group facility recognises three sensor sensitivities: ‘pre-fire’, ‘fire’ and ‘super-fire’. The sensors within a group may be configured to trigger an alarm condition on a combination of different numbers of sensors responding to different combinations of sensitivity.

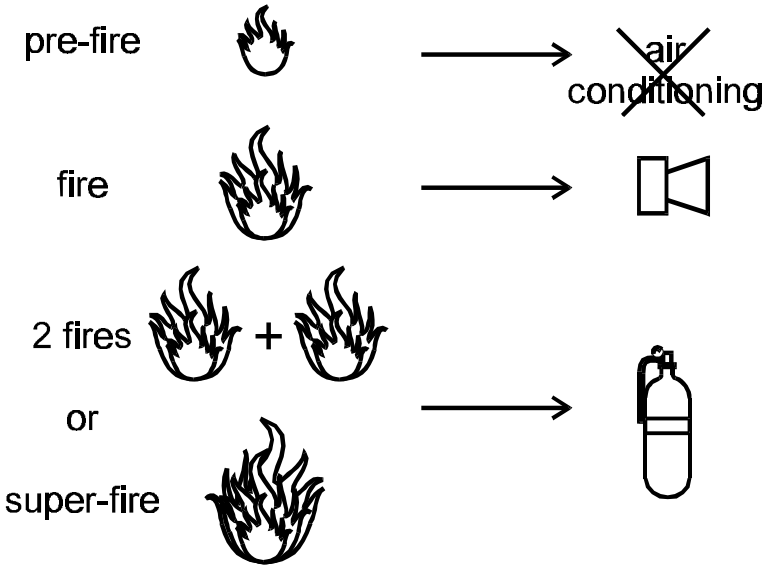

Figure 38-3 Applications of fire - prefire - superfire

cd106

Tasks Tasks are used as inputs to command builds. Each task may trigger one command build. Each individual group may be configured to initiate up to to 8 individual tasks. Each task can be configured to be triggered depending on the number of each type of fire (pre-fire, fire or super-fire) that is detected, the number may be 1, 2, 3 or ignore.

Each group may include a time block that disables all of the tasks within it while the time block is active.

	W sensors	X pre-fires	Y fires	Z super-fires		
group task 1	1	1	0	0	=> CB1 =>	A/C off
group task 2	1	0	1	0	=> CB2 =>	
group task 3	2	0	2	0	=> CB3 =>	

maximum 8 tasks per group
maximum value of W (sensors) = 3

Figure 38-2 Application of group tasks

cd108

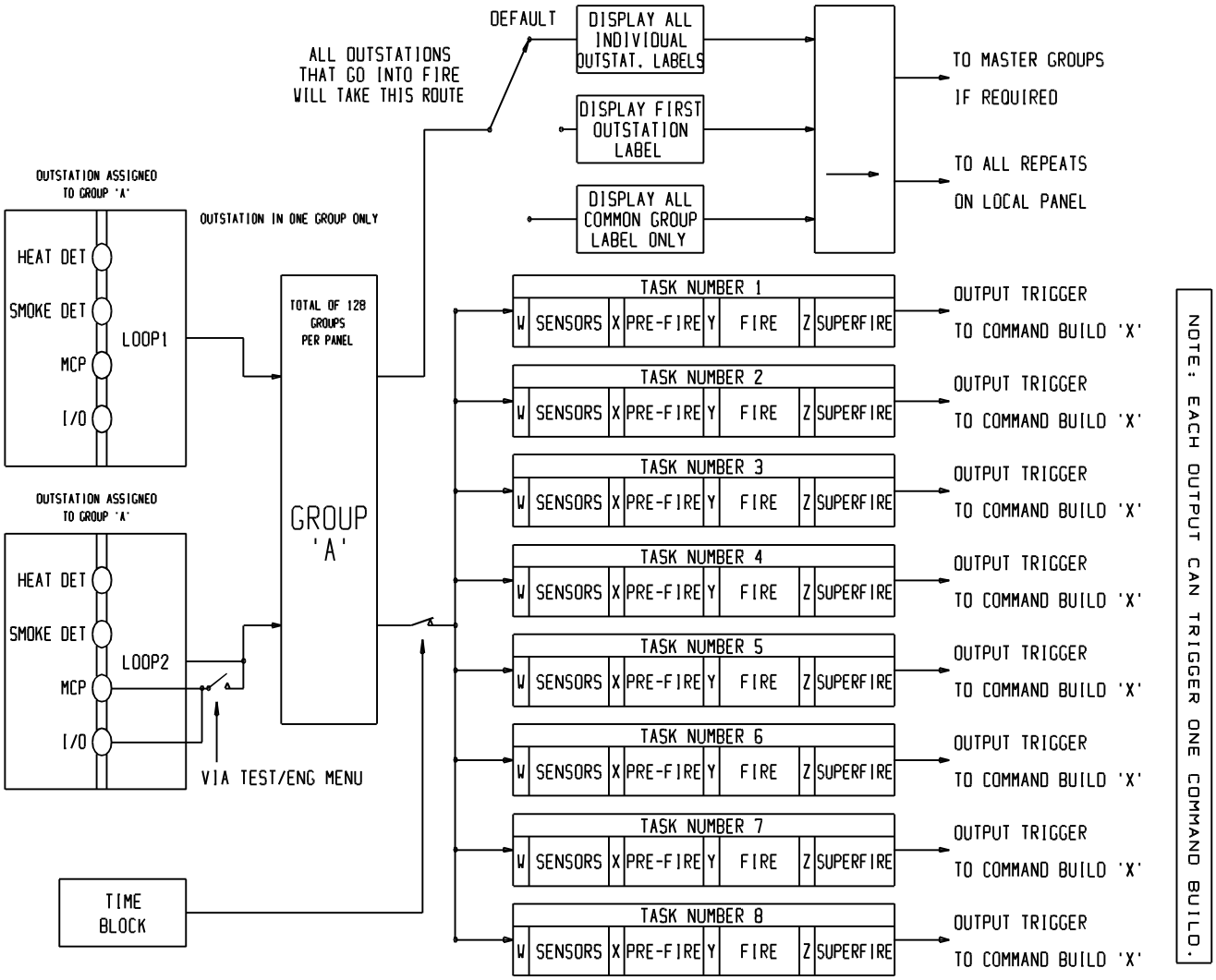

Figure 38-4 Group function

cd71

Master Groups

- Maximum of 8 Master Groups per secure network

Master Groups allow messages to be passed around a secure network between control panels, terminal nodes, repeat panels and mimic panels. Specifically messages may be routed to the following:

- individual loops (loop cards)
- displays (LCD cards)
- printers (printer cards)

The 8 Master Groups may be used individually to establish sub-groups of control panels within the network.

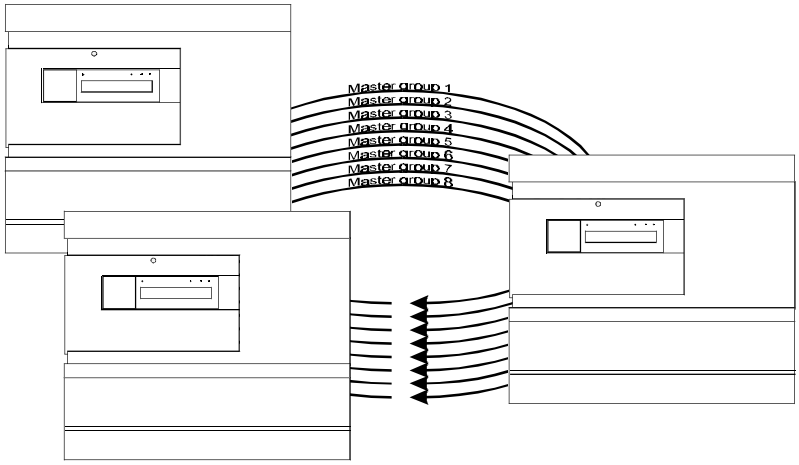

Figure 39-1 Master groups

cd52

Fire messages

Each card may be individually set to display or print Fire information from each Master Group individually.

System messages

Each card may be individually set to display or print all system event information (including fires) from each Master Group individually.

Global controls (sound alarms, silence,reset)

Each control panel and terminal node may be individually set to operate and/or respond to global controls on each Master Group individually.

Repeat Panels - All repeat panels wired to the same loop will display and print the same information.

Mimic Panels - All mimic panels may be configured to display different information irrespective of whether or not they are wired to the same loop.

Control Panels and Terminal Nodes - All panels can access fault and warning information from any other panel

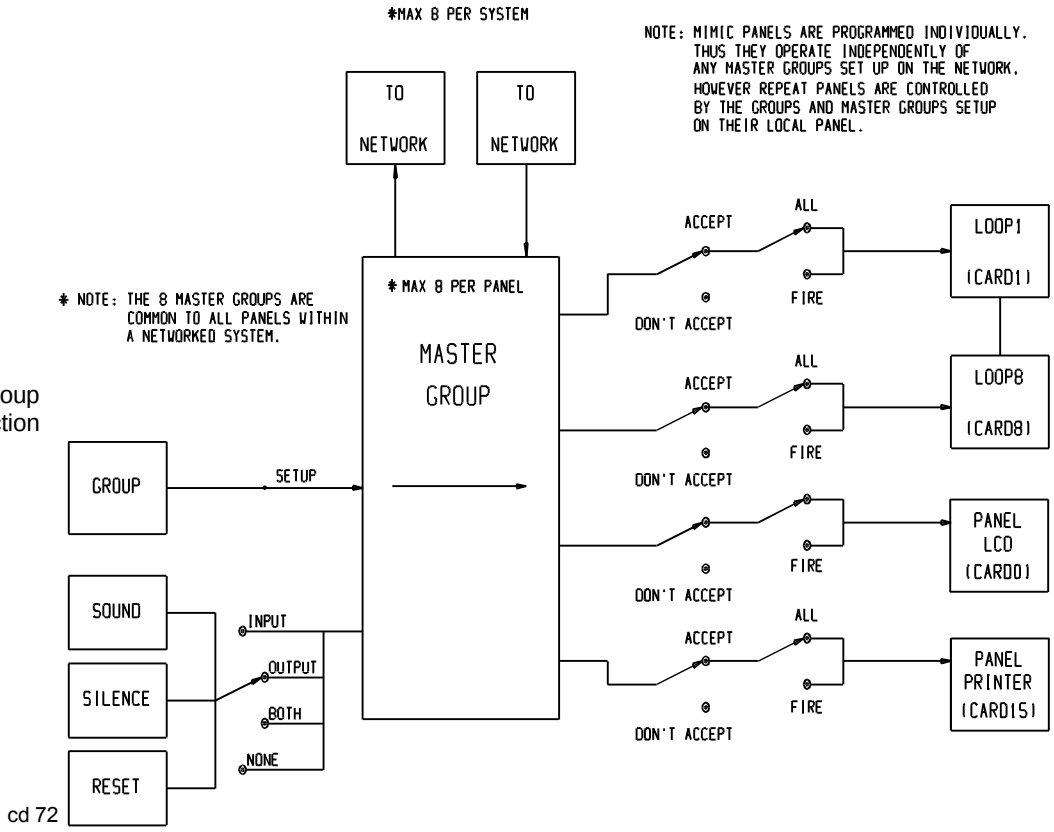

Figure 39-2 Master group function

Command Builds

- Maximum of 255 per panel.

Command Builds provide a general purpose link for use in configuring the control panel. They are primarily used for NON-FIRE actions, but may also be used during a fire.

Each command build has a Trigger, and an Action. The action is usually performed immediately upon receipt of the Trigger.

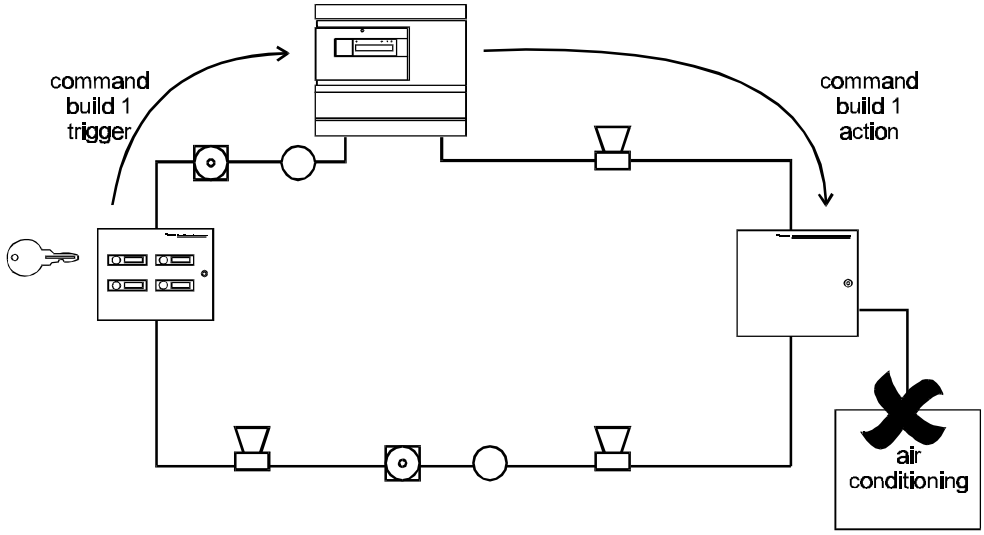

Figure 40-1 Applicaiton of command build

Triggering and Actioning with command builds

cd109

Command Build Labels

- Each command build can be given a label of up to 40 characters. This label can be used in one of 3 ways:
  - Display only when command build is triggered.
  - Display and print when command build is triggered (and printer is on).
  - Do not display or print.
- If the label is displayed, the control panel's buzzer is also activated at the same time.
- Command builds are logged with an On/Off time, but only if they have been given a label.

Triggering Command Builds

☐ A command build can be triggered by:

- One (or a range of) **Timeblocks** - *triggered when the timeblock is ENABLED*.

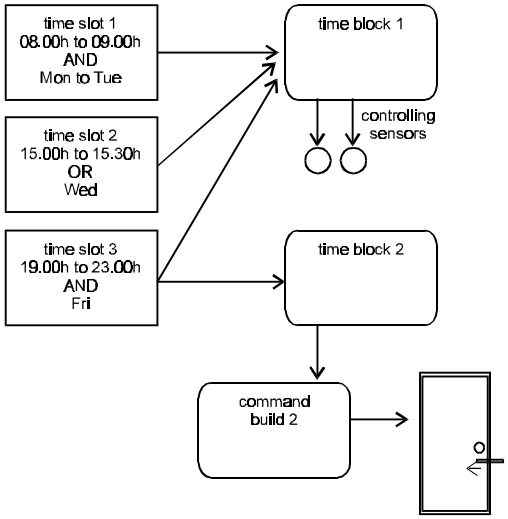

Figure 40-2 Command build trigger

Using command builds with time blocks and time slots

cd110

- One (or a range of) **Input lines** on one (or a range of) **Interfaces** - *Note: this can be used to provide non-fire actions if a Loop Powered Interface is used, with the input set as 'supervisory'*.
- One (or a range of) **Sectors** - *triggered when a fire is detected in that sector*.
- One (or a range of) **Master Sectors** (from other panels on a network) - *triggered when a fire is detected in that master sector*.
- A command build can ALSO be actioned by any number of other **command builds**.
- A command build can ALSO be triggered by any number of **Group Tasks** - *triggered when all of the conditions for that task are true (see the part of this manual on Groups)*.

Command Build Actions

☐ Each command build has ONE action only.

☐ A command build can perform, automatically, any of the actions that can be performed, annually, in the *'Control'* menu of the panel (see the functional diagram for a detailed list of these actions).

☐ Most ACTIONS may be Reversible or Non-Reversible .

- REVERSIBLE means that the action reverses when the trigger condition is removed (e.g.. the sector is re-enabled, when the keyswitch is turned back).
- NOT REVERSIBLE means that the action continues even when the trigger condition is removed (e.g.. the sector stays disabled until it is manually re-enabled).

☐ FIRES take priority over command builds

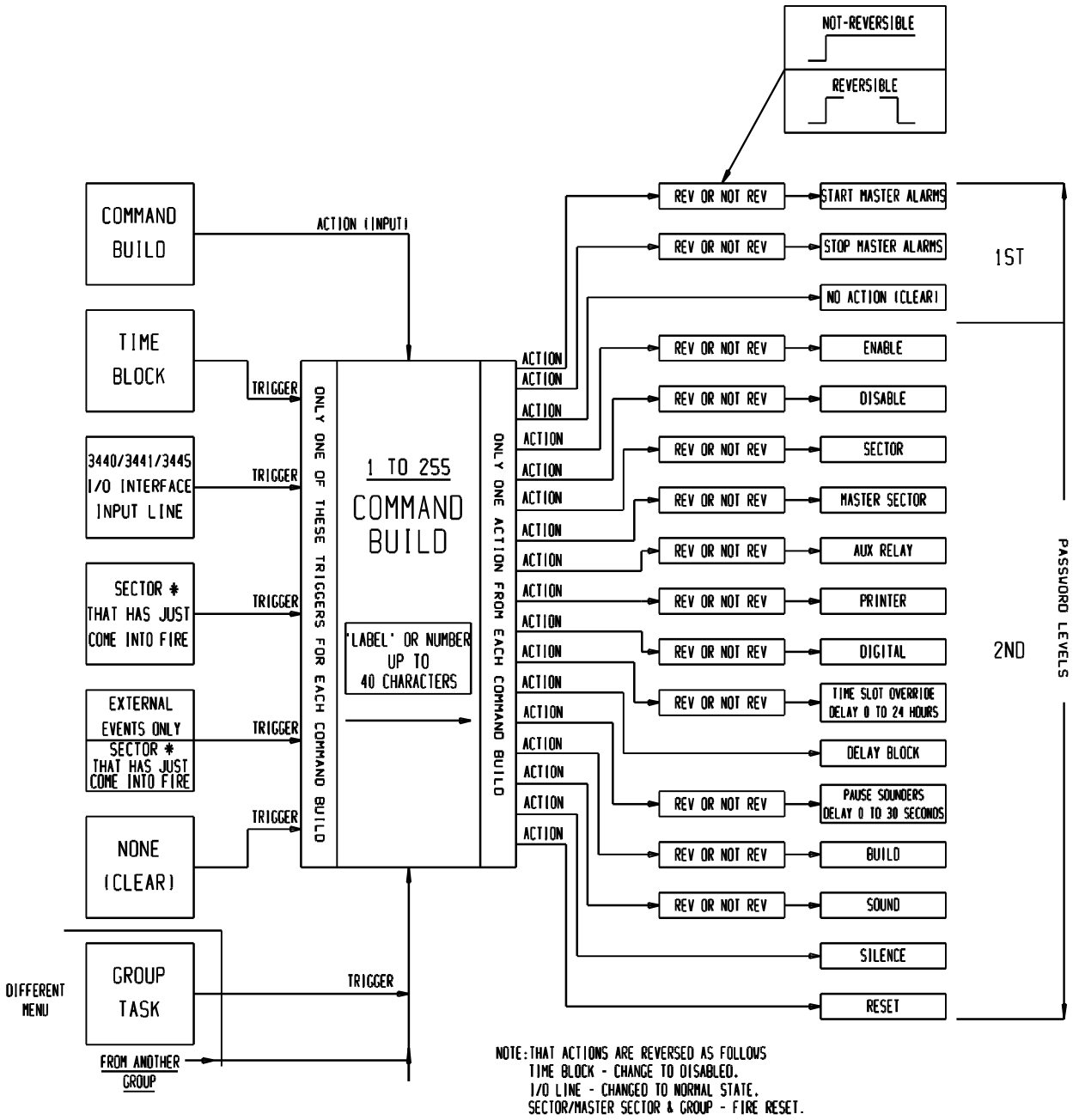

Figure 40-3 Command build function

cd73

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3404 - Control Panel

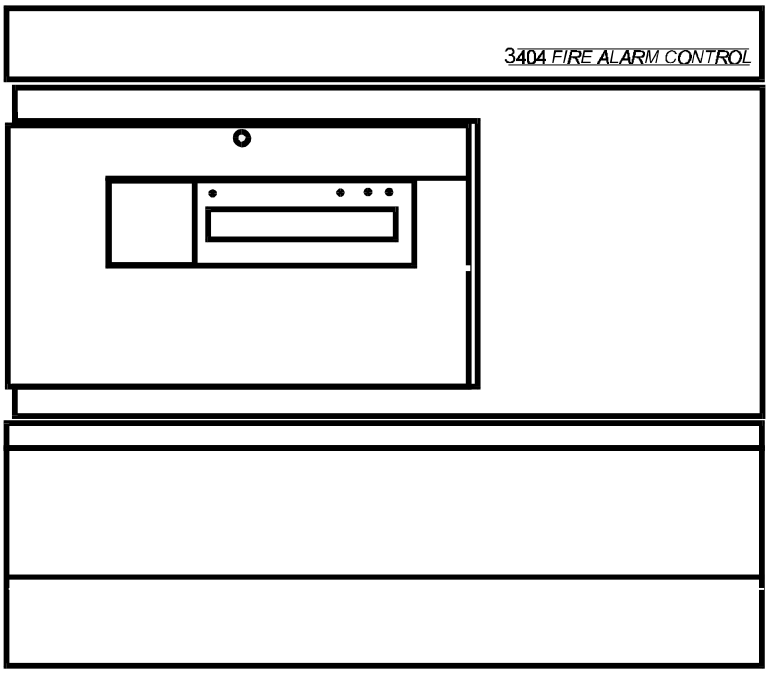

Figure 41-1 1-4 Loop control panel

cd63

The 3404 is a self-contained fire alarm panel conforming to the requirements of BS 5839:Part 4 and Loss Prevention Council. It houses its own power supply and batteries.

The control panel is designed to be used with the 34000 range of addressable analogue sensor and sounders.

A lockable front cover prevents unauthorised access to fire alarm controls but allows all of the indicators to be seen. All fire, fault and warning events are indicated by coloured lights with message display. Each sensor and zone can be given a name thus making the message easy to understand.

Options

The 3404 is available as

☐ **Version 3 plus** *(model no 13404-12V3+)*

The control panel is supplied in basic form. The following cards may be added:

- up to 3 more **loop** cards (loops 2 to 4) *(model no 13431-01V3)*
- 1 **network** card for interconnecting control panels and terminal node *(model no 13501-01)*

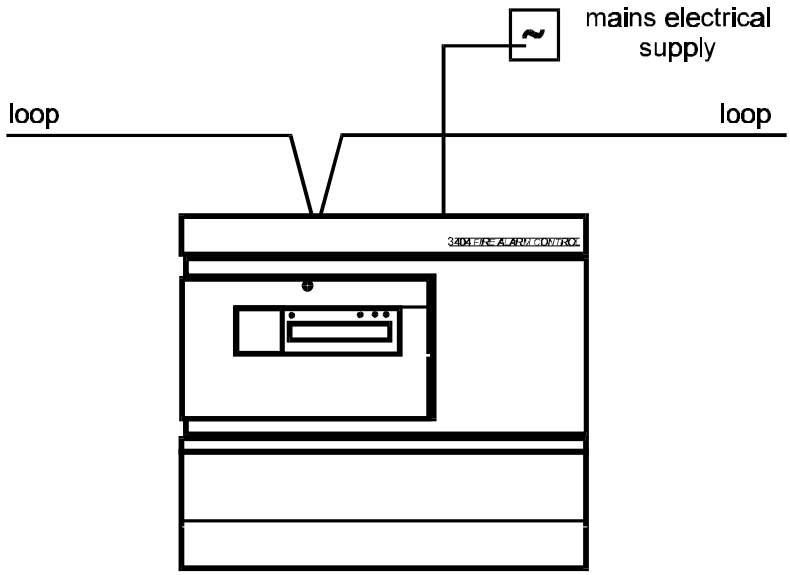

Figure 41-2 Panel external wiring

cd121

Specification

Standard	BS5839:Part 4
Panel Dimensions	Width 650mm height 650mm depth 130mm
Full Assembly weight	30Kg
Storage temperature	-30 to 70ºC
Operating temperature	0 to 45ºC
Relative Humidity (Non condensing) Temperature 5 - 45˚C	up to 90%
Mains Operating voltage	230V 50Hz +10% -6%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP40 estimated
Vibration	5 to 60Hz
Colour	Grey/Brown (cover) - Black (backbox)
Loops	Up to 4 Loops (loops 2-4 require optional cards) automatic allocation of addresses (up to 200 per loop) Labels - up to 270 per loop for: outstations, interfaces. Each label may have up to 32 characters (28 for manual call points)
Master alarm circuits	2 - (24 volt) 400 mA max per circuit
Auxiliary relays	2 - double pole change-over, voltage-free contacts Configurable to operate with Fire, Fault or Warning event
Manned centre link connector	1 - single pole change-over relay, voltage-free contacts
Serial I/O connector	1 - RS232/485 for connecting to a Supervisor system or a commissioning computer

Panel networking connector	1 - RS485 for connecting to the secure network (optional card)
Indicators	Fire (red) Fault (amber) Warning (amber) Power On (green) Alpha-numeric display - 4 line 40 character, back-lit, (black on green, liquid crystal display)
Internal sounders	Fire buzzer Fault buzzer Keypad ‘beep’
Controls (door open)	Sound Alarms Silence Alarms Reset Fire Cancel Fault Buzzer Menu keys and Qwerty keyboard
Menu options	Current fault and warning logs Analysis of analogue sensor information Interrogation of sensor cleanliness Loop map connections Enable/disable sensors, zones, sounders Enable/disable interface unit channels Fire plan menus Outstation label Address allocation
Logs	255 Fault, Warning & Status events 100 Fire (only) event Current fault events Current warning events Command build (active) Command build (255 previous events)
Printer	The printer operates when the access door is open. The printer can be used to provide a printed copy of most of the messages presented on the display. Printer controls include: ON, OFF, line feed and test.
Standby power supply	The integral battery-backed power supply will provide power for 24 hours in standby and a further 30 minutes in alarm.

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3408 - Control Panel

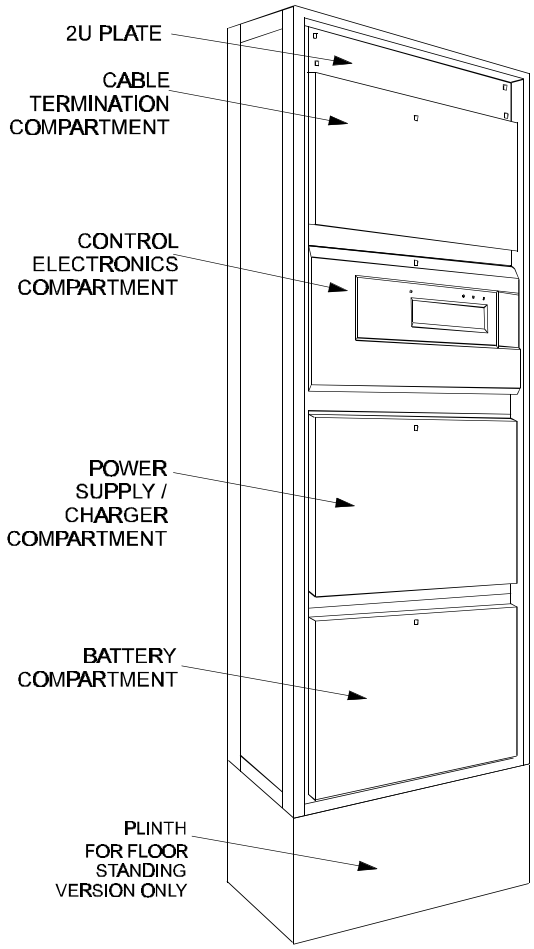

Figure 42-1 1-8 Loop Control panel

Floor standing version shown

fl211

The 3408 is a self-contained fire alarm panel conforming to the requirements of BS 5839: Part 4. It houses its own power supply and batteries.

The control panel is designed to be used with the 34000 range of addressable analogue sensor and sounders.

A lockable front cover prevents unauthorised access to fire alarm controls but allows all of the indicators to be seen. All fire, fault and warning events are indicated by standard coloured lights with message display. Each sensor and zone can be given a name thus making the message easy to understand.

Options

The 3408 is available as:

☐ **Version 3 plus software** *(model no 13408-12V3+)*

The control panel is supplied in basic form. The following cards may be added:

- up to 7 more **loop** cards (loops 2 to 8)
- 1 **network** card for interconnecting control panels and terminal nodes *(model no 13501-01)*

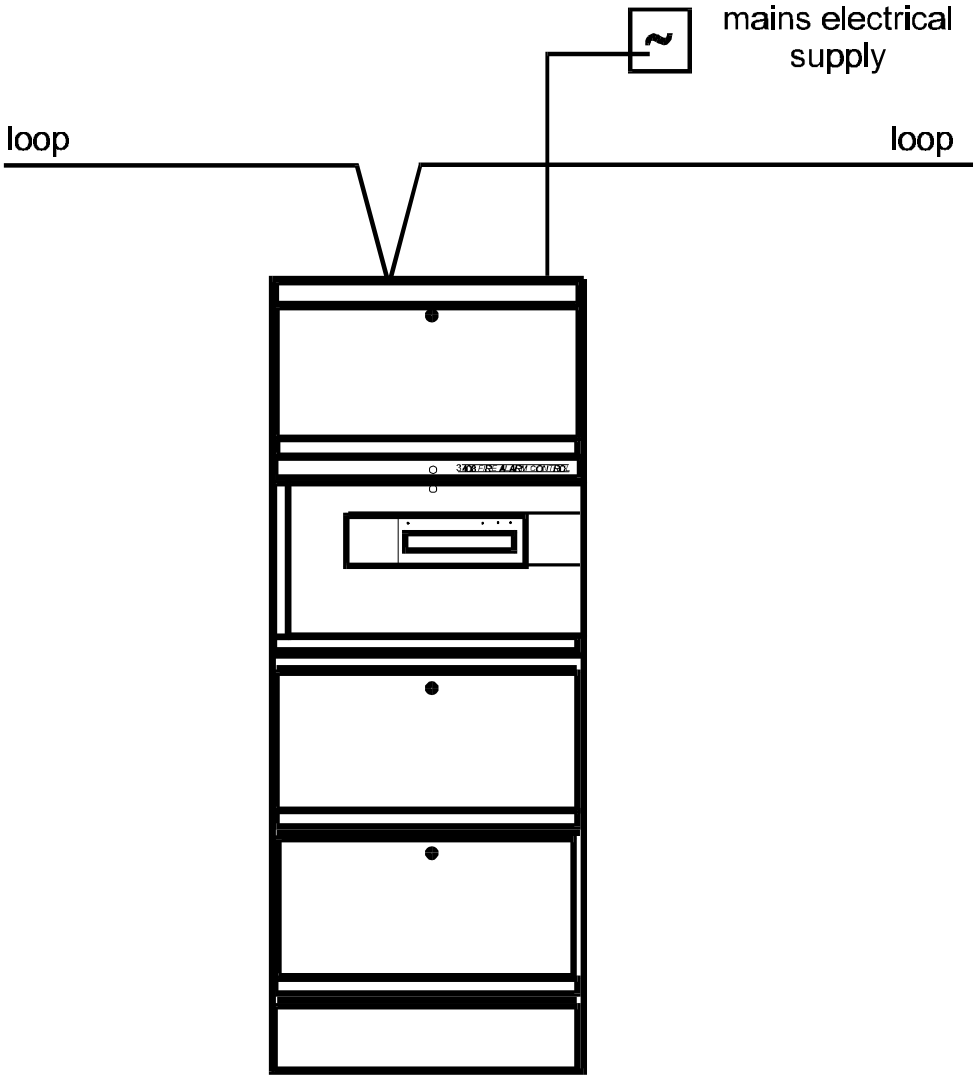

Figure 42-2 Control panel wiring

cd66

Specification

Standard	BS5839:Part 4
Panel Dimensions Wall mounted Floor standing	 width 600 mm height 1614 mm depth 270 mm width 600 mm height 2014 mm including plinth depth 270 mm
Full Assembly weight Wall mounted Floor standing	 100Kg (approximate) 120Kg (approximate)
Storage temperature	-30 to 70ºC
Operating temperature	0 to 45ºC
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Mains Operating voltage	230V 50Hz +10% -6%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP30 estimated
Vibration	5 to 60Hz
Colour	Grey/Brown (door covers) - Blcak (backbox)
Loops	Up to 8 Loops (loops 2-8 optional cards) Automatic allocation of addresses (up to 200 per loop) Labels - up to 270 per loop for: outstations, interfaces & monitored line manual call points. Each label may have up to 32 characters (28 for manual call points)
Auxiliary relays	2 - double pole change-over, voltage-free contacts which are configurable to operate with Fire, Fault or Warning event
Manned centre link connector	1 - single pole change-over relay, voltage-free contacts
Serial I/O connector	1 - RS232/485 for connecting to a Supervisor system or a commissioning computer
Panel networking connector	1 - RS485 for connecting to the secure network (optional card)
Indicators	Fire (red) Fault (amber) Warning (amber) Power On (green) Alpha-numeric display - 4 lines - 40 characters per line, back-lit, (black on green, liquid crystal display)
Internal sounders	Fire buzzer Fault buzzer Keypad ‘beep

Controls	Sound Alarms Silence Alarms Reset Fire Cancel Fault Buzzer Menu keys and Qwerty keyboard
Master alarm circuits	2 (24 Volts) 200 mA per circuit
Menu options	Current fault and warning logs Analysis of analogue sensor information Interrogation of sensor cleanliness Loop map connections Enable/disable sensors, zones, sounders Enable/disable interface unit channels Fire plan menus Outstation label Address allocation
Logs	255 Fault, Warning & Status events 100 Fire (only) event Current fault events Current warning events Command build (active) Command build (255 previous events)
Printer	The printer operates when the access door is open. The printer can be used to provide a printed copy of most of the messages presented on the display. Printer controls include: ON, OFF, line feed and test.
Standby power supply	The integral battery-backed power supply will provide power for 24 hours in standby and a further 30 minutes in alarm.

3450 - Repeat Panel

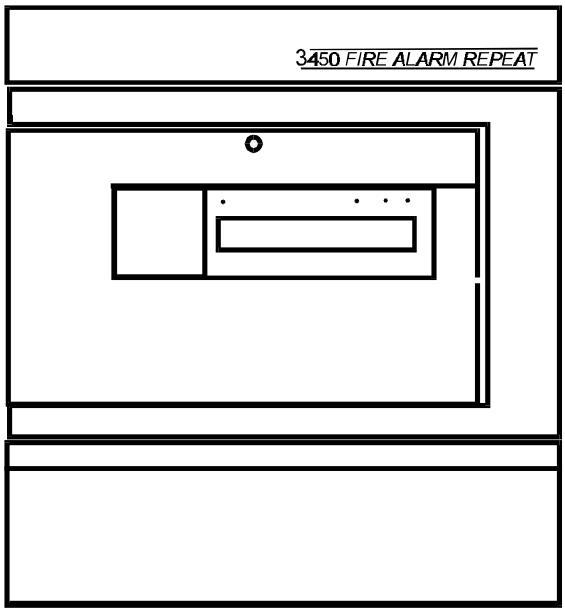

Figure 43-1 Repeat panel

cd49

The 3450 Repeat Panel repeats all of the front panel indications that are provided on the main panel. In addition, all of the essential controls are also available.

The repeat panel can therefore take the place of a main panel for all standby and emergency needs. This allows the main panel to be sited elsewhere, close to security staff or to fit-in with cable routes.

The repeat panel is connected directly to a loop and has a built-in 'T' connection. The panel has an integral battery-backed mains power supply.

Options

The 3450 is available in two versions:

- ☐ without printer and keyboard *(model no 13450-01V3)*
- ☐ with printer and keyboard *(model no 13450-02V3)*

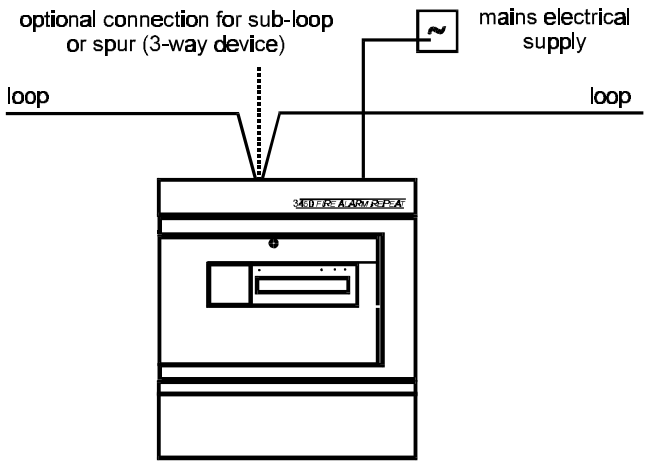

Figure 43-2 Wiring a repeat panel

cd39

Specification

Standard	BS5839:Part 4
Panel Dimensions	width 496 mm height 550 mm depth 130 mm
Full Assembly weight	20Kg
Storage temperature	-30 to 70ºC
Operating temperature	0 to 45ºC
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Mains Operating voltage	230V 50Hz +10% -6%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP40 estimated
Vibration	5 to 60Hz
Colour	Grey/Brown (cover) - Black (backbox)
indicators	Fire, Fault, Warning, Power On lamps 4 line 40 character per line, back-lit, display (black on green, liquid crystal display)
controls (door open)	Sound Alarms, Silence Alarms, Reset Fire Cancel Fault Buzzer
printer (optional)	The printer operates when the access door is open. The printer can be used to provide a printed copy of most of the messages presented on the display. Printer controls include: ON, OFF, line feed and test.
maximum number per loop	maximum number of repeat and mimic panels per loop = 32 load factor (1000 max) = 3

13460-01 Mimic Repeat Panel

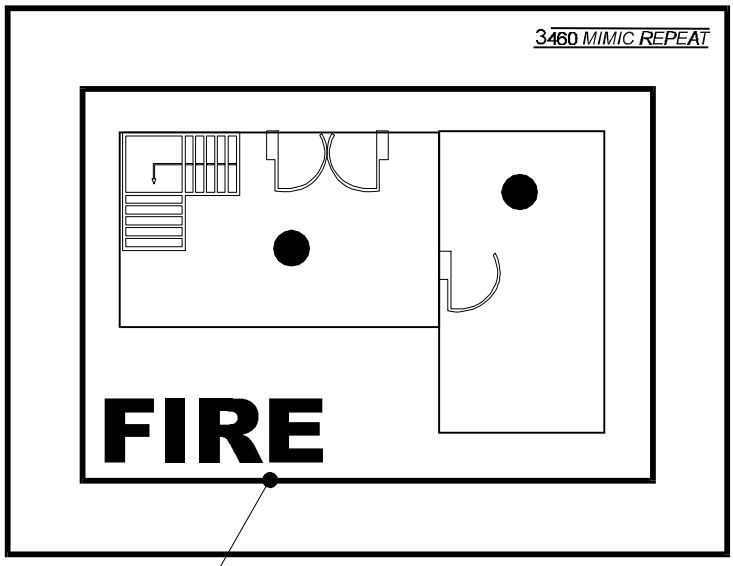

Figure 44-1 Mimic panel

cd20

- The 13460-01 Mimic Panel provides a pictorial representation of the building layout and the location of a fire.
- An array of LEDs, covering an A2 area, may be programmed to illuminate in fire conditions. They may be illuminated individually or in groups.
- Options facilitate the display of other text information. In its standby state it may display a digital clock.
- The mimic repeat panel is connected directly to a loop and has a built-in ‘T’ connection. The panel has an integral battery-backed mains power supply.
- The mimic repeat panel does NOT include any fire alarm control functions.
- *Model no (requires a custom drawing) 13460-01V3*

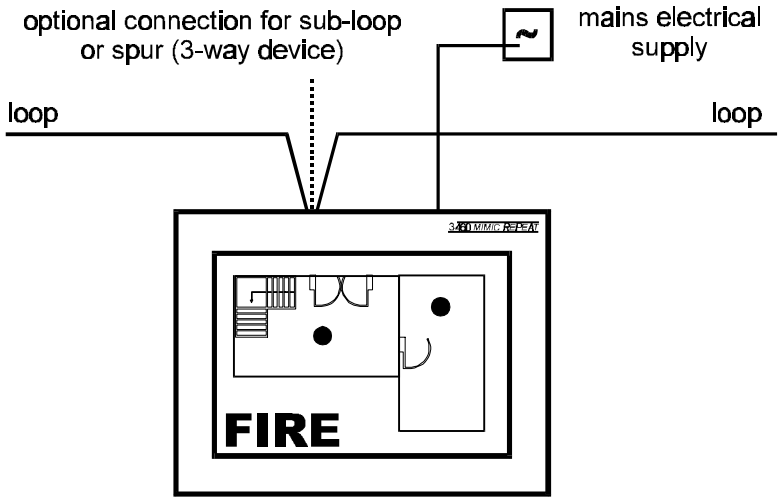

Figure 44-2 Wiring a mimic panel

cd40

Specification

Standard	BS5839:Part 4
Panel Dimensions	width 830 mm height 650 mm depth 90 mm
Full Assembly weight	18Kg
Storage temperature	-30 to 70ºC
Operating temperature	0 to 45ºC
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Mains Operating voltage	230V 50Hz +10% -6%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP40 estimated
Vibration	5 to 60Hz
Colour	Grey/Brown (cover) - Black (backbox)
Display	area - A2 landscape
LEDs	1536, high intensity RED, a maximum of 256 may be illuminated at a time
Standby power supply	The integral battery-backed power supply will provide power for 24 hours in standby and a further 30 minutes in alarm.
Maximum number per loop	maximum number of repeat and mimic panels per loop = 32 load factor (1000 max) = 3

13460-02 Zonal Repeat Panel

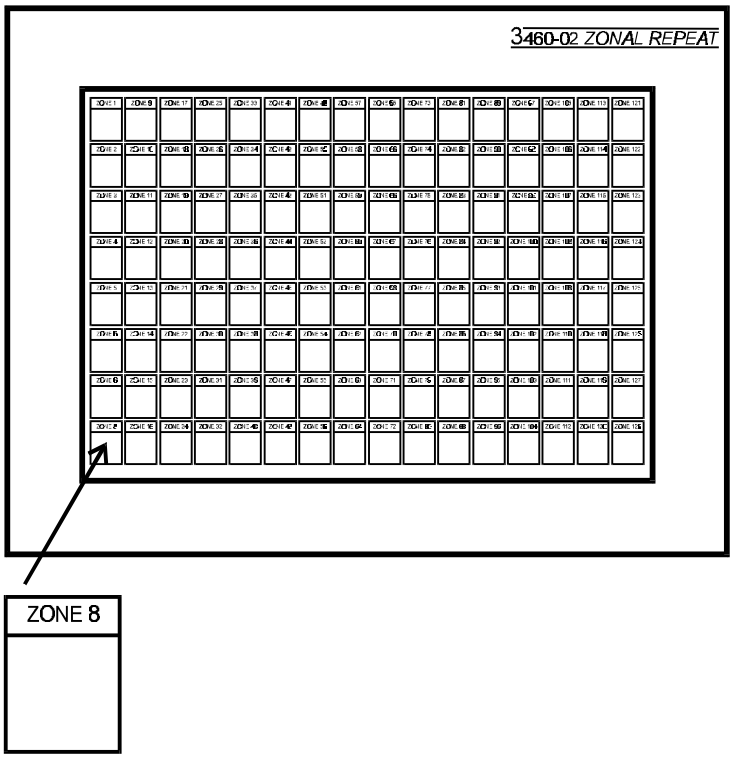

Figure 45-1 Mimic panel

cd51

- The 13460-01 Zonal Repeat Panel provides a traditional zone by zone indication of a fire. This is achieved using an array of LEDs behind a translucent film. The translucent film is supplied ready to identify zones 1 to 128.
- The zonal repeat panel is connected directly to a loop and has a built-in 'T' connection. The panel has an integral battery-backed mains power supply.
- The panel does NOT include any fire alarm control functions.
- Model no 13460-02V3.

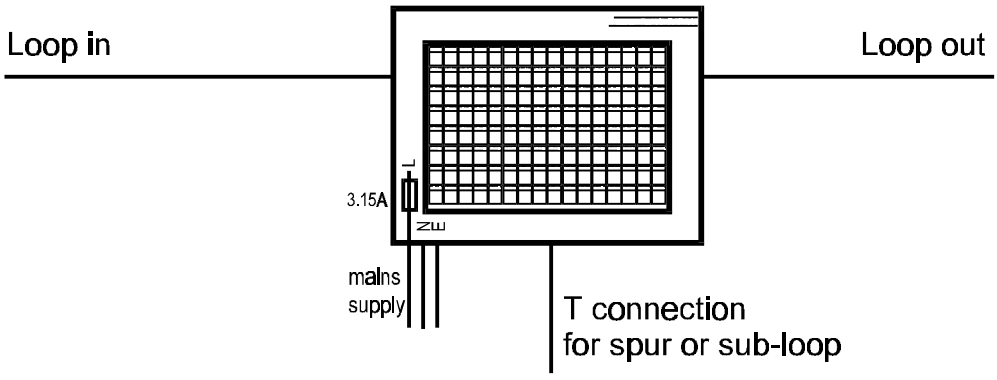

Figure 45-2 Wiring Zonal mimic panel

cd59

Specification

Standard	BS5839:Part 4
Panel Dimensions	width 830 mm height 650 mm depth 90 mm
Full Assembly weight	20Kg
Storage temperature	-30 to 70ºC
Operating temperature	0 to 45ºC
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Mains Operating voltage	230V 50Hz +10% -6%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP40 estimated
Vibration	5 to 60Hz
Colour	Grey/Brown (cover) - Black (backbox)
Display	area - A2 landscape
LEDs	1536, high intensity RED, a maximum of 256 may be illuminated at a time
standby power supply	The integral battery-backed power supply will provide power for 24 hours in standby and a further 30 minutes in alarm.
maximum number per loop	maximum number of repeat and mimic panels per loop = 32 load factor (1000 max) = 3

34604-XX A4 Mimic panel set

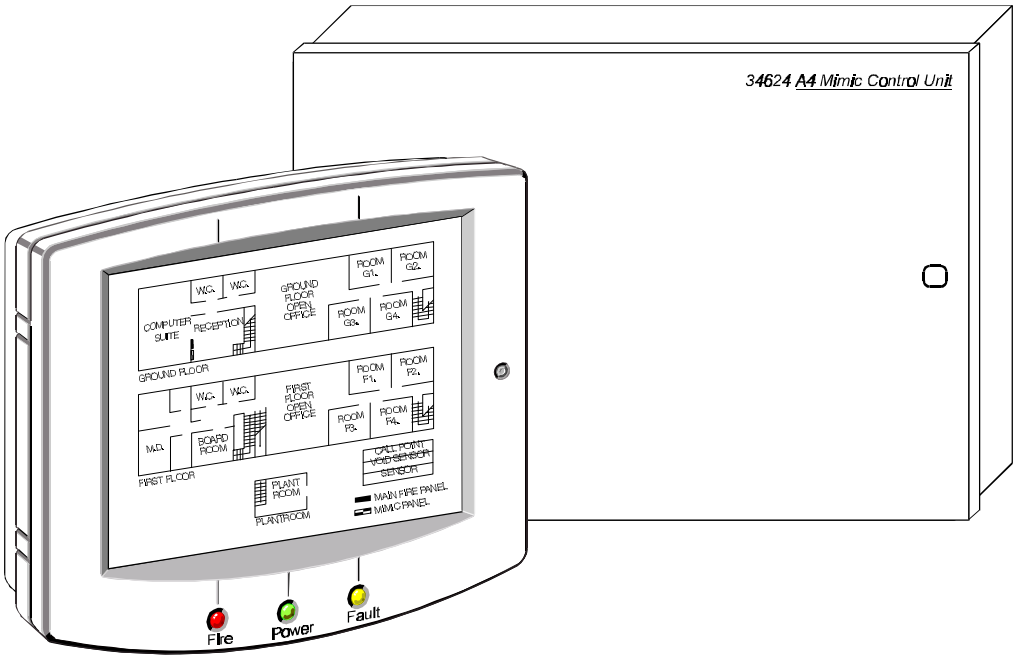

Figure 46-1 A4 Mimic panel set
cdm59

- The *34604-B1 A4 Mimic panel set* consist of an A4 Display unit and an A4 Control unit. (*-B1 is a Grey brown option, see specification*)
- The A4 Display unit is used to show the location of fire event. The lights behind a pictorial representation of the protected building/area are illuminated in the event of fire.
- The A4 Control unit communicates with the 3400 system. It passes on the system fire event information to the A4 Display unit, along with power to illuminate the lights (Light Emitting Diode-LED).
- The array of LEDs are programmed during the commissioning stage to give fire indications. They may be illuminated individually or in groups.
- The Mimic panel illumination can include a display of simple text messages and a digital clock.
- The A4 Mimic control unit connects directly to a loop circuit and includes ‘T’ connection for sub loop and spur. The unit has an integral battery-backed mains power supply.

> ***NOTE:*** *It is recommended that the A4 Display unit is mounted on a flat surface.*

- A computer generated site specific plan must be produced for fixing onto the LEDs of the A4 Display unit. In addition a custom EPROM is produced during commissioning that holds illumination information.

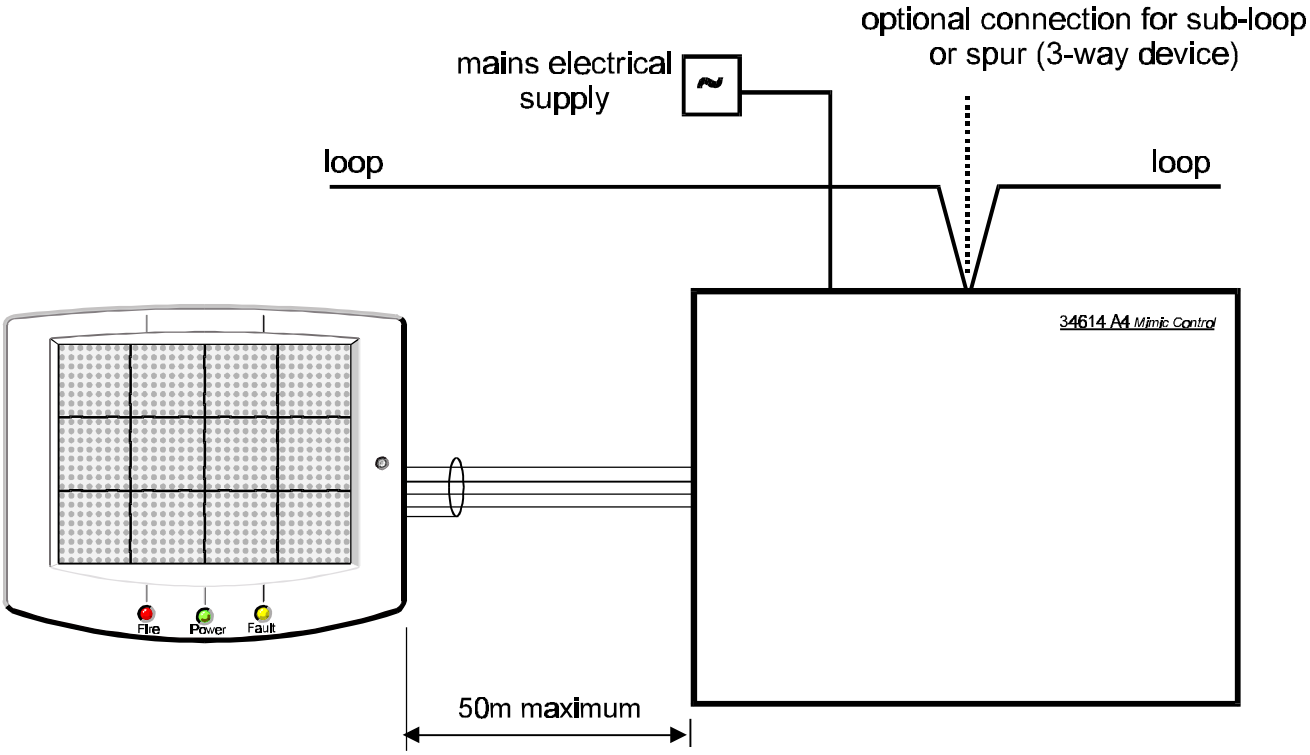

Figure 46-2 Wiring an A4 mimic panel set
cdm60

Specification

Standard	BS5839:Part 4
Fully assembly dimensions A4 Mimic display unit	 width 330 mm height 276 mm depth 73 mm
A4 Mimic control unit	width 483 mm height 385 mm depth 78 mm
Full Assembly weight A4 Mimic display unit	 2.3Kg
A4 Mimic control unit	10.4Kg (with 2 batteries installed)
Maximum cable distance between A4 Display unit and A4 Control unit	50m
Storage temperature	-30 to 70ºC
Operating temperature	0 to 45ºC
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Mains Operating voltage	230V 50Hz +10% -6%
Standby power supply 24 hour standby plus 0.5 hour alarm load:	 1 off - 12V 6Ah sealed battery
72 hour standby plus 0.5 hour alarm load:	2 off - 12V 6Ah sealed battery (Optional)
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**

Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection for both A4 display unit and A4 control unit	IP30 estimated
Colour A4 Mimic display unit Code 34604-B1 Code 34604-G1 A4 Mimic control unit	 Grey brown RAL 8019 or Squirrel Grey RAL7000 Grey (cover) - Black (backbox)
Controls at A4 Display unit	lamp test facility by a hidden switch
Internal buzzer (non cancelable) A4 Mimic display unit A4 Mimic control unit	Operates on **system fire** and **local fault** events Permanent buzzer disable by link P3 Permanent buzzer disable by link P1
User LED indication at A4 Display unit Display area Common LEDs	 768 high intensity Red LEDs 32 (vertical axis) by 24 (horizontal axis) LEDs aperture size 244mm (wide) by 184mm (height) Fire - Red LED Power On (local) - Green LED Fault (local) - Amber LED
Maximum number per loop	maximum number of repeat and mimic panels per loop = 32 load factor (1000 max) = 3

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13505-01 Terminal node

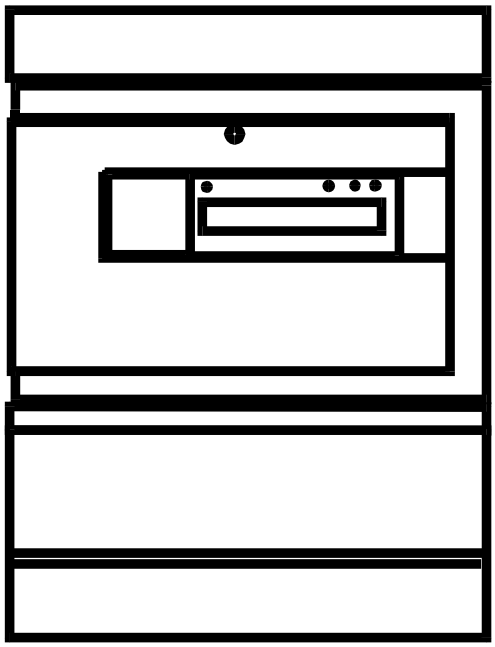

Figure 47-1 Terminal node

cd117

The terminal node is used as part of a network. It provides essential control functionality of a control panel without the ability to connect loops.

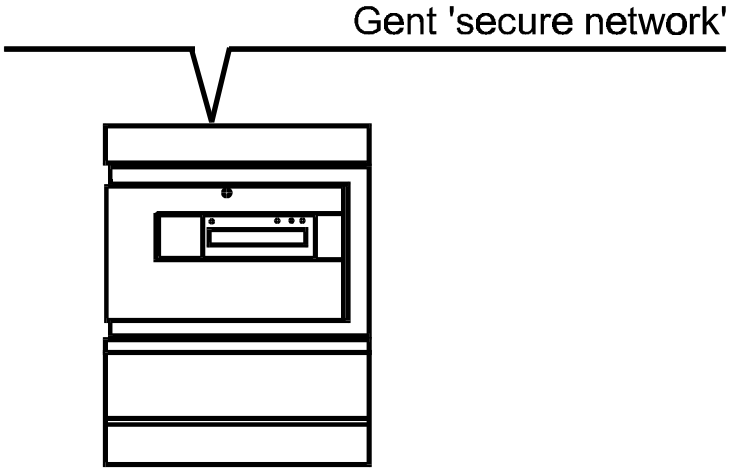

Figure 47-2 Wiring a terminal node

cd118

Specification

Standard	BS5839:Part 4
Panel Dimensions	width 496 mm height 550 mm depth 130 mm
Full Assembly weight	20Kg
Storage temperature	-30 to 70ºC
Operating temperature	0 to 45ºC
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Mains Operating voltage	230V 50Hz +10% -6%

Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP40 estimated
Vibration	5 to 60Hz
Colour	Grey/Brown (cover) - Black (backbox)
Display	common Fire, Fault and Warning indicators 4 x 40 character Liquid Crystal Display for event messages
Controls	Global Sound alarms, Silence alarms and Reset Cancel buzzer
Power supply	The integral battery-backed power supply will provide power for 24 hours in standby and a further 30 minutes in alarm.
Printer	Same as 3404/8 control panel

34710 Optical Heat Sensor

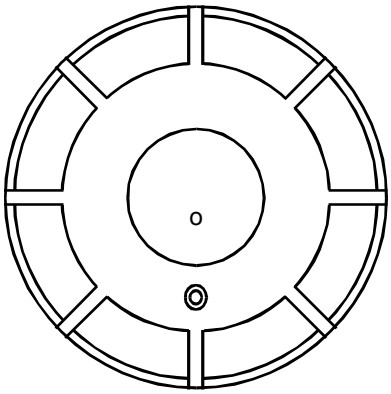

Figure 48-1 Optical Heat Sensor

cd49

Variants

☐ 34710 Standard optical heat sensor

☐ 34710-RL Optical heat sensor with fourth terminal for connection of remote LED - Requires the 34704 four way terminal plate to be used.

37410

This combination sensor provides a truly general purpose sensor. As well as operating as 2 stand-alone sensors, it will also react to the presence of smoke and heat at the same time.

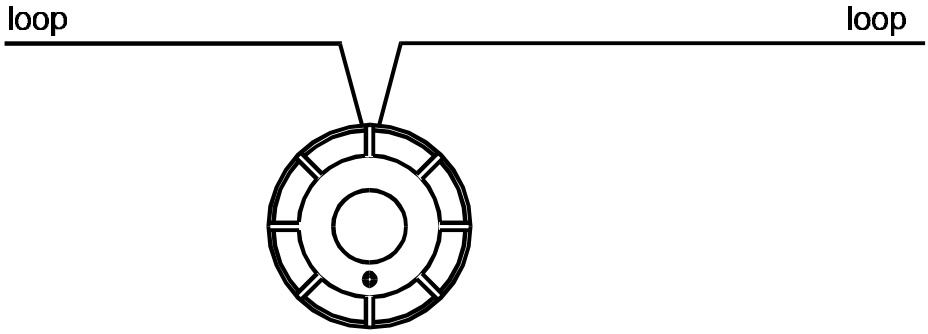

Figure 48-2 Wiring the Optical heat sensor

cd80

Specification

Standard Heat Smoke	 BS5445:Part 5 (EN54 : Part 5) BS5445:Part 7 (EN54 : Part 7
Dimensions	diameter 86 mm height 60 mm (with terminal plate)
Full Assembly weight	580g with terminal plate
Storage temperature	-30 to 70ºC
Operating temperature	0 to 50°C (If heat is used then 0 to 45°C)
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%

Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP30 estimated (mounted on a flat ceiling) IP20 estimated (mounted on a BESA box)
Air flow in installed environment	10m/s gusting for up to 30 minutes 5m/s continuous
Vibration	5 to 60Hz
Colour	White
Operating voltage	20-50V
Indicators	Red LED visible at 500LUX ambient light levels 3m
Mounting	Surface or Semi-flush, using mounting kit *(model no 19279-01)*
Chamber format	Sensing chamber is removable
Loop	Maximum number per loop = 200 Load (1000 max) = 1

Sensitivity

State 0 LPC approved	Medium sensitivity (Default) Suitable for most applications. Heat - grade 2 heat, Smoke - normal sensitivity.
State 1	High sensitivity optical or grade 2 heat Used in areas or situations where airborne smoke or dust is unlikely to occur and therefore a more sensitive detection is available
State 5	Medium sensitivity optical only Where high ambient temperatures of greater than 40°C are expected in the detection area. Smoke Detection only.
State 8 LPC approved	Medium sensitivity optical with time delay (20s time constant) or grade 2 heat. This state is useful in hotel bedrooms where low levels of signal could occur for short durations. If smoke and heat occur simultaneously the time delay is effectively overridden to provide fast detection.
State 10	Medium sensitivity optical with time delay (20s time constant) or grade 2 heat. Similar performance to state 8 without the time delay overridden. Useful in hotel bedrooms, and loading bays where low levels of signal may occur.
State 11	Low sensitivity optical or grade 3 heat If smoke detection is desirable in areas where airborne particles or smoke are normally present, or high temperatures (up to 40°C) can be normally attained.
State 12 **State 13** **State 14**	Grade 1 heat only - LPC approved Grade 2 heat only - **LPC approved** Grade 3 heat only No optical smoke detection. Can be used where airborne particles or smoke could occur briefly or at specific times. Optical detection can be used in conjunction with time blocks/slots to enable/disable depending on application
State 15	No detection, total disablement of sensor

34710-RL

The 34704-RL is identical to the standard version sensor except that it has a fourth terminal which connects to the fourth terminal in the 34704 four way terminal plate, see terminal plate data sheet.

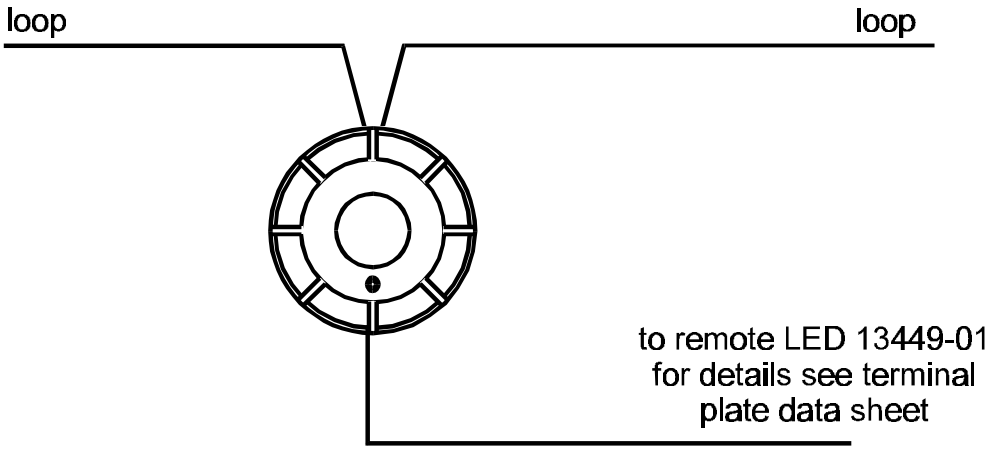

Figure 48-3 Wiring the Optical heat sensor - remote LED

cdn277

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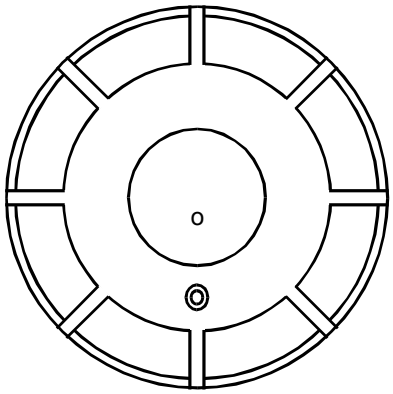
34770 Optical Heat Sounder

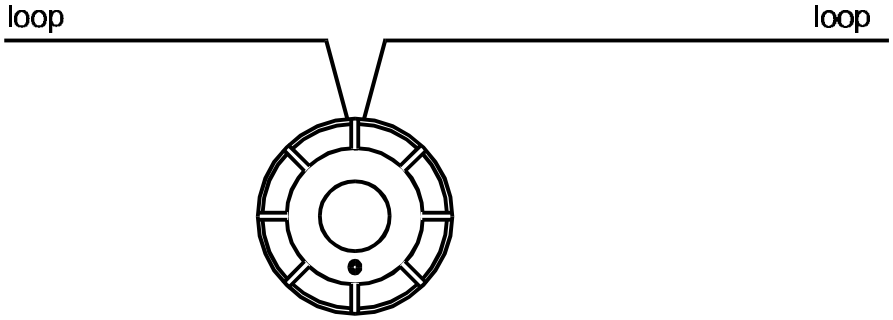
Figure 49-1 Optical heat sounder



cd83

In addition to the features of the combined optical heat sensor, the 34770 incorporates a high output sounder that achieves 75 dBA when correctly installed above a bedhead.

Figure 49-2 Wiring an Optical heat sounder



cd80

Specification

Standard Heat detection Smoke detection Sounder	 BS5445: Parts 5 (EN54 : Part 5) BS5445 : Part 7 (EN54 : Part 7) BS5839 : Part 1 Sound output 85dBA at 1m
Dimensions	diameter 86 mm height 60 mm (with terminal plate)
Full Assembly weight	600g with terminal plate
Storage temperature	-30 to 70ºC
Operating temperature	0 to 50°C (If heat is used then 0 to 45°C)
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP30 estimated (mounted on a flat ceiling) IP20 estimated (mounted on a BESA box)
Air flow in installed environment	10m/s gusting for up to 30 minutes 5m/s continuous
Vibration	5 to 60Hz
Colour	White

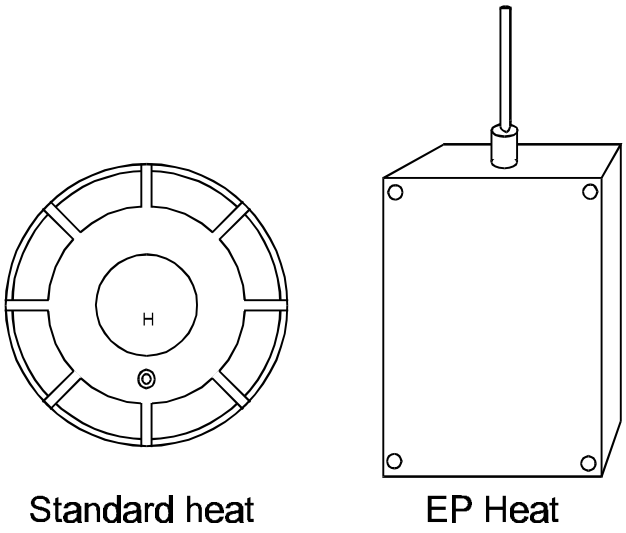
Operating voltage	20-50V
Indicators	Red LED visible at 500LUX ambient light levels 3m
Mounting	Surface or Semi-flush using mounting kit *(model no 19279-01)*
Chamber format	Sensing chamber is removable
Loop	Maximum number per loop = 125 Load (1000 max) = 8

Sensitivity

State 0 LPC approved	Medium Sensitivity (Default) Suitable for most applications. Heat - grade 2 heat, Smoke - normal sensitivity.
State 1	High Sensitivity optical or grade 2 heat Used in areas or situations where airborne smoke or dust is unlikely to occur and therefore a more sensitive detection is available
State 5	Medium Sensitivity optical only Where high ambient temperatures of greater than 40°c are expected in the detection area. Smoke Detection only.
State 8 LPC approved	Medium Sensitivity optical with time delay (20s time constant) or grade 2 heat. This state is useful in hotel bedrooms where low levels of signal could occur for short durations. If smoke and heat occur simultaneously the time delay is effectively overridden to provide fast detection.
State 10	Medium sensitivity optical with time delay (20s time constant) or grade 2 heat. Similar performance to state 8 without the time delay overridden. Useful in hotel bedrooms, and loading bays where low levels signal may occur.
State 11	Low Sensitivity optical or grade 3 heat If smoke detection is desirable in areas where airborne particles or smoke are normally present, or high temperatures (up to 40°C) can be normally attained.
State 12 **State 13** **State 14**	Grade 1 heat only - LPC approved Grade 2 heat only - **LPC approved** Grade 3 heat only No smoke detection. Can be used where airborne particles or smoke could occur briefly or at specific times. Optical detection can be used in conjunction with time blocks/slots to enable/disable depending on application
State 15	No detection, total disablement of sensor

34720 Heat Sensor

Figure 50-1 Heat sensor



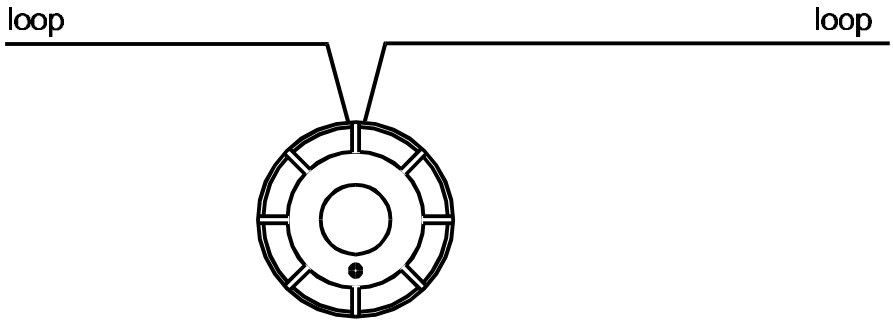
cd13

The heat sensor is a good alternative to smoke sensors where the environment is subject to constant levels of smoke or dirt.

Options Two options available:

- ☐ Standard sensor *(model no 34720)*
- ☐ Environmentally protected, IP55 *(model no 34729)*

Figure 50-2 Wiring a heat sensor



cd80

Specification

Standard Heat	BS5445:Part 5 (EN54 : Part 5) BS5445:Part 8 (EN54 : Part 8)
Dimensions standard	diameter 86 mm height 60 mm (with terminal plate)
environmentally protected	180 mm height (the probe protrudes 100mm) 180 mm width 90 mm depth
Full Assembly weight	505g with terminal plate
Storage temperature	-30 to 70ºC
Operating temperature	0 to 45°C

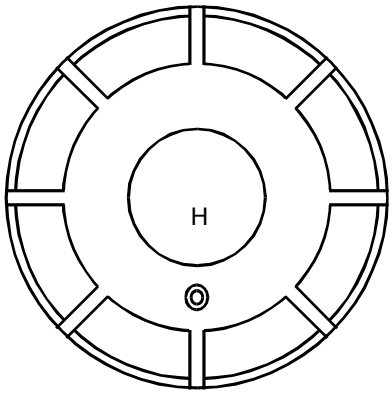
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP20 estimated IP55 environmentally protected version
Air flow in installed environment	10m/s gusting for up to 30 minutes 5m/s continuous
Vibration	5 to 60Hz
Colour	White
Operating voltage	20-50V
Indicators	Red LED visible at 500LUX ambient light levels 3m
Mounting	Surface or Semi-flush using mounting kit *(model no 19279-01)*
Chamber format	Sensing chamber is removable
Loop	Maximum number per loop = 200 Load (1000 max) = 1

Sensitivity

State 0 **LPC Approved**	(Default) Grade 2, rate of rise and fixed temperature. Suitable for general use in ambient temperatures up to 40°C. Provides detection to Grade 2 performance as defined in BS5445 Part 5.
State 1 **LPC Approved**	Grade 1, strong rate of temperature rise as well as fixed temperature. Applicable for areas with normally very steady low ambient temperatures e.g. cold stores. A strong rate of rise can signal a fire below the normal set temperature at 58°C.
State 2	Grade 1, limited rate of rise. Applicable for normal ambient temperatures where temperature variations are expected up to 40°C, but faster response than grade 2 is required e.g. hotel bedroom.
State 5	High temperature with rate of rise. Provides detection as specified by Range 1 (BS5445:Part 8) for ambient temperatures up to 70°C with a rate of rise feature. Fixed temperature will operate at 84°C.
State 6	High temperatures with no rate of rise Provides detection as specified by Range 1 (BS5445:Part 8) for ambient temperatures up to 70°C with no rate of rise feature. Will operate at 84°C.
State 15	No detection. This is a total disablement of the sensor.

34780 Heat Sounder

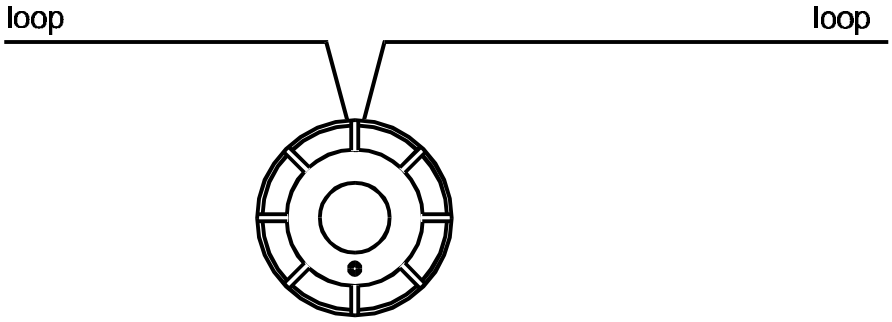
Figure 51-1 Heat sounder



cd13

In addition to heat detection, the 34780 incorporates a high output sounder that achieves 75 dBA when correctly installed above a bedhead.

Figure 51-2 Wiring an Heat sounder



cd80

Specification

Standard Heat detection Sounder	 BS5445: Parts 5 (EN54 : Part 5) BS5839 : Part 1 Sound output 85dBA at 1m
Dimensions	diameter 86 mm height 60 mm (with terminal plate)
Full Assembly weight	600g with terminal plate
Storage temperature	-30 to 70ºC
Operating temperature	0 to 50°C
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP30 estimated (mounted on a flat ceiling) IP20 estimated (mounted on a BESA box)
Air flow in installed environment	10m/s gusting for up to 30 minutes 5m/s continuous
Vibration	5 to 60Hz
Colour	White
Operating voltage	20-50V

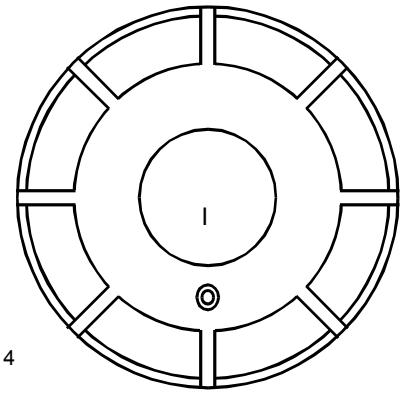
Indicators	Red LED visible at 500LUX ambient light levels 3m
Mounting	Surface or Semi-flush using mounting kit *(model no 19279-01)*
Chamber format	Sensing chamber is removable
Loop	Maximum number per loop = 125 Load (1000 max) = 8

Sensitivity

State 0 LPC approved	Medium Sensitivity (Default) Heat - grade 2 heat
State 12 LPC approved	Grade 1 heat only
State 13	Grade 2 heat only -
State 14	Grade 3 heat only
State 15	No detection, total disablement of sensor

34730 Ionisation Sensor

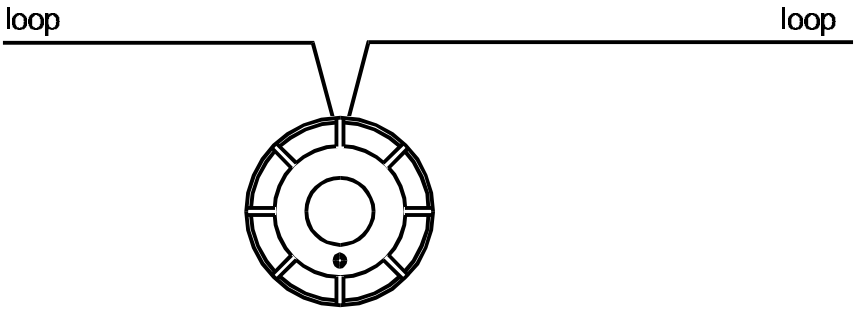
Figure 52-1 Ionisation smoke sensor



cd14

The ionisation sensor is a useful alternative to optical sensors where fires are likely to include invisible products of combustion.

Figure 52-2 Wiring an ionisation sensor



cd80

Specification

Standard Smoke detection	BS5445 : Part 7 (EN54 : Part 7)
Dimensions	diameter 86 mm height 60 mm (with terminal plate)
Full Assembly weight	610g with terminal plate
Storage temperature	-30 to 70ºC
Operating temperature	0 to 50°C
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP30 estimated (mounted on a flat ceiling) IP20 estimated (mounted on a BESA box)
Air flow in installed environment	5m/s gusting for up to 30 minutes 2m/s continuous
Vibration	5 to 60Hz
Colour	White

Operating voltage	20-50V
Indicators	Red LED visible at 500LUX ambient light levels 3m
Mounting	Surface or Semi-flush using mounting kit *(model no 19279-01)*
Chamber format	Sensing chamber is removable
Loop	Maximum number per loop = 200 Load (1000 max) = 1

Sensitivity

State 0 **LPC Approved**	(Default) Medium sensitivity. Same sensitivity as a standard conventional detector.
State 3	Medium sensitivity with 20 second time constant Medium sensitivity, but ignores faster transients. Fire signal must be present for a minimum of 20 seconds to create an alarm.
S**tate 5**	Medium sensitivity with no background Same as state 0 but ignores smouldering fires taking greater than 20 minutes to reach alarm levels. Used when mixed with 3471 Optical Smoke/Heat Sensors or in normally smoky environments.
State 10	Low sensitivity with 5 second time constant Lower sensitivity detection than state 0. Can be used where low levels of airborne smoke or dust are likely to occur.
State 12	Slow or Low sensitivity Lower sensitivity detection as for state 10, but ignores faster transients. Fire signal must be present for a minimum of 20 second to create an alarm.
State 15	No detection, total sensor disablement This is a total disablement of the sensor.

34740-90/91 Beam Sensor

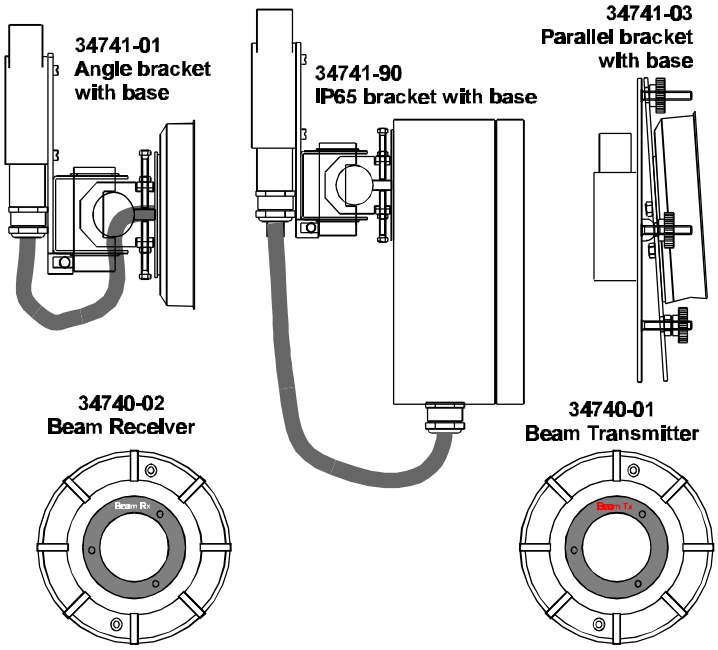


Figure 53-1 Beam sensor
cdm76

The beam sensor allows detection of smoke over distances up to 100 metres. The sensor comprises 2 parts a transmitter and a receiver. Both include the base and bracket.

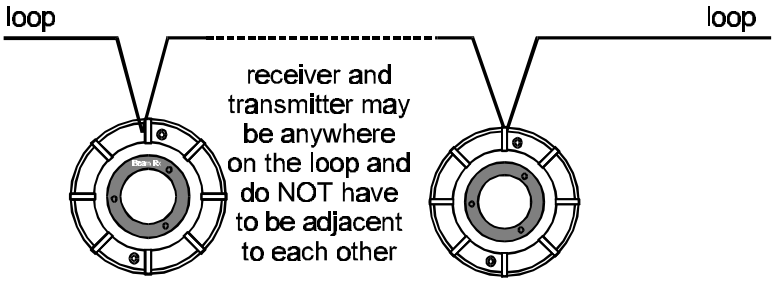


Figure 53-2 Wiring a beam sensor

cd129

Options

- ☐ Beam sensor pair, 2 to 100 metres (*model no 34740*).
- ☐ Angle bracket with base (*model no 34741-01*).
- ☐ IP66 Angle bracket with base (*model no 34741-90*).
- ☐ Parallel bracket with base (*model no 34741-03*)
  This version is intended fro use with short paths of up to 10m.

Specification

Standard Smoke detection	BS5445 : Part 5 (EN54 : Part 5)
Dimensions	Angle bracket and sensor: TBA IP66 bracket and sensor: TBA Parallel bracket and sensor: TBA
Full Assembly weight	Angle bracket and sensor: TBA IP66 bracket and sensor: TBA Parallel bracket and sensor: TBA
Storage temperature	-30 to 70ºC
Operating temperature	0 to 50°C
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 95%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP66 estimated (IP66 version only)
Vibration	5 to 60Hz
Colour	Grey
Operating voltage	20-50V
Indicators	Two Red LED visible at 500LUX ambient light levels 3m
Loop	Maximum number per loop = 16 pair Load (1000 max) = 2

Sensitivity

State 0	(Default) A fire is detected when there is a 50% (3dB) fall in signal level, however if the fall is by 90% (10dB) in less than 1 second and is maintained for 40 seconds, then it is a Fault. This allows the Control Panel to differentiate between a fire and a fault signal caused by accidental obscuration.
State 1	A fire is detected when there is a 50% (3dB) fall in signal level, however if the fall is by 90% (10dB) in less than 1 second and is maintained for 40 seconds then it also is a fire.
State 2	Medium sensitivity. A fire is detected when there is a 25% (1.3dB) fall in signal level, however if the fall is by 90% (10dB) in less than 1 second and is maintained for 40 seconds then a fault is registered.
State 3	Medium sensitivity. A fire is detected when there is a 25% (1.3dB) fall in signal level, however if the fall is by 90% (10dB) in less than 1 second and is maintained for 40 seconds then a fire is registered.
State 4	Hi-Sensitivity. A fire is detected when there is a 10% (0.5dB) fall in signal level, however if the fall is by 90% (10dB) in less than 1 second and is maintained for 40 seconds then a fault is registered.
State 5	Hi-Sensitivity. A fire is detected when there is a 10% (0.5dB) fall in signal level, however if the fall is by 90% (10dB) in less than 1 second and is maintained for 40 seconds then a fire is also registered.
State 15	This is a total disablement of the sensor.

34760 Duct Mounting Sensor

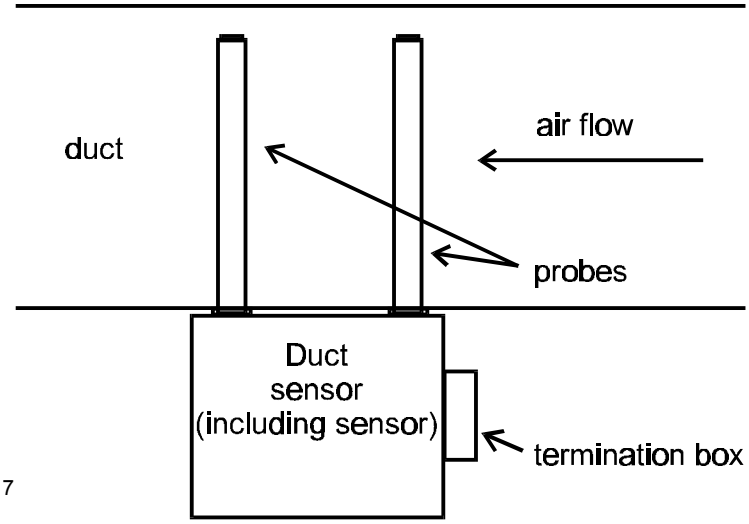


Figure 54-1 Duct sensor

The duct sensor acts as an additional detection device by using probes to sample the air in ducts. It can be used to trigger the shut-down of air-conditioning or ventilation plant to prevent the spread of smoke.

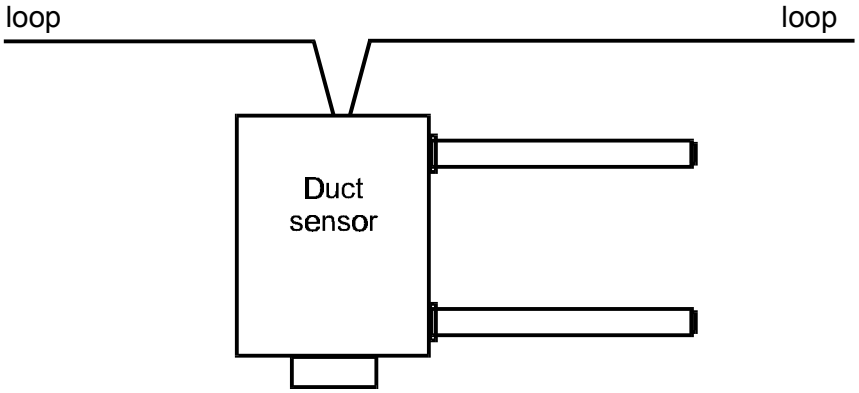


Figure 54-2 Wiring a duct sensor

Block diagram

Specification

Standard	Not applicable
Dimensions Housing Probes	 height 60 mm width 180mm depth 170mm length 0.92m supplied
Probes	The probes are 0.92 metres long, but may be cut down to suit. An extension kit allowing probes to be extended by a further 0.92 metres is available *(model no 17908-06)*
Full Assembly weight	3.3Kg
Storage temperature	-30 to 70ºC
Operating temperature	0 to 50°C
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**

Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP55 estimated
Air flow in installed environment	10m/s gusting for up to 30 minutes 5m/s continuous
Vibration	5 to 60Hz
Colour	White
Operating voltage	20-50V
Indicators	none, use a separate slave LED *(model no 32702)*
Loop	Maximum number per loop = 200 Load (1000 max) = 1

Sensitivity

State 0	Medium Sensitivity (Default) Suitable for most applications.
State 1	High Sensitivity Used in areas or situations where airborne smoke or dust is unlikely to occur and therefore a more sensitive detection is available
State 8	Medium Sensitivity optical with time delay (20s time constant).
State 11	Low Sensitivity If smoke detection is desirable in areas where airborne particles or smoke are normally present.
State 15	No detection, total disablement of sensor

Terminal Plates

34700 Terminal plate

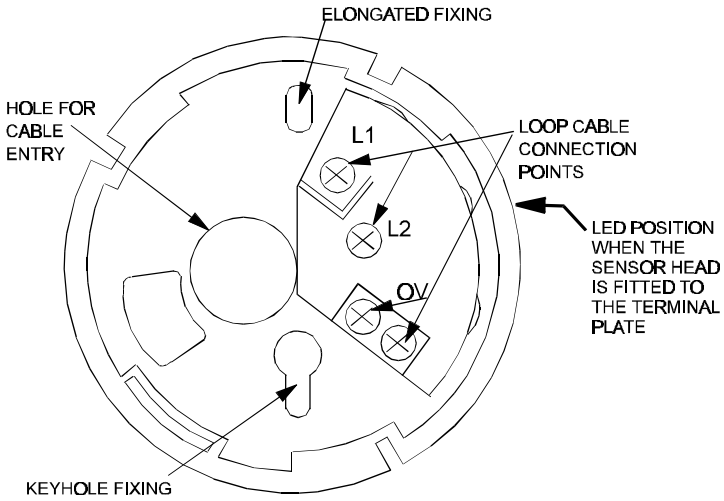


Figure 55-1 Terminal Plate

fl112

Specification

Diameter	75mm
Weight	Included in weight of sensor
Colour	White

34704 Four way terminal plate

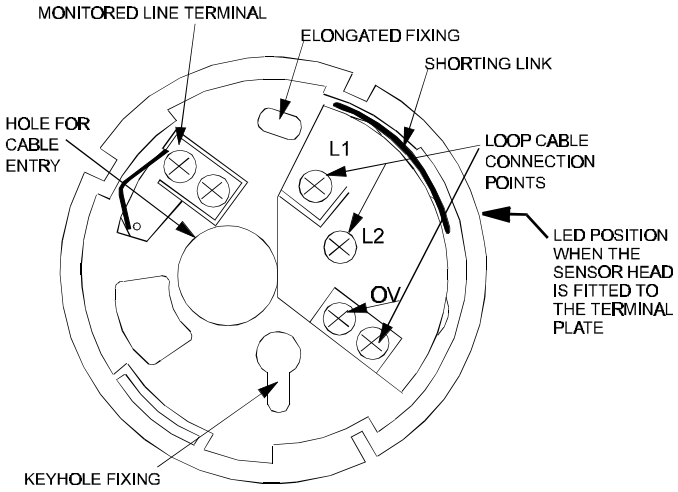


Figure 55-2 Four way terminal plate

cdn276

Specification

Diameter	75mm
Weight	Included in weight of sensor
Colour	White

Remote LED 13449-01

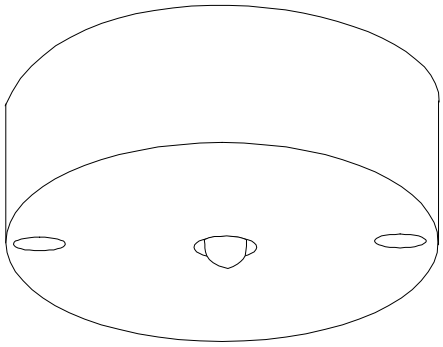


Figure 55-3 Remote LED

Specification

Diameter	62mm
Colour	White
Terminals	Two

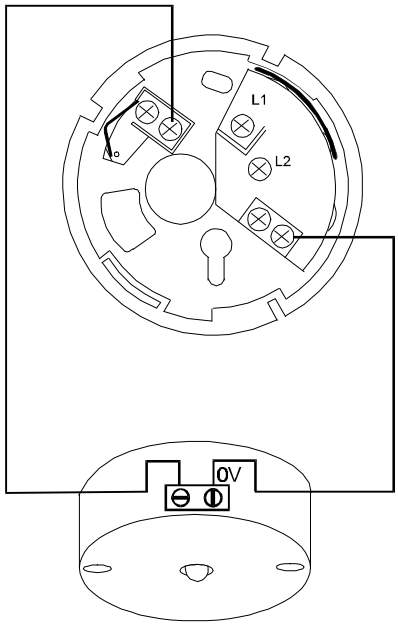
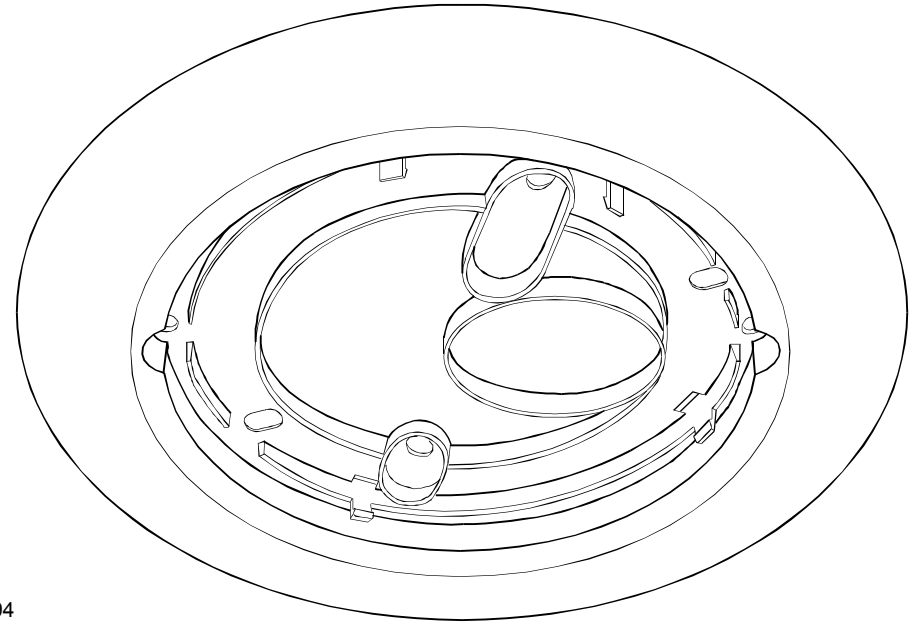


Figure 55-4 Wiring remote LED to 4 way terminal plate

19279-10 Sensor Trim Ring

Figure 56-1 Sensor trim ring



cdn94

The sensor trim ring provides the following benefits:

- Installation time required on ceilings of low quality material is reduced as there is no need to cut such accurate holes.
- Installation in refurbished installations where the sensors are of an larger diameter is easier as there is no need to repair or replace the ceiling

Specification

Diameter	120mm
Weight	TBA
Backbox Compatibility	1. BESA type 2. 'MK switch' type 3. 'American style' type
Colour	White

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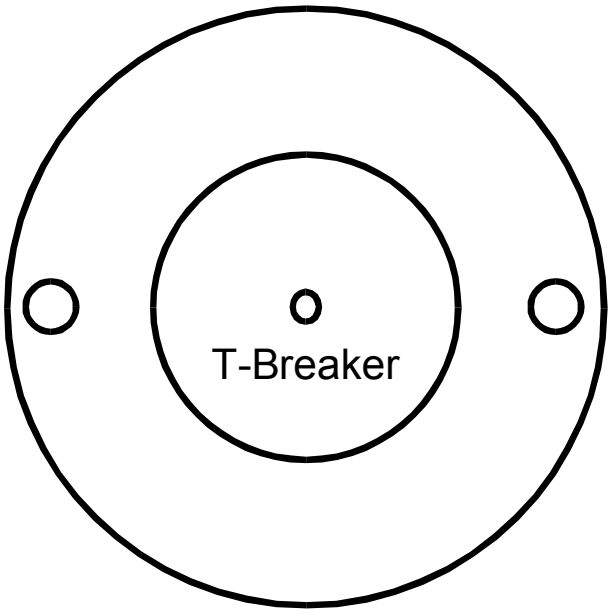
34701 T-Breaker Unit

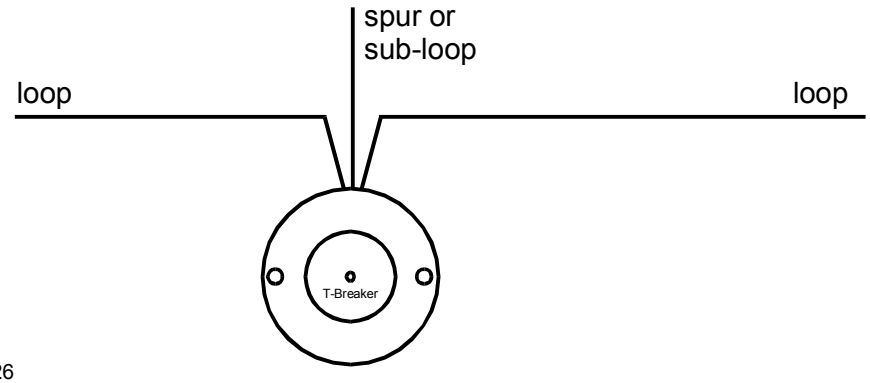
Figure 57-1 T-breaker



cd122

The T-breaker may be placed anywhere in a loop to provide connection for a spur or sub-loop. The T-breaker uses a single address of its own.

Figure 57-2 Wiring a T-breaker



cd126

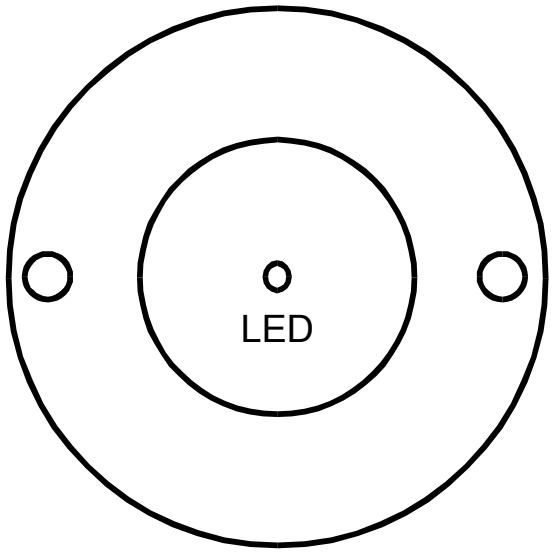
Specification

Dimensions	diameter 86 mm height 48 mm
Full Assembly weight	350g with fixing base
Storage temperature	-30 to 70ºC
Operating temperature	0 to 50°C
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP40 estimated

Vibration	5 to 60Hz
Colour	White
Operating voltage	20-50V
Indicator	Green LED, may be switched ON for identification purposes, also illuminates to indicate hardware fault
Loop	Maximum number per loop = 200 Load (1000 max) = 1

34702 Slave LED

Figure 58-1 Slave LED

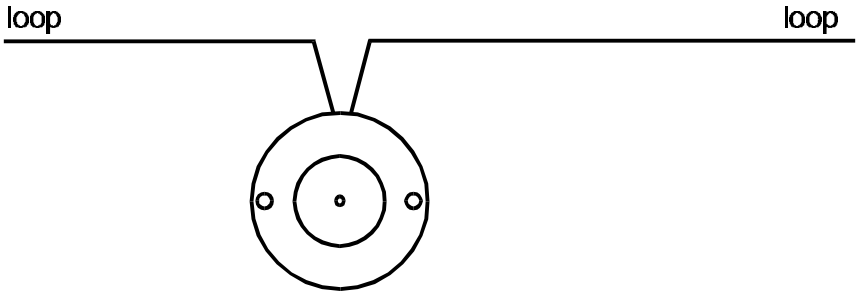


cd124

The slave LED provides a remote repeat indicator for a sensor. This is particularly useful where the sensor is mounted in a ceiling void or some other hidden location.

> ***NOTE:*** *The slave LED is positioned directly before the associated sensor. It does not use an address of its own.*

Figure 58-2 Wiring a Slave LED



cd125

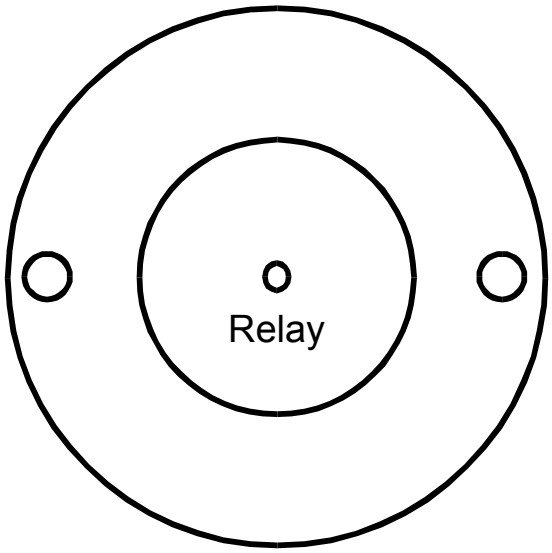
Specification

Dimensions	diameter 86 mm height 48 mm
Full Assembly weight	340 with fixing base
Storage temperature	-30 to 70°C
Operating temperature	0 to 50°C
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**

Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP40 estimated
Vibration	5 to 60Hz
Colour	White
Operating voltage	20-50V
Indicators	Red LED
Loop	Maximum number per loop =100 Load (1000 max) = 1

34703 Slave Relay

Figure 59-1 Slave relay

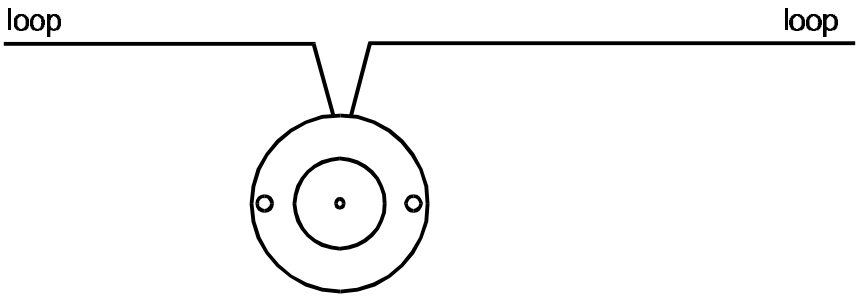


cd123

The slave relay provides a relay contact that operates when a particular sensor senses fire.

NOTE: *The slave relay is positioned directly before the associated sensor. It does not use an address of its own.*

Figure 59-2 Wiring a slave relay



cd125

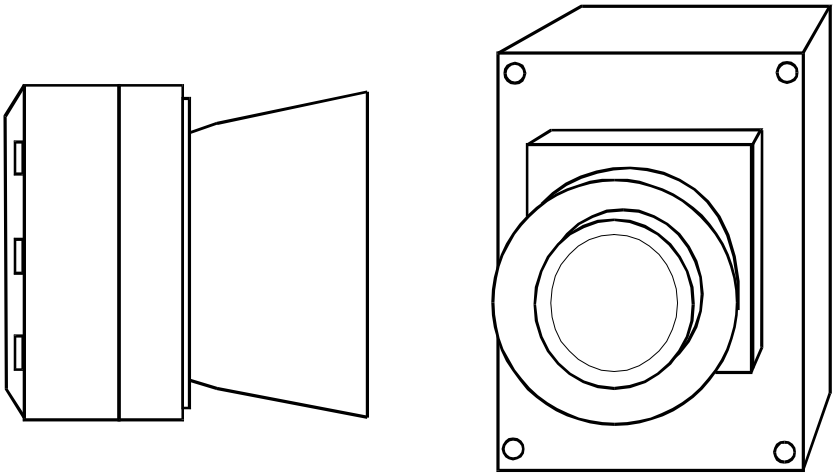
Specification

Dimensions	diameter 86 mm height 48 mm
Full Assembly weight	360g with fixing base
Storage temperature	-30 to 70ºC
Operating temperature	0 to 50°C
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*

Ingress Protection	IP40 estimated
Vibration	5 to 60Hz
Colour	White
Operating voltage	20-50V
Indicators	Red LED
Loop	Maximum number per loop = 100 Load (1000 max) = 1
Contacts	SPCO 2 amp, 24 Vdc

34202/3 and 34213(EP) Sounder

Figure 60-1 Alarm sounder

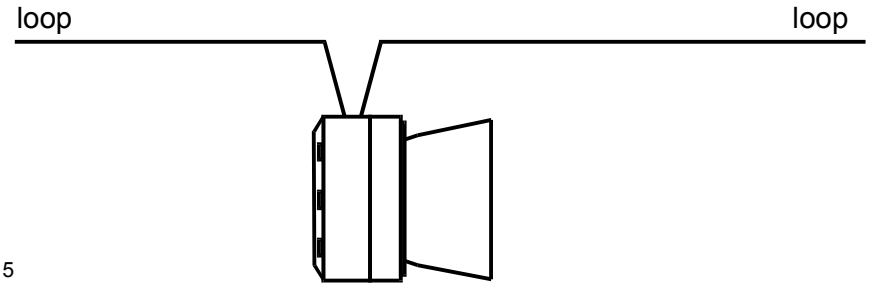


cd114

Options

- ☐ Standard 2-way sounder *(model no 34202)*
- ☐ 3-way version *(model no 34203)*
- ☐ Environmentally protected version of 3-way *(model no 34213)* IP55

Figure 60-2 Wiring an alarm sounder



cd115

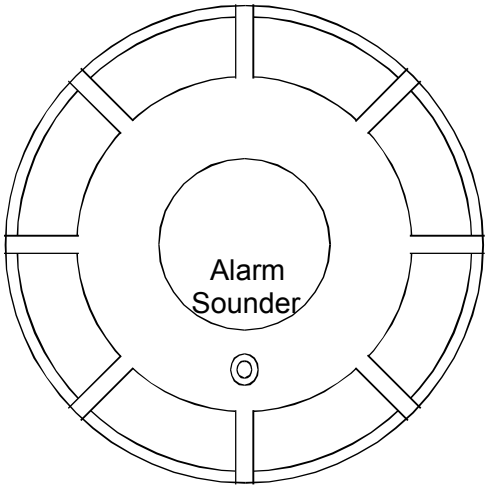
Specification

Sound output	BS5839: Part 1 Sound output 98 dBA at 1 metre
Dimensions Standard variant	 width 108 mm depth 112 mm height 108 mm
environmentally protected	width 180 mm depth 155 mm height 180 mm
Full Assembly weight	1.1Kg -approximate for standard variant 4Kg - environmentally protected
Storage temperature	-30 to 70ºC

Operating temperature	0 to 50°C
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP30 estimated standard type IP55 - Environmentally protected type
Vibration	5 to 60Hz
Colour	White
Operating voltage	20-50V

34777 Repeat Sounder

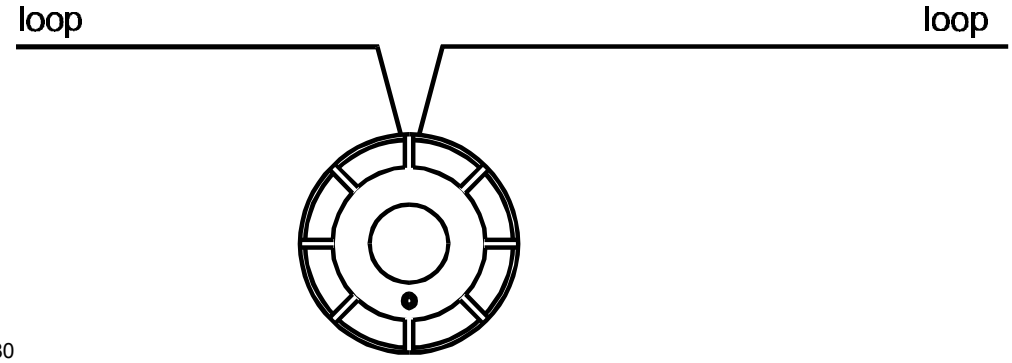
Figure 61-3 Repeat Sounder



cdn204

The Repeat Sounder is aimed at providing alarm sounder coverage in areas that do not require smoke/heat coverage or already have sufficient smoke/heat coverage but inadequate sounder output levels. Typical applications are en-suite bathroom/shower in a hotel, toilets/washrooms and in complicated building layouts where a more even sounder coverage is required than could be obtained by system sounders.

Figure 61-4 Wiring a repeat sounder



cd80

Specification

Sounder	BS5839 : Part 1 Sound output 85dBA at 1m
Dimensions	diameter 86 mm height 60 mm (with terminal plate)
Full Assembly weight	600g with terminal plate
Storage temperature	-30 to 70ºC
Operating temperature	0 to 50°C
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*

Ingress Protection	IP30 estimated (mounted on a flat ceiling) IP20 estimated (mounted on a BESA box)
Vibration	5 to 60Hz
Colour	White
Operating voltage	20-50V
Indicators	Red LED visible at 500LUX ambient light levels 3m
Mounting	Surface or Semi-flush using mounting kit *(model no 19279-01)*
Loop	Maximum number per loop = 125 Load (1000 max) = 8

34800 range MCPs

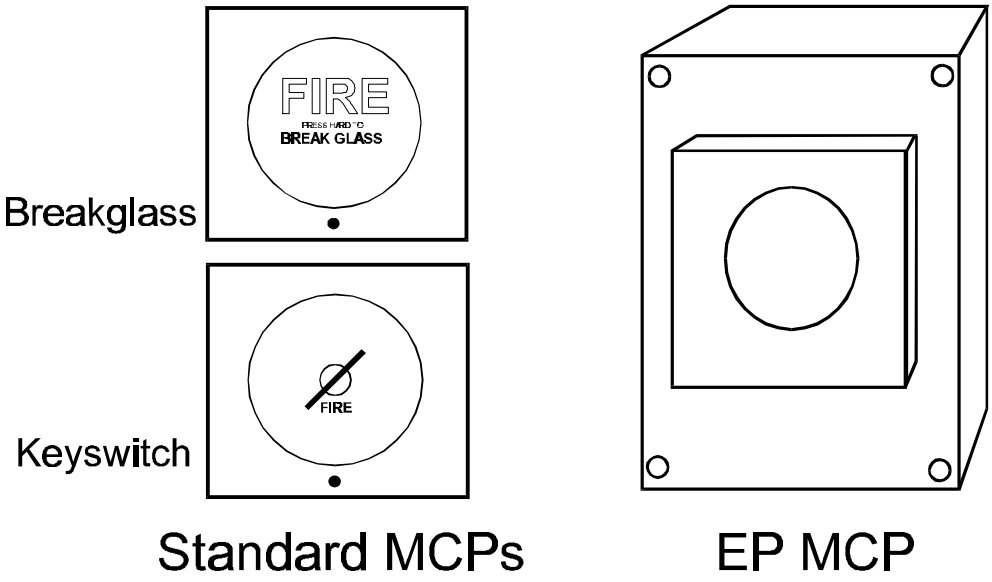


Figure 62-1 Manual call point

Options

The 34800 range includes:

- ☐ Surface mounted MCP - LPC certified *(model no 34800)*
- ☐ Surface mounted MCP, water resistant IP44 *(model no 34812)*
- ☐ Surface mounted MCP, environmentally protected IP55 *(model no 34829)*
- ☐ Surface mounted MCP with lift-up cover *(model no 34842)*
- ☐ Surface mounted MCP with lift-up cover, water resistant IP54 *(model no 34852)*
- ☐ Surface mounted MCP with key switch *(model no 34807)*

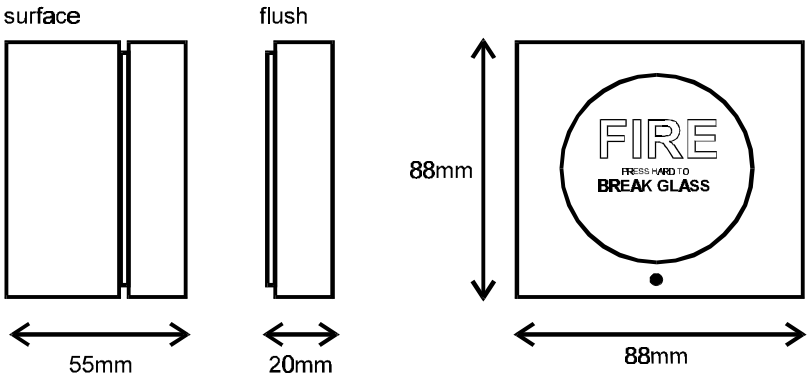
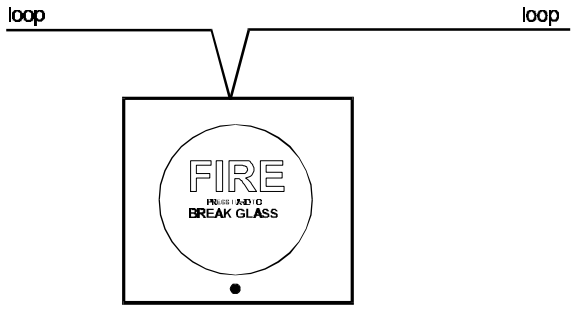


Figure 62-2 MCP dimensions

NOTE: *If the MCP is flush mounted the plastic backbox supplied* **must be** *used. A* **flush fixing bezel** *Part number 19289-01 is available.*

Figure 62-3 Wiring a MCP

Block diagram



Specification

Standard	BS5839: Part 2 (break glass type only)
Dimensions Standard variant environmentally protected	 width 88 mm depth 75 mm height 88 mm width 180 mm depth 130 mm height 180 mm
Full Assembly weight	770g - approximate for standard variant 3.5Kg - environmentally protected
Storage temperature	-30 to 70ºC
Operating temperature	0 to 50°C
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP40 estimated standard type IP55 - Environmentally protected type
Vibration	5 to 60Hz
Colour	Red
Case	ABS engineering plastic
Indication	Red LED that illuminates when the MCP is operated
Testing	The mechanism and operation of the MCP is tested by using a test key
Operating voltage	20-50V

Accessories

Spare glasses, pack of 10 *(model no 14112-09GR)*

Spare glasses (for LPC version), pack of 10 *(model no 34809)*

34410 Loop Powered Zone Module

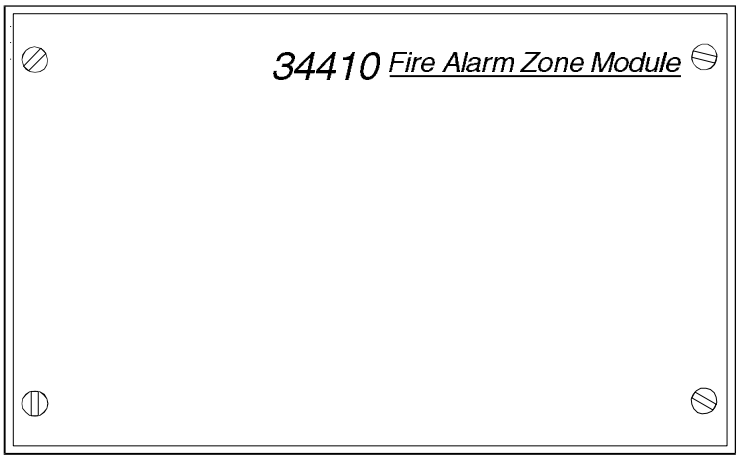


Figure 63-1 Loop powered zone module

cdn103

The 34410 loop powered zone module is a single channel device, which can accomodate up to 20 conventional detectors. The loop powered zone module can also accomodate conventional manual call points fitted with either a 3.9V Zener or 470 ohm resistor in series with its contacts.

NOTE: *The loop powered zone module must be used with loop processor software version* **V3.42 or above**.

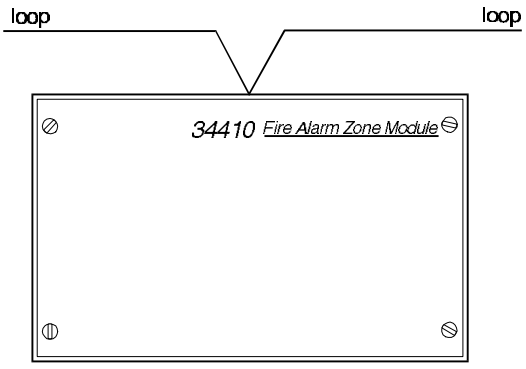


Figure 63-2 Wiring a loop powered zone module

cdn105

Specification

Panel Dimensions	Width 204mm height 125mm depth 50mm
Full Assembly weight	0.676Kg
Storage temperature	-30 to 70ºC
Operating temperature	0 to 45ºC
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%

Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP40 estimated
Vibration	5 to 60Hz
Colour	Grey/Brown and Black
Number of channels	1 channel
Input channels	2-wire input for conventional zone circuits. Circuits are monitored for: Fire MCP fire Wiring open circuit fault Wiring short circuit fault Monitoring conforms to BS5839 by detecting a MCP activation if a detector is removed. Maximum detector load: *TBA* End-of-line capacitor/diode (supplied) must be used. The input circuits may be configured to operate with various manufacturers conventional detectors: Menvier 700 series: Ionisation Menvier 700 series: Optical Apollo series 60: Ionisation Apollo series 30: Ionisation Apollo series 30: Rate of rise Hochiki SLK-E Optical Hochiki SIH-E Ionisation Hochiki Comb Heat Hochiki DFE-90E Fixed Temp Nittan 2KC Optical Smoke System Sensor 1151E System Sensor 4451E Notifier SD-651E Thorn MR601/AFA1706 Optical Thorn MR601T/AFA1705 High Performance Optical Thorn MD611/AFA 1704 Thorn MF601/AFA 1702 Thorn MS302 Ex Flame, provided; 1. The flame detector is the only device connected to the zone. 2. The EOL is fitted directly to the flame detector and is housed in the base.
Loop	Maximum number per loop = 100 Load factor (1000 max) = 10 2-way device

34415 Single Channel Interface

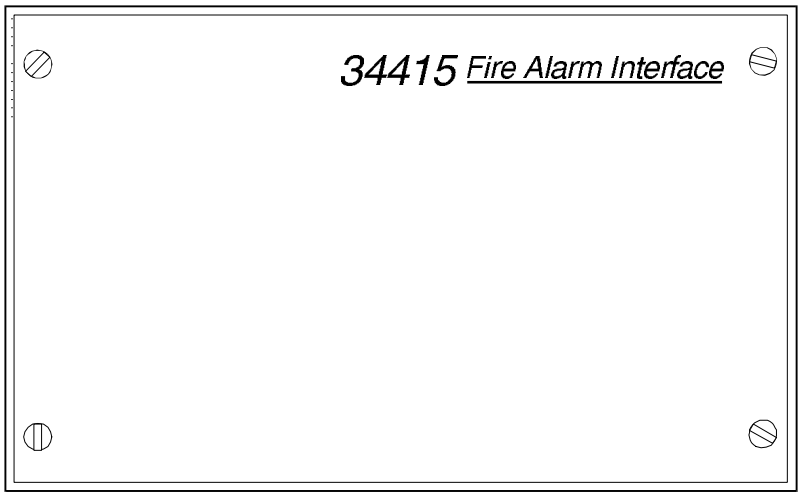


Figure 64-1 Single Channel Interface

cdn102

The 34415 single channel interface operates directly from the loop power supply. It has 1 channel, which may be configured as an input or output and can be configured to work as a single input, multiple input or output (via relay change over contacts) device.

When configured as a single input device, a line module must be used. The line module may be installed up to 100m cable distance away. Its two position switch must be set to input.

When configured as a multiple input device, an end of line capacitor unit must be used. If the multiple inputs are from manual call points, there must be a 470 ohm resistor in series with the contacts.

When configured as an output device, the output relay contacts are voltage free and rated at 5A at 30Vdc/5A at 250Vac. The relay output of the interface operates with a 3400 sector. Therefore the single channel outstation will need to be configured to a sector.

NOTE: *The loop powered zone module must be used with loop processor software version* **V3.42 or above**.

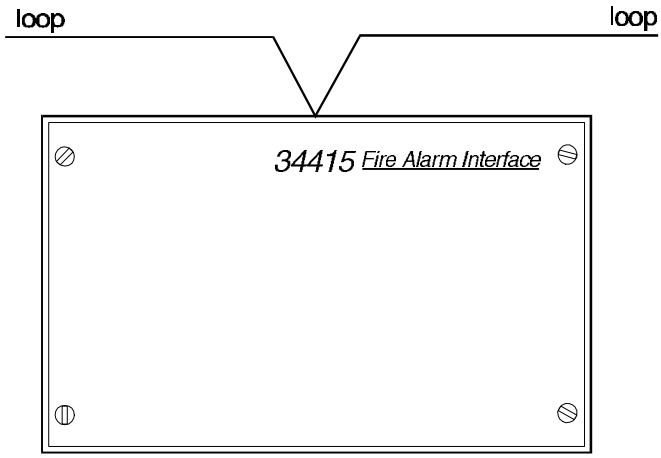


Figure 64-2 Wiring a single channel interface

cdn104

Specification

Panel Dimensions	Width 204mm height 125mm depth 50mm
Full Assembly weight	0.702Kg
Storage temperature	-30 to 70ºC
Operating temperature	0 to 45ºC
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP40 estimated
Vibration	5 to 60Hz
Colour	Grey/Brown and Black
Number of channels	1 channel, (configurable as input or output)
Input channels	Single input (using line module): monitors voltage free contacts, normally open or normally closed, inputs may be configured as: fire, fault, supervisory (with 0s or 30s delay before signal accepted) Multiple input (with capacitor end of line unit): monitors voltage free contacts (in series with 470 ohm resistor for mcps) normally open or normally closed, inputs may be configured as: fire only (with 0s or 30s delay before signal accepted)
Output channels	Voltage free SPCO contacts rated at: 5 amps at 24 Vdc 5 amps at 250 Vac
Loop	Maximum number per loop = 100 Load factor (1000 max) = 10 2-way device

34440 Mains-powered Interface

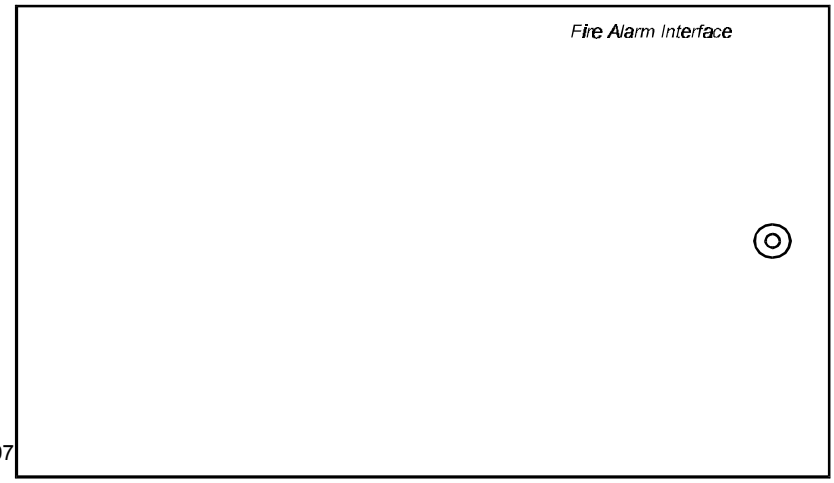


Figure 65-1 Mains powered interface unit

cdn197

The 34440 interface operates from mains power and incorporates its own battery-backed power supply. It has 4 channels, each may be configured as as input or output and are configured as conventional zone and sector circuits respectively.

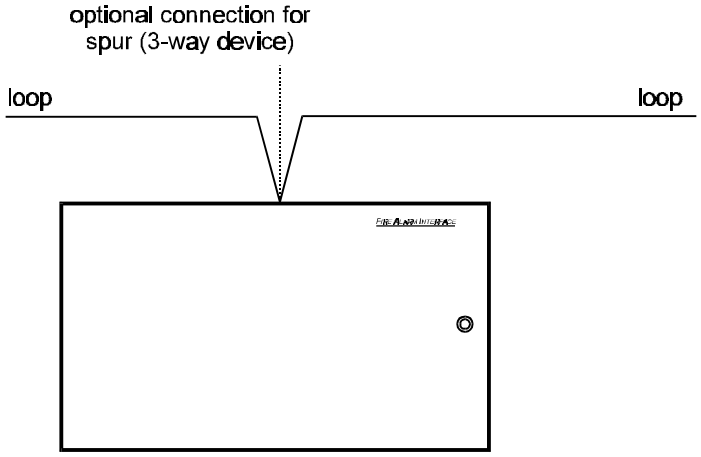


Figure 65-2 Wiring a mains powered interface

cdn206

Specification

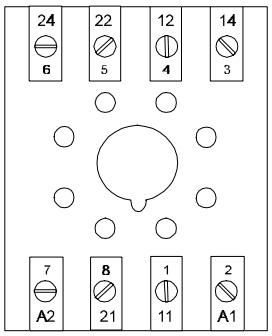
Panel Dimensions	Width 504mm height 305mm depth 98mm
Full Assembly weight	8.6Kg
Storage temperature	-30 to 70ºC
Operating temperature	0 to 45ºC
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Mains Operating voltage	230V 50Hz +10% -6%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**

Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP40 estimated
Vibration	5 to 60Hz
Colour	Grey/Brown and Black
Number of channels	4 channels, (each configurable as input or output)
Input channels	2-wire inputs for conventional zone circuits. Circuits are monitored for: Fire MCP fire Wiring open circuit fault Wiring short circuit fault Monitoring conforms to BS5839 by detecting a MCP activation if a detector is removed. Maximum detector load: 2 mA. End-of-line capacitor/diode (supplied) must be used. The input circuits may be configured to operate with various manufacturers detectors and MCPs: Gent Apollo / Hockiki Menvier Nittan Notifier Thorn On certain site, older type detectorsand MCPsplace a short across the zone when in fire. In order that these shorts are detected as fires and not shorts, position ‘F’ on the rotary switch should be selected.
Output channels	Output channels will operate conventional sector equipment such as sounders and door holders. Maximum current 500 mA per circuit (fused at 800 mA). Sectors are monitored for: wiring open circuit fault wiring closed circuit fault End-of-line 2k2 resistor (supplied) must be used. Up to 4 Octal relays with diode packs may be fitted within the enclosure. These provide DPCO voltage-free contacts rated at 10 amps, 240 Vac, resistive load.
Loop	Maximum number per loop = 8 Load factor (1000 max) = 3 3-way device (terminals provided for spur or sub-loop)

19104-52 Power Relay

For use in the 34440 mains powered interface unit. A maximum of 4 relays with diode units can be fitted on the DIN rail inside the interface unit.

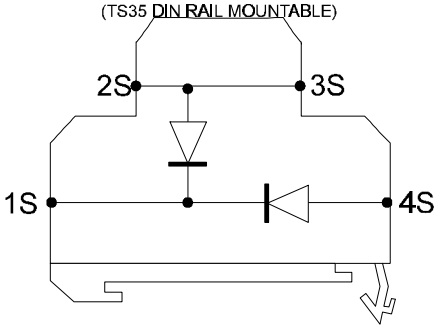
Figure 65-3 Power Relay base



cdn36

HOLDER
TOP VIEW
(TS35 DIN RAIL MOUNTABLE)

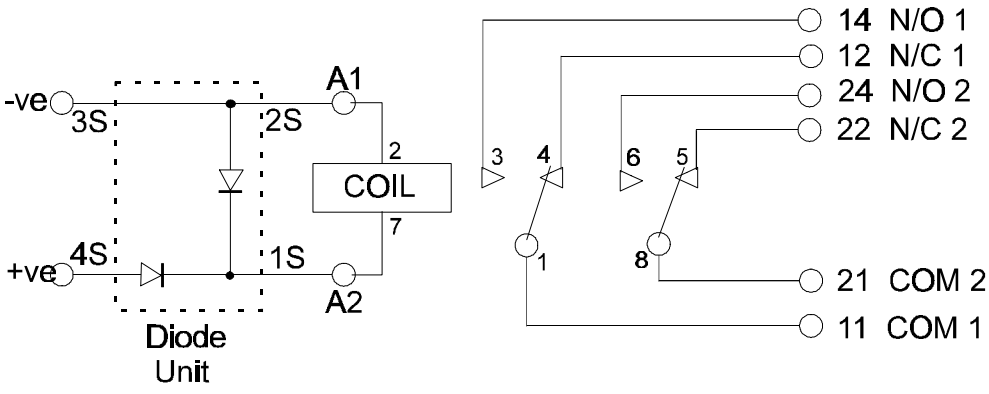
Figure 65-4 Diode unit



cdn28

DIODE UNIT
(TS35 DIN RAIL MOUNTABLE)

Figure 65-5 Relay connections



cdn241

Specification

Octal base	DIN Rail Mountable
Relay voltage	24V
Relay coil resistance	470R
Relay contact rating	10A
Relay current consumption	50mA

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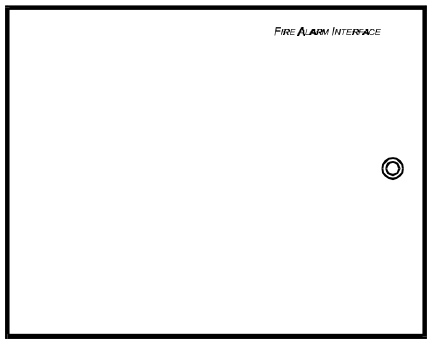
34450 Loop-powered Interface

Figure 66-1 Loop powered interface unit



cd27

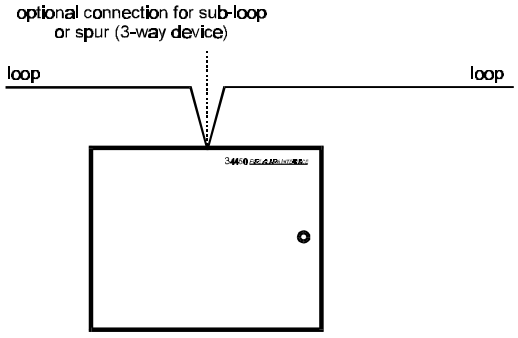
The 34450 interface operates directly from the loop power supply and does not use mains power. It has 4 channels. The interface must be used in conjunction with one or more of the following interface options:

- Line modules *(model no 19245-05).*
  Provides a single channel input or output, the output contacts of which are rated at 24Vdc 2A. Up to 4 may be used in conjunction with the interface. Line modules connect to the interface with 2 wires. All four line modules may be housed within the interface enclosure. Alternatively, any line module may be housed in the host equipment; the limit of the 2-wire interconnection is 100 metres with a maximum of 1km for each loop.

- Power supply unit *(model no 19245-06)*.
  The supply unit provides up to four 240 Vac, 5 amp rated single pole changeover relay contacts in a separate enclosure. Each relay is controlled by one channel of the interface. They are interconnected by a 2-wire cable. The maximum length of this cable is 100 metres. One relay is supplied with the supply unit, additional relays, up to 3 maximum, are ordered separately *(model no 19245-07)*.

- Key switches 4-position door *(model no 34454)*
  2-way key switch *(model no 19245-02)*- max 4 per interface
  3-way key switch *(model no 19245-03)*- max 2 per interface
  The 4-position door replaces the standard door of the interface. The door may be assembled with up to 4 key switches. Key switches are available in 2-way and 3-way configurations and include LEDs to indicate status. Key switches connect to the interface via push-on connectors. Label plates are built-in to each key switch position. Unused positions may be covered using a blanking plate (supplied).

Figure 66-2 Wiring a loop powerd interface



cd3

Specification

Panel Dimensions	Width 261mm height 270mm depth 60mm
Full Assembly weight	2.4Kg
Storage temperature	-30 to 70ºC
Operating temperature	0 to 45ºC
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP40 estimated
Vibration	5 to 60Hz
Colour	Grey - Brown and Black
Number of channels	4 channels, (each configurable as input, output or off)
Input channels	(using line modules) monitors voltage-free contacts, normally open or normally closed. inputs may be configured as: fire fault non-fire event (with 10 second sprinkler switch delay option)
Output channels	(using line modules) voltage-free SPCO contacts rated at: 2 amps at 24 Vdc (using supply unit and relays) voltage-free SPCO contacts rated at: 5 amps at 240 Vac All ratings - resistive load
Loop	Maximum number per loop = 30 Load factor (1000 max) = 2 3-way device (terminals provided for spur or sub-loop)

Notes on using 19245-05 line module

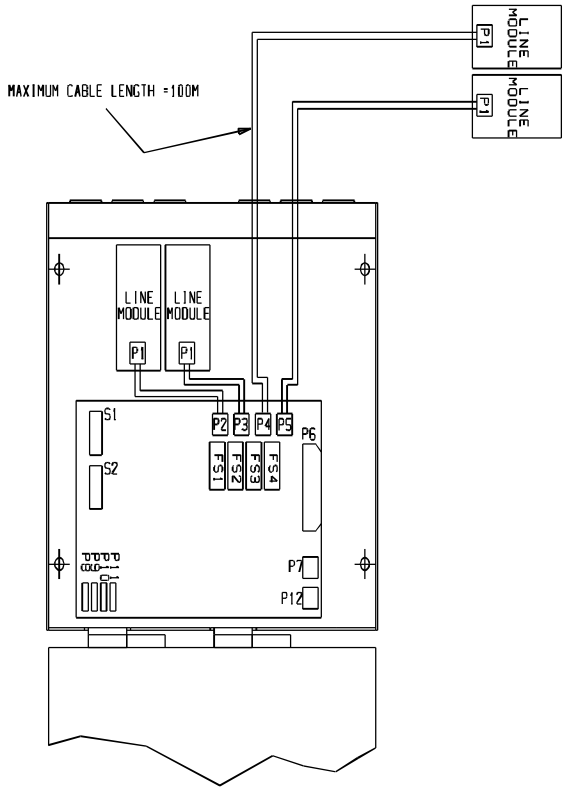


Figure 66-3 Connecting a line module to an interface

cd85

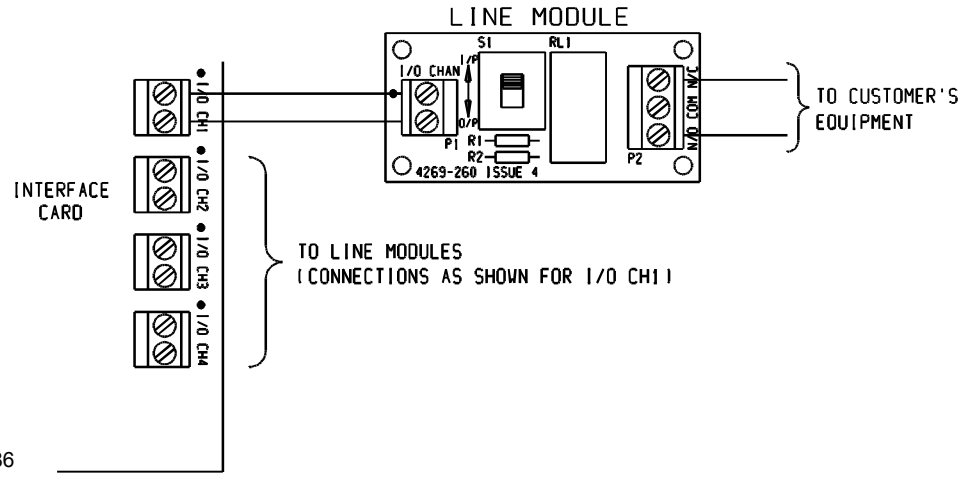


Figure 66-4 Line module input configuration

cd86

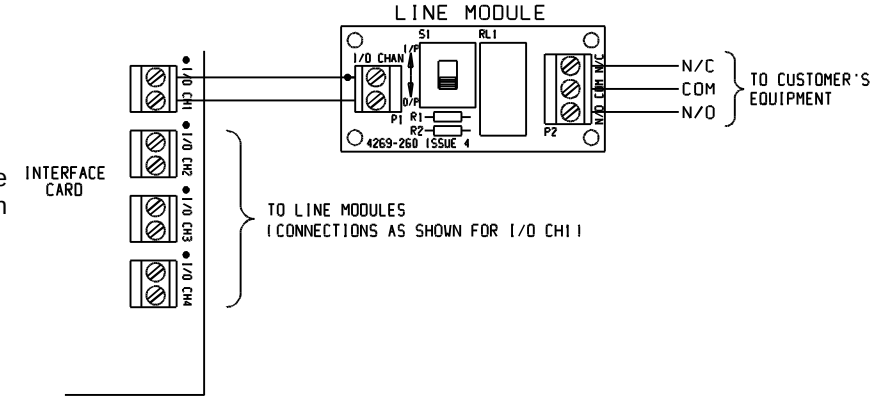


Figure 66-5 Line module output configuration

cd87

Notes on using 19245-06 supply unit

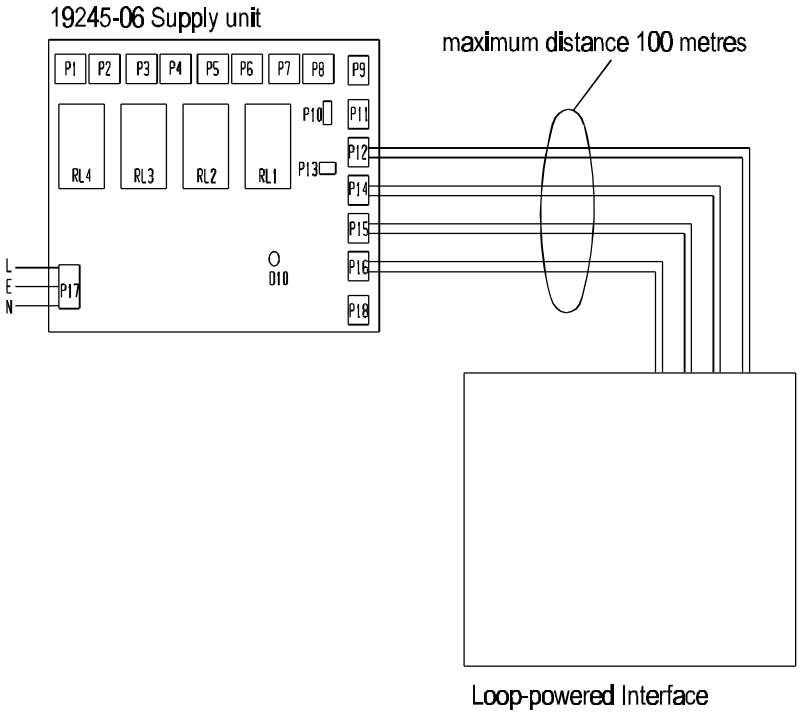


Figure 66-6 Connecting a supply unit to an interface

cd88

Notes on using keyswitches

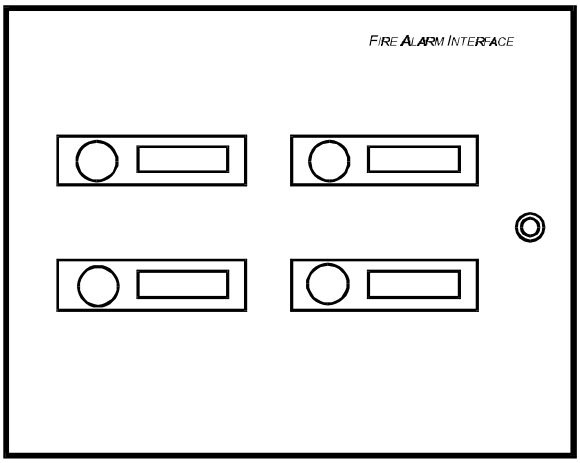


Figure 66-7 Keyswitch door

A 2-way switch is able to activate a single interface channel, ON and OFF.
A 3-way switch is able to activate either of 2 interface channels, either ON (one at a time), or both OFF.
cd3

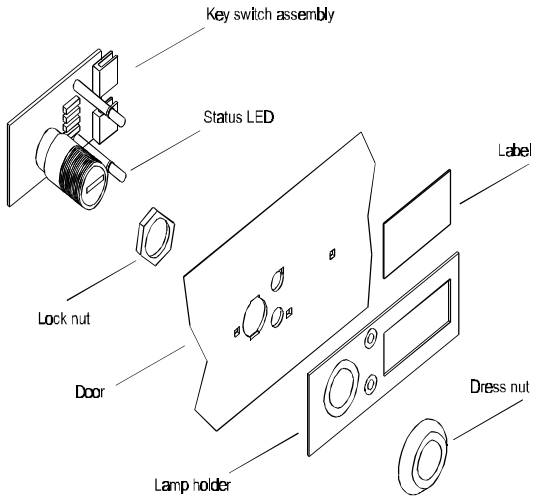
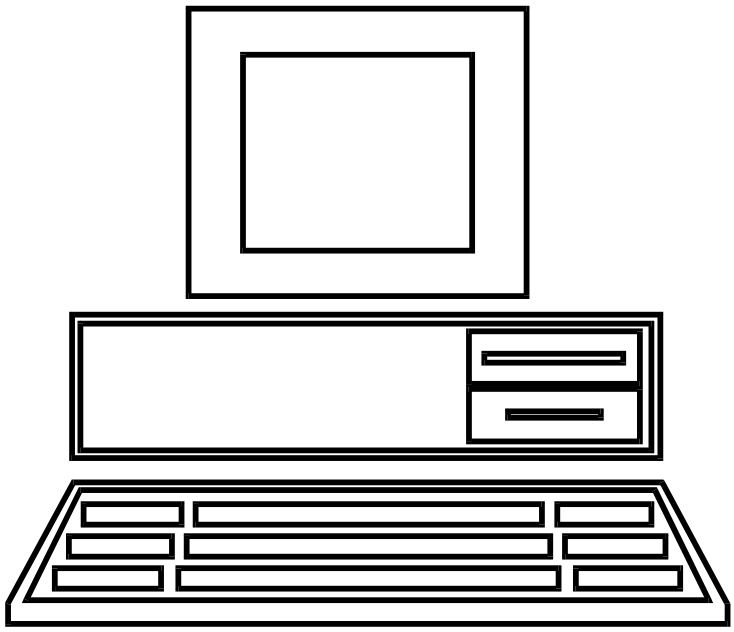


Figure 66-8 Keyswitch assembly

cd89

GENT Supervisor text package

Figure 67-1 Gent Supervisor textual



cd116

Minimum Specification

processor	486DX, 33 MHz
memory	8 Mb RAM 250 Mb hard disk
floppy disk	3.5" 1.44 Mb
ports	2 serial 1 parallel
video	super VGA colour 1024 x 768
monitor	14" colour low radiation 0.28 mm dot pitch maximum
keyboard	enhanced 101 or 102
pointer	PS/2 or bus mouse
operating system	MS DOS version 5 or 6 Microsoft Windows version 3.1 (not 3.11)

Real time clock

Preferred Specification

processor	Pentium, 166 MHz
memory	16 Mb RAM 500 Mb hard disk
floppy disk	3.5" 1.44 Mb
CD Rom drive	at least 2x speed
ports	2 serial 2 parallel
video	super VGA colour 1024 x 768
monitor	14" colour low radiation 0.28 mm dot pitch maximum
keyboard	enhanced 101 or 102
pointer	PS/2 or bus mouse
operating system	MS DOS version 5 or 6 Microsoft Windows version 3.1 (not 3.11)
Sound card	Soundblaster 16 compatible sound card with speakers
	On the NT Approved Platform list
	Real time clock

GENT Supervisor Graphics package

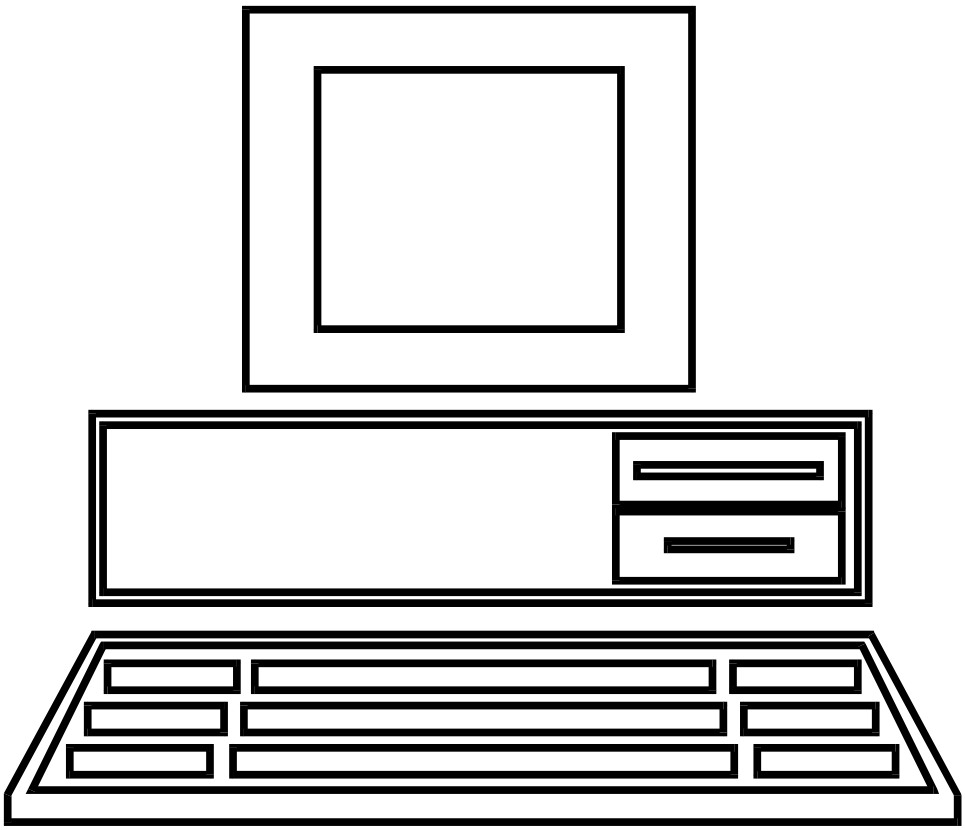


Figure 67-2 Gent Supervisor graphics

Minimum Specification

processor	486DX, 33 MHz
memory	8 Mb RAM 250 Mb hard disk
floppy disk	3.5" 1.44 Mb
ports	2 serial 1 parallel
video	super VGA colour 1024 x 768
monitor	14" colour low radiation 0.28 mm dot pitch maximum
keyboard	enhanced 101 or 102
pointer	PS/2 or bus mouse
operating system	Windows NT version 3.51 (not V4.00)
	On the NT Approved Platform list
	Real time clock

Preferred Specification

processor	Pentium, 166 MHz
memory	16 Mb RAM 1Gb hard disk
floppy disk	3.5" 1.44 Mb
CD Rom drive	at least 2x speed
ports	2 serial 2 parallel
video	super VGA colour 1024 x 768
monitor	14" colour low radiation 0.28 mm dot pitch maximum
keyboard	enhanced 101 or 102
pointer	PS/2 or bus mouse
operating system	MS DOS version 5 or 6 Microsoft Windows version 3.1 (not 3.11)
Sound card	Soundblaster 16 compatible sound card with speakers
	On the NT Approved Platform list
	Real time clock

Printers

Text	Epsom LX850
graphics	HP Deskjet 550C
remote printer	HP Thinkjet

Uninterruptible power supply

14 minutes standby	UPS Micro 106
55 minutes standby	UPS Micro 106-22

Appendix A- Environmental considerations

Radio frequency interference

34000 range sensors have been built to withstand normal levels of radio frequency interference.

Sensors have been tested to with stand up to 10 volts per metre field strengths in the frequency range:

- ☐ 10 MHz to 1 GHz

Flame sensors Flame sensors are the most sensitive type of sensor because of the technique used to sense fire.

Cellular telephones Most cell phones operate at about 900 MHz and should not normally cause a problem with fire alarm sensors. Do not use a cell phone within 2 metres of a sensor, especially a flame detector.

Interference The 3400 system utilises a digital data bus and therefore inherently creates a small amount of radio frequency interference. Sensitive electronic equipment, such as measuring equipment and radio receivers, should not be placed close to any part of the 3400 system or its wiring.

EMC Systems should be designed within the guidance provided for EMC compliant systems. Refer to *EMC Compliance* section.

Infra-red radiation

Infra-red radiation can be generated by strong sunlight and high intensity lamps, such as tungsten or arc lights.

Infra-red radiation may adversely effect :

- ☐ flame detectors
- ☐ optical sensors
- ☐ beam sensors

Avoid positioning these sensors in strong infra-red light.

X-rays and Gamma rays

Generally, an environment accessible to humans under normal operating conditions will be suitable for 3400 fire alarm equipment.

Areas that have higher levels of X-ray or gamma radiation may increase the failure rate of the subjected equipment. Very high levels of this radiation may cause a total malfunction.

Electro-magnetic interference

Refer to *EMC Compliance* section.

Electro-magnetic interference is generated by large current pulses and electrical sparks. Current pulses are often caused by plant control equipment such as thyristor controllers. Sparks are often generated by motors, generators and switch gear.

Normally 3400 fire alarm equipment should be placed at least 2 metres from such sources of interference. High power circuits may present a greater problem.

Static discharge

Static discharges are commonly caused by lightning and man-made fibres.

System 3400 components are designed to withstand static discharges up to 8 kilovolts, see data sheets.

The best defence is a system with good earth bonding as described in the *EMC Compliance* section.

Temperature

Consider using environmentally protected products in this environment.

Do NOT use optical smoke or beam sensors in cold stores. Condensing air, created when external doors are opened, may cause false alarms.

System 34000 sensors are designed to operate in the temperature range 0ºC to 50ºC (if heat sensing is used on a sensor, it can only operate up to 45ºC). Standard products are not designed to operate in a condensing atmosphere.

Cold stores

A cold store may be specified to operate at temperatures just above 0ºC but this will normally utilise a chiller discharging air at colder temperatures. Any sensor installed in such an environment may experience temperatures well below 0ºC.

Beware of ceiling and other areas around cold stores, temperatures may fall below 0ºC.

Humidity

System 34000 sensors have been designed to operate in the following humidity ranges:

☐ 0 - 90% relative humidity, non-condensing, 0 to 45ºC

Exception:

- Environmentally protected (EP) devices
  0 - 95% relative humidity, non-condensing, 0 to 50ºC

source The most common source of high humidity in uncontrolled environments are:

☐ bathrooms, showers and saunas

☐ sports changing rooms

Ingress of water (and dust)

Environmentally protected Environmentally protected versions of 34000 sensors provide the following degree of protection:

Sensor	**IP rating** (estimated)
Environmentally protected (EP) sensors	IP55

Non-protected Non-environmentally protected system 34000 sensors provide the following degree of protection:

Sensors	**IP rating (estimated)**
Optical-Heat (sounder) and ionisation sensors	
mounted on a flat ceiling	IP30
mounted off the ceiling, ie on a BESA box	IP20
Heat sensor and Heat Sounder	IP20
Duct sensor	IP55
Beam sensor	IP55
Manual call point	IP40
with water resistant gasket	IP44

NOTE: *Some applications have processes that can create problems with respect to water ingress. Examples include laboratories and abattoirs which are hosed-down with water. In these instances water resistant gaskets are unlikely to provide adequate protection.*

Fast moving air

System 34000 sensors are designed to operate in air speeds up to:

- ☐ 5 metres/second continuous
- ☐ 10 metres/second gusting

exception ☐ Ionisation sensor

- 2 metres/second continuous
- 5 metres/second gusting for periods up to 30 minutes)

Where wind is present, the positioning of sensors should be such that smoke is not blown away from the sensor or sensing beam. The diluting effects of high airflows should also be considered.

Vibration

The 34000 sensors are designed to tolerate vibration at frequencies of between 5 and 60 Hz.

Very strong vibration may cause sensors to become detached from the terminal plate or otherwise come apart. Avoid subjecting sensors to vibration caused by process equipment.

Corrosion

Strong acid or alkaline environments will cause sensors to corrode. This will reduce the time between failures.

Appendix B - Hazardous areas

Classification & Equipment

Hazardous areas arise from a combination of gas, vapour or dust and the presence of a potential source of ignition, typically electrical equipment.

Many industrial sites are now designated as hazardous areas. Areas are classified by ‘zones 0, 1, 2 or safe’. The classification is determined by the user (normally in conjunction with specialists and the factory inspectorate), and refers to the length of time for which the risk is present.

There are two types of fire alarm equipment that can be used in hazardous areas:

Area ‘zone’ classification	type of equipment
zone 0 (risk permanently present)	Certified intrinsically safe
zone 1 (risk present between 10 and 1000 hours per year)	Certified intrinsically safe or Certified Flameproof (dependant on enclosure classification)
zone 2 (risk present less than 10 hours per year)	Certified intrinsically safe or Certified Flameproof (dependant on enclosure classification)

Zone classifications Y and Z refer to risks from dust.

3400 systems

> ***WARNING**: 34000 devices **must not** be installed in hazardous areas*

Hazardous areas are protected using **conventional certified detectors and sounders**. These should be interfacedvia the correct isolating equipment to the 3400 system using a 34440 mains-powered interface.

> ***NOTE**: Design information for intrinsically safe and flameproof systems is provided separately.*

The mains-powered interface will connect to detector and sounder circuits via galvanic isolators and IS alarm drivers as required (flameproof sounders can be connected directly to the interface without an alarm driver: check approvals for positioning of end-of-line device).

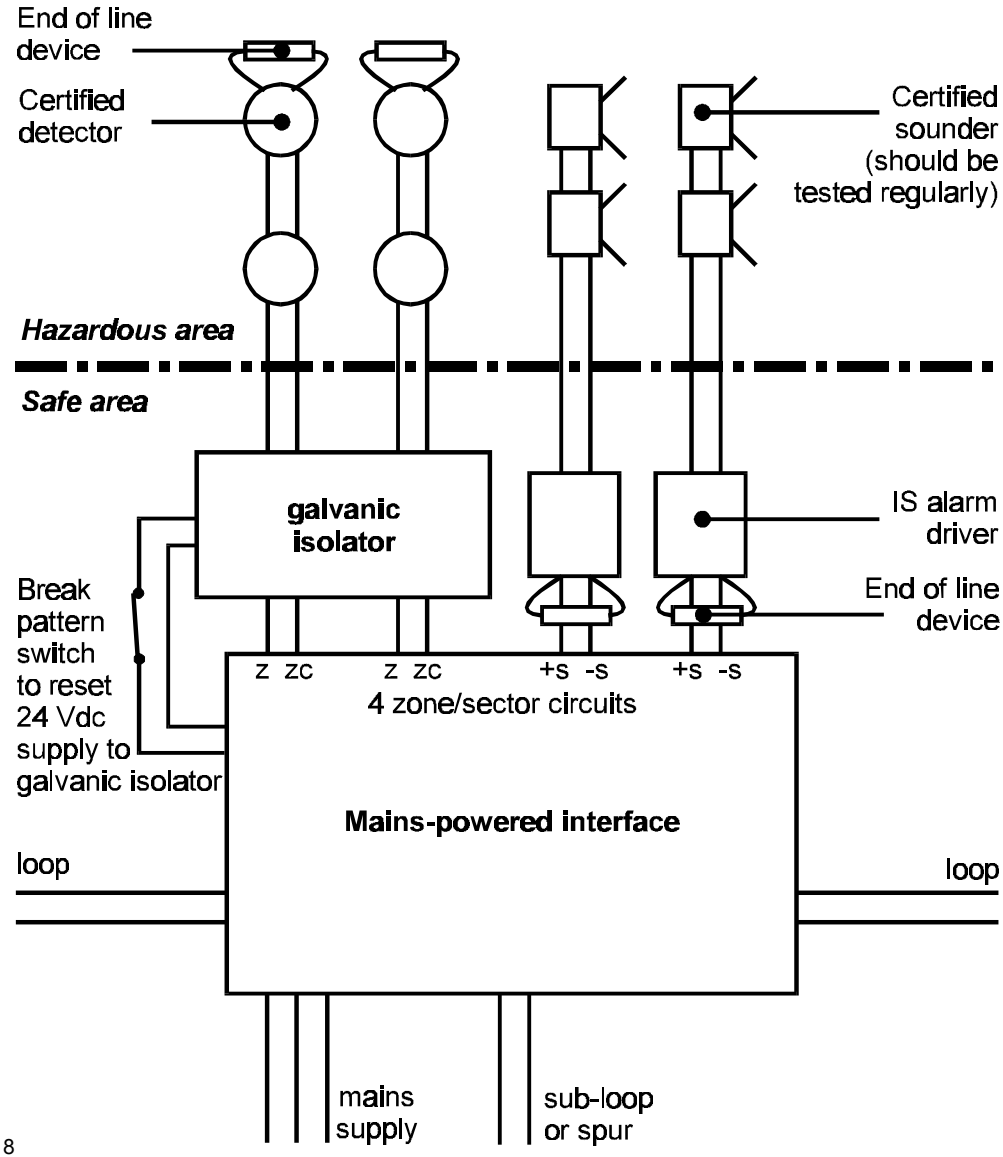


Figure B-1 Interface of hazardous area equipment

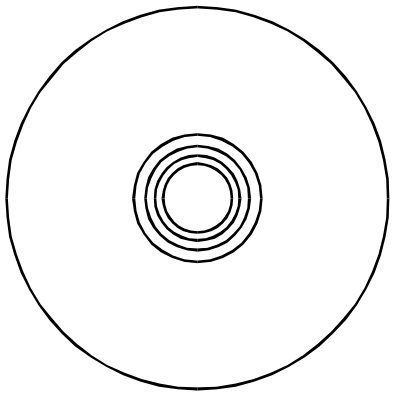
***NOTE**: Sounder circuits cannot be monitored through the alarm driver and should therefore be tested regularly*

NOTE: *Manual call points and sensors should be located on separate isolator channels.*

Appendix C -07012-31 Flame Detector

CAUTION: *This is not a loop wired device.*

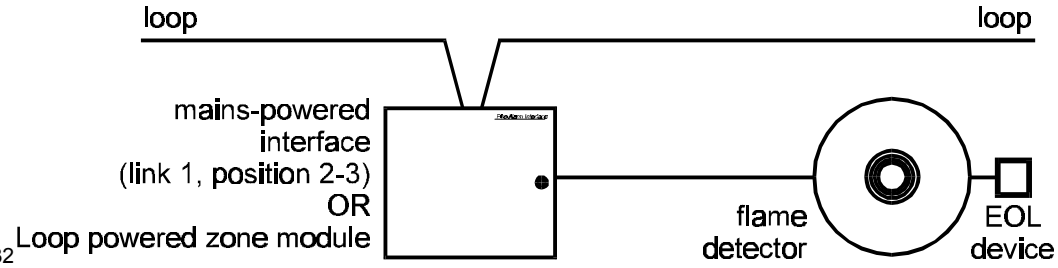
Figure C-1 Flame detector



cd131

The flame detector senses infra-red radiation emitted from flames and ensures rapid response to carbon-based, free burning fires. It is ideally suited to buildings with high ceilings such as churches, shopping malls and sports halls.

Figure C-2 Wiring a flame detector



cd132

The detector is mounted on a base *(model no 07700-21)*, not included with detector.

Specification

Standard	EN54: Part 10 (draft)
Dimensions	diameter 108mm height 75mm
Weight	275g with base
Operating temperature	0 to 60°C
Relative humidity (non condensing)	95% RH (non-condensing)
Colour	White
Indicators	Red LED

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Appendix D

Loop Loading And Battery Standby Calculation Tool V1.0 User Guide

Introduction

- **Hardware Requirements:** IBM PC or compatible, minimum processor should be a 486DX 33 with 8MB of RAM.
- **Minimum Software Requirements:** Microsoft Windows 3.1, EXCEL 5.0. Will run on Windows 95 and with Excel from Office 97

This software is designed to calculate the battery standby time of the following Gent products:

- 3404 Alarm Panel
- 3408 Alarm Panel
- 32000 Alarm Panel
- 34440 Mains Powered Interface
- 32440 Mains Powered Interface

The interface between the user and the computer is the familiar windows format of pop up dialog boxes giving various choices for configuring the particular product chosen. As the macros are designed to run within MS EXCEL the results of all calculations are written to a worksheet which can either be saved or printed.

Installation

- In order to install this software onto your P.C. create a directory on your hard drive called loopload.
- Copy the contents of the supplied disk from A:\ to C:\loopload.
- Run Windows and then Excel 5.0.
- From the pull down menu File choose Open, click on the loopload directory and then the file Genttemp.xls. Now press O.K, the file should open.
- From the View menu in Excel choose Toolbars, a dialog will now appear which allows the user to choose additional toolbars, click on the Customize button.

- ☐ In Windows 3.1 another dialag called Customize will appear, notice the scrollbar and menu, move down the scrollbar to the bottom and click on custom. In Windows 95 Click on Commands and scroll down to and click on Mactros.
- ☐ The custom set of icons is now displayed to the right of the scrolling menu, pick an icon you wish to use for the loop loading calculator and drag it to the toolbar at the top of your screen.
- ☐ A dialog called Assign Macro will now be present on your screen, scroll down the macro names until you come across the word START, click on START, click on O.K.
- ☐ The loop calculator will now be assigned to this icon. The customize dialog will still be open, click on close and the installation is complete.

Starting a Calculation

After pressing the button which you specified to invoke the loop loading macro's the following introduction screen will appear.

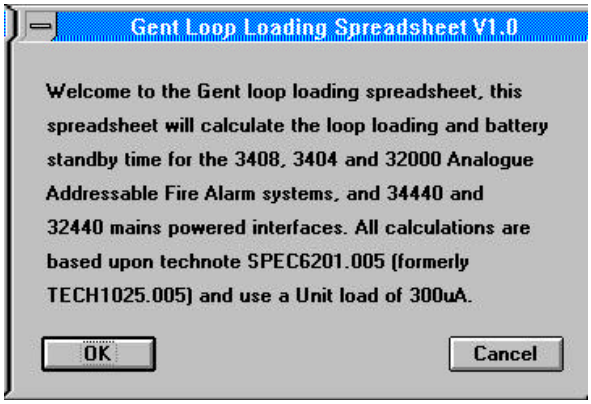


Figure D1 Introduction screen

cdn208

This window explains the capabilities of the software and the technical document which it was based upon. Press OK to proceed.

The software will now prompt you as to weather you wish to perform a new calculation or edit an old one.

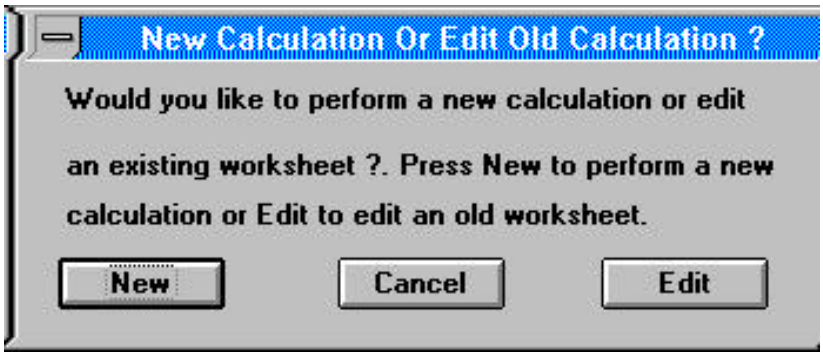
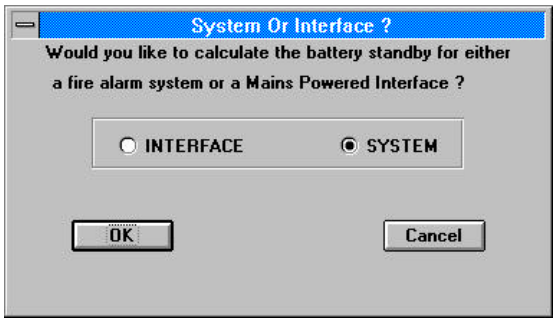


Figure D2 Calculation options screen

cdn209

Configuring a System.

Figure D3 System or Interface window



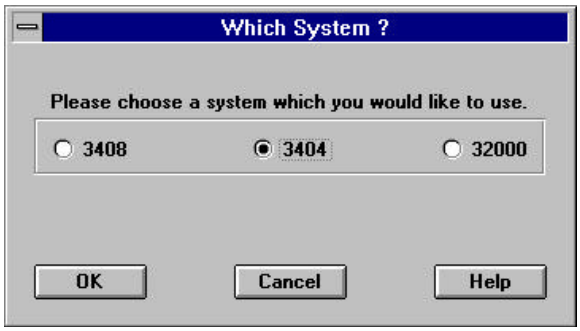
cdn210

The two radio buttons on the window offer the user a choice of either performing a calculation for a fire alarm system or for a mains powered interface. If whilst configuring the alarm panel, a mains powered interface is used on any of the loops a choice will be given at the end to calculate the battery standby of the interface.

Which System ?

This software will currently calculate the battery standby for all three Gent analogue addressable alarm systems in order to choose which system the calculation is to be performed upon, the appropriate radio button on the *Which System ?* window must be highlighted.

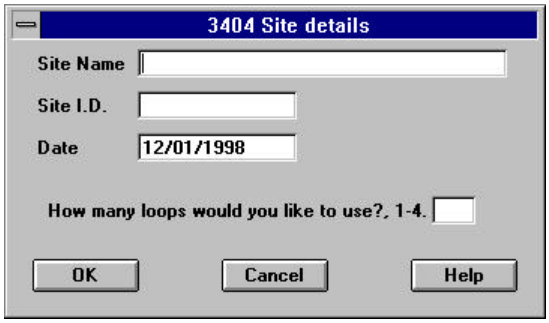
Figure D4 Which system window



cdn260

The next window to appear will be the *Site Details* window. This requires all of the edit boxes to be filled out as this information is written to the worksheet which can be printed.

Figure D-5 Site details window



cdn261

3400 or 34000 Outstations ?

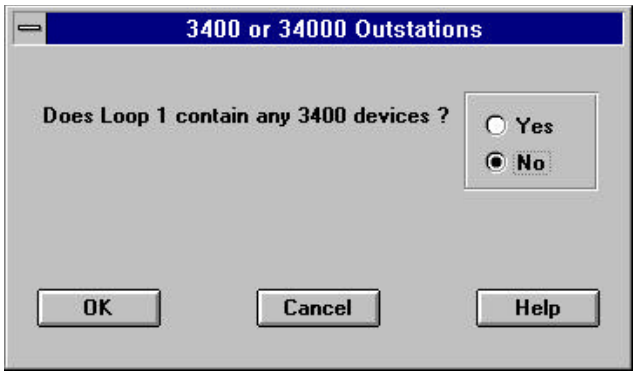


Figure D6 3400 or 34000 outstations window

cdn262

As system 3400 is capable of handling both 3400 and 34000 outstations (although 3400 outstations are no longer available) the software will prompt the user to indicate if any 3400 devices are present upon the loop as this will reduce the maximum number of devices allowable upon a loop.

Configuring a loop

If 3400 devices are present on the loop, the *3400 and 34000 Loop Configuration* window presents the user with the loop connected devices and the quantity of each device is entered into the appropriate edit box when the loop is configured the user should press OK. If there are no 3400 devices on the loop a reduced *34000 Loop Configuration* window will appear.

If the data entered exceeds the allowable quantity the software will warn the user that the figure entered is too great and that the calculation cannot proceed until the figure is reduced. If the loop is overloaded in terms of

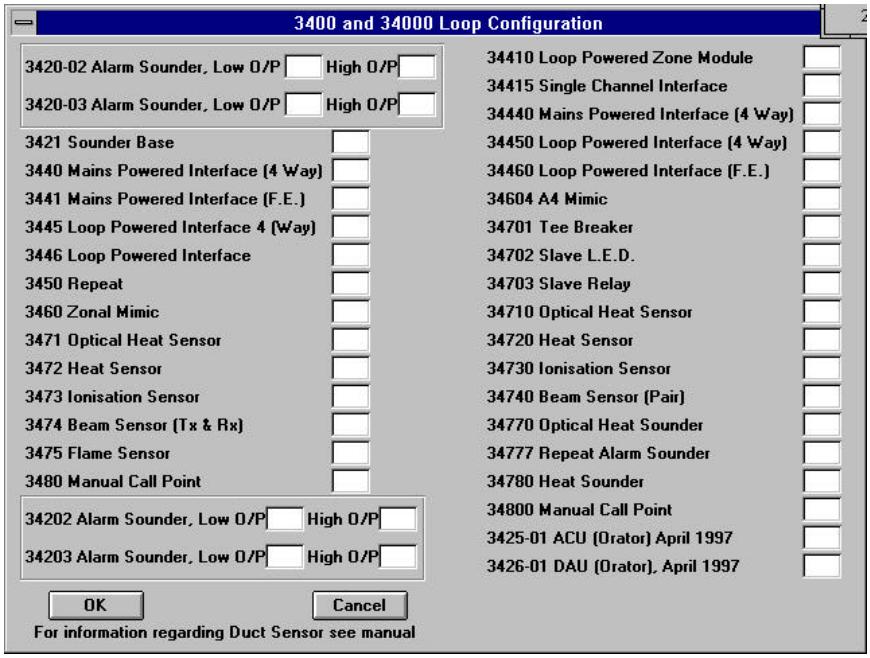


Figure D7 Loop Configuration window

cdn263

current required the software will again flag a warning and the number of

devices on that particular loop should be reduced in order for the calculation to proceed. Note that the absolute value will be taken in the event of any negative values entered. If the loop configuration is acceptable the window and there is another loop to configure, the window will re-appear.

Adding Additional Cards.

It is possible to include additional cards within the control panel for networks or I/O devices, after the loops are configured the *Additional cards* window will appear, unless both loops are configured, allowing the user to specify the number of either I/O or Network cards are to be placed inside the panel.

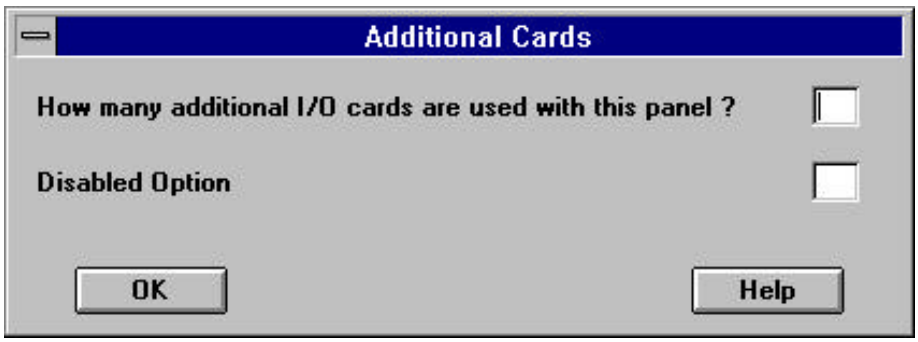


Figure D8 Additional cards window

cdn232

If these limits are exceeded the software will ask the user to re-edit and reduce the number of cards entered.

Loading the Master Alarm Circuits.

Each panel has two master alarm circuits available for supplying bells, beacons etc. The loading which can be placed upon these circuits is 0.4A/Circuit

This limit may be exceeded to 0.8A/Circuit providing that the total system alarm current does not exceed 5.5A.

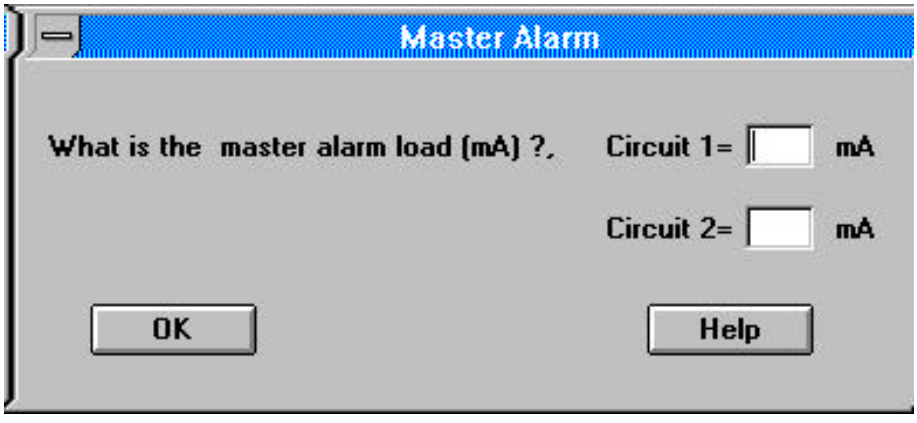


Figure D9 Master Alarm window

cdn217

The *Master Alarm* window is used to enter the value of the load upon the master alarm circuits in mA. If this value exceeds the allowable current the software will warn the user to re-edit and reduce this value of current.

> **NOTE:** *In the event of the panel being overloaded due to the loops connected to the panel being loaded to near maximum, the Master Alarm window may not appear. Instead a warning will appear that the panel is overloaded and the calculation should be repeated and the number of devices connected to the panel reduced.*

Interface Calculation and Saving a Worksheet.

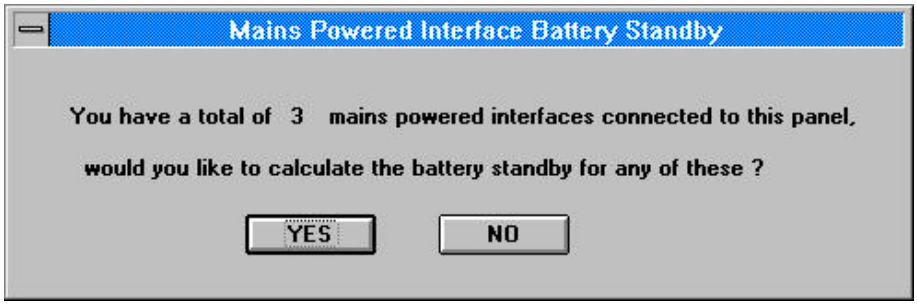


Figure D10 Mains Powered Interface Battery Standby window

cdn229

If during configuration of one of the loops on the panel a 34440 mains powered interface was chosen the software will prompt the user to indicate if they would like to calculate the battery standby time of an interface.

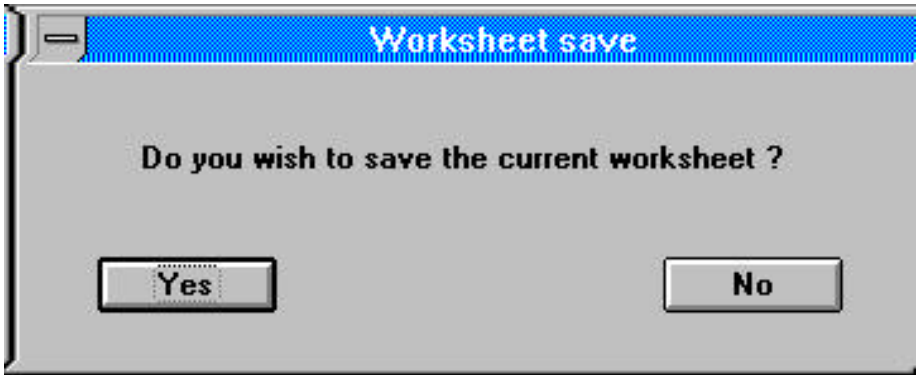


Figure D11 Worksheet save window

cdn218

If no is pressed on the *Mains Powered Interface Battery Standby* window the software prompts the user as to whether they wish to save the worksheet.

In order to save the worksheet press yes. The dialog shown in the *Save As* window will be displayed in order to save the file specify a filename and the drive and directory where you whish the file to be stored.

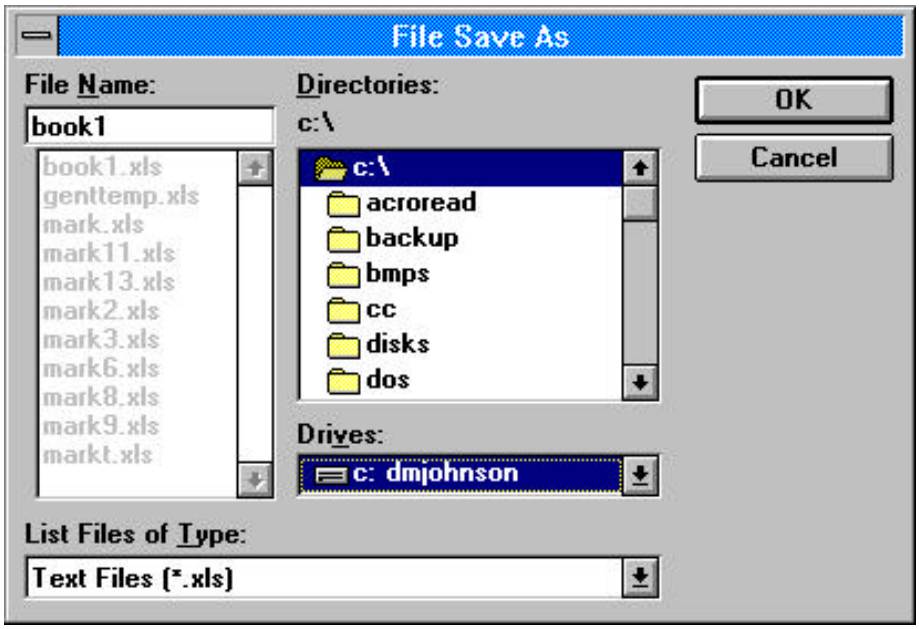


Figure D12 Save As window

cdn219

Interface Battery Standby Calculations

There are four I/O's which can be configured to be either Zones (Inputs) or Sectors (Outputs). The maximum current which the interface is capable of sourcing is 500mA, this may be via a single sector or a combination of up to four sectors.

The interface also provides an auxiliary supply capable of sourcing up to 250mA.

The *Mains Powered Interface Configuration* window is used to configure the four I/O channels, by highlighting the appropriate radio button each I/O channel can be configured to be either a Sector, Zone or Not Connected.

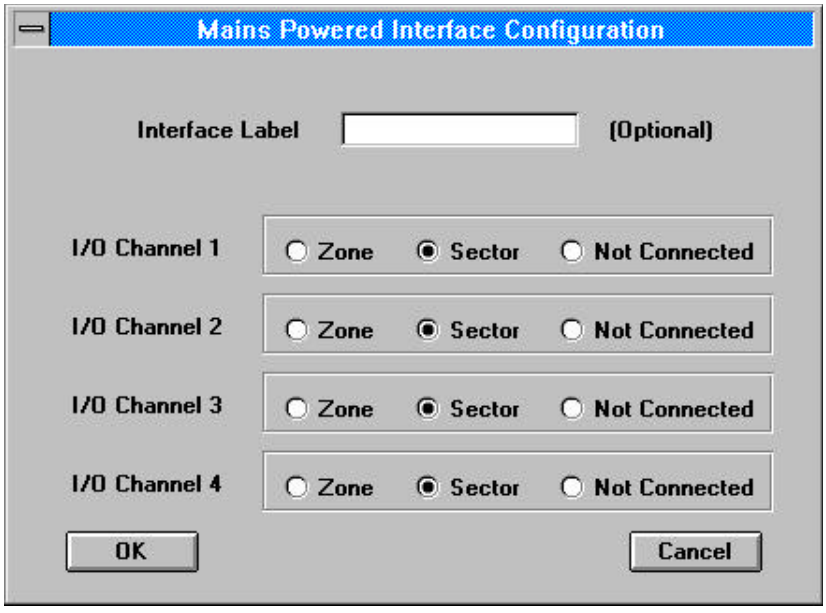


Figure D13 Mains Powered interface Configuration window

cdn222

The interface label is used as an identifier/name for the particular interface, this will be printed out along with the results of the standby calculation. It is not required that a label is provided but it is advisable for your records. The choices highlighted on this window will influence the options available on the Mains Powered Interface Sector Loading window.

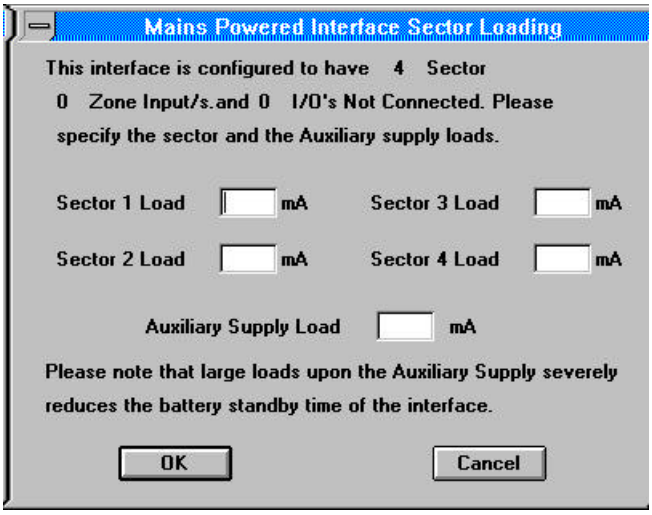


Figure D14 Mains Powered Interface Sector Loading window

cdn223

The window is used to enter the loading of the channels chosen to be sectors and also the optional auxiliary power supply. As mentioned previously each sector is capable of sourcing up to 500mA however the maximum current which can be sourced by all four sectors is also 500mA. The maximum current which the Aux supply is capable of sourcing is 250mA, however it must be stressed that if the Aux supply is connected the battery standby time of this interface is severly reduced. The software will detect any invalid entries in the edit boxes and not allow the calculation to continue until the entry is re-edited to within the directed limits.

Once valid data has been entered and OK is pressed the *Another Mains Powered Interface* window will appear. If the yes button is pressed the program will return to the *Mains Powered Interface Configuration* window and another interface can be configured. if no is pressed the program will produce the *Worksheet save*window and the worksheet may be saved.

Printing a Worksheet

It is possible to either print the Worksheet by pressing yes when prompted by the software or alternatively following the instructions listed below.

In order to print the worksheets contents you should have the worksheet which you wish to print open, click on the File pull down menu and then click on Print Preview. The page should now be visible in, choose set-up to set-up the page orientation which is suggested to be Landscape to display the information clearly. Often the contents of the worksheet will stretch over a number of pages so it is a good idea to adjust the scaling of the pages but do not make the information too small as it becomes hard to read. When the page is set-up to your liking press OK and then Print. The worksheet should now be printed, assuming you have the printer set-up correctly.

Opening Saved Worksheets

To open saved worksheets you must first of all have Excel open. Click on the File pull down menu and then click on Open, a window will appear. Highlight the particular drive and directory in which the file resides and then click on the file and press OK, the file should then be opened by Excel.

Editing Loop Configurations On Previous Calculations

It is possible to edit the configuration of a loop which is part of a previous calculation, however it is not possible to add or remove another loop on an old calculation.

In order to edit a calculation, execute the software and when the dialog shown in screenshot two appears press the Edit button.

Opening an Old Calculation

Once you have chosen to edit an old calculation it is necessary to open the file which this is stored in. In order to open the file the *File Open* dialog will appear as usual in windows applications specify the drive and directory where the file is stored and then click upon the file and press O.K. The file will now be opened and and providing it is a Gent loop loading calculation will be copied to worksheet one.

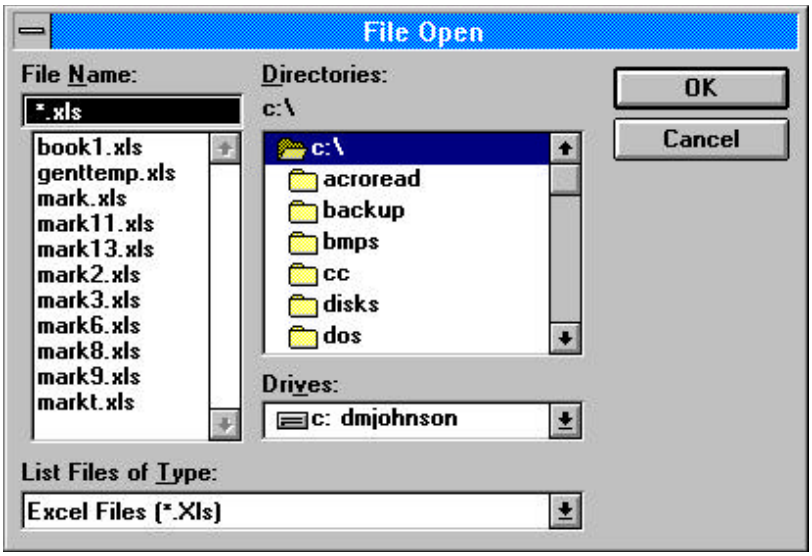


Figure D15 File open window

cdn225

Editing the Loop Configuration

Once a file has been opened the *Which option to edit* window will appear, if the Edit Loop Config button is pressed you will be able to edit any of the loops which are present upon the panel. In order to edit the number of additional cards present upon the panel or the Master Alarm Circuit load and indeed complete the re-calculation of the battery standby etc. Press the Finshed button.

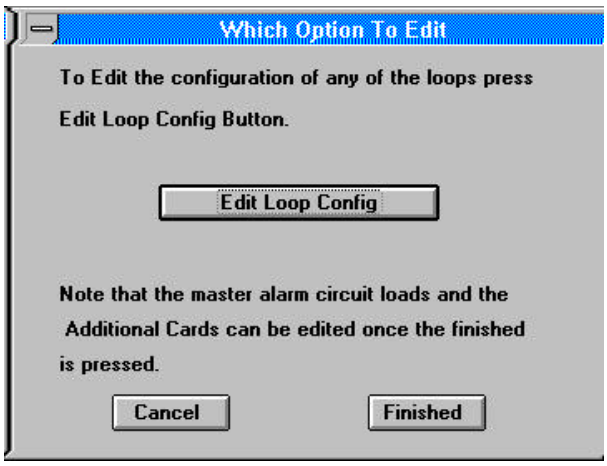


Figure D16 Which Option to Edit window

cdn226

Editing the Loop Configuration 2

Assuming that the Edit Loop Config button was was pressed on the *Which option to edit* window then the *Which loop would you like to edit* dialog will appear. This dialog states the number of loops which are present on the worksheet and asks which loop you wish to edit.

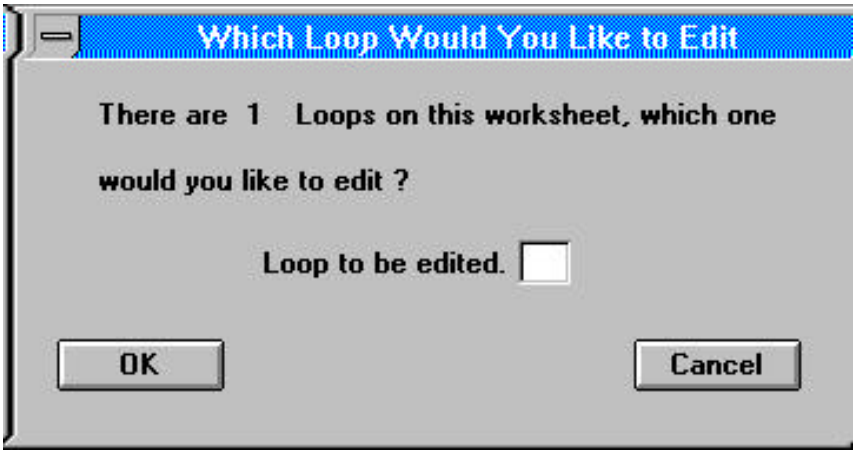


Figure D17 Which loop would you like to edit window

Once a loop has been chosen press O.K. the appropriate loop configuration dialog will appear with the number of devices present upon that loop . Once you have finished editing that particular loop the software will ask you if you wish to edit another loop. If you choose yes the *Which loop would you like to edit* dialog will re-appear else the *Which option to edit* window will re-appear.

Editing the number of Additional Cards and the Master Alarm Circuit Load.

If you have highlighted the Edit Loop Config radio button and pressed O.K. on the *Which option to edit* window or you have pressed the Finished button on the same window, then you will given the same options. These are to edit the Number of Cards and the Master Alarm Circuit load, the current information stored on the worksheet will be displayed in the dialogs. Once editing is complete the software will prompt you to save the worksheet.

What Does The Information Displayed Upon the Worksheet Mean ?

The worksheet displays the information entered by the user and also the information which is calculated by the software itself. The left hand side of the worksheet is displays the device type and product numbers, the corresponding number of those devices used on each loop is displayed to the right of these product descriptions and to the far right the total number of each device used on that particular panel.

The Quiescent loop current line shows the current consumption of each loop under normal operating conditions and the Alarm loop current shows the current consumption for each loop when it is in alarm. The loop load is also calculated as a percentage which is displayed on the line below the Alarm loop current.

The Total System Alarm Load (Amps) and the Total System Quiescent Load (Amps) are the total load placed upon the panel under each condition.

The last few lines at the bottom of the worksheet display the panel battery standby duration and the required battery capacity in order to satisfy both 24 and 72 hours battery standby.

Notes On Products

This section contains additional notes onvarious different products.

Single Channel Interface

Each loop must have no more than 1 Km of additional cable connected to the it for applications such as single channel interfaces, in addition to this each single channel interface or loop powered zone module must have no more than 100M of cable connected to it. This is why the loop loading software will warn the user with the *Interface cable warning* window when the number of single channel interface, or zone modules, or combination of the two exceeds ten.

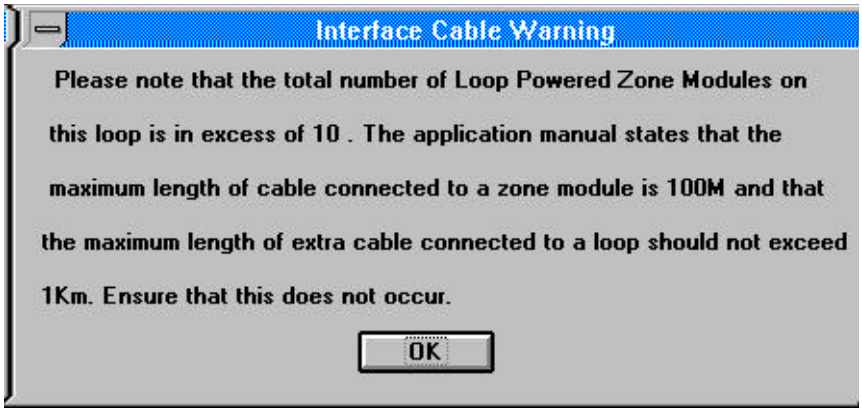


Figure D18
Interface Cable
Warning window

cdn228

Duct Sensors

A duct sensor is basically a sensor housed in a metal box, in order to enter these into the calculation add the number of duct detectors to the appropriate detector which is placed in the Duct housing.

Appendix E

34710-ML Optical Heat Sensor (Chinese market only)

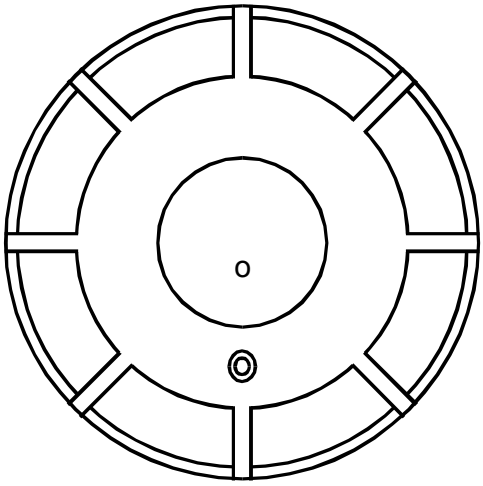


Figure E-1
34710-ML Optical
heat sensor

cd12

This combination sensor provides a truly general purpose sensor. As well as operating as 2 stand-alone sensors, it will also react to the presence of smoke and heat at the same time.

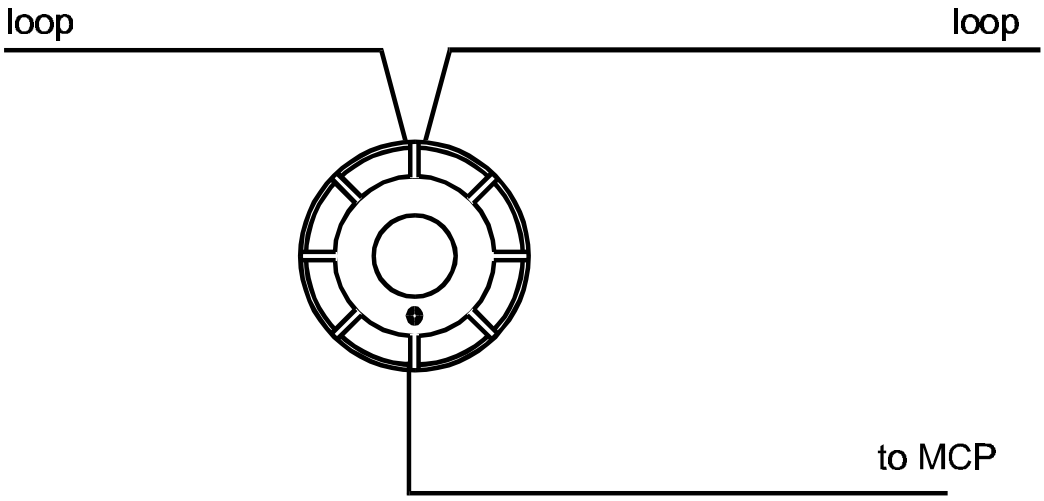


Figure E-2 Wiring
the 34710-ML
Optical heat sensor

cdn278

Specification

Standard Heat Smoke	 BS5445:Part 5 (EN54 : Part 5) BS5445:Part 7 (EN54 : Part 7
Dimensions	diameter 86 mm height 60 mm (with terminal plate)
Full Assembly weight	580g with terminal plate
Storage temperature	-30 to 70ºC
Operating temperature	0 to 50°C (If heat is used then 0 to 45°C)

Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP30 estimated (mounted on a flat ceiling) IP20 estimated (mounted on a BESA box)
Air flow in installed environment	10m/s gusting for up to 30 minutes 5m/s continuous
Vibration	5 to 60Hz
Colour	White
Operating voltage	20-50V
Indicators	Red LED visible at 500LUX ambient light levels 3m
Mounting	Surface or Semi-flush, using mounting kit *(model no 19279-01)*
Chamber format	Sensing chamber is removable
Loop	Maximum number per loop = 200 Load (1000 max) = 1

Sensitivity

State 0 LPC approved	Medium sensitivity (Default) Suitable for most applications. Heat - grade 2 heat, Smoke - normal sensitivity.
State 1	High sensitivity optical or grade 2 heat Used in areas or situations where airborne smoke or dust is unlikely to occur and therefore a more sensitive detection is available
State 5	Medium sensitivity optical only Where high ambient temperatures of greater than 40°C are expected in the detection area. Smoke Detection only.
State 8 LPC approved	Medium sensitivity optical with time delay (20s time constant) or grade 2 heat. This state is useful in hotel bedrooms where low levels of signal could occur for short durations. If smoke and heat occur simultaneously the time delay is effectively overridden to provide fast detection.
State 10	Medium sensitivity optical with time delay (20s time constant) or grade 2 heat. Similar performance to state 8 without the time delay overridden. Useful in hotel bedrooms, and loading bays where low levels of signal may occur.
State 11	Low sensitivity optical or grade 3 heat If smoke detection is desirable in areas where airborne particles or smoke are normally present, or high temperatures (up to 40°C) can be normally attained.
State 12 **State 13** **State 14**	Grade 1 heat only - LPC approved Grade 2 heat only - **LPC approved** Grade 3 heat only No optical smoke detection. Can be used where airborne particles or smoke could occur briefly or at specific times. Optical detection can be used in conjunction with time blocks/slots to enable/disable depending on application
State 15	No detection, total disablement of sensor

Appendix F

13590-01 Service Request Interface Unit

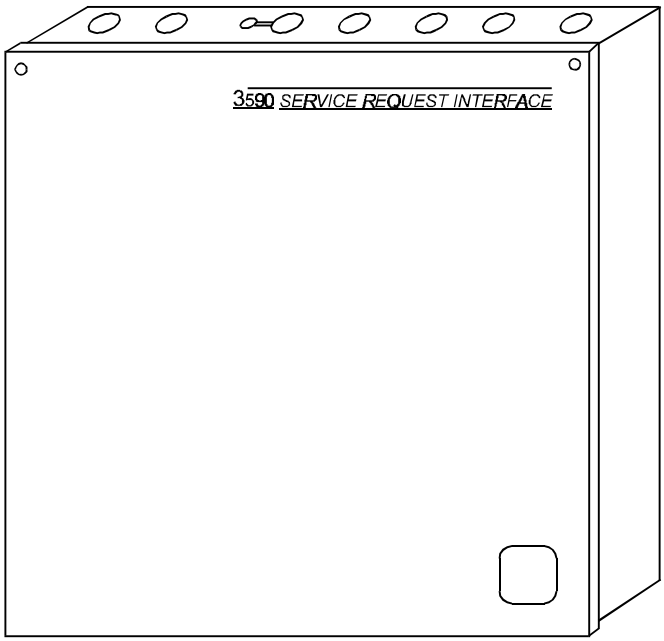


Figure F-1 Service Request Interface

cdm307

The service request interface unit automatically connects a 3400 fire system to a **remote service monitoring station,** also known as **central station**. The central station monitors the status of the fire system to enable early information to help **maintenance action.**

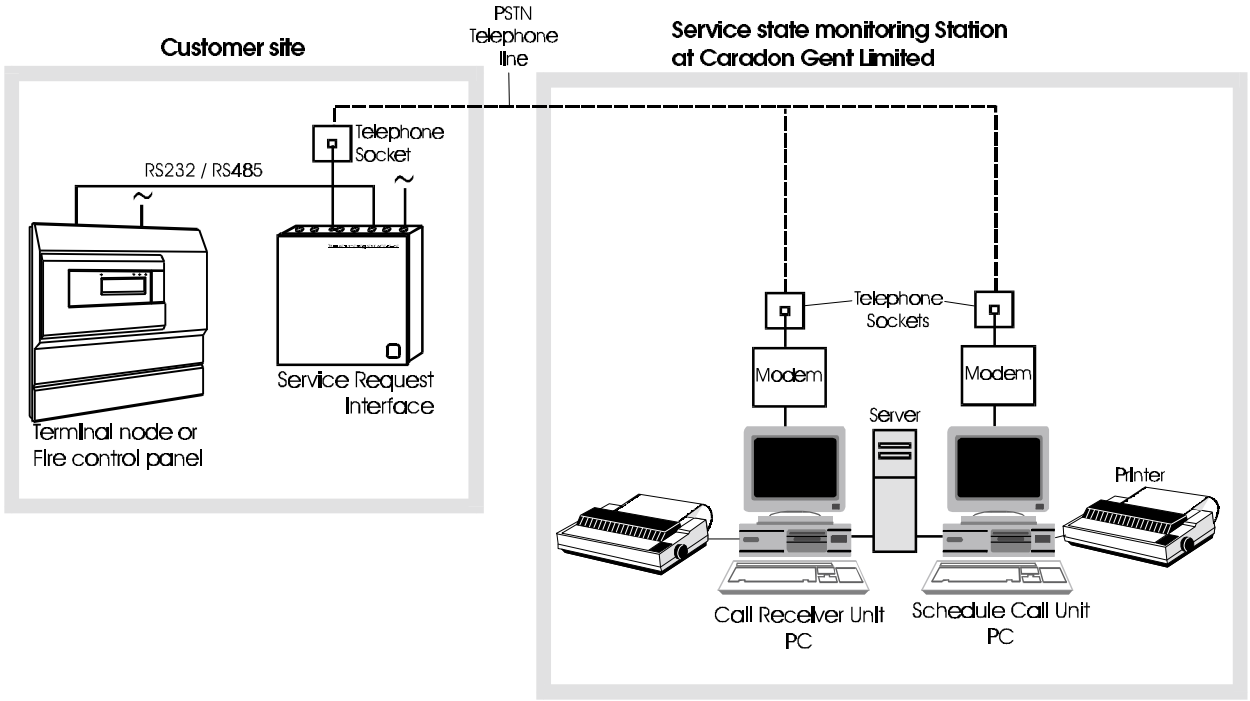


Figure F-2 System wiring

cdm302

Central station

There are two units at the central station:

Call Receiver unit

This unit receives **active events** from the **fire system**, such as *fire, fault and warning events.* This information is used to determine the need for maintenance work on the fire system.

Call Scheduler unit

This unit forces the fire system to send its status data on a **pre-programmed day and time.**

Telephone socket

A telephone socket must be provided close to the SRI unit, located no more than **2.4m** cable distance form the unit.

> ***NOTE:*** *The telephone line must be provided by the customer and all line rental and telephone charges are the responsibility of the customer.*

Specification

Dimensions (assembled unit)	width 359 mm depth 359 mm height 80 mm
Full Assembly weight	5.7Kg
Storage temperature	-30 to 70ºC
Operating temperature	0 to 50°C
Relative Humidity (Non condensing) Temperature 5 - 45°C	up to 90%
Mains Operating voltage	230V 50Hz +10% -6%
Emission	BS EN50081-1:1992 Part 1 Residential, Commercial & Light Industry **Class B limits**
Immunity	BS EN50130-4: 1995: Part 4 Alarm systems: *Electromagnetic compatibility* Product family standard: *Immunity requirements for components of fire, intruder and social alarm systems*
Ingress Protection	IP30 estimated
Vibration	5 to 60Hz
Colour	Grey/Brown
Operating voltage	12V
Standby battery	12V 2.8Ahr sealed lead acid battery (1-off - supplied)
Serial I/O connector	1- RS232/RS485 terminals for connection to the control panel or terminal node
Telephone line connection	A standard PSTN telephone socket

System 3400 (with 34000 devices)

Introduction

This section lists parts used in the Systems 3400 (with 34000 devices) and system 3500. For further details on the availability of the parts, contact Gent.

> ***NOTE:*** *Only the* **V3** *parts listed here are compatible with* **version 3 plus** *systems.*

Control and indicating equipment

Control Panels

* - first fix products

13404-12V3+	1 - 4 Loop panel set V3+
& *13404-80V3+	1 - 4 Loop panel back and front cover V3+ (1st fix)
13408-12V3+	1 - 8 Loop panel set V3+
& *13408-44	1 - 8 Loop panel rack (1st fix)
13408-45	1 - 8 Loop panel Plinth (for floor standing)

> ***NOTE:*** *All fire alarm control panels are supplied with* ***one loop processor card*** *as standard.*

13495-24	1 - 4 Loop panel battery pack - 8 off 12V @ 6Ah
13495-48	1 - 8 Loop panel battery pack - 4 off 12V @ 24Ah
09406-06	1 - 4 Loop panel /Mimic weather resistant case
13404-82M2	1 - 4 Loop panel inner box assy, inc printer & keyboard
13408-40	1 - 8 Loop panel Termination unit
13408-41	1 - 8 Loop panel Control unit
13408-42	1 - 8 Loop panel Power supply charger
13408-43	1 - 8 Loop panel Battery box

Terminal node

13505-01	Terminal node (for use in secure network)
& 13505-80	Backbox (front cover (M2)

Repeat and Mimic Panels

13450-01V3	Repeat panel, no printer
& *13450-80M2	Repeat panel backbox and front cover (1st fix)
13450-02V3	Repeat panel, with printer
& *13450-80M2	Repeat panel backbox and front cover (1st fix)

13450-81V3	Repeat panel inner box assy, no printer & keyboard
13450-82V3	Repeat panel inner box assy, C/W printer & keyboard
13460-01V3	Mimic panel C/W drawing

> ***NOTE:*** *The Mimic repeat panel plan and programmed EPROM details must be advised at the time or ordering.*

13460-02V3	Zonal mimic panel
13495-01	Mimic / repeat battery pack 1 - off 12V @ 6Ah
19222-01	Printer paper
09406-06	1 - 4 Loop panel /Mimic weather resistant case
09410-06	Repeat panel weather resistant case
13496-01M2	Panel key for Mark II
34604-G1	A4 Mimic Brown (Grey brown RAL8019) panel set 34614-G1 A4 Mimic Display Brown 34624-01 A4 Mimic Control Unit
34604-B1	A4 Mimic Grey (Squirrel Grey RAL7000) panel set 34614-B1 A4 Mimic Display Grey 34624-01 A4 Mimic Control Unit
34604-64ZK	A4 Mimic Zonal kit
3604-SPK	A4 Mimic Site plan kit

Cards

13430-11V3+	Local controller card V3+ (LCC)
13431-01V3	Loop processor card (LPC)
13433-01V3	1 - 4 Loop panel RAM card
13433-03V3	1 - 8 Loop panel RAM card
13501-01	Secure network card
13432-03V3	I / O card V3
13532-50	Universal I / O card **V3**
13532-52	Remote printer I/O card
13532-53	Slave I/O card

Sensors and Accessories

Sensors	34710	Optical heat sensor
	19271-01	Optical chamber
	34710-RL	Optical heat sensor with Remote LED connection
	34710-ML	Optical heat sensor with MCP connection (Chinese market only)
	34770	Optical heat sensor sounder
	19271-01	Optical chamber
	34780	Heat sounder
	19274-01	Heat sounder chamber
	34720	Heat sensor
	19272-01	Heat chamber
	34730	Ionisation sensor
	19273-01	Ionisation chamber
	34729	Environmentally protected Heat sensor
	34740	Beam Sensor Pair
	34741-01	Angle Bracket with base
	34741-90	IP65 Angle baracket with base
	34741-03	Parallel bracket with base
	34740-01	Beam sensor transmitter
	34740-02	Beam sensor receiver
	34741-02	Base for 34740 Beam
	07012-31	Conventional Flame detector
	34760	Duct sensor (inc 17908-05 Probes and Slave LED unit)
Tools	17918-22	Sensor chamber Extractor cup (32000 & 34000)
	17918-23	Optical chamber electronics module removal tool
	17918-24	Ionisation chamber electronics module removal tool
	17918-25	Heat sensor electronics module removal tool
	17918-26	Sensor removal tool kit (32000 & 34000)
Terminal Plate	34700	3 way Terminal plate
	34704	4 way terminal plate
	19279-01	Semi-flush sensor mounting kit
	07700-21	Base for Conventional flame detector

T Breaker and Slaves	34701	T breaker Unit
	34702	Slave LED unit
	34703	Slave Relay unit

Alarm sounders

	34202	2 way electronic sounder
	34203	3 way electronic sounder
	34213	Environmentally protected sounder 3-way electronic sounder
	34777	Repeat sounder

Manual call points (MCP) 2-way

	34800	Surface mounted MCP
	34807	Surface mounted keyswitch MCP
	34842	Surface mounted MCP with cover
	34812	Surface mounted water resistant MCP
	19289-01	MCP flush fixing plate
	34852	Surface mounted water resistant MCP with cover
	34829	Environmentally protected surface mounted MCP
Spares	13480-09	Spare MCP glasses 10 pack for LPCB approved
	14112-09GR	Spare MCP glasses 10 pack non LPCB approved

Interfaces

Mains powered	34440	Mains powered fire alarm interface
	34441	Card for mains powered interface
	19104-52	Power relay (for mains powered interface) (up to 4 maximum can be used - supplied with base and diode)
4- Channel Loop powered	34450	Loop powered fire alarm interface

	34451	Card for loop powered interface
	19245-05	Interface line module -up to 4 can be fitted in a loop powered fire alarm interface
	34454	4 way keyswitch **door** for loop powered interface
1- Channel Loop powered	34410	Loop powered zone module
	34415	Single Channel Interface (Loop Powered)
Rack	13445-80	Rack interface back box
	13445-05	Rack interface
	13445-06	Interface rack keyswitch door
	13445-15	4 way interface line module assembly
Keyswitches	19245-02	2 position keyswitch assembly (for use with optional interface doors)
	19245-03	3-position keyswitch assembly (for use with optional interface doors)
	13445-40	Interface card (loop powered) (up to 10 used in 13445-05 rack interface
Power supply Unit	19245-06	Power supply unit with 1 relay (for use with loop powered interface unit)
	19245-07	Mains relay (up to 4 for use with 19245-06 unit)
Fix Extinguishant	#34460	Loop powered fixed extinguishant interface
	#34461	Card for loop powered extinguishant interface

- Not available at time of issue

Manuals & Accessories

13499-23	Installation manual **V3.3X** (for system 3400 with 34000)
13499-26	Operating manual **V3.3X** (for system 3400 with 34000)
13563-011	GENT Supervisor Operator's Manual

GENT Supervisor

PC	13563-10	PC for the GENT Supervisor

Graphics only	13564-01	Graphics software
Text only	13565-01	Information mode software
	13565-04	Configuration mode software
Accessories	13563-03	A4 text printer with cable and paper
	13563-05	Light pen accessory
	4214-006	Fan fold paper (for 13563-03)
	4214-054	A4 paper 5 reams (for 13563-04)

NOTE: *The Gent Supervisor graphics software requires custom graphics pages*

Converter / Compactor / UPS

13547-14	Uninterrupted power supply (55 minutes standby)
13547-15	Uninterrupted power supply (14 minutes standby)
13563-02	Converter unit (RS232/RS485)
13548-03	Compactor unit (1 to 8 - RS232)
13563-01	Modem (pairs)