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CONSULTANTS' SPECIFICATION

Fire & Emergency Lighting Combined Systems

This Consultants' Specification has been produced by Hochiki Europe (UK) Limited for use by Fire System and Emergency Lighting Consultants preparing specifications for the design and supply of life safety systems.

This Specification shall be used in conjunction with our individual Product Specifications which are available free online or direct from Head Office.

Scope of Work

To design, supply and install an Analogue Addressable Fire Alarm and Emergency Lighting Combined Control System in accordance with the details specified herein and in accordance with supplied drawings.

The specification shall include all materials, equipment and wiring required to install the complete Fire Detection and Emergency Lighting System. The system shall include but not be limited to one or more control panels, repeater panels, sensors, call points, audible and visual alarm indicating devices, exit signs, luminaires and relays.

The installation shall include the provision of all cables required for connection of the detection, alarm indicating, emergency lighting and other devices along with connections to the power supply as appropriate to the design. All cabling shall conform to the requirements and recommendations of the Fire Alarm and Emergency Lighting Control Panel manufacturer and British Standard 5839-2017.

The system shall be designed such that no more than 90% of the available signalling / detection loop capacity is employed to allow for future requirements.

Standards

The combined fire detection and emergency lighting system shall be designed, installed and commissioned in accordance with, and all elements shall meet the requirements of

- BS5839 Part 1: 2017 Code of Practice
- EN54-Part 2: 1998
- BS5266 Part 1: 2016 Code of Practice
- IEC 62034 PERC

The responsible company shall be able to demonstrate their competence to design, install and commission the combined system, for example by certification to BAFE SP203, LPS1014 or another relevant standard and must be an approved Hochiki Systems Partner. A list of current Systems Partners is available from the Hochiki Europe web site here:

www.hochikieurope.com/partners

The equipment manufacturer shall operate a quality management system in accordance with ISO 9001:2000. In addition, the equipment shall be manufactured under a recognised factory control procedure such as the BSI Kitemark scheme.

All fire detection devices shall be independently certified as complying with the relevant EN54 standard.

Control Panel

Functional Description

The combined fire alarm and emergency lighting control panel (FAELCP) shall be the central processing unit of the system, receiving and analysing signals from fire sensors, modules, manual call points and emergency lighting units, providing audible and visual information to the user, initiating automatic alarm response sequences and providing the means by which the user interacts with the system.

The FAELCP shall be certified as meeting the requirements of EN54-2 and EN54-4 by a suitable, notified body. A certificate and test report shall be made available for inspection as evidence of certification.

The FAELCP shall be easily configurable to meet the exact detection zone and output mapping requirements of the building.

The FAELCP shall be microprocessor based and operate under a multitasking software program. Operating programs and configuration data shall be contained in re-configurable non-volatile memory. Retention of the memory shall not rely on any form of battery or capacitor back-up device. The FAELCP shall incorporate separate processors for loop processing and central processing.

Provision shall be made for each addressable loop to be sub-divided into geographical zones. The section of wiring corresponding to each zone circuit shall be protected from faults in other sections by line isolator modules.

In order to facilitate re-configuration and system extension, the allocation of addresses to devices shall be independent of their physical arrangement on the loops.

Up to 127 individually addressed standard devices shall be configured on each addressable loop. Loop powered sounders incorporated as a sensor bases shall be available.

The FAELCP shall have the capability to support sub-addressing of addressable modules so that the support of 4 inputs and 4 outputs from one loop address is provided. Inputs and Outputs shall be controlled independently.

It shall be possible to fit a 40-column printer to the FAELCP which will print system events automatically and logged data upon request.

Additional Components

It shall be possible to fit the FAELCP with a network board to allow up to twelve control panels to communicate with each other. The network shall be fully fault tolerant and shall continue to function normally under any single fault condition.

Up to 16 relay cards shall connect to a separate serial bus but shall be programmable in the same manner as devices connected to the addressable loops.

Configuration

It shall be possible to perform configuration updates on site using a portable personal computer and a windows-based configuration utility. This facility shall allow the following parameters to be set:

System

- Produce a configuration file which contains data for up to 12 panels connected together as a network.
- Set cause and effect tables for any device to operate devices or functions on any panel or panels connected to the network.
- View graphically the configuration from a single panel or entire network of panels.

Control Panel

- Panel name (network identity, twenty characters maximum)
- Panel text (comfort message or service company twenty characters maximum)
- Change code numbers for access levels two and three.
- Select sounder ringing mode as common or zonal
- Set number of loops on panel as one, two, three or four
- Set number of zones on panel between 1 and 512
- Set loop sounder volume globally

Sensors

- Allocate a zone
- Indicate pre-alarm
- Address loop-powered base sounders
- Allocate a twenty-character location text message.

Call points

- Allocate a zone
- Allocate a twenty-character location text message

Switch units (input)

- Allocate a zone for each device
- Define input action as fire, fault, pre-alarm, active, disablement (dependent on module selected)
- Allocate a twenty-character location text message

Relay or sounder units (output)

- Allocate a zone for each device
- Define whether the device responds to evacuate inputs as a sounder, is silenceable or needs to be reset
- Allocate a twenty-character location text message

Loop powered sounders

- Allocate a zone
- Allocate a twenty-character location text message.

Panel Construction

The housing containing the FAELCP shall be of metal construction and shall be capable of being surface mounted. It shall be complete with cable knock-outs in sufficient quantity to accommodate all likely cabling requirements. The housing shall afford a minimum ingress protection to IP30 and it shall not be possible to open the FAELCP without the use of a special tool.

Panel Indications

The FAELCP shall monitor the status of all devices on the addressable loops for fire, short-circuit fault, open-circuit fault, incorrect addressing, unauthorised device removal or exchange, pre-alarm condition, battery fault (EL), LED fault (EL) and contaminated sensor condition.

The FAELCP shall also monitor the status of internal connections and interfaces including charger and batteries.

The FAELCP shall provide the following discrete visual indications:

POWER ON	Green LED
FIRE ALARM	Red LED Indicator
PRE-ALARM	Yellow LED
TEST MODE	Yellow LED
ADDRESS RESET FAILURE	Yellow LED
EMERGENCY LIGHTING	Yellow LED
EMERGENCY LIGHTING	Yellow LED
EMERGENCY LIGHTING TEST	Yellow LED
MAINTENANCE REQUIRED	Yellow LED
GENERAL DISABLEMENT	Yellow LED
GENERAL FAULT	Yellow LED
POWER FAULT	Yellow LED
SYSTEM FAULT	Yellow LED
SOUNDERS FAULT/DISABLED	Yellow LED

Display

In addition to the indications above, the FAELCP shall have an integral 240 x 64 pixel graphic LCD display.

The display shall incorporate a backlight which will illuminate upon any event (excluding mains failure) or button press.

The display shall be capable of simultaneously indicating the number of outstanding events and their types as well as the current event.

Panel Controls

The panel shall be provided with at least the following manual controls:

SILENCE BUZZER	MORE EVENTS
SILENCE/RESOUND ALARM	SERVICE
LOOP	ZONE
ADDRESS	ENABLE
RESET	MENU NAVIGATION PAD (UP, DOWN, LEFT, RIGHT, HOME)
TEST	DISABLE
	EMERGENCY LIGHTING

Remote Monitoring Signals

The FAELCP shall contain at least three programmable inputs to allow interconnection to other systems.

The FAELCP shall contain at least two programmable outputs to allow interconnection to other systems.

The FAELCP shall be capable of monitoring and controlling remote site devices, such as relays for the control of plants and dampers directly from the addressable loops.

The FAELCP shall be capable of monitoring fire doors such that, in the event of a fire alarm condition, an event is generated to warn of the failure of a fire door to close.

Software

The FAELCP shall have, as a standard software enhancement, the ability to annunciate a pre-alarm condition designed to give the earliest possible warning of potential fire condition without raising the full alarm condition.

The FAELCP shall have as a standard software enhancement the ability to automatically adjust the alarm threshold levels to compensate for changes in sensor sensitivity due to contamination over a period of time.

The FAELCP shall have, as a standard software enhancement, the ability to provide an indication that a detector is nearing a level of contamination which requires that it be replaced or serviced.

The FAELCP shall have, as a standard software enhancement, the ability to synchronise loop data transmission to eliminate the possibility of data corruption due to cross-talk or similar effects.

Sounder Connections

The FAELCP shall provide the necessary outputs to separately operate a minimum of four monitored circuits of common system sounders. At least two outputs shall be capable of driving a sounder load of up to 1A.

The FAELCP shall also be able to monitor the integrity of and control standard sounder circuits, via a suitable addressable module.

The FAELCP shall have the facility to independently operate a room's sounder if the attached sensor is activated.

Fault Reporting

The FAELCP shall monitor all critical system components and interconnections, internal and external, such that a failure, which would prevent the correct operation of the alarm functions, causes the FAULT indicator to light and a message to be given on the alphanumeric display within 60 seconds of occurrence.

The following faults shall be reported in the manner described above:

Loop Short Circuit	Charger Failure
Loop Open Circuit	Earth Fault Monitoring
Unconfigured Device	Panel Battery Fault
Luminaire Battery Fault	Luminaire LED Fault
Internal Memory Fault	Mains Failure
Device Missing	Sounder Wiring Open Circuit (Per Circuit)
Addressable Device Failure	Sounder Wiring Short Circuit (Per Circuit)
Incorrectly Configured Device	Low Battery
System Fault (Processor)	Communications Fault

To help fault finding and repair, the FAELCP shall provide text messages to indicate the location of where a fault has occurred in the system.

System Management

The FAELCP shall incorporate the following system management facilities:

Isolate/re-connect individual zones	View system status
Isolate/re-connect individual loops	Print event log
Isolate/re-connect individual addresses	Print point status
Disable/Enable individual loops	Set time
Disable/Enable individual zones	View contamination status
Disable/Enable individual addresses	Activate emergency lighting test
Activate panel indicator test	Activate panel buzzer test

Access to the facilities describe above shall be restricted to user Engineer level or above.

The FAELCP shall have an event log capable of storing the last 500 events that have occurred. It shall be possible to view the content of the log via the alphanumeric display. Events shall be displayed in chronological order with the newest events first. It shall be possible to scroll through the events.

The FAELCP shall be designed so that, for each type of analogue addressable sensor, the overall response time including the sensor, the signal transmission system and the fire decision algorithm, meets the requirement of European Standards.

The FAELCP shall be capable of isolating a group of selected sensors in areas of the building where maintenance work is carried out.

Additional Components

It shall be possible to connect the following additional components to the FAELCP

- Up to 7 additional user interfaces (to act as repeater panels)
- 1 pager unit
- Up to 16 8-way voltage outputs (2A)
- Up to 16 8-way relay boards
- Up to 16 8-way LED indication boards

User interfaces shall be connected via an eight-core cable, the ancillary boards shall be connected via a four-core cable, both carrying power and serial data.

Each of the above additional components shall be allocated a bus address. Once connected and accepted by the FAELCP, removal or disconnection of any additional component shall be announced as a fault condition at the FAELCP.

Power Supply

The FAELCP shall incorporate a 33 V AC power supply. The power supply shall deliver up to 4.5 Amps at 33 V AC. The battery charger shall be capable of charging six 12V batteries of up to 20Ah capacity. The power supply shall have a nominal input voltage of 230 V AC.

Fire Detection Devices

Basic Requirements

The manufacturer shall have available the following types of analogue addressable automatic sensors, for direct connection to the system addressable loops, these analogue sensors shall be addressed using a hand-held programmer:

- Optical smoke sensors
- Heat sensors
- Multi-sensors (smoke and/or heat)

The devices shall be compatible with a single, electronics-free mounting base.

Addressable Units

The manufacturer shall be capable of offering two-state addressable versions of the following units, taking only one address from the loop:

- Optical smoke sensor
- Heat sensor
- Multi-sensor (smoke and/or heat)
- Optical beam smoke sensor
- Conventional detector interface modules (single and multiple zone versions)
- Addressable sounder module
- Addressable relay interface modules
- Addressable switch monitoring module
- Addressable mains relay monitoring module
- Addressable plant control module
- Addressable single input monitoring module
- Addressable powered output module (inputs configured for emergency lighting phase monitoring only)
- Loop powered base and wall sounders
- Loop powered visual devices such as beacons and remote indicators
- Manual call points for indoor use

Analogue Addressable sensors and modules must be able to transmit to the FAELCP an address to be used in the system configuration.

It must be possible to connect and mix analogue addressable sensors, addressable manual call points, addressable modules, addressable exit signs and addressable emergency luminaires within the same zone sub-division of an addressable loop.

All equipment connected to the system's addressable loop(s), either directly or via interfaces, shall be proofed against electrical noise, high frequency pulses and electromagnetic influences from other equipment.

The manufacturer shall have available suitable equipment to test and remove or exchange all three main types of automatic point-type sensors when installed.

Optical Smoke Sensors

The analogue addressable Optical smoke sensors shall be capable of detecting visible combustion gases emanating from fires and shall employ the forward light-scatter principle.

The Optical smoke chamber shall be equally sensitive to a wide range of combustible materials and incorporate flat response technology. The operating voltage range of the Conventional Detector shall be 9.5 Vdc to 30 Vdc. The Detector shall also incorporate a locking mechanism, this is utilised by removing a plastic tab from the underside of the detector, once locked onto the base, and the detector can only be removed with a special removal tool.

The design of the point-type Optical smoke detector sensing chamber shall be optimised to minimise the effect of dust deposit over a period of time. The chamber cover shall be removable for ease of cleaning or replacement.

The point-type Optical smoke sensors shall incorporate screens designed to prevent all but the very smallest of insects from entering the sensing chamber, (50 holes per square centimetre or more).

The Optical smoke sensors shall be designed to have high resistance to contamination and corrosion and shall include RFI screening to minimise the effect of radiated and conducted electrical interference.

The Optical smoke detector shall incorporate two LEDs, clearly visible from the outside, to provide indication of alarm actuation.

In locations where the detector is not readily visible, remote indicator units shall be provided.

Multi-Sensors

The analogue addressable multi-sensor shall be capable of monitoring two different sensing elements:

- Optical
- Thermal

The design of the point-type multi-sensor Optical smoke sensor sensing chamber shall be optimised to minimise the effect of dust deposit over a period of time. The chamber cover shall be removable for ease of cleaning or replacement. The Sensor shall also incorporate a locking mechanism, this is utilised by removing a plastic tab from the underside of the sensor, once locked onto the base the sensor can only be removed with a special removal tool.

The point-type multi-sensors shall incorporate screens designed to prevent all but the very smallest of insects from entering the sensing chamber, (50 holes per square centimetre or more).

The multi-sensors shall be designed to have high resistance to contamination and corrosion and shall include RFI screening to minimise the effect of radiated and conducted electrical interference.

The multi-sensor shall incorporate two LEDs, clearly visible from the outside, to provide indication of alarm actuation. The LEDs shall be controlled from the FAELCP if the LEDs flash during the normal polling sequence.

The modes of the multi-sensor shall be controlled by the FAELCP, when the FAELCP changes from one mode to another the FAELCP shall re-calibrate the multi-sensor.

In locations where the sensor is not readily visible, remote indicator units shall be provided.

The multi-sensor shall have the capability of monitoring either sensing elements, if either or both of the elements fail it shall be reported and displayed at the FAELCP.

The sensor shall be able to operate in the following modes:

Combined Mode

The sensor shall be able to operate simultaneously as both an Optical sensor and a Heat Sensor. Either sensing element shall be capable of initiating an alarm.

Optical Mode

The sensor shall be able to return the analogue value for the Optical element during a normal polling sequence.

The sensor shall also be able to signal to the FAELCP if the Optical sensing element exceeds a pre-defined threshold.

The Optical smoke chamber shall be equally sensitive to a wide range of combustible materials and have a high-performance technology smoke chamber.

Thermal Mode

The sensor shall be able to return the analogue value for the thermal element during a normal polling sequence.

The sensor shall also be able to signal to the FAELCP if the thermal sensing element exceeds a fixed temperature threshold.

Heat Sensors

The analogue addressable heat sensors shall be capable of detecting rapid rise in temperature and/or fixed absolute temperatures.

The heat sensors shall employ two heat-sensing elements with different thermal characteristics to provide a rate of rise dependent response.

The heat sensors shall include RFI screening to minimise the effect of radiated and conducted electrical interference. The Sensor shall also incorporate a locking mechanism, this is utilised by removing a plastic tab from the underside of the sensor, once locked onto the base the sensor can only be removed with a special removal tool.

The heat sensors shall incorporate two LEDs, clearly visible from the outside, to provide an indication of alarm actuation.

In locations where the sensor is not readily visible, remote indicator units shall be provided.

Common Mounting Base

All automatic point-type fire sensors and emergency lighting luminaires and exit signs shall be fixed by means of screw-fit bases, which shall incorporate the optional feature of being able to lock the attached devices in place once fitted. Termination facilities shall be available for earthing.

The base shall not contain any electronic circuitry. This shall enable insulation and continuity checks to be completed on the wiring with the sensor heads removed.

The base shall be capable of supporting sensors, beacons, remote indicators, sounders, sounder/beacons, low voltage exit signs and emergency luminaires without the need to physically change base types.

Addressable Beam Smoke Detector

The addressable beam smoke detector shall be of a reflective type and be able to provide a detection range of between 5 m and 100 m. The unit shall be loop-powered and be capable of continually and automatically correcting its alignment without intervention. The detector head shall be commissioned and controlled from ground level utilising a control unit to avoid working at height.

Addressable Manual Call Points

The addressable manual call points shall monitor and signal to the FAELCP the status of a switch operated by a "non-frangible element" assembly. They shall be red in colour and suitable for surface or flush mounting. The addressable call points shall also feature an integral SCI (short-circuit isolator) and be provided with an integral bi-coloured LED to indicate activation (red) or short-circuit isolating (amber). The polling LED shall be able to be switched off from the FAELCP.

The addressable call points shall be capable of operating by means of thumb pressure and not require a hammer. They shall be capable of being tested using a special 'key' and feature a non-frangible, resettable element instead of a glass.

The addressable call points shall incorporate a mechanism to interrupt the normal addressable loop scan to provide an alarm response within 3 seconds and shall be field programmable to trigger either an alert or an evacuate response from the FAELCP.

Addressable Loop Powered Beacon

The beacon shall have its address programmed via a hand-held address tool, and the lens shall be available in red, blue or amber with a flash rate of 1 Hz. It shall fit the same standard mounting base as the other analogue addressable devices.

The Beacon shall also incorporate a locking mechanism, once locked onto the base, the beacon can only be removed with a special removal tool as per a sensor.

Addressable Sounder Module

The addressable sounder module shall be capable of monitoring and controlling two independent circuits of alarm sounders using a single loop address and be provided within an enclosure.

24 V dc power to drive the sounders shall be derived independently from the FAELCP.

Each circuit shall be individually programmable. Sounder circuits shall be capable of synchronisation.

The addressable sounder module shall provide the facility to monitor the wiring to the sounders for open or short-circuit and transmit the necessary fault signal to the FAELCP.

The addressable sounder module shall provide the facility to monitor for failure of the power supply for the sounders and transmit the necessary fault signal to FAELCP.

The addressable sounder module shall provide a green LED indication when the FAELCP is polling it.

The addressable sounder module shall feature a short-circuit isolator (SCI) as standard with a separate LED to indicate when the loop is in short-circuit.

The module shall also be available in a DIN rail mountable alternative housing.

Addressable Powered Output Module

The addressable powered output module shall incorporate two inputs configured for emergency lighting phase monitoring. The module shall use a single loop address, addressed electronically using a hand-held tool and special lead.

Addressable Single Input Module

The addressable single input module shall incorporate one monitored input and be designed to connect to the loop via a terminal block.

The unit shall be addressed electronically using a hand-held tool and special lead.

Addressable Relay Controller Module

The addressable relay interface module shall be capable of switching two independent relays; either normally open or normally closed, each rated at 30 V, 1 Amp.

A single input shall provide open and short circuit monitoring facilities, set locally at the unit.

The addressable relay interface module shall be powered directly from the addressable loop.

The addressable relay interface module shall provide an LED indication when the FAELCP is polling it.

The addressable relay interface module shall feature a short-circuit isolator (SCI) as standard with a separate LED to indicate when the loop is in short-circuit.

The module shall also be available in a DIN rail mountable alternative housing.

Addressable Mains Relay Controller Module

The addressable mains relay controller module shall be capable of switching one relay; either normally open or normally closed, rated at 250V, 5 Amps.

A single input shall provide open and short circuit monitoring facilities, set locally at the unit.

The addressable mains relay controller module shall use a single loop address and be powered directly from the addressable loop.

The addressable mains relay controller module shall provide an LED indication when the FAELCP is polling it.

The addressable mains relay controller module shall feature a short-circuit isolator (SCI) as standard with a separate LED to indicate when the loop is in short-circuit.

The module shall also be available in a DIN rail mountable alternative housing.

Addressable Input Monitoring Module

The addressable switch monitoring module shall be capable of monitoring two independent voltage free contacts, each normally open or normally closed, using a single loop address.

The unit shall be powered directly from the addressable loop.

The addressable switch-monitoring module shall provide a red LED indication when the FAELCP is polling it. The LED shall be continuously lit when either input is active.

The addressable switch monitoring module shall feature a short-circuit isolator (SCI) as standard with a separate LED to indicate when the loop is in short-circuit.

The module shall also be available in a DIN rail mountable alternative housing.

Short Circuit Isolator Base

The short circuit isolator base shall provide protection on the addressable loop by automatically disconnecting the section of wiring between two isolators where a short circuit has occurred.

The short circuit isolator base shall derive its power directly from the addressable loop.

Any Sensor or Beacon can be fitted to the isolator base; the isolator base is also ceiling or wall mountable.

Loop Powered Sounder Beacon Base

Addressable electronic sounder beacon bases shall be able to be connected directly to the detection loops and be mounted onto a standard mounting base. An analogue smoke sensor, multi-sensor, heat sensor, addressable beacon or an addressable remote indicator may also then be mounted onto the sounder beacon base, if required. A cover plate shall be available to be fitted over the terminals if no other device is fitted to the sounder beacon base. The sounder beacon base shall be ceiling or wall mountable.

The address of sounders used as sensor bases shall be set automatically at the FAELCP. This will be above 127 so as not to restrict the number of other addressable devices on the loop.

The loop-powered sounder beacon base volume and tone shall be determined via configuration software. The loop powered sounder beacon base shall be programmable to have a sound output variable between 50 dB(A) and 98 dB(A) (± 2 dB(A)) at 1 metre distance and have a maximum current draw of between 0.8 mA and 21 mA with both sounder and beacon activated simultaneously. The beacon shall employ LED technology to reduce current consumption and maintenance.

Where recommended by the risk assessment, an EN54-23 compliant variant shall be available for certain environments.

Loop Powered Sounder Base

Addressable electronic sounder bases shall be able to be connected directly to the detection loops. These shall be able to be mounted onto a standard mounting base. An analogue smoke sensor, multi-sensor, heat sensor, addressable beacon or an addressable remote indicator may then also be mounted onto the sounder base, if required. A cover plate shall be available to be fitted over the terminals if no other device is fitted to the sounder base. The sounder base shall be ceiling or wall mountable.

The address of sounders used as sensor bases shall be set automatically at the FAELCP. This will be above 127 so as not to restrict the number of other addressable devices on the loop.

The loop-powered sounder base volume and tone shall be determined via configuration software. The loop powered sounder base shall be programmable to have a sound output variable between 50 dB(A) and 98 dB(A) (± 2 dB(A)) at 1 metre distance and have a maximum current draw of between 0.8 mA and 16 mA.

The unit shall be capable of producing EN54 compatible tones.

Loop Powered Wall Sounder

The Loop Powered Wall Sounder shall be connected directly to the loops where required. The unit shall be fixed onto a sounder specific mounting base which will be red to match the sounder. A

weatherproof kit shall be available to increase the IP Rating of the wall sounder to IP66, for external use.

The Wall Sounder sound output shall be variable between 90 dB(A) and 102 dB(A) (± 2 dB(A)) and shall have a maximum current draw of between 2 mA and 8 mA depending on the tone used.

The unit shall be capable of producing EN54 compatible tones.

Loop Powered Wall Sounder Beacon

The Loop Powered Wall Sounder Beacon shall be connected directly to the loops where required. The unit shall be fixed onto a sounder specific mounting base which will be red to match the sounder. A weatherproof kit shall be available to increase the IP Rating of the wall sounder to IP66.

The beacon lens shall be transparent and utilise LED technology to reduce current consumption and maintenance.

The Wall Sounder Beacon sound output shall be variable between 90 dB(A) and 102 dB(A) (± 2 dB(A)) and shall have a maximum current draw of between 2 mA and 13 mA depending on the tone used and with both sounder and beacon activated simultaneously.

The unit shall be capable of producing EN54 compatible tones.

Where recommended by the risk assessment, an EN54-23 compliant variant shall be available for certain environments.

EN54-23 Compliant Loop Powered Wall Beacon

The loop-powered wall beacon shall contain a free-form optic designed to produce a highly visible flash which shall meet the cubic light volume coverage requirements of EN54-23. The flash frequency shall be 0.5/1 Hz at an operating voltage of 17-41 V dc. The unit shall fit directly onto the standard sensor mounting base and be available with either red or white LEDs.

EN54-23 Compliant Loop Powered Ceiling Beacon

The loop-powered ceiling beacon shall contain a free-form optic designed to produce a highly visible flash which shall meet the cylindrical light volume coverage requirements of EN54-23. The flash frequency shall be 0.5/1 Hz at an operating voltage of 17-41 V dc. The unit shall fit directly onto the standard mounting base and be available with either red or white LEDs.

Hand Held Address Programmer

This unit shall be capable of electronically addressing analogue devices such as sensors, beacons, remote indicators, sounder bases, sounder/beacon bases, exit signs, luminaires and (with an optional lead) manual call points. It shall also be capable of listing six different fault codes relating to the device that is being programmed. This programmer shall also be capable of reading the sensor's current analogue value.

Optical Beam Smoke Detectors

The Optical beam smoke detectors shall be capable of detecting visible combustion gases emanating from fires and shall utilise the light obscuration principle. The emitter shall project a near infra-red beam to the receiver.

Two types are acceptable:

- The Optical beam smoke detectors shall consist of an emitter and a receiver pair. The detectors shall operate over a 5 – 100 metre range providing a maximum coverage of 1500 m².
- A Optical reflective beam smoke detector consisting of a combined control unit and a separate reflector. The detector shall operate over a 5-30 metre range providing a maximum coverage of 450 m².

The Optical beam smoke detectors shall have automatic recalibration in order to adjust for contamination.

The Optical beam smoke detectors shall be designed to have high resistance to corrosion and shall include RFI screening to minimise the effect of radiated and conducted electrical interference.

The Optical beam smoke detectors shall incorporate two LEDs, clearly visible from the outside and below, to provide indication of alarm actuation and fault.

Sounders

Two types of Electronic sounders shall be acceptable: loop-powered addressable sounders (see above) and stand-alone versions. Stand-alone versions shall be powered by 24 V dc from the FAELCP.

Non-loop-powered versions shall be surface mountable with a back box available in indoor or outdoor IP ratings. They shall have a minimum sound output of 95 dB(A) at 1 metre distance and shall have a maximum current consumption at 24 Vdc of 100 mA.

Emergency Lighting Devices

Basic Requirements

Every lighting device in the range should be EN 54 part 18 approved. Each luminaire shall be self-contained and consist of a single LED light source - with a specially designed lens to provide optimum light distribution, electronics and battery, all contained within a single plug-in housing. The manufacturer shall have the following types available:

- Open area luminaires
- Escape Route/Corridor luminaires
- 20 m viewable exit signs
- 40 m viewable exit signs
- High power luminaires (for high ceilings)

Luminaires

Each luminaire shall be of the self-contained type and be connected via a 2-core data communication cable to a control panel. The power to charge the batteries in each self-contained luminaire shall also be delivered through this cable.

Each luminaire shall be microprocessor controlled and allocated an individual address within the system. This address will be programmed into the microprocessor of the luminaire using a hand-held programming tool. Setting address by use of switches shall not be permitted.

Each luminaire and exit sign shall be capable of a minimum of 3 hours' continuous operation in an active mode.

Each luminaire shall be fitted with a bi-colour Red/Green LED to indicate its status. This LED shall provide the following information:

Green Steady	Battery fully charged
Green Flashing	Battery charging
Alternate Green/Red	LED fault
Red Flashing	Battery fault
Red Steady	LED and battery faults

Each luminaire shall be site programmable for operation in a maintained or non-maintained mode and shall provide a minimum of 3 hours' continuous operation in the event of a mains power supply failure.

When a luminaire is operating in the maintained mode, it shall be possible to set the light output to seven different levels of brightness. Shall the main supply fail, the luminaire shall automatically switch to maximum brightness.

To assist in servicing and maintenance, each luminaire shall plug-in to a common base. This base shall be free of any electronic components, addressing devices or batteries.

To avoid unauthorised removal, it shall be possible to lock the luminaire into the base with removal only possible by use of a special tool.

Battery Technology

The standby batteries incorporated into each luminaire shall be Lithium Polymer or Lithium Ion or Metal Hydride technology and incorporate over voltage, over current and deep discharge protection circuitry. Additional protection shall also be provided in case of a short circuit across the battery terminals.

End of Life Disposal

Luminaires shall be WEEE and RoHS compliant and suitable for recycling. Luminaires shall not contain any heavy metals which require special handling for disposal, such as mercury, lead or cadmium.

Range of Luminaires

A range of products shall be available covering all types of emergency lighting application. All of the luminaires shall use LED technology. The range shall include the following:

- LED Down-light with specially designed lens for corridor area applications. Both surface and flush mounting models shall be available with a self-contained intelligent battery.
- LED Down-light with specially designed lens for open area applications. Both surface and flush mounting models shall be available with a self-contained intelligent battery.
- LED Down-light with a specially designed lens and high-output back-up battery to provide recommended light levels from high ceilings up to 9 metres and featuring a self-contained intelligent battery.
- A weatherproof housing shall be available for the above three devices.
- LED “step light” designed for flush mounting applications.
- LED “swing frame” exit signs which allows the same sign to be either ceiling or wall mounted. These signs shall utilise the same “plug-in” base as the luminaires. Two sign sizes shall be available for 20 m and 40 m viewing distances, with all variants featuring a self-contained intelligent battery. The legend designs provided shall comply with ISO7010
- LED recessed mounting exit signs.

All of the above luminaires and exit signs shall be soft addressable via a handheld programming tool.

Wiring

The cable that interconnects the luminaires, I/O units and the panel shall be a fire-rated and twisted single pair 1.5 mm² cable with a maximum length of up to 1000 m.

Output Relay Card

It shall be possible to connect up to four 8-way relay cards on a single RS485 Port. These relays shall be used for interfacing to other systems within the building.

Monitoring of General Lighting Mains Supplies

Each lighting final sub-circuit shall be monitored at the lighting distribution board by a DIN rail mounting phase monitor. The phase monitor shall be microprocessor controlled and detect the presence or absence of the mains supply in accordance with the parameters laid down in the BS 5266 part 1 sub circuit monitoring integrity requirements and incorporate a voltage free change of state relay.

Each phase monitor shall be connected via an addressable input module to the ELCP to signal the presence or absence of its monitored supply.

System Delivery

The specialist fire system contractor must be able to demonstrate competence by means of a valid manufacturer endorsed certificate relating to the products associated with this project.

The specialist fire system contractor must also be able to demonstrate competence by means of valid certification for technical accreditation by one of the following assessment bodies:

- LPS1014
- BAFE SP203
- ECA / FSA Category A3

The accreditation must be specifically relevant to the specialist fire system contractor being positioned to certify their work in the following modules:

- Design
- Installation
- Commissioning
- Maintenance
- Verification

END OF SPECIFICATION

Hochiki Europe (UK) Ltd. reserves the right to alter the specification of its products from time to time without notice. Although every effort has been made to ensure the accuracy of the information contained within this document it is not warranted or represented by Hochiki Europe (UK) Ltd. to be a complete and up-to-date description. Please check our web site for the latest version of this document.

Your Safety, Our Technology

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