Advanced

Consultants Specification

Scope of work:

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

The operation and functions described in this document are for guidance only.

The EN54 Part 2 & 4 Fire System

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

The system components shall be freely available from a number of sources, (i.e. not a closed protocol system), and shall support at least two independent manufacturer's protocols including Apollo (Discovery, Xplorer, XP95 and S90) and Hochiki (ESP).

The installation shall include the laying of all cables required for connection of the detection, alarm indicating 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 Control Panel manufacturer. Any openings /chasings in walls, ceilings or floors shall be made good.

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 fire detection system shall be designed, installed and commissioned in accordance with, and all elements shall meet the requirements of BS5839-1: 2002 Code of Practice and EN54-Part 2: 1998. The responsible company should be able to demonstrate their competence to design, install and commission the system, e.g. by certification to BAFE SP203, LPS1014 or other relevant standard.

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

The Fire Alarm Control Panel shall be independently certified as complying with requirements of EN54 Part 2 and EN54 Part 4. The Independent approvals body shall be either British Standards Institute (BSI) or Buildings Research Establishment (BRE/LPC).

In addition to the basic requirements of EN54, the Fire Alarm Control Panel shall offer the following EN54 optional features with requirements:

Optional Functions:		EN54-2 Clause
Indication	Fault signals from points	8.3
Outputs	Outputs to fire alarm devices	7.8
Controls	Investigation delays to outputs	7.11
	Co-incidence detection	7.12
	Disablement of points	9.5
	Test condition	10
	Standardised I/O	11

Power Supply Equipment Functions:	EN54-4 Clause
Operation from a main power supply	5.1
Operation from a standby battery	5.2
Monitor and charge the standby battery	5.3
Recognise and notify supply faults	5.4

The Fire Alarm Control Panel shall also support a number of additional functions that are not covered by EN54. These additional functions shall include:

Programmable Cause / Effect on Outputs (e.g. Phased Evacuation)
Auxiliary Power Supply Output
Auxiliary Relay Outputs
Printer Option

Fire Alarm Control Panel (FACP)

Functional Description

The FACP shall be the central controller of the complete system. It shall receive and process analogue information from the detection devices, provide audible and visual indication of alarm and other conditions to the user, automatically initiate alarm response sequences and provide the user interface for interrogation and user programming of the system.

Updates to the FACP operating software shall be simple to undertake and shall not require the use of replaceable components. The operating program and configuration memory shall be stored in non-volatile memory and shall not rely on batteries for retention. The FACP shall incorporate separate microprocessors for signalling loop control and central operation.

The FACP shall provide a user interface from which; controls can be operated, manual operations can be carried out, indications are audible and/or visible and system information can be obtained. It shall also be capable of unambiguously indicating the following functional conditions: Quiescent condition, fire alarm condition, fault warning condition and disablement condition. Furthermore, the fire alarm condition shall always be capable of clearly being indicated without any prior manual intervention at the FACP.

The FACP shall be easy to configure all basic operating characteristics and variables through the user interface on the FACP to satisfy the detection zone and output mapping of the premises. A PC Tool operating under the Windows ™ operating system shall also be available to fully program the panel.

The FACP shall support up to 127 devices on the signalling loop. The FACP shall fully support the sub-addressing capabilities of the relevant input and output devices.

The FACP shall contain of one, one to two, or one to four signalling loop drivers depending on the system design requirements. Each signalling loop shall be capable of supplying at least 500mA of power for loop-based sounders or other output devices. The Fire Alarm Control Panel software and hardware loop driver, without modification, shall be compatible with the analogue detection, call points, input and output devices available from, at least, the following manufacturers:

Apollo S90, XP95, Discovery and Xplorer ranges
Hochiki ESP, GTP and ASX ranges

Refer to Sections 4 and 5 for the list of compatible devices.
The FACP shall fully support the sub-addressing capabilities of loop devices incorporating this feature.

The FACP shall provide 2 or 4 outputs to fire alarm devices, each rated at 1-ampere. An auxiliary supply output shall also be available to provide power for internal option modules.

The FACP shall provide a diagnostic monitoring feature for all signalling loop, alarm device output and auxiliary supply output circuits to monitor voltage, current load, etc. This information shall be available to view at Level 2. In addition, diagnostic monitoring of the signalling loop return current pulses shall be provided at Level 3.

The FACP shall incorporate a real-time clock for time stamping of events in the event history log and for scheduling of time related functions.

It shall be possible to install a network communications card to allow connection of up to 200 control panels, remote terminals, mimic displays or other peripheral devices. The network shall offer peer-to-peer operation and have a fault tolerant capability. The time to propagate a fire alarm condition across the network shall not exceed 3 seconds.

A single FACP shall have the capability for configuration and operation of 200 fire alarm zones. In a network system, the overall system shall have the capability for up to 1000 zones.

It shall be possible to adjust sensitivity settings for all detection devices based on a time clock. It shall be possible to select device modes for both active and inactive time periods for multi-sensor detectors.

It shall be possible to configure the panel for Stage 1/ Stage 2 Investigation operation based on a time clock. It shall be possible to configure the devices used for investigation on an individual basis. This shall also include call point type devices.

It shall be possible to configure up to 10 independent time clocks. Each time clock shall be capable of up to two active time periods for each day of the week.

All fault conditions (except CPU System Fault) shall be non-latching.

All input devices shall have the capability of being latching or non-latching (except when configured for Fire Alarm input).

It shall be possible to configure complex cause and effect operation for phased evacuation and output control operations at the panel. It shall be possible to assign each output device to one of 200 output groups, each output group operation being programmable as to response on a zone by zone basis for fire, double knock fire, pre-alarm, fault, enablement or disablement conditions and shall be capable of up to 21 programmable ringing styles with programmable delays and pulsing tones.

It shall be possible to connect optional equipment in accordance with the requirements of EN54-2 Standardised I/O such as mimic panels and remote control terminals.

Panel Construction

The Fire Alarm Control Panel shall be of metal construction. It shall be capable of surface or semi-flush mounting. Sufficient 20mm knockouts shall be provided to accommodate all likely wiring requirements.

The housing shall meet IP30 minimum ingress protection classification. It shall not be possible to open the enclosure without a key or special tool.

Panel Indications

The Fire Alarm Control Panel shall be equipped with a graphics liquid crystal display (240x64 pixels) as the primary indicator giving at least 6-lines of information. The display shall incorporate an LED backlight that will illuminate upon any event (excluding mains failure) or button press.

The primary display shall be simultaneously capable of indicating the presence of Fire Alarms, Faults, Disablements and Tests in accordance with the requirements of EN54-2.

In addition, the following minimum LED indicators shall be provided in accordance with the requirements of EN54-2:

Power On	Green	
Fire Alarm	Red	(x2)
Fault	Yellow	
Disabled	Yellow	
Test	Yellow	
Sounders Silenced	Yellow	
Sounders Disabled	Yellow	
Sounder Fault	Yellow	
System Fault	Yellow	
Delayed	Yellow	

In addition, there shall be five programmable LED Indicators (4x Yellow and 1x Red) for application use.

A zone based indicator panel shall be provided as an option to additionally indicate zone fire alarms and shall provide 20, 50, 100 or 200 zone indicators. Additionally, this optional feature shall also be provided on a graphical mimic basis.

Panel Controls

The Fire Alarm Control Panel shall be provided with the following minimum manual controls:

Silence Buzzer
Evacuate (Sound Alarms)
Silence / Resound Alarms
Reset

In addition, the following controls shall be provided for menu operation and programming:
Navigation keys, ←→↑↓
A confirmation key, ✓
A numeric keypad, 0-9, also providing the function for letter / character programming
A cancel key
A menu select key

Software

A PC Configuration Tool shall be available for configuration of the FACP and for retention of configuration data.

The PC Configuration Tool shall be graphically based and operate under Windows ™ operating systems 98, NT, 2000, ME, and XP.

Configuration

It shall be possible to configure ALL basic configuration parameters and settings from either the FACP front panel or from the PC Configuration Tool. It shall be permitted to configure enhanced / extended features and functions from the PC Configuration Tool only.

Remote Dial-up

Software shall also be available to provide full dial-up capability to the FACP using a modem. This software package should enable remote access to interrogate and inspect the operation of the FACP, retrieve panel status and historic event log.

Remote Terminals

It shall be possible to provide remote access to monitor (Remote Display Terminal) or monitor / control (Remote Control Terminal) operation of the installation.

The Remote Control Terminal shall provide the same display, indication and buttons as the FACP.

The Remote Display Terminal shall provide the same display, indication and buttons as the FACP except for the control buttons.

Remote Control shall provide the capability to silence alarms, resound alarms, evacuate and reset the system. In addition, it shall be possible to remotely enable or disable zones and points and remotely configure a zone walk test.

Power Supplies

All power supplies (integral to the fire alarm control panel or remote) shall be certified to EN54-4: 1998 and shall be capable of supporting 72 –hour standby requirements.

All power supplies shall be capable of operating from a main supply of 230VAC 50/60Hz.

Additional System Components

The following additional system components shall be provided as optional equipment.

It shall be possible to connect the following standardised I/O equipment to the network:

Remote Control Terminals:	providing the features and functions described in section 3.8
Remote Display Terminals:	providing the features and functions described in section 3.8
Mimic Module:	providing a bespoke solution for graphical presentation, using LED Indicators, to indicate either zone based fires or output groups activated
Graphics Interface Module:	providing a gateway to 3rd party graphics packages with full reporting and control features and functions as described in section 3.8. It shall be possible to install multiple graphics gateways in the network.

It shall be possible to connect the following modules internally to the FACP for locally based input and output extensions:

Relay Module:	providing 8 individually programmable relay outputs with NO, NC and COM contacts rated at 30V DC, 1A
Input Module:	providing 8 individually programmable digital inputs.
Printer:	providing the capability to select and automatically print fire, alarm, fault and test events and the capability to manually print the historic log. The printer arrangement shall be such that it is not required to open the enclosure to change the paper roll. The printer shall not use replaceable ink ribbons or cartridges.
Shop Interface Module:	providing inputs and outputs specifically configured for connection to a landlord's main system.
Integral Modem:	providing remote connection to the FACP.

It shall be possible to connect the following modules for locally based input and output extensions:

Sounder Splitter:	providing 4 additional outputs to fire alarm devices from one of the panel outputs. Operation of all additional outputs is to follow the programmed operation of the selected panel output.
Sounder Booster:	providing a 4-ampere output to fire alarm devices from one of the panel outputs. Operation is to follow the programmed operation of the selected panel output.

Apollo Detectors and Devices

The system shall be compatible with, and fully capable of using all of the features of, the following Apollo detection, alarm indicating and other devices.
(Complete or omit this section as required)

Hochiki Detectors and Devices

The system shall be compatible with, and fully capable of using all of the features of, the following Hochiki detection, alarm indicating and other devices.
(Complete or omit this section as required)

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