nsc / **SIEMENS**
Sicherheitstechnik GmbH

Fire Alarm & Gas Detection Systems

Table of Contents

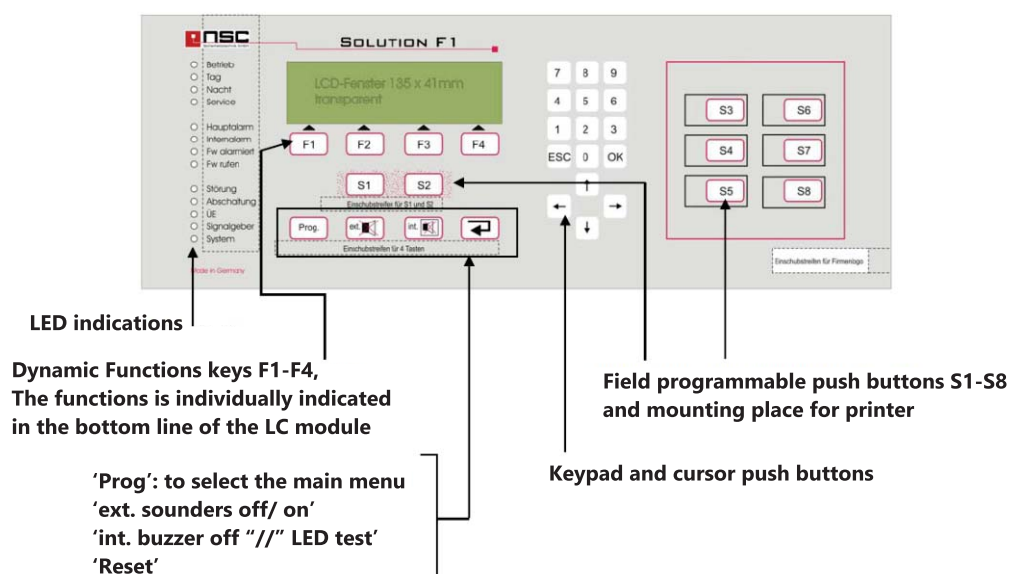**Addressable Fire Alarm Control Panel**

CONTROL PANEL

The Solution F1 Fire Control Panel range is a new genera-tion, modular and ultramodern Fire Control Panel range. These have been developed to meet international standards and to satisfy specific international requirements at the highest level.

These panels contain numerous new features – several are unique in the security business – and they convince by their comprehensive equipment.

Many optional (at extra cost) features in other panels are included in the "Solution F1" standard configuration. This range has been designed to be a universal and flexible product in terms of both the different configuration possibilities as well as the front fascia design. It thus meets the requirements for all possible applications.

■ Modular, intelligent Hybrid Fire Control Panel Range

■ Supports Hochiki ESP and Apollo XP95 / Discovery detectors

■ 2 – 18 loops in one standard housing

■ Brand new touch screen control panel

■ Graphics LCD module 240 x 64 as standard included on basic model

■ Integral Power supply 24V DC with max. 7,5 A or 4,0 A as standard included

■ 32 bit high performance CPU

■ Flash memory up to 8 MB and RAM memory up to 8 MB

■ Many powerful features included

■ Configuration software operated via Modem or USB interface

**Description of
Addressable Fire Alarm Control Panel**

LED indications

**Dynamic Functions keys F1-F4,
The functions is individually indicated
in the bottom line of the LC module**

**'Prog': to select the main menu
'ext. sounders off/ on'
'int. buzzer off "//" LED test'
'Reset'**

**Field programmable push buttons S1-S8
and mounting place for printer**

Keypad and cursor push buttons

Optical Smoke Detector

Strobe

Heat Detector

Multi Sensor

ADDRESSABLE LOOP

Manual Call Point

Remote Indicator

Dual Monitor Module for I.S. signaling devices

Wall Sounder

Loop Module

Galvanic Isolator for I.S. detectors

Ex

Intrinsically Safe Smoke Detector

Intrinsically Safe Heat Detector

Hazard Area

NSC SOLUTION F1 MICROPROSSESOR BASE ADDRESSABLE FIRE ALARM CONTROL PANEL

Moudbus

Moudbus

NSC
Sicherheitstechnik GmbH

Main Components

Loop Card for Solution F1 with 2 loops / 8 stub lines

- 2 loop- each maximum 127 detectors/ module or alternative 8 stub line
- 8 user programmable open collector outputs
- Cable shielding monitored for open and short circuit to +/- wire
- Earth fault detection

Redundant Loop Card for Solution F1 with 2 loops / 8 stub lines

As loop card for Solution F1 with 2 loop/ 8 stub liens but additional with 100% redundancy. This means the microprocessor, the RAM and the operating system memory are doubled on this card.
So there will be no failure in case of micro processer fault.
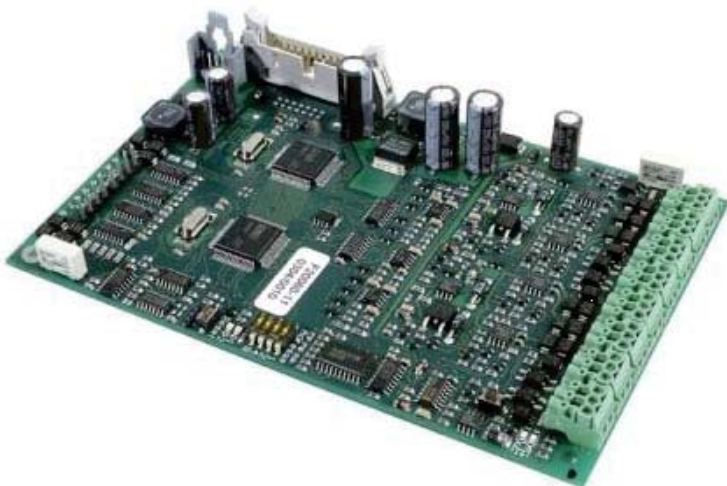
The Reliability

If for certain applications a higher reliability as EN-54 and VdS standards is required – that will be no problem for the"Solution F1" control panel: the Control Processing Unit can be doubled as well as the system boards
which are responsible for the communication with the sensors and which passes the information from the detectors to the CPU. So the user gets a 100% redundancy of his whole system.

integrity solutions

NSC
Sicherheitstechnik GmbH
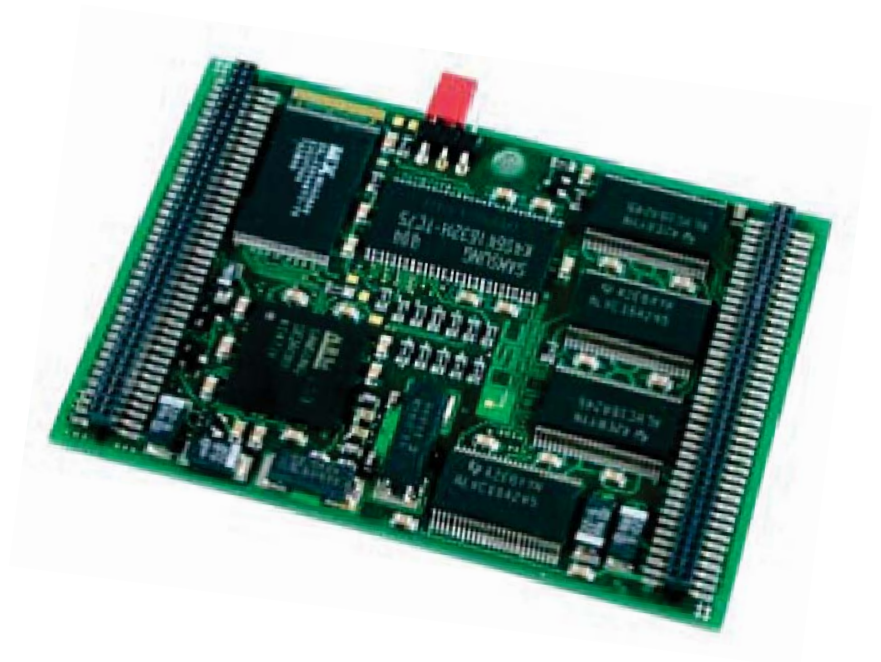
Main Components

Relay card with 8 change over contacts

- Compatible to fire detection system but usable as a universal device in other systems too

- 8 programmable change over contacts, each 250V AC / 5 A
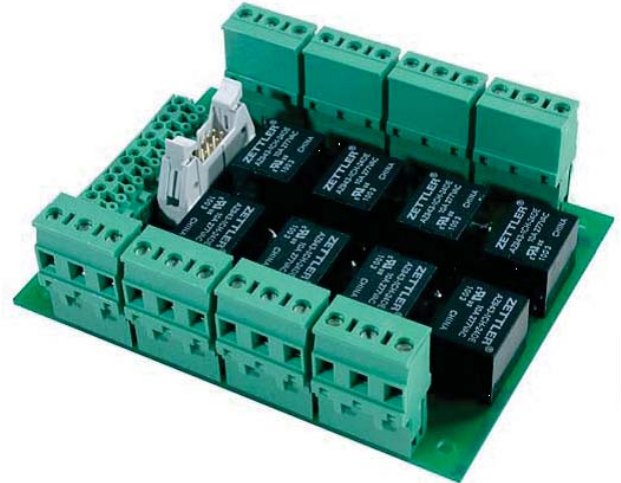
Analogue or ISDN modem for operating the configuration software via telephone line

- The modules can be plugged into a slot in the Fire Control Panel. Data speed up to 64.000 bps and they use the Fire Control Panel battery backup in case of mains failure.

Sariak

integrity solutions   **www.sariak.com**

Main Components

Conventional detector card

- Compatible to almost all conventional detectors on the market
- 32 detectors per line
- 8 programmable open collector alarm outputs
- Earth fault detection
- Failure mode in case of microprocessor fault

Conventional detector card with 100% redundancy for 8 stub lines

As Conventional detector card for 8 stub lines but with 100 % redundancy.

That means the microprocessor, the Ram and the operating system memory are doubled on this card. So there will be no failure in case of microprocessor fault.

integrity solutions

SIEMENS

Beam Gas Detector   **Gas Detector**   **Flame Detector**

Analogue Input(4-20 mA)

LHD

Digital Input

Manual Call Point

Digital Output – 24Vdc

Sounder   **Flasher**   **Bell**

Monitoring   **Printer**   **Programing**
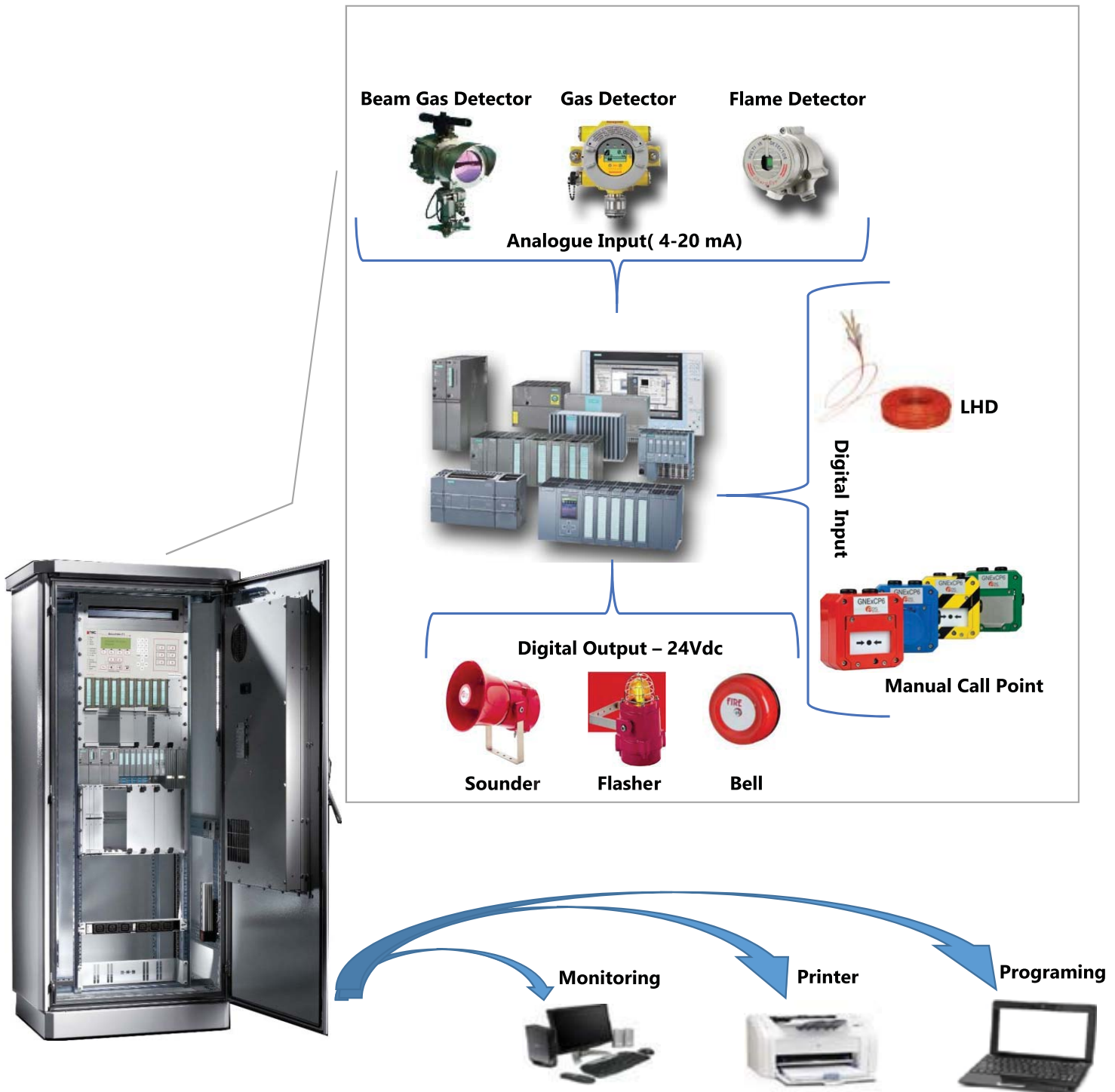
**SIMATIC
S7-400 PROCESS
CONTROLLER**

▶ **Ready to use**
▶ **Long-term compatibility and availability**
▶ **For use in harsh environments**
▶ **Modular expansion and scalability**
▶ **Vibration-resistant**
▶ **Maintenance-free**

High Quality, Intelligent Components

Our systems utilize the highest quality components with intelligent RS-485 MODBUS and HART® capabilities in a wide variety of configurations, including dual and triple redundant systems:

- Operator Work Stations
- DCS & PLC Controllers
- Networking – MODBUS compatible
- Event Log Recorders
- Trip Amplifiers& Controllers
- Gas Detectors
- Flame Detectors
- Alarms, Horns, Beacons
- Special Hazards Extinguishing

SIL-Rated - PLC-Based Systems

For mid-size to larger applications, the Programmable Logic Controller (PLC) has evolved as a highly intelligent controller. PLCs reliably detect alarms and initiate an orderly system control or shutdown in emergencies.

Their advantages include:

- Microprocessor intelligence
- Communications and networking(e.g., Modbus)
- Hardware and software self-diagnostics
- Lower cost than controllers for larger systems

Proven in use across industries

- Oil and Gas Exploration
- Hydrocarbon Processing
- Industry
- Oil and Gas Downstream
- Power
- Chemicals
- Metals
- Minerals
- Mining
- Pharmaceuticals
- Water Treatment Plants

SIEMENS

Overview of the S7-400

The S7-400 is a programmable logic controller. Almost any automation task can be implemented with a suitable choice of S7-400 components.

S7-400 modules have a block design for swing-mounting in a rack. Expansion racks are available to extend the system.

Features of the S7-400

The S7-400 programmable controller combines all the advantages of the previous system with those of a new system and new software. These are:

- A graded CPU platform
- Upwardly-compatible CPUs
- Enclosed modules of rugged design
- Convenient terminal system for the signal modules
- Compact modules with a high component density
- Optimum communication and networking facilities
- Convenient incorporation of operator interface systems
- Software parameter assignment for all modules
- Extensive choice of slots
- Operation without fans
- Multi computing in the non-se gmented rack

In this chapter, we show you the most important components with which you can assemble an S7-400.

S7-400

The power PLC for the mid high-end performance ranges.

The solution for even the most demanding tasks. With a comprehensive range of modules and performance graded CPUs for optimal adaptation to the automation task flexible in use through simple implementation of distributed structures; user- friendly connections. optimal communication and networking options.

User- friendly handling and uncomplicated design without a fan. Can be expanded without problems when the tasks increase.
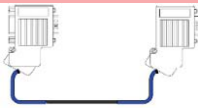
Multi computing: simultaneous operation of several CPUs in one S7-400 central controller.

Multi computing distributes the overall performance power of an S7400. For example complex tasks can be divided into technologies such as open-loop control computing or communication, and assigned to different CPUs.

And every CPU can be assigned its own local I/O.Modularity: The powerful backplane bus Of the S7-400 and the communication interfaces that can be connected direct to the CPU enable high performance operation of a host of communication lines. This enables, for example, division into one communication path for HMI and programming tasks, one for high-performance and equidistant motion control components, and one for a "normal" I/O field bus. Additionally required connections to MES/ERP systems or the Internet can also be implemented. Engineering and diagnostics: The S7-400 is configured and programmed extremely efficiently together with the SIMATIC Engineering Tools particularly in the case of extensive automation solutions with a high engineering component. For this purpose, high-level languages such as SCL and graphical engineering tools for sequential controls, state graph programs and technology-oriented diagrams are available.

Sariak

integrity solutions

S7-400 components
The most important components of the S7-400 and their functions are given in the following tables:

C	Function	Illustration
Racks **(UR: Universal Rack)** **(CR: Central Rack)** **(ER: Expansion Rack)**	**Provide the mechanical and electrical connections between the S7-400 modules.**	
Power Supply Modules **(PS = Power Supply)** **Accessories:** **Backup battery**	**Convert the line voltage (120/230 VAC or 24 VDC) to the 5 VDC and 24 VDC operating voltages required to power the S7-400.**	
CPUs **Central Processing Units** **(CPUs)**	**Execute the user program; communicate via the multipoint interface (MPI) with other CPUs or with a programming device (PG).**	
IF 964-DP interface module	**Used to connect distributed I/Os via PROFIBUS-DP**	
Signal Modules **(SM = Signal Module)** **(digital input modules, digital output modules, analog input modules, analog output modules)** **Accessories:** **Front connector with three different terminal systems**	**Match the different process signal levels to the S7-400.** **... form the interface between PLC and process.**	
Interface modules **(IM = Interface Module)** **Accessories:** **Connecting cable Terminator**	**Interconnect the individual racks of an S7-400.**	
PROFIBUS bus cables	**Connect CPUs to programming devices**	
PG cables	**Connect a CPU to a programming device.**	

SIEMENS

S7-400H

Fault-tolerant automation system with redundant design. For applications with high fail-safety requirements. Processes with high restart costs, expensive downtimes, little supervision, and few maintenance options.

Redundant central functions.

Increases availability of I/O: switched I/O configuration. Also possible to use I/Os with standard availability: single sided configuration.

Hot stand-by: automatic reaction-free switching to the standby unit in the event of a fault.

Configuration with two separate or one divided central rack. Connection of switched I/O via redundant PROFIBUS DP.

Irmax Fixed Point Gas Detectors

Infrared Hydrocarbon Gas Detector

Irmax is a compact, low power and highly rugged infrared gas detector, that delivers rapid, fail-safe detection of methane, butane, propane and many other hydrocarbon gases and vapors.

Feature

- Industry standard 4-20mA output
- Options for HART communications and RS-485 Modbus
- IRmax is compatible with virtually any control system
- Can be wall mounted, fitted to a 50mm (2 inch) pipe or connected to an auxiliary junction box using a choice of mounting accessories.
- Hand-held Intrinsically Safe (I.S) calibrator
- Enables up to 32 detectors to be multi-dropped on an addressable network

Fixed IR Display

- Large, clear display shows gas level and other status information
- Simple non-intrusive calibration
- Enables connection of hand-held HART communicators
- Can be rotated up and down to provide the optimum viewing angle

Remote IR Display

- Can be mounted up to 30 meters from Irmax
- Removes the need to directly access the IRmax detector
- Choice of connection lead lengths

SIL
Safety Integrity Level

HART

CROWCON

IREX

Pellistor Exchange IR Gas Detector

IREX is an innovative infrared (IR) flammable gas detector designed specifically to directly replace pellistor (catalytic bead) type flammable gas detectors. IREX operates from control systems designed solely for use with pellistor-based gas detectors: it produces a mV Wheatsone Bridge type signal (as per a pellistor) and operates from as little as 2.9Vdc. IREX can be directly connected to a control system, or can be supplied with an M20 'spigot gland' enabling originally installed detector junction boxes and cables to be retained.

Feature

- **EMC compliance**
- **Functional safety**
- **Performance**
- **Response time**
- **Electrical output**

EN 50270, FCC, ICES-003
Validation to IEC61508 SIL 2
Tested in accordance with EN60079-29-1
T-90 <4 seconds
3-wire mV (Wheatstone) Bridge. Typically 10-20mV per % vol. methane

Accessories

Spigot gland

Auxiliary junction boxes

Mounting bracket

Txgard & Flamgard Plus

Toxic and oxygen gas detector with display

Irmax is a compact, low power and highly rugged infrared gas detector, that delivers rapid, fail-safe detection of methane, butane, propane and many other hydrocarbon gases and vapors.

Feature

- 3-digit LCD back-lit display, LED status indicator
- Wide range of sensors
- 4-20mA current sink or source
- 2 or 3 wire formats
- Optional relays for alarm and fault
- Works with a wide selection of control panels
- Can be used for switching local alarms
- Approvals: Ex II 2 G / Exd IIC T6 Gb / UL Class I Zone 1
- EMC compliance: EN50270, FCC, ICES-003

Flamgard Plus:

Flamgard Plus is a Flameproof (Ex d), ATEX and UL certified flammable gas detector, which uses poison-resistant pellistors to detect explosive levels of hydrocarbons, hydrogen and other flammable gases and vapors, including aviation fuel and leaded petrol vapors.

Txgard Plus:

Txgard Plus is a Flameproof (Ex d), ATEX and UL certified toxic or oxygen gas detector with local LCD display. A choice of sensors are available enabling use in a wide range of applications, including water treatment, oil and gas exploration, chemical plants and steel production.

TXgard-IS+:

TXgard-IS+ is a Intrinsically Safe (I.S.) toxic and oxygen gas detector with local LCD display. A wide choice of sensors is available for use in a variety of applications. TXgard-IS+ is ATEX certified for use in Zone 0,1 or 2 hazardous areas, and also UL and CUL certified for use in Division 1 or 2 hazardous areas.

>>CROWCON

Xgard Fixed Gas Detectors

Xgard are a family of gas detectors for monitoring a very wide range of toxic and flammable gases and oxygen. **Xgard** are available as either Intrinsically Safe (Exia) or Flameproof (Exd) detectors, dependent upon sensor type and customer preference. Intrinsically Safe versions are suitable for use in Zone 0, 1 or 2 hazardous areas when used with a suitable. Zener barrier or galvanic isolator. Flameproof versions are suitable for use in Zone 1 or 2 hazardous areas.

Feature

- Poison resistant pellistors, for all flammable detection needs including hydrocarbons, ammonia and jet fuel leaded petrol and vapors containing halogens.
- Thermal conductivity sensor are available to monitor % volume concentrations of gases.
- Electrochemical sensor are used to detect vast range of toxic gases and oxygen.

Validity: IEC61508 – SIL1 to SIL3
Electrochemical sensor are used to detect vast range of toxic gases and oxygen.

Xgard range and types:

- **Type 1:** Intrinsically safe toxic and oxygen gas detector
- **Type 2:** Flameproof toxic and oxygen gas detector
- **Type 3:** Flameproof flammable gas detector
- **Type 4:** Flameproof high temperature flammable gas detector
- **Type 5:** Flameproof flammable gas detector with 4-20mA output
- **Type 6:** Flameproof thermal conductivity type gas detector

Flameproof high. temperature (up to 150 C) catalytic bead type detector with mV bridge output.

Flameproof electrochemical type detector with 2-wire 4-20mA output.

Flameproof catalytic bead type detector with 3-wire 4-20mA output.

Intrinsically Safe electrochemical type detector with 2-wire 4-20mA output.Wide range of sensor options. A zener barrier or galvanic isolator is required for I.S. operation.

Flameproof catalytic bead type detector with 3-wire mV bridge output.

Non-certified low cost catalytic bead type detector with 3-wire 4-20mA or mV bridge output.

Flameproof thermal conductivity type detector with 3-wire 4-20mA output.

XgardIQ Intelligent Gas Detector and Transmitter

Product Description

XgardIQ is an intelligent and versatile gas detector and transmitter compatible with Crowcon's full range of sensor technologies. XgardIQ is available fitted with a variety of flammable, toxic and oxygen gas sensors and provides a bright OLED display with clear and comprehensive status information in a range of languages.

Flexible signal outputs

Feature

- Analogue 4-20mA signal with auto sink/source detection\
- RS-485 Modbus communications are provided as standard
- HART communication
- Alarm and fault optional relays contacts, rated 230Vac 5A
- Foundation Fieldbus optional output
- ATEX and IECEx certified for use in Zone 1 and Zone 2 hazardous areas
- 316 stainless steel enclosure
- Bright, clear display. OLED 128 x 64 pixels, yellow texton black background
- Hot-swap sensor modules

Status LEDs

Positive Safety LED

Bright OLED display

Function buttons

Feature

- EN60079-29-1 (flammable gas sensors)*
- EN50104 (oxygen sensors)*
- EN45544 (toxic gas sensors)*
- IEC61508, EN50402 SIL 2

Gas Detection Control Panels

Choosing the Control Panel for Your Needs

Vortex offers all the flexibility you will need while still being simple to operate. All the day to day operations can be completed via push buttons on the front panel. With up to 12 channels*, including up to 3 for fire, Vortex can be customized to meet your site requirements, however complex, without the need for extensive cabling.

Wall Mounted Vortex

A standalone unit for surface mounting on walls, the display panel shows the fault and alarm levels for all the channels, but the LEDs only light when a hazard or fault is detected.

Panel Mounted Vortex Panel

For fitting into an existing panel or door and offering wide range of PSU and battery options.

19 inch Rack Mounted Vortex Rack

A flexible option where modules, PSU and batteries can be supplied separately for fitting within an existing 19 inch enclosure, permitting multi-rack systems to be created.

Vortex Flameproof

Vortex flameproof (FP) systems are designed for use in ATEX Zones 1 & 2, with IP66 ingress protection.

Vortex FP

With up to 24 relays, the enclosure is capable of accommodating
up to 4 intrinsically safe (I.S.) barriers for interfacing with I.S. detectors and alarms.

Channels and Display

- 1 to 12 channels (including 3 for fire)
- Each channel has 1 fault level and 3 alarm levels which
  can be combined in any pattern to trigger up to 32 output relays.
- Can be factory set to your requirements. Then when in situ,
  can easily be configured to suit your requirements using Vortex PC software.
- Push buttons on front display.
- LED display panel lights.
- Up to 12 devices can be monitored by reviewing just
  one control panel saving time and manpower.

Installation and Maintenance

- Modbus compatibility
- Simple to integrate into existing control systems
- Uses industry standard communication links
- Separate zones can be individually inhibited

Compliance and Reliability

- Validated to IEC 61508 (SIL 1)
- System monitors relays continuously
- Demonstrates system dependability
- Validated to IEC61508

Digital communications

- RS-485 Modbus or Profibus
- RS-232 (configuration software and lead supplied)

Inputs

- Gas - 2 or 3 wire 4-20mA (sink or source), 0-5V
- Fire – smoke & heat detectors, manual call-points - Up to 3 loops, Up to 20 devices per loop

CROWCON

XgardIQ

Gas monitor Plus

Gas monitor plus is our flexible microprocessor controlled system designed with a modular approach, so you get exactly what you want. Used throughout the world, both on and offshore, Gas monitor plus provides the cost effective solution to your system requirements. Gas monitor Plus, the gas and fire control system you can trust.

Feature

- Each channel has three levels of alarm as well as a dedicated analogue output, set as 4-20 mA as standard.
- Optional relay modules can interface to the panel to provide up to a total of 84 output relays per rack. Sixteen of these relays can be configured/voted from a combination of the three levels of alarm per channel.
- The RS232 digital interface provides connectivity with PC for configuration, monitoring and data log upload
- Each rack is uniquely addressable, making multi-drop architectures possible. This cuts down on configuration and monitoring cabling.
- Each channel is inhibited separately.

Specification

- Mounting Rack mounted (3u format)
- Channels: 16 per rack
- Inputs: 1- Gas: 2 or 3 wire, 4-20 mA (sink or source), or mV bridge 2- Fire - Smoke detectors, heat detectors and manual call points, Maximum of 32 loops per rack.
- Panel indication: 1- Channel number 4 lines x 20 characters back-lit LCD display 2- Gas reading as above plus green LED bar-graph
- Measurement units: ppm, %LEL, %VOL fire

Approvals

- Low voltage directive Meets BS EN 61010-1
- RF immunity Meets EN 50082-1
- RF emissions Meets EN 50081-1

Sariak

ALN-EN

Multi Sensor Detector

The ACC-EN has 3 modes, which are controlled from the control Panel, allowing either the optical element or thermal element or both elements to be active in making the fire decision.

The sensor polling LEDs can be controlled via the Control Panel (pulsing/non-pulsing).

The ACC-EN smoke chamber can easily be removed or replaced for easy maintenance.

User selectable modes

Incorporates Optical & Heat elements

Photo Electric Smoke Sensor

The ALN-EN incorporates Hochiki's newest High Performance Chamber Technology removing the need to use Ionization Smoke Sensors in the majority of appli -cations. This also allows the sensor threshold level to be increased, thereby improving the signal to noise ratio and reducing susceptibility to false alarms.

Features

▶ Removable, High Performance chamber
▶ Twin LEDs allow 360 viewing –
  green when polling, turn red in fire
▶ Pulsing/non-pulsing controlled from panel
▶ Variable sensitivity
▶ Electronically addressed
▶ Approved by LPCB & VdS
▶ SIL Level 2 approved variants available
▶ Available in white

Features

▶ Removable, High Performance chamber
▶ Twin LEDs allow 360 viewing –
  green when polling, turn red in fire
▶ Locking mechanism (sensor to base)
▶ Variable sensitivity
▶ Electronically addressed
▶ Pulsing/non-pulsing controlled from panel
▶ Approved by LPCB & VdS
▶ SIL Level 2 approved variants available
▶ Available in white

ACC-EN
Multi-Sensor

HOCHIKI

ATJ-EN

Multi-Heat Sensor

The ATJ-EN incorporates a variable temperature heat element and a rate of rise heat element, both of which are controlled from the Control Panel, allowing either thermal element or both elements simultaneously to be active in making the fire decision. The sensor polling LEDs can also be controlled via the Control Panel.

Features

‣ User selectable modes
‣ Incorporates Fixed Temperature and
‣ Rate of Rise Heat elements
‣ Twin LEDs allow 360° viewing - Green when polling, turn red in fire
‣ Pulsing/non-pulsing controlled from panel*
‣ Electronically addressed
‣ LPCB & VdS approved to Classes A1, B & C
‣ SIL 2 approved variant available

Control Panel (pulsing/non-pulsing)*.

ANALOGUE SOUNDERS

Model CHQ-WS2 is an addressable loop powered Wall Sounder innovatively designed to give a variety of tones with an output of up to 102dB(A) (±2dB(A)) with low current consumption. It is used in conjunction with either the YBO-R/3(RED) Standard Base or the YBO-R/SCI(RED) Isolator Base. Also incorporates an auto shutdown mode* which allows the user to set a fixed time within which the sounder will operate, before automatically silencing itself, ideal for minimising noise pollution.

The CHQ-WS2 is designed for internal use, but with the addition of the WS2-WP K Weatherproofing Kit, it can be used externally. The kit whic h includes a back box and gaskets increases the Ingress Protection rating to IP65. The sounder is also available in white, CHQ-WS2(WHT).

▶ Single Loop Address - addressed by the TCH-B100
▶ Hand Held Programmer
▶ Variable sound output 90 ~ 102dB(A) @ 1m (±2dB(A))
▶ Selection of 51 tones
▶ Auto-shutdown Mode*

YBO-BS
(shown with ALG-E Sensor)
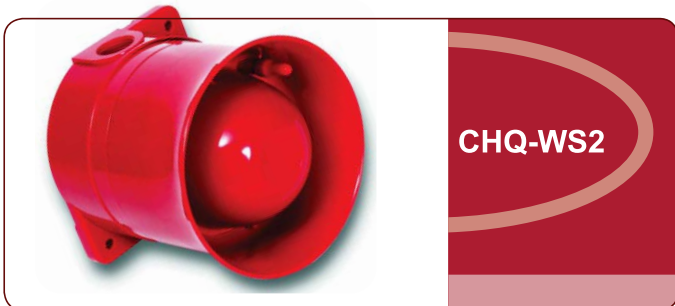
Model YBO-BS is an addressable loop powered Sounder Base allowing solid state addressing automatically by the control panel or remotely by using the TCH-B100 Hand Held Programmer. It is mounted using either the YBN-R/3 Standard Base or the YBO-R/SCI Isolator Base and can be fitted with any of the ESP Sensor or Beacon/Indicator ranges. Also available in white.

▶ Selection of tones, selected via control panel
▶ Variable sound output 50 - 98dB(A) @ 1m (±2dB(A))
▶ Optional cover available
▶ Auto-shutdown Mode*

*Dependent on control panel compatibility.

CHQ-WS2

CHQ-WS2

Flexible
Aspirating Smoke Detection

This pneumatic system is powered by a 2,000 Pa aspirator fan that functions in open, very high-airflow areas, air-conditioned environments and clean rooms. Other aspirating systems typically operate on a tlent of the ICAM IFT's suction, which renders them ineffective in more challenging and difficult applications.

▶ Single, four and six areas
▶ High-sensitivity laser detection
▶ 0.001% to 20% obscuration/m
   (0.0003% to 6% obs/ft)
▶ Modular, optional relay output units
▶ Optional 4-20 mA output module
▶ 24 VDC operation (standard)
▶ With or without display

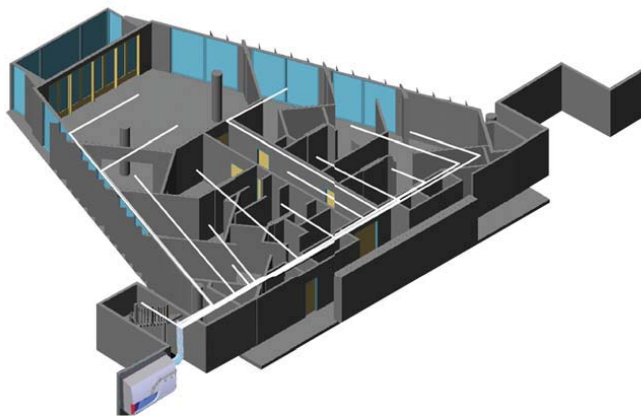ICAM IFT-1, IFT-4 and IFT-6

ICAM IFT-1, IFT-4 and IFT-6

ICAM IFT-P

▶ **Small compact footprint**
▶ **Up to 2,000 m^2 (20,000 sq ft) of protection**
▶ **0.001% to 20% obscuration/m (0.0003% to 6% obs/ft)**
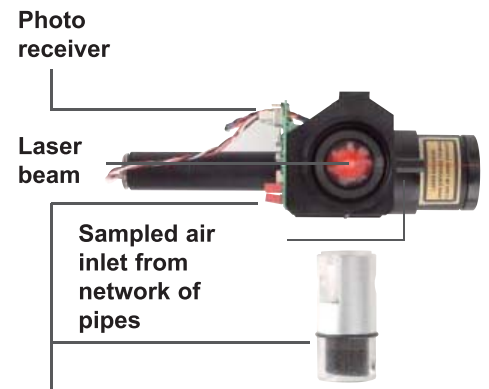▶ **IP65**
▶ **24 VDC operation**

Key Features

■ **4 alarms - Alert, Action, Fire 1, Fire 2**
■ **Up to 100 m sampling pipe perchannel**
■ **TCP/IP Ethernet interface**
■ **Remote monitoring support**
■ **Powerful 2,000 Pa fan**
■ **RS232 and RS485 Modbus**
■ **Logs up to 20,000 events**
■ **Optional output module**
■ **Unequaled removable and servic eab le optical chamber**
■ **External in-line air**
■ **Closed-loop sampling for**
■ **Absolute calibration of the**
■ **Microprocessorcontrolled**
■ **Approvals: FM, UL, VdS, CFE,**

How do the World's Finest Aspirating Systems Work?

The ICAM IFT high-sensitivity ASD is an instrument-quality nephelometer collecting scattered laser light from smoke particles over a full 360-degree sweep. The resulting sensitivity is 0.001% osculation/ m (0.0003% obs/ft), which is several hundred times more sensitive than conventional smoke detectors. This sensitivity, coupled with advanced processing and filtration, enables ICAM IFT systems to be used in the world's most demanding applications and environments.

Photo receiver

Laser beam

Sampled air inlet from network of pipes

Detection chamber/filter cartridge:
- **360-degree light guide collector**
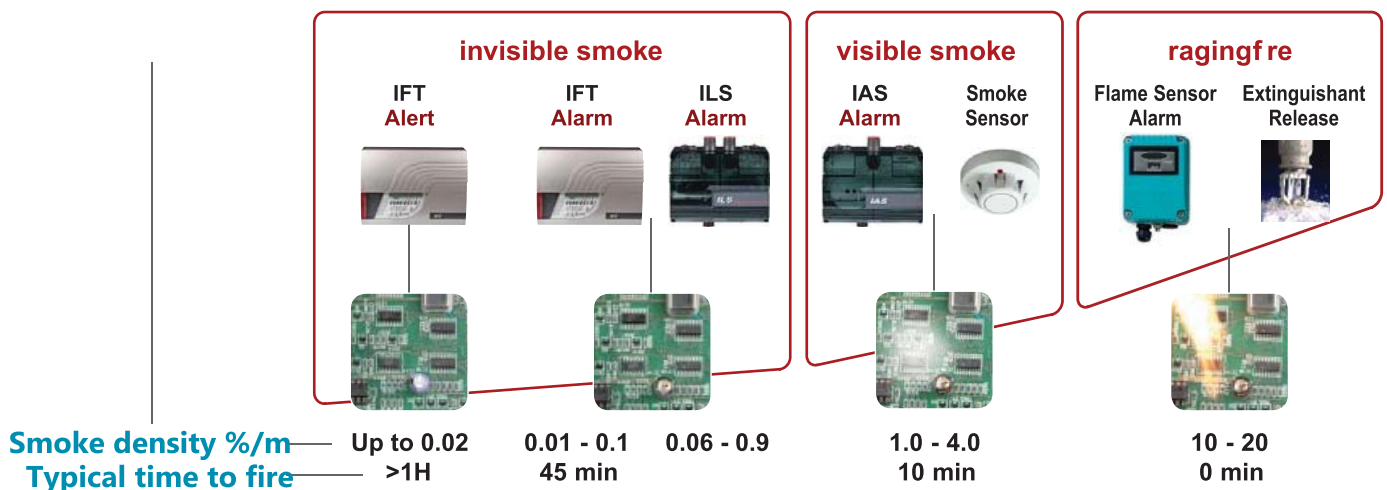- **Hundreds of times more sensitive than conventional smoke detectors**

ICAM by Xtralis instrument quality optics are protected by a rugged, removable optical chamber and filter cartridge, enabling field serviceability in the dirtiest of environments.

The image below shows the evolution of a fire on an overheating printed circuit board in a computer cabinet. The event progresses from releasing small invisible particles into a raging fire over a substantial period of time. The more time you have to react to an event, the less likely significant damage will occur, ensuring business continuity.

The additional response time provided by early detec-tion enables minor events to be investigated with minimal business disruption before fire can cause catastrophic loss.

Understanding TIME

	invisible smoke			visible smoke		ragingf re	
	IFT Alert	IFT Alarm	ILS Alarm	IAS Alarm	Smoke Sensor	Flame Sensor Alarm	Extinguishant Release
Smoke density %/m	Up to 0.02	0.01 - 0.1	0.06 - 0.9	1.0 - 4.0		10 - 20	
Typical time to fire	>1H	45 min		10 min		0 min	

OPERATING PRINCIPIES

The Discovery multi sensor construction is similar to that of the optical detector but uses a different lid and optical moldings to accommodate the thermistor (heat sensor).

The sectional view (Fig 3) shows the arrangement of the optical chamber and the thermistor.

The Discovery Optical/heat multi sensor detector contains an optical smoke sensor and a thermistor temperature sensor whose outputs are combined to give the final analogue value.

The way in which the signals from the two sensors are combined depends on the response mode selected. The five modes provide response behavior which incorporates pure heat detection, pure smoke detection and a combination of both. The multi sensor is therefore useful over the widest range of applications.

The signals from the optical smoke sensing element and the temperature sensor are independent, and represent the smoke level and the air temperature respectively in the vicinity of the detector.

The detector's micro-controller processes the two signals according to the mode selected.
When the detector is operating as a multi sensor (i.e. modes 1, 3 and 4) the temperature signal processing extracts only rate-of-rise information for combination with the optical signal. In these modes the detector will not respond to a slow temperature increase–even if the temperature reaches a high level.

A large sudden change in temperature can, however, cause an alarm without the presence of smoke, if sustained for 20 seconds.

DISCOVERY OPTICAL/HEAT MULTI SENSOR DETECTOR

DISCOVERY OPTICAL SMOKE DETECTOR

The Discovery Optical Detector has a white molded poly carbonate case with wind-resistant smoke inlets. The indicator LEDs are colorless when the detector is in quiescent state and ed in alarm.
Within the case is a printed circuit board which, on one side, has the light-proof chamber with integral gauze surrounding the optical measuring system and on the other, the signal processing and communications electronics.

The IR LED emits a burst of collimated light every second. In clear air the photo-diode receives no light directly from the IR LED, because of the angular arrangement and the chamber baffles.

When smoke enters the chamber it scatters light from the emitter IR LED onto the photo-diode characteristics and density The photo-diode signal is processed to provide an analogue value for transmission when the detector is interrogated.

Additional heat sensor information

Discovery optical/heat multi sensor detectors manufactured from mid 2009 incorporate additional temperature information that is intended for use in signal processing. Temperature data can be read separately by the control panel (see Note 1) and used to validate an alarm signaled by the multi sensor analogue value. An example of this would be a high multi sensor analogue value not accompanied by an increase in heat: this would indicate that an agent other than smoke, e.g. steam, had caused the high analogue value.
The exact method of polling to make use of this feature is described in a Technical Sales document available to panel partners.
This feature offers protection from false alarms.

DISCOSERY MANUAL CALL POINT

OPERATING PRICIPIES

Discovery heat detectors have a common profile with ionization and optical smoke detectors but have a low air flow resistance case made of self-extinguishing white poly carbonate.

The Discovery heat Detector uses a single thermistor to sense the air temperature at the detector position. The thermistor is connected in a resistor network, which produces a voltage output dependent on temperature . The design of the resistor network, together with the processing algorithm in the micro controller, gives an approximately linear characteristic from 10°C to 80°C.

This linearize signal is further processed, depending on the response mode selected, and converted to an analogue output.

For the European standard version of the detector, the five modes correspond to five "classes" as defined in EN54-5:2001.
The classes in this standard correspond with different response behavior, each of which is designed to be suitable for a range of application temperatures.
All modes incorporate "fixed temperature" response, which is defined in the standard by the "static response temperature".

OPERATING PRICIPIES

The Apollo Discovery EN54–11:2001 compliant manual Call Point (mCP) is based on the KAC conventional mCP range. It is electronically and mechanically compatible with previous Apollo call points based on KAC's World Series product.

The address of each call point is set at the commission-ing stage by means of a seven-segment DIL switch.

If an mCP is a is activated, it interrupts the normal protocol to give a fast response.
A single bi-coloured alarm LED is provided on the call point. This LED is controlled, independently of the call point, by the control panel and may be set to flash each time the call point is polled.

The red LED is lit when the call point has been activat-ed and sent into alarm. On the isolated versions an amber/yellow LED indicates a short circuit on the loop wiring either side of the call point.
Call points can be remotely tested from the panel by transmission of a single bit in the communications protocol. Call points respond by providing a value of 64 which corresponds to the alarm value.
The panel should recognize this response as a test signal and should not raise a general alarm.
Discovery manual Call Points are available with or without an isolator. Each version is available with a resettable element and a back box for surface mount-ing as standard.

DISCOVERY HEAT DETECTOR

WATERPROOF AND NON-STANDARD MANUAL CALL POINTS

Discovery waterproof (IP67) manual call points are available in red or yellow. For special purposes, such as initiating a 'hazard' alarm, specially colored call points can be used on the fire system.

DISCOVERY

INTERFACES

INTERFACES

A comprehensive range of interfaces for use with Discovery systems is available from Apollo. They are designed to enable fire protection systems to be engineered simply and effectively without the need for custom-designed equipment.

These interfaces are available in three types of housing. The standard interfaces are designed to be surface or flush-mounted while the DIN-rail vers-ions feature enclosures that clip to a standard 35mm DIN rails (DIN 46277) or are screwed to the base of a larger enclosure .miniature interfaces use very compact enclosures for installation into other equipment.

The standard interface range is fitted with bi-directional, short-circuit isolators. These interfaces allow for easier installation when large numbers of interfaces are required.

The following interfaces may be incorporated into Discovery systems:

• Input/Output Unit provides a relay output and one monitored input

• 3-channel Input/Output Unit provides 3 relay outputs and 3 monitored inputs

• Mains Switching Input/Output Unit switches machinery operating at 230V

• Output Unit provides one relay output

• Zone Monitor controls a zone of conventional detectors

• Switch Monitor monitors the operation of a switch

• Switch Monitor Plus monitorsthe operation of a switch; also incorporates a time delay

• Sounder Controller controls the operation of conventional sounders

• Mini Switch Monitor monitors the operation of a switch and is small enough to fit into other equipment

• Dual Isolator

OPEN AREA SOUNDER BEACON

The Discovery® Open Area Sounder Beacon is an alarm device comprising a sounder, a beacon and a short-circuit isolator for use with Discovery detec -tion systems. It is supplied with a mounting base which incorporates a short-circuit isolator.

OPEN AREA
SOUNDER
BEACON

Application

The Discovery Open Area Sounder Beacon is used to provide audible and visual warning of fire and is controlled by the fire control panel by means of the Discovery protocol.

The particular features of this sounder beacon are available only when it is being controlled by the full Discovery protocol with the panel programmed accord -ingly Information on available features should be requested from the panel manufacturer.

Features & advantages

These are identical to the Discovery Sounder Beacon Base but the Open Area Sounder Beacon is a wall-mounted stand-alone device that produces a higher sound output of up to 100dB(A).

TECHNICAL DATA

Discovery Open Area sounder Beacon
Part No 58000-005 (red), 58000-007 (white)
Specifications are typical at 24v, 23°C and 50% relative humidity unless otherwise stated.

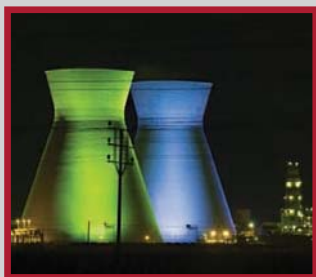|		
Operating voltage:	17–28V DC (polarity sensitive)	
Protocol pulses:	5–9V	
Current consumption at 24V:	switch-on surge, <1s	1.2mA
	quiescent	350µA
	device operated at maximum volume	8.2Am
Maximum sound output at 90°:	100dB(A) Sound pressure level data is published in	
	PIN sheet PP2203 available from Apollo	
Operating temperature:	–20°C to +60°C	
Humidity (no condensation or icing)	0–95%	
IP rating:	65	

Sariak

integrity solutions