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YELLOW FINCH GMN

Optically Powered
Gas Monitoring Network

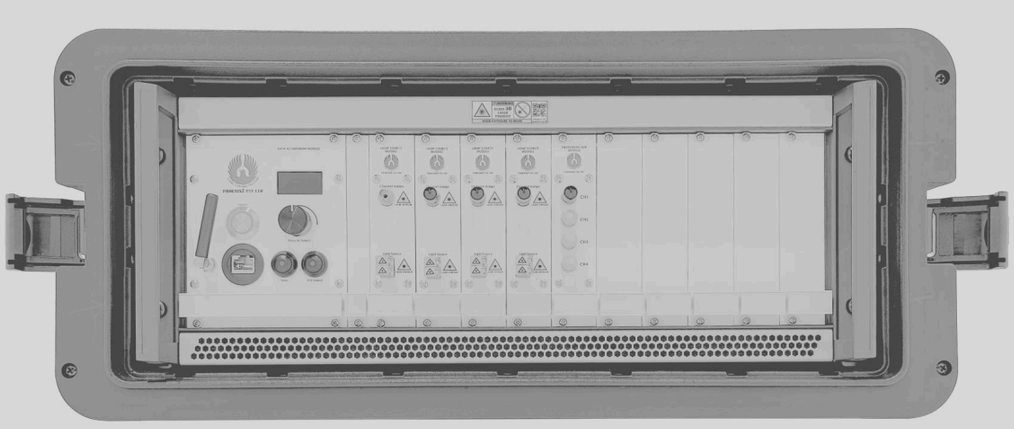


YELLOW FINCH GMS

The Optically Powered Yellow Finch Gas Monitoring Network (GMN) is designed for real time monitoring of CH_4, CO_2, CO and O_2 in underground coal mines. It consists of four intrinsically safe, optically powered Gas Monitoring Stations (GMS) connected to a Remote Terminal Unit (RTU) via a ruggedised optical fibre cable. The RTU can be located kilometres away on the surface of the mine or in a non-hazardous area, where electrical power is available. The GMS units are optically powered and intrinsically safe (Ex ia op is I Ma).

FEATURES	
01	4 x digital gas sensors (CH_4, CO_2, CO and O_2)
02	Temperature and air pressure sensors
03	1 second sampling interval (software adjustable)
04	Visible alarm triggered locally
05	In-situ calibration available
06	Intrinsically safe battery for an alarm and backup power
07	Real-time webpage display of gas concentrations
08	Data logging with time stamps
09	Bluetooth connectivity

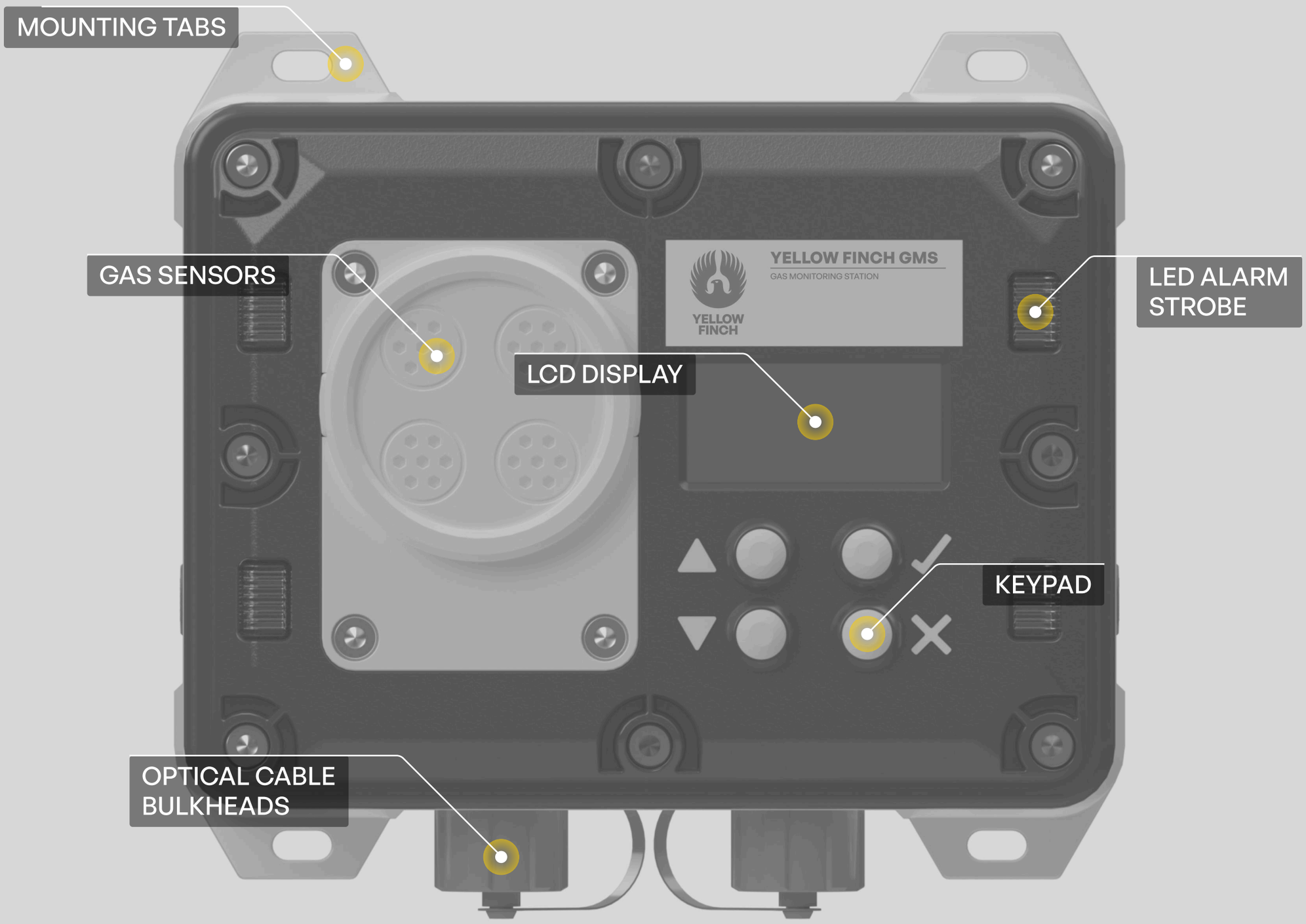




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GAS MONITORING STATION (GMS)

The GMS is intrinsically safe, optically powered and includes an intrinsically safe auxiliary power source (battery). The LCD display provides real-time readings for gas concentrations of CH_4, CO_2, CO and O_2, and together with the keypad, users can configure its settings. With industry standard optical cable bulkheads at the bottom, the GMS is powered by optical power from the Light-in port.

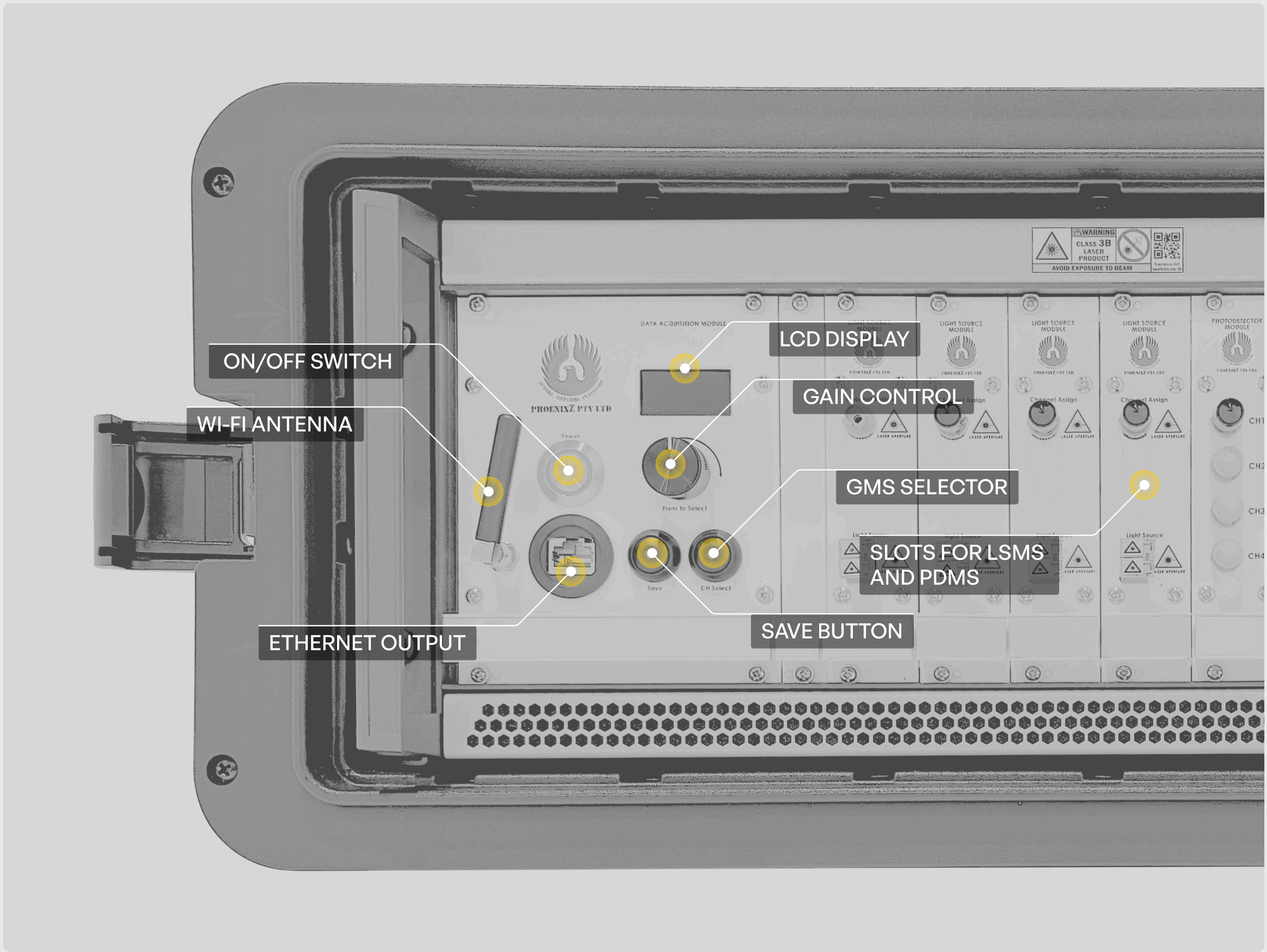


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REMOTE TERMINAL UNIT (RTU)

The RTU consists of a chassis which houses the Data Acquisition Module (DAM) and up to eight Light Source Modules (LSMs) supporting eight GMS units and two corresponding Photodetector Modules (PDMs).





LIGHT SOURCE MODULE (LSM)

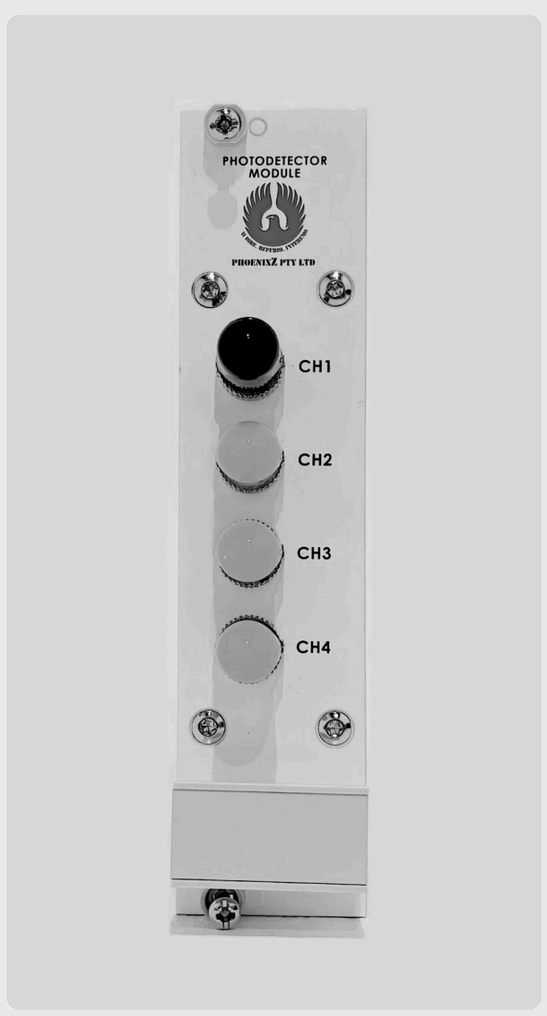
The LSM is an electro-optic module that supplies light via optical cable to the GMS, to power it and read output data. Each unit is IS certified.





PHOTODETECTOR MODULE (PDM)

The PDM receives the optical data signal from the GMS, converts it to an electrical signal, and transmits it to the DAM. Each PDM supports up to four LSM units.





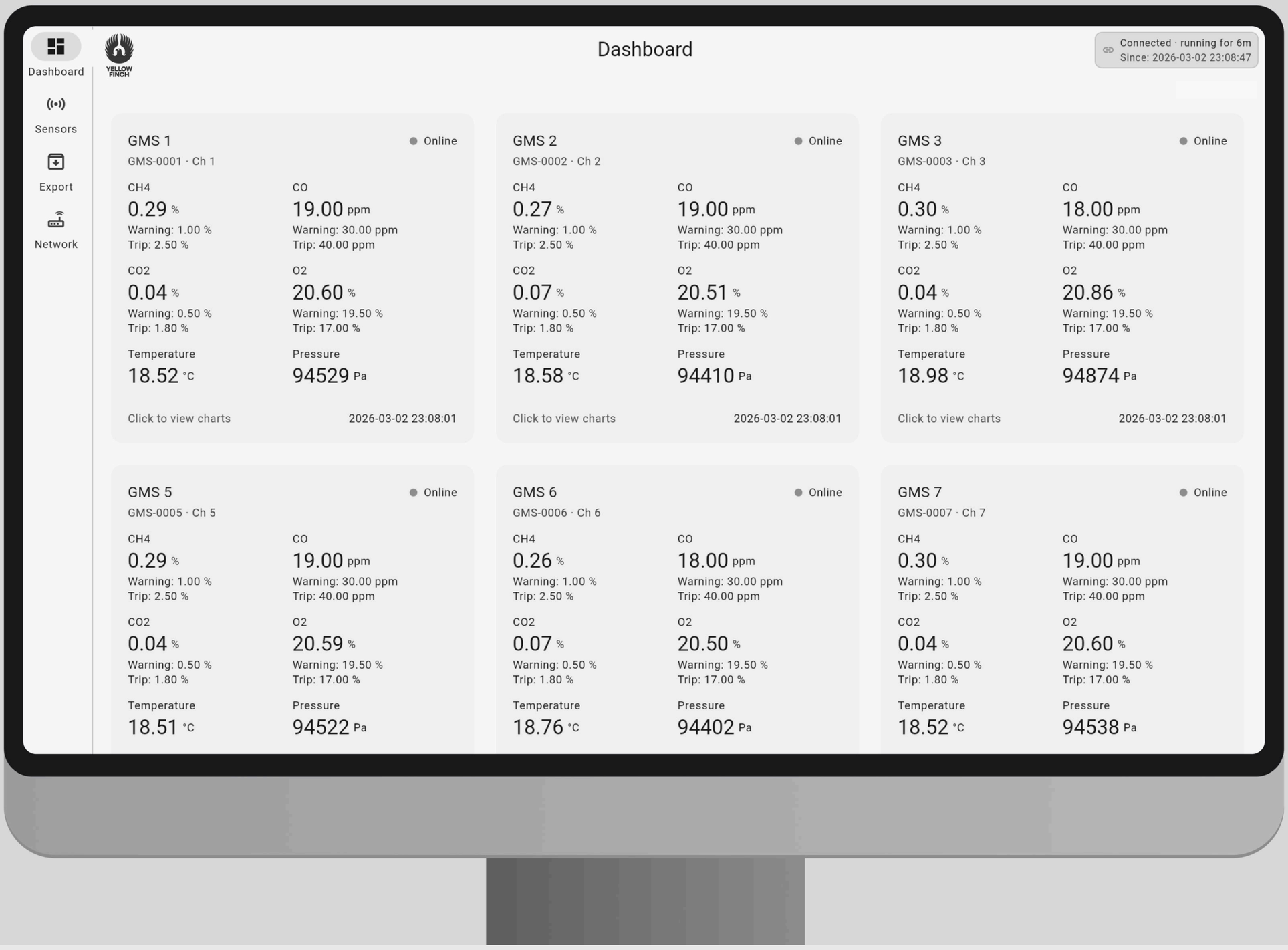
SOFTWARE INTERFACE OVERVIEW

The Yellow Finch software interface provides a real-time visualisation and control platform for the Gas Monitoring Station (GMS) and Remote Terminal Unit (RTU).

Sensor data is transmitted optically from the underground GMS to the surface RTU, where it is converted into Ethernet format. The RTU hosts a local web interface that can be accessed via Ethernet or Wi-Fi using a laptop, tablet, or mobile device within the same network.

NETWORK OVERVIEW PAGE

The first page of the interface presents the entire gas monitoring network, consisting of multiple GMSs. Each station displays real-time measurements and its operational status as well as alarm status and threshold levels.



By clicking on a specific station, the user can access detailed data for that station.

STATION DATA VIEW

The station page presents sensor data in the time domain. Each graph shows the variation of a specific sensor output versus time, updated in real time.

The interface displays:

- Real-time gas concentrations (CH_4, CO_2, CO, O_2, etc.)
- Alarm status and threshold levels
- Historical data stored with time stamps (micro-SD based logging)



Using the Station Control Menu the user can:

- Select the desired time span
- View live and historical trends
- Monitor alarm thresholds
- Download data into an Excel spreadsheet for further analysis

INTERFACE FEATURES

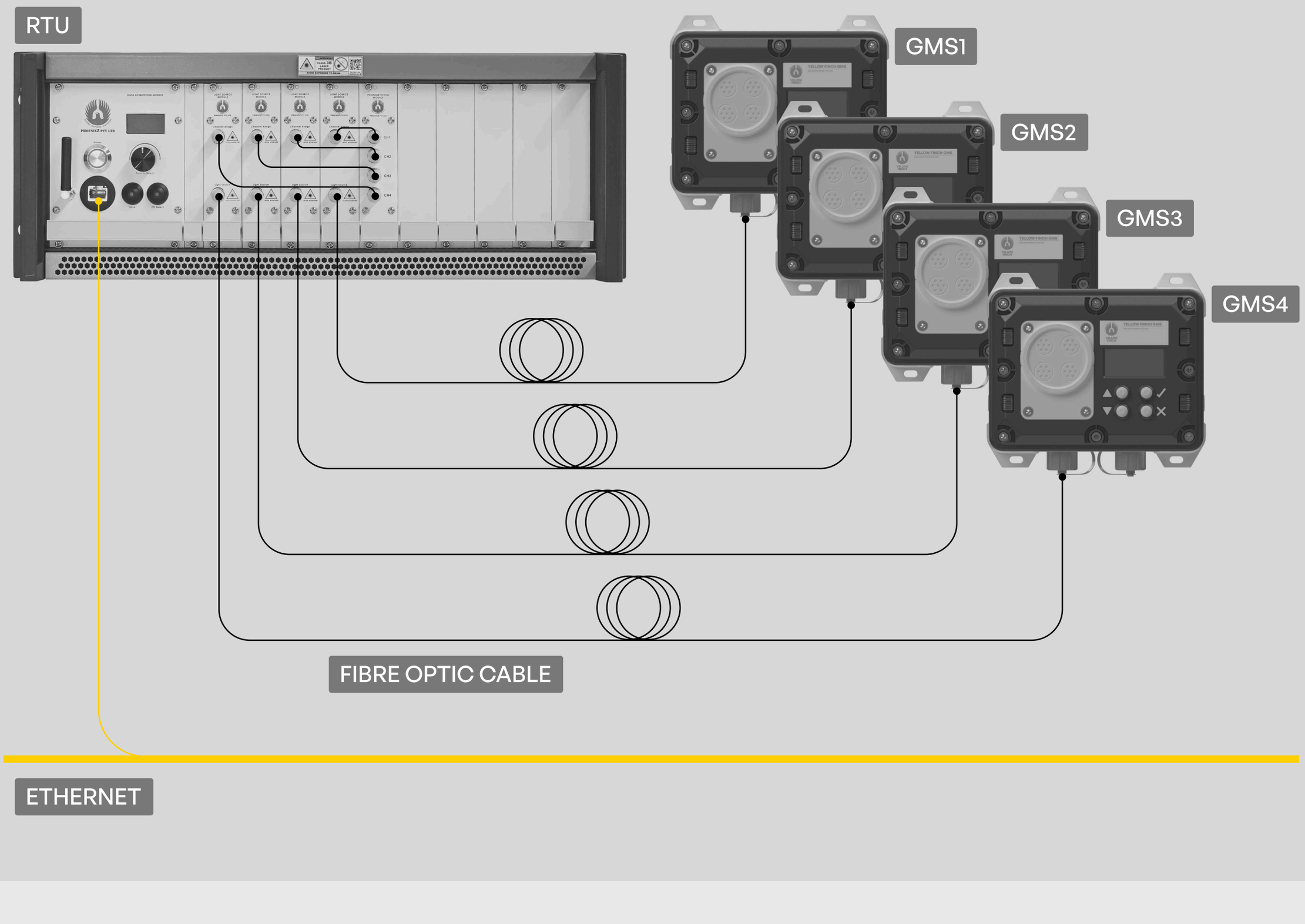
DISPLAYED FEATURES	
01	Real-time gas concentrations (CH_4, CO_2, CO, O_2, etc.)
02	Alarm status and threshold levels
03	Historical data stored with time stamps (micro-SD based logging)
04	Calibration, zeroing, and span adjustments can be performed directly using the GMS interface. All measurements and operational modes are time-stamped and stored for compliance, traceability, and auditing.

The system is designed to be simple, intuitive, and fully compatible with standard industrial Ethernet and SCADA integration.

OPTICAL NETWORK CONFIGURATION

The optical network is based on ruggedised multi-core optical fibre cables. The preferred configuration involves a dedicated cable connecting each GMS with the RTU.

The optical signal carrying sensor data returns to the RTU along the same optical path as the original signal. The RTU then converts this signal into the required digital format and provides it to the customer via Ethernet. By connecting the RTU to a Wi-Fi router, laptops and mobile devices within the same network can access the system webpage either over Ethernet or wirelessly.



TECHNICAL SPECIFICATIONS

GENERAL SPECIFICATION		
TARGET GAS	CH_4, CO_2, CO, O_2	
OTHER SENSORS	Temperature, Air pressure	
GAS SAMPLING METHOD	Diffusion	
	GMS	RTU
OUTPUT SIGNAL	Digital Output (SFK) Wireless, Bluetooth	Ethernet
POWER SUPPLY	<148mW optical power	240 V AC at 50 Hz
WEIGHT	<1kg	<10kg
DIMENSIONS (W, H, D)	225mm x 200mm x 72mm	19 in Rack, 4U
MAX FIBEROPTIC CABLE LENGTH	10km	
SAMPLING RATE	1Hz	
TELEMETRY SYSTEM RESOLUTION	12-bit	
INGRESS PROTECTION LEVEL	IP 54	
OPERATING TEMPERATURE	0 to 40° C	
TEMPERATURE MEASUREMENT	0 to 40° C	
PRESSURE MEASUREMENT	300 to 1100hPa	
WARMUP TIME	60s	
BATTERY LIFETIME	Depends on alarm trigger times	

GAS SENSOR SPECIFICATION		
GAS SENSOR	MEASUREMENT RANGE	RESPONSE TIME T90 (S)
CH_4	0-5% v/v	30
CO_2	0-1.5% v/v	30
CO	0-500ppm	15
O_2	0-25%	15

CERTIFICATIONS
GMS: IECEx ExTC 26.0005X Ex ia op is I Ma
RTU (LSM): IECEx ExTC 26.0006X [Ex ia op is Ma] I

CONTACT US

For enquiries, product information, or partnership opportunities, please get in touch with the PhoenixZ team.

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ACARP

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