GDS
TECHNOLOGIES LTD

C930
Manual No. ARW 127-9
Issue E

GasNet

OPERATING HANDBOOK

www.gds-technologies.co.uk

Tel. +44 (0)113 286 0166 Fax. +44 (0)113 287 8178
Email. sales@gds-technologies.co.uk

GasNet – Gas Monitor

Main Controller		Location	Serial No.			
Sensor No	Add		Gas Type	Relay O/P	Snoop Box	Group
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						

Contents

Page

Illustrations

Fig.

Factory set at dispatch	Standard	Special
Gas Type		
Lo Alarm		
Hi Alarm		
Overrange Alarm		
Lo Alarm	Latched	Unlatched
Hi Alarm	Latched	Unlatched
Overrange Alarm	Latched	Unlatched
Alarm relays	De-energised	Energised
Fault relay	De-energised	Energised
Sensors Calibrated	Yes	No
Alarm relays – to standard specification – see technical – outputs		
Works Order No		
Notes:-		

Description

Gas Net is an addressable gas monitoring system having the capacity to interrogate up to 32 GDS sensors on a single 4 core cable network.

All sensors continuously monitor the atmosphere reporting any hazardous condition to the control unit which would be displayed by the alpha numeric screen, indicating the reporting sensor, gas type, concentration, alarm status and peak reading (historical record).

Alarm levels that are exceeded will automatically activate user-selected relays, resulting in operation of remote alarm and control functions. In addition each safe area sensor has an on board alarm relay for local sounders or visual indicators, which may be supplied from the network 24v DC.

Data acquisition may be accessed through the RS232 port, see technical page 5.

To provide for local control of equipment the SNOOP box is available, and is connected via a four core cable to the sensor network.

Each SNOOP box provides four independant 4~20mA outputs, each of which may be driven by any combination of the 32 sensors, providing a peak signal output for the selected sensor group. In addition four relays are available, again selectable for any combination of sensors which may be zoned and voted as required.

The SNOOP unit may also be used as a local alarm indicator providing the sensor number that has alarmed with audible and visual warnings.

Technical

CONTROL UNIT

Addressable Sensors Available	32
Power Supply	230/115v AC or 24v DC – sensor network operating voltage 24v DC normally supplied by the control unit but on larger systems may be fed from an independent source
Standard Control Unit	Internal power available for sensors 4A @ 24v DC Consumption without sensors 160mA (alarm condition 200mA) Toxic/Oxygen sensor consumption 90mA (Alarm condition 100mA) Flammable sensor consumption 100mA (Alarm condition 110mA) Sensor minimum operating voltage 17v DC (see sensor cable volt drop – page 6)
Indicators	POWER – Green L.E.D. ALARM Red L.E.D. FAULT Amber L.E.D. Display – Four line alpha numeric
Auxiliary power supply (Network Booster)	24v DC @ 2A – see page 16
Remote outstation power supply	24v DC @ 2A (1~8 sensors) – see page 16
Sensor Type/Inputs	Electrochemical, infra-red 4~20mA, catalytic – mV
Sensor Communication	RS485
	All relay contacts used to switch inductive loads (relays etc) should have suppressors fitted, typical device Farnell 772-756
Outputs	16 relays user selectable S.P.C.O. (zone selection for any sensor) For alarm voting see Snoop Box page 4 Relay 1 pre-set – Common low alarm (1st alarm stage) Relay 2 pre-set – Common high alarm (2nd alarm stage) Relay 3 pre-set – Common overrange alarm (3rd alarm stage) Fault – Common relay S.P.C.O. N/D – N/E option (Relay 17) Mains fail relay – S.P.C.O. N/E (Relay 18) General Alarm Relay - Common to all alarms which will reset whenever the reset button is pressed regardless of alarm state - used for remote sounders (Relay 19) All volt-free relay contacts rated 5A-230v AC Relays 1-16 user selectable normally energised or de-energised, latched or unlatched Relays 1-16 user selectable for any number of sensors Relays 1-16 user selectable time delay to alarm Analogue 4~20mA output – see Snoop Box page 7 RS232 communication – ASCII – Data Collection Information available for display Real time clock Gas Net identification letter Continuous 1st line (top line) of Gas Net display – refreshed every 10 seconds. Option: - No readout until alarm condition – top line display refreshed every 10 seconds

Setting up: -

Windows 95 → hyper terminal → hyper trim, choose name and icon.
Select comms channel, input following information

Bits per second	1200
Data bits	8
Parity	None
Stop bit	1
Flow Control	None

On exit save session

Internal Audible Alarms

Alarm/Fault – permanent mute option

SENSORS

Sensor Outputs (Safe Area Sensor)

Relay D.P.C.O. N/D 5A/230v AC (not resetable until gas has cleared)
Option – resetable while gas present (factory option)
Activated by low alarm
Internal alarm L.E.D. (Red)
Optional: - Digital display card

Sensor Cable

Open ended screened 4-core 1.5^{2}mm minimum - (24v DC power may be looped)
(2x power 24v DC and 2x Comms. RS485-AB)
Outstation – 3 core 1.5^{2}mm screened max length 250m
Remote outstation – 3 core 0.2^{2}mm screened max length 1Km
Cable type – Electrically shielded i.e. MICC, SWA, screened
Sensor cables terminating at control unit 1~32
Sensor field terminal allocation within enclosure
4 x 4-way (sensor lines 1~4) all connected internally
Connectors – push-on 4mm max cable size

Environmental

Metal control unit (standard) – IP52
Plastic control unit (optional) – IP65
Sensors standard – IP53
Fitted with weather cones – IP65
Operating temperature – 10 + 50˚C
Humidity 0 to 90% R.H.

Screen text indicating sensor type (gas type) may be factory adjusted to accommodate customer requirements i.e. humidity, temperature etc.

Miscellaneous

Enclosure cable entry – bottom, rear
Alarm relays – Automatic inhibit during service periods
Dimensions plastic enclosure:- 296W x 260H x 140D
metal enclosure:- 310W x 265H x 75D
Option:– standby power supply
Weight:– 3.4kg
CE – Cert. No C500

Sensor cable – Volt Drop (current carrying capacity)

mm^2	Volt drop/ampere/mtr (mV)
1	43
1.25	35
1.5	31
2.5	18
4	11

Snoop Box

Power for the unit is derived from the Network 24v DC

Description

Any number of snoop units may be attached to the network at any point using a four core cable and offers four analogue 4~20mA outputs each of which may be driven by any number of the 32 sensors providing a peak reading output.

Four relays are available which may be zoned and voted for any sensor grouping. When voting the number of alarms required to switch the alarm relay in any of the four groups is selectable between 1 and 4.

Indicators

Power – Green L.E.D. Alarm – Red L.E.D.
Display – four line alpha numeric

Screen information: -
S – Sensor No (I ~ 32)
Val – Value % of full scale gas reading
AL – Alarm activated (opposite appropriate sensor)
SG – Sensor Group (1 ~ 4)
VA – Voting alarm selection
420M – 4 ~ 20 mA scaling

Environmental

Protection – IP65
Operating temperature -10 + 50˚C
Humidity 40 to 90 RH

Miscellaneous

Enclosure cable entry – bottom, sides, top, rear
Dimensions – 200W 120H 60D
Weight – 600g
Sounder – Mutable for each alarm (permanent mute option)
Relays – 4 sets D.P.C.O. rated 5A 230v AC

Operational Notes

DISPLAY DATA – GAS NET

The controller is always scanning the sensors and displays the results on the display. The top three lines are the results of measurements. The bottom line is used to control the actions of the controller.

Four lines - 20 characters.

Typical line display	**1**	**4.52%**	**L.e.L.**	**^**	**K 4.52**	**D**
	Channel No	Sensor Reading	Gas Type	Rising Level	Peak Reading Obtained	Delay to Alarm Seconds

The top three lines rotate in sequence with new data being inserted in line 1 (top line) and older data being on line 3.

If a sensor fails to respond the message 'NO RESPONSE' is displayed on the line rather than data, should a sensor cable fault occur then sensor failure will be displayed, followed by a fault alarm after approx. 3 minutes.

On power up the display shows: Polling - Alarm - 0, the initialising period is 30 seconds.

This indicates that the sensors are being requested for data and the total number of alarms present are 0, this number can change when alarm conditions are detected and it could be as high as 32, which would indicate that all 32 channels are in some alarm state.

Functions available:-

In order of Access

1 Sensor - activate/deactivate

2 Gas Type Selection

3 Low Alarm trip point set and latched or unlatched set

4 High Alarm trip point set and latched or unlatched set

5 Overrange Alarm trip point set and latched or unlatched set

6 Low alarm relay selection – 1 to 16 options

7 High alarm relay selection – 1 to 16 options

8 Overrange alarm relay selection – 1 to 16 options

9 Alarm relays - energised/de-energised

10 Sensor zero

11 Sensor calibration – span gas setting and peak hold

12 Gas alarm on delay - seconds

Normal operating status, allows interrogation of all functions and any alarm status – but no adjustments of settings.

Buttons (KEYS)

(U) ↑ **(D)** ↓

Pressing ↑ or ↓ allows for change of channel and the increase or decrease of values

(O) !

Having selected a channel the range of data to be viewed may be selected by pressing !

(E) ∧

Data on a range may be altered by pressing ∧ and ↑ or ↓.

When the ∧ key is depressed the selected date column will change from lower case to upper case.

Z/R and **S**

Used to instigate a change i.e. pressing **Z** will zero a channel or initiate selection of an alarm relay.

S is used to silence the audible alarm. **R** will reset any latched alarms within the main alarm panel and sensor housing, this will only be possible when the gas level has reduced below the alarm trip threshold.

Settings

The fourth line of the display will under normal conditions indicate: (Polling - Alarms = 0) this corresponds to ‘ NO SENSOR SELECTED’ and is termed the polling position (quiescent state).

Pressing ↑ or ↓ rotates the channel selection from 1 to 32 and poll position.
Where multiple sensors are used the following settings may be carried out sequential to each sensor eg. Gas Type settings – select gas type from the library and set all active sensors

i.e. press ↑ for channel number then press !
press ∧ ↑ or ∧ ↓
1. L.E.L. sensors
2. CO sensor
3. O_2 sensor etc.

The system is supplied factory set to customer requirements. Should further adjustment be required then the following routines should be followed: -

The setting up sequence is as follows:

Entry Access – Interrogation and adjustment of all functions

1. **Access Entry** – With instrument in polling status press **!** (o)
   Press button D the first * will appear
   Press button U the second * will appear
   Press O for the third *
   Access is indicated by a key F symbol located in the bottom left hand corner of the screen and words – changes enabled.

   Inhibit – All alarm relay actions are inhibited (INHIBIT) during the access period. To remove access, the code should be re-entered, at which time the inhibit will also be removed.
   For fail safe purposes the inhibit is removed automatically one hour after the last function adjustment.

When activated all control unit relays are maintained in their current state.
Sensor relays are returned to their normal non-alarm state.
(Note: The inhibit is automatically removed one hour after accessing).
Where a faulty sensor needs to be temporarily isolated from the network the sensor should be de-activated. See No 2 - Adding or removing a sensor.

2. **Adding or removing a sensor**

When wishing to add or remove a sensor from the system the appropriate channel must be activated or de-activated on the display:

a. Select channel using ↑ or ↓
b. Press ∧ and ↑ to activate, typical screen indication 1# 0.0% LEL ∧ K 0.0
c. Press ∧ and ↓ to de-activate, screen indication – not active

3. **Gas Type – See page 13**

a. Press **!** the display will indicate a gas type selected from the library.
Typical screen indication 1 # Gas = % LEL ∧
b. Press ∧ and ↑ or ↓ this will change the indicated gas type.

4. **Low Alarm Trip Point Settings and Latch or Unlatched Alarms**

a. Press **!** the display will indicate LOW ALARM – Typical screen indication
1 # low alarm = 20.0 N
b. Press ∧ and ↑ or ↓ this will change the indicated alarm trip points.
Alarm Latched or Unlatched
press **Z** for unlatched (N) or **S** for latched (L)

5. **High Alarm Setting**

a. Press **!** the display will indicate HIGH ALARM.
Repeat as for 4

6. **Overrange Alarm Setting**

a. Press ! the display will indicate OVER ALARM
Repeat as for 4

7. Low Alarm Relay Selection

There are 16 relays any of which may be driven by the low, high or overrange alarm drivers.

Low Alarm Relay Pointer *

	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
Rl	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	← Relay No
														C O	C H	C L	Common

a. Press **!** the above will be displayed (excluding relay numbers).
b. Press ∧ the pointer will move from right to left across the relay indicators until the pointer is above the appropriate relay.
c. Press **S** to activate (* will appear) or **Z** to de-activate, any number of the 16 relays may be selected.

8. High Alarm Relay Selection

	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
Rh	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	← Relay No
														C O	C H	C L	Common

a. Press **!** the above will be displayed (excluding relay numbers).
b. Repeat as for 7

9. Overrange Alarm Relay Selection

	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	
Ro	-	-	-	-	-	-	-	-	*	-	-	-	-	-	-	-	← Relay No
														C O	C H	C L	Common

a. Press **!** the above will be displayed (excluding relay numbers).
b. Repeat as for 7

10. Alarm Relays - Normally energised or normally de-energised

a. Press **!** Typical screen display Normally energised
b. Press **Z** for de-energised or **S** for energised

11. To Zero Sensors

a. Press **!** Typical screen display 1 # 10.0%LeL ∧ K 10
b. Press ∧ and **Z** the reading will go to zero, this should only be carried out in clean air (minimum sensor output).

NOTE: - Do not zero oxygen sensors the sensor is constantly monitoring at 20.8% - (Normal reading should be 20.8%). See Sensor Settings - Oxygen - page 18 - Calibrate only.

12. To calibrate sensors

Span gas = 50.0% LeL

a. Press **!** Typical screen display 1 # 0.0% LeL ∧ K 0.0

b. To clear any old peak readings press ∧ and **Z**

Note: Oxygen sensors peak readings should not be zeroed but remain at 20.8% as for normal ambient reading - and calibrated at that level.

c. Press **S** and ↑ or ↓ to set span gas level i.e. calibration gas used 1% CH_4 = 20% LEL, the span setting should be 20.

d. Apply test gas - a gas reading will be obtained with its peak reading being recorded.

e. Remove test gas, if the peak reading is different to that of the span gas figure then press ∧ and **S** – (**CAUTION):** Only carry this out if span gas has been applied. The unit is now calibrated.

13. Delay to Alarm

a. Press ! Typical screen display 1 # 0 seconds.
Where 1 = sensor number and 0 = time in seconds.

b. Press ↑ ↓ to select sensor number.

c. Press ∧ and ↑ or ↓ to adjust time.

14. Return to Poll Position.

Press ↑ **or** ↓ until poll position appears on the bottom line of the display.

15. Remove system access. (Inhibit)

Re-enter access code.

DATA COLLECTION – see technical page 5

Alarm panel identification letter A to Z

During power up press and maintain pad 0.
Use ↑ (U) ↓ (D) to set panel letter.
Press silence when set
Low sensor ON/OFF

REAL TIME CLOCK

Use ↑ ↓ to set year then press silence (s).
Repeat for month, day, hour, min.
The unit will then power up as normal.
The panel number appears on the L.C.D. and on the serial data port.
The time appears on the data record only.

Gas Type Library

	GAS	RANGE	STANDARD ALARM SETTINGS		
			LO	HI	OR
1	% L.E.L.	0-100 % L.E.L.	20%	40%	100%
2	O_2 %v - Low/High	0-25 % vol.	18%	23%	25%
3	CO_2 %v	0-2%	0.5%	1.5%	2%
4	CO_2 %v	0-30 %	5%	15%	30%
5	CO ppm	0-250 ppm	50 ppm	200 ppm	250 ppm
6	H_2S ppm	0-50 ppm	5 ppm	10 ppm	50 ppm
7	SO_2 ppm	0-10 ppm	2 ppm	5 ppm	10 ppm
8	N_2O ppm	0-100 ppm	25 ppm	30 ppm	100 ppm
9	NO_2 ppm	0-10 ppm	3 ppm	5 ppm	10 ppm
10	Cl_2 ppm	0-10 ppm	0.5 ppm	1 ppm	10 ppm
11	H_2 ppm	0-1000 ppm	250 ppm	500 ppm	1000 ppm
12	HCN ppm	0-25 ppm	5 ppm	10 ppm	25 ppm
13	HCl ppm	0-10 ppm	2 ppm	5 ppm	10 ppm
14	NH_3 ppm	0-100 ppm	25 ppm	35 ppm	100 ppm
15	O_3 ppm	0-1 ppm	0.1 ppm	0.3 ppm	1 ppm
16	C_2H_4O ppm	0-25 ppm	5 ppm	10 ppm	25 ppm
17	CH_4 %v	0-5 % vol.	1% vol.	2% vol	5% vol
18	HF	0-100	100	100	100
19	CO ppm	0-80 ppm	10 ppm	30 ppm	
20	LPG % L.E.L.	0-100 % L.E.L.	20%	40%	100%
21	Refrigerant	0-1000 ppm	250 ppm	500 ppm	1000 ppm
22	Zone 1	0-100	100	100	100
23	Zone 2	0-100	100	100	100
24	Zone 3	0-100	100	100	100
25	Zone 4	0-100	100	100	100
26	O_2 %v – Low/Low	0-25% vol.	17%	19%	25%
27	NO ppm	0-100 ppm	25 ppm	35 ppm	100 ppm
28	H_2S	0-100 ppm	5 ppm	10 ppm	100 ppm
29	NH_3 ppm	1000 ppm	500	750	1000
30	NH_3 %v	0-5 % vol.	2%	3%	5%
31	mmWg	-1000 to +3000	-200	+500	+3000

Installation

SITING THE SENSING HEADS

A key feature of the installation is the correct siting of the sensing head. Several considerations must be taken into account, the most important being the density of the gas.

Density (air = 1)			
Acetone	2.0	Hydrogen-Sulphide	1.18
Acetylene	0.91	Hydrogen	0.069
Ammonia	0.6	Methane	0.6
Benzene	2.8	n-Pentane	2.5
n-Butane	2.0	n-Propane	1.6
Carbon Dioxide	1.53	Town gas	0.4-0.7
Carbon Monoxide	0.96	Xylene	3.7

Under still air conditions, a 'lighter than air' gas such as methane leaking from a small aperture at ground level, will rise in a plume the shape of which approximates an inverted cone. As the gas rises, it draws air from the surroundings and creates a turbulence. Resulting from this there occurs rapid dilution and, unless a sensor is positioned within the plume, there will be no initial indication of a leak.

As gas continues to escape, the diluted concentration rises to ceiling level and begins to layer. In time the concentration at ceiling level will increase and this, in turn, will displace air downwards.

Dangerous concentrations will therefore, tend to occur at ceiling level and the thickness of this layer will increase with the passage of time.

Ventilation of the room will of course alter the situation significantly but it should be remembered that if the ventilator is not at ceiling level, a dangerous concentration can still occur between the top of the ventilator and the ceiling.

For heavier than air gases such as propane or butane, the formation of dangerous layers occurs at ground level. These gases tend to behave like water and will run down gradients and pool at the lowest point.

The number of heads required in individual rooms is determined by the number of possible hazards in the vicinity.

Gas leakage may occur around valves, flanges and wherever gas pipes are jointed. It may be possible to cover several probable gas leaks in one room by the careful siting of a single head. Cable ducts, trenches and manholes are also likely places where a build up of heavy gases may occur.

When siting a head in such places it is most important to ensure that there is no likelihood of flooding by water, or excessive dust which may block the sintered disc and prevent gas from reaching the sensor.

When monitoring gases outside, those lighter than air will be quickly dispersed, but gases heavier than air will tend to form in layers and again cause a dangerous hazard. When siting heads outdoors prevailing winds must be taken into consideration and adequate protection given against wind and rain by the use of weather or collector cones.

The **GAS NET** control unit is designed for installation in a safe area only. Siting of the instruments should be chosen with regard to the following points:

a. away from sources of local heat with room for adequate ventilation.

b. within easy reach and audible distance of operating personnel.

c. convenient to a separately fused power supply.

d. incoming sensor cables and outgoing alarm annunciation.

e. sensor cables to be electrically shielded, steel wire armoured or screened cable.

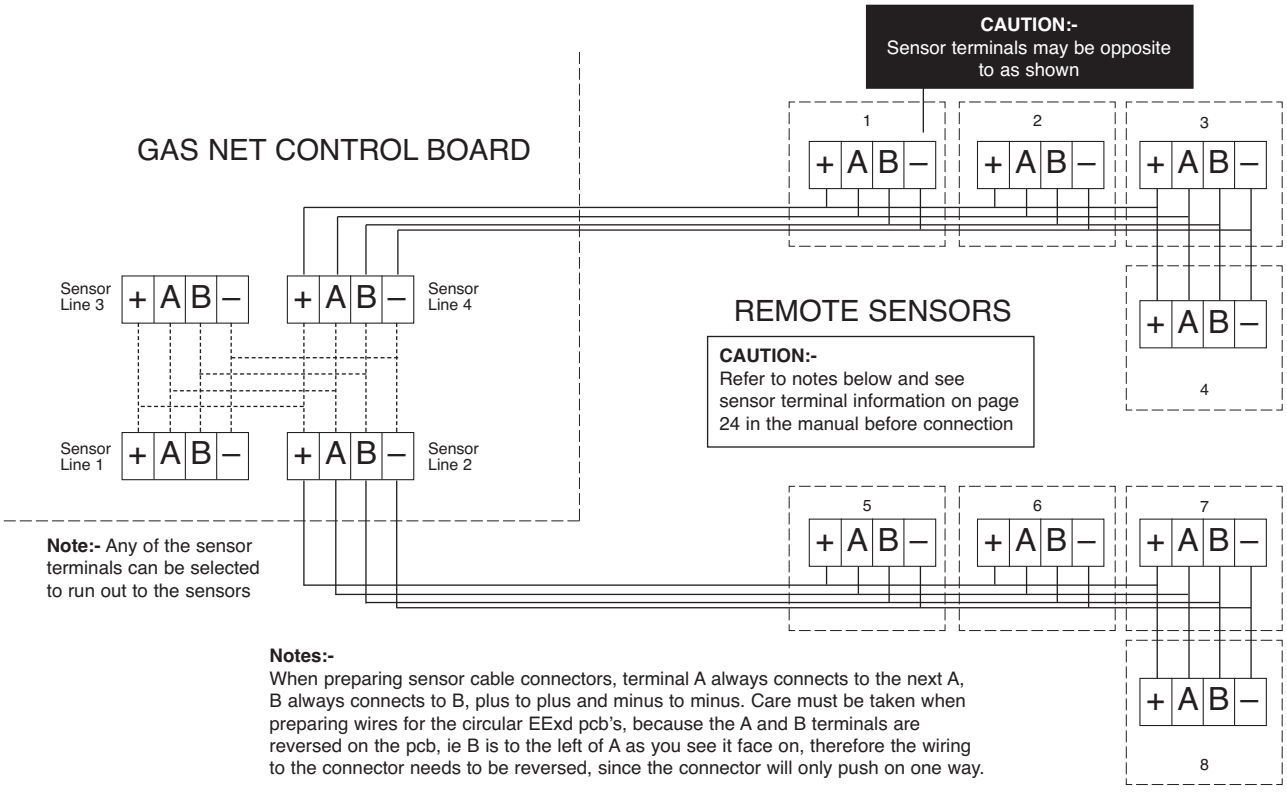
f. sensor cables to be run separately from power cables.

Field cables which are terminated within the Gas Net enclosure should be kept as short as possible and not be allowed to cross over electronic components or the ribbon cable.

To prevent any effect from earth currents the cable shielding should be grounded at the equipment end only.

The instrumentation should be subjected to a minimum of vibration and shock.

Ascertain the voltage rating of the power supply to which the instrument will be connected.



Notes:-
When preparing sensor cable connectors, terminal A always connects to the next A, B always connects to B, plus to plus and minus to minus. Care must be taken when preparing wires for the circular EExd pcb's, because the A and B terminals are reversed on the pcb, ie B is to the left of A as you see it face on, therefore the wiring to the connector needs to be reversed, since the connector will only push on one way.

Four separate sensor line terminals are available for terminating the four core field cables to the control unit. All four connectors are commoned and would be used when sensor cables are run in opposite directions – see fig 2.

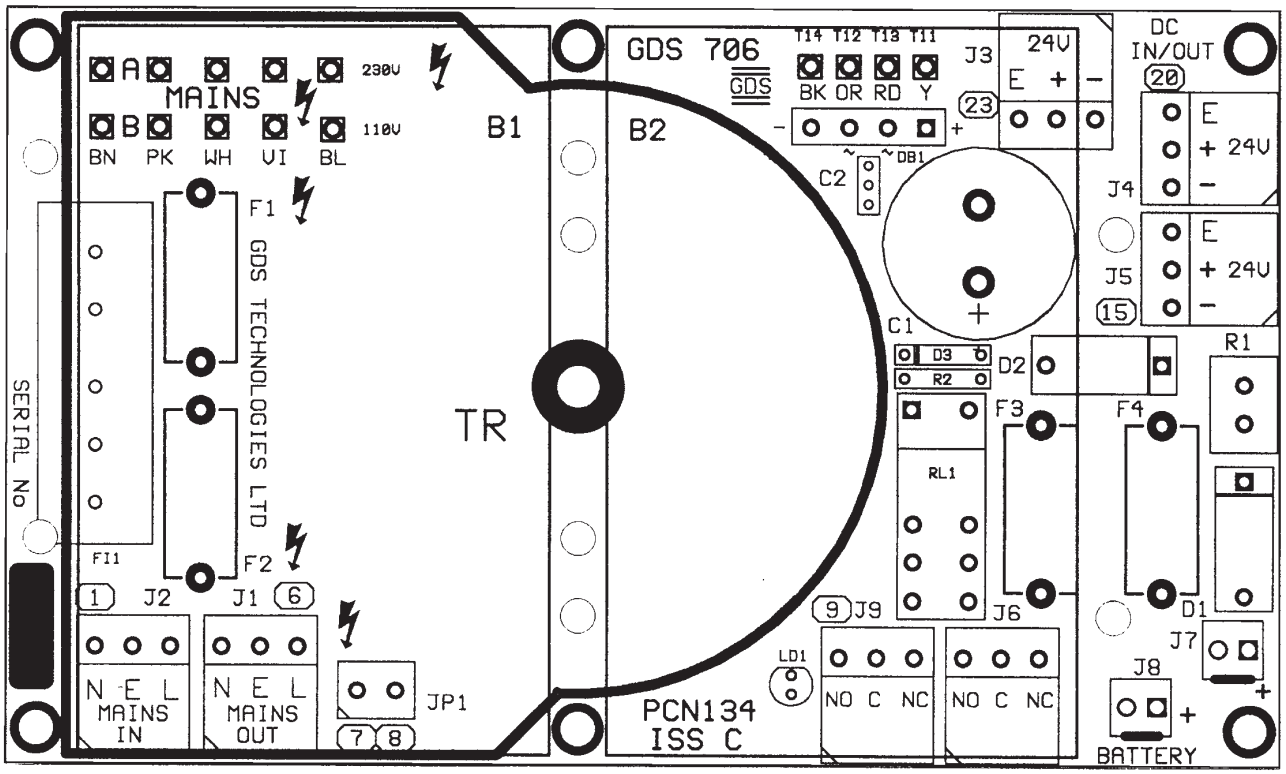
REMOTE OUTSTATION / AUXILIARY POWER SUPPLY

A remote station power pack should be connected to the remote sensors using the ± 24V output (J3) from the power pack to sensor terminals + and – (network).

To enable the control panel to communicate with the outstation a three wire connection is required, A and B (address) and -Ve supply only (+Ve should not be connected), this only requires a lightweight three-core cable.

AUXILLIARY POWER SUPPLY

Where the 24v DC network voltage drops below the minimum 17v required by a sensor the power supply may be attached locally to the network to act as a booster (24v DC terminal J3 to network 24v DC).



Commissioning

Before applying power to the instrument ensure that all terminations are correct and that the sensors are addressed correctly and connected (each detector head is identified by a number – factory set).

Cautionary Note: - When adding or removing a sensor from an active network the appropriate sensor channel must first be de-activated at the control unit (see section 2 page 10). Then remove D9 and D10 links from the sensor board (comms lines) before disconnecting the sensor from the network. When adding a sensor to the network the reverse should be carried out.

Should it be necessary to check the numbering or re-address the sensors refer to Fig.4 sensor board and Fig.6 sensor board address.

Each sensor will be identified by its own binary number using the jumpers across the appropriate pins.

The sensors are (factory set) calibrated and need no adjustments other than a zero check. See operational notes (SETTING UP SEQUENCE) all sensors must be zeroed as stated.

The following adjustments will only be required where a sensor insert/cell is to be replaced.

Flammable Sensor (PCN 126)

The following set up procedure may be carried out with the device disconnected from the network but supplied with a 24v DC.

1. Sensor voltage:-

   Measuring across the sensor terminals P and W adjust VR1 for the required sensor voltage (VQ21 = 2v) where the F1 sensor is remote from the circuit board measure across test pins TP1 and TP3 for sensor current (VQ21 = 300mA) using mV DVM range = 300mV across test pins.

2. Sensor Zero:-

   Connect DVM +ve lead to TP2 (calibrate) and -ve to TP3 (OV) adjust the zero potentiometer VR3 until the DVM reading is 0.5 volts.

3. Calibration:-

   The first step is to calculate the change of output voltage for the test gas used. Where F.S.D. = 2 volts sensor output change = 100 % L.E.L. Therefore when monitoring methane gas which has an L.E.L. of 5% and 2.5% methane test gas is used a 1V change would be required to achieve correct calibration.

   With the DVM –ve connected to TP3 (OV) and the +ve connected to TP2 (calibrate) apply test gas until a peak reading is obtained. Adjust the reading using the span potentiometer VR2 until a 1v increase is achieved. Example: - standing voltage 0.5v + 1v increase = 1.5 volts. The sensor is now calibrated.

Toxic Sensor (PCN 135)

As for the flammable sensor, calibration may be carried out with the sensor unit disconnected from the network.

1. Sensor Zero:-

   Connect DVM +ve to TP2 and –ve to TP4. Using the zero potentiometer adjust the reading for 0.5 volts.

2. Calibration:- Example carbon monoxide

   The first step is to calculate the change of output voltage for the test gas being used.

   Where F.S.D. = 2 volts change in sensor output and assuming a measuring range of 0 – 250 ppm CO.

   When using a test gas of 125 ppm then a one volt output change would be required i.e. 1.5 v across TP2 and TP4 = 125 ppm CO.

   With the DVM connected to TP2 and TP4 apply the test gas until a peak reading is obtained. Adjust the reading using the span potentiometer until a one volt increase is achieved.

   Connection of external 4-20mA output device: -

   Remove jumper JP7 and connect jumper JP9. Connect device to terminal block JP6 ± 24v DC sig. (4-20mA input).

   For calibration purposes as above 4mA = 0.5 volts and 20mA = 2.5 volts.

Oxygen (PCN 135)

Where ambient oxygen level monitoring is required a reading of 20.8% would normally be required.

Where F.S.D. = 2 volts = 25% oxygen

1. Connect DVM +ve to TP2 and -ve to TP4.
   With the control unit in zero mode.
   Remove the sensor cell from its connector.
   Using the zero potentiometer adjust the reading for 0.5V. To ensure correct zero press Z for 2 seconds, the current readings will change to zero.
   Reconnect cell and allow 5 minutes to stabilise. Adjust span potentiometer to give a reading of 2.17v on DVM.

   With the control unit in calibration mode.
   The reading on the control panel should be ≈ 20.8%. If for some reason current reading is not 20.8%. Press ∧ and **S** at the same time, this will change current reading to 20.8%.

   Note - to change the peak reading to that of the current reading press **Z**.

Service – routine attention

The owner or occupier of the premises should place the supervision of the system in the charge of a responsible executive whose duty it should be to ensure the day to day operation of the system and to lay down the procedure for dealing with a gas alarm or fault warning. To ensure reliability an agreement should be negotiated for regular servicing. When a service contract cannot be arranged an employee with suitable experience of electrical equipment should be trained to deal with the basic servicing and instructed not to attempt to exceed the scope of such training.

Liaison should be established with those responsible for maintenance of the building fabric or redecoration etc. to ensure that their work does not cause a fault or otherwise interfere with the operation of the alarm installation. Particular attention appertaining to the Detector Head.

The operating instructions should be kept available with the control unit; all faults service tests and routine attention given should be recorded.

DAILY: A check should be made that any fault condition which may be indicated is in fact being attended to and that all other indicators are normal.

TWICE YEARLY MAINTENANCE SCHEDULE

1. All zeros at the control unit to be checked logged and aligned.
2. Each detector to be gas tested and reading logged (sensitivity checked).
3. Field indicators to be tested.
4. All alarm set points checked and re-aligned.
5. Lamp Test.
6. All faulty parts replaced where required.
7. All filter elements checked and replaced as necessary.
8. Power supply – complete functional check.
9. Visual inspection made to confirm that all cabling fitting and equipment is secure, undamaged and adequately protected.

ACTION TO BE TAKEN IF THE APPARATUS ALARM SOUNDS:-

A. Extinguish all naked flames, including smoking materials.
B. Turn off all gas appliances.
C. Do not switch on or off any electrical lights or appliances.
D. Turn off the gas supply at the gas emergency control and/or (with L.P.G supply) the storage tank.
E. Open doors and windows to increase ventilation.

If the alarm continues to operate, even after an alarm re-setting action where appropriate, and the cause of the leak is not apparent and/or cannot be corrected, vacate the premises and immediately notify the gas supplier and/or the gas emergency 24 hour service in order that the installation may be tested and made safe and any necessary repairs carried out.

E – Mode enable set up

GDS
TECHNOLOGIES LTD

FAX BACK SHEET
SERVICE / MAINTENANCE PLAN
0113 287 8178

GDS Technologies can offer comprehensive maintenance & service cover on all of your gas detection systems. Should you require further details, please complete and fax / return this document for an immediate response.

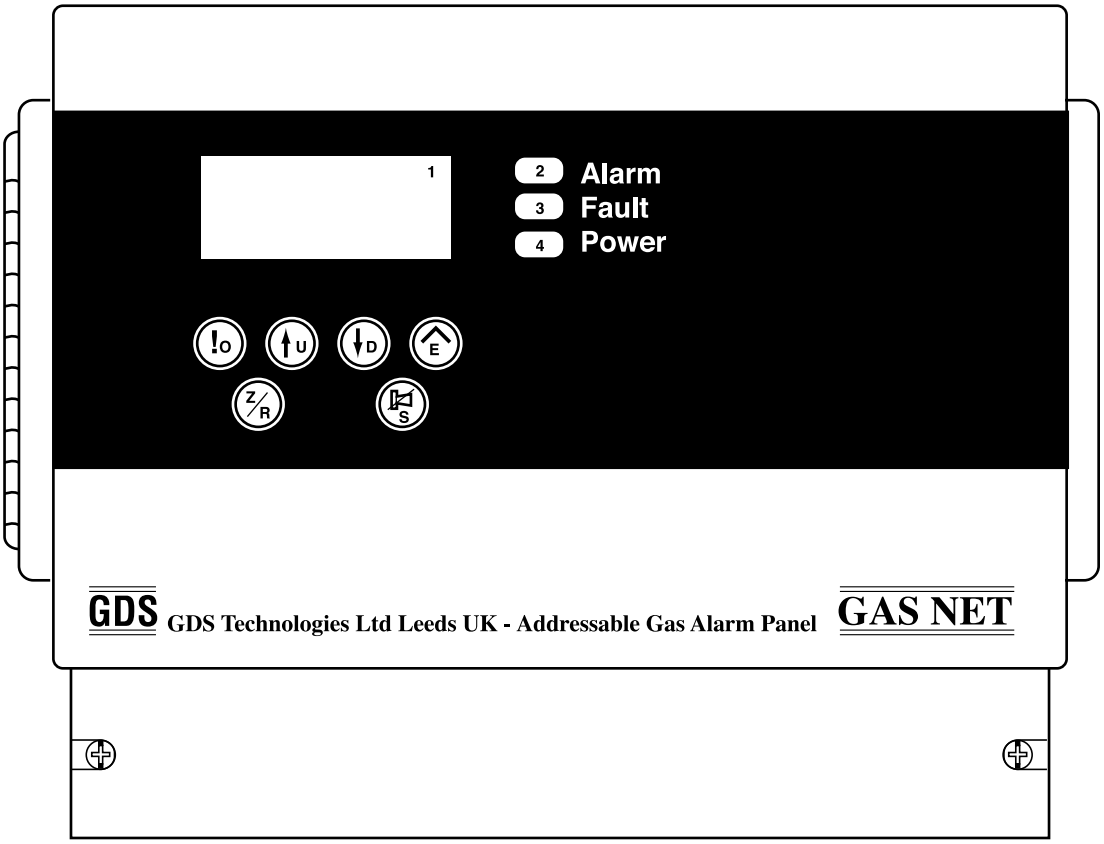
Company Name			
Company Address			
Tel No.		Fax No	
Site Location (if different from above)			
Contact Name			
Product Type (if known)			
No. of Sensors			

For telephone inquiries your contact is:- Julie Mitchell 0113 286 0166

GDS Technologies Ltd
Fusion Point, Ash Lane, Garforth, Leeds UK LS25 2GA
Tel +44 (0)113 286 0166 Fax +44 (0)113 287 8178
E-Mail: sales@gds-technologies.co.uk

Fig 1

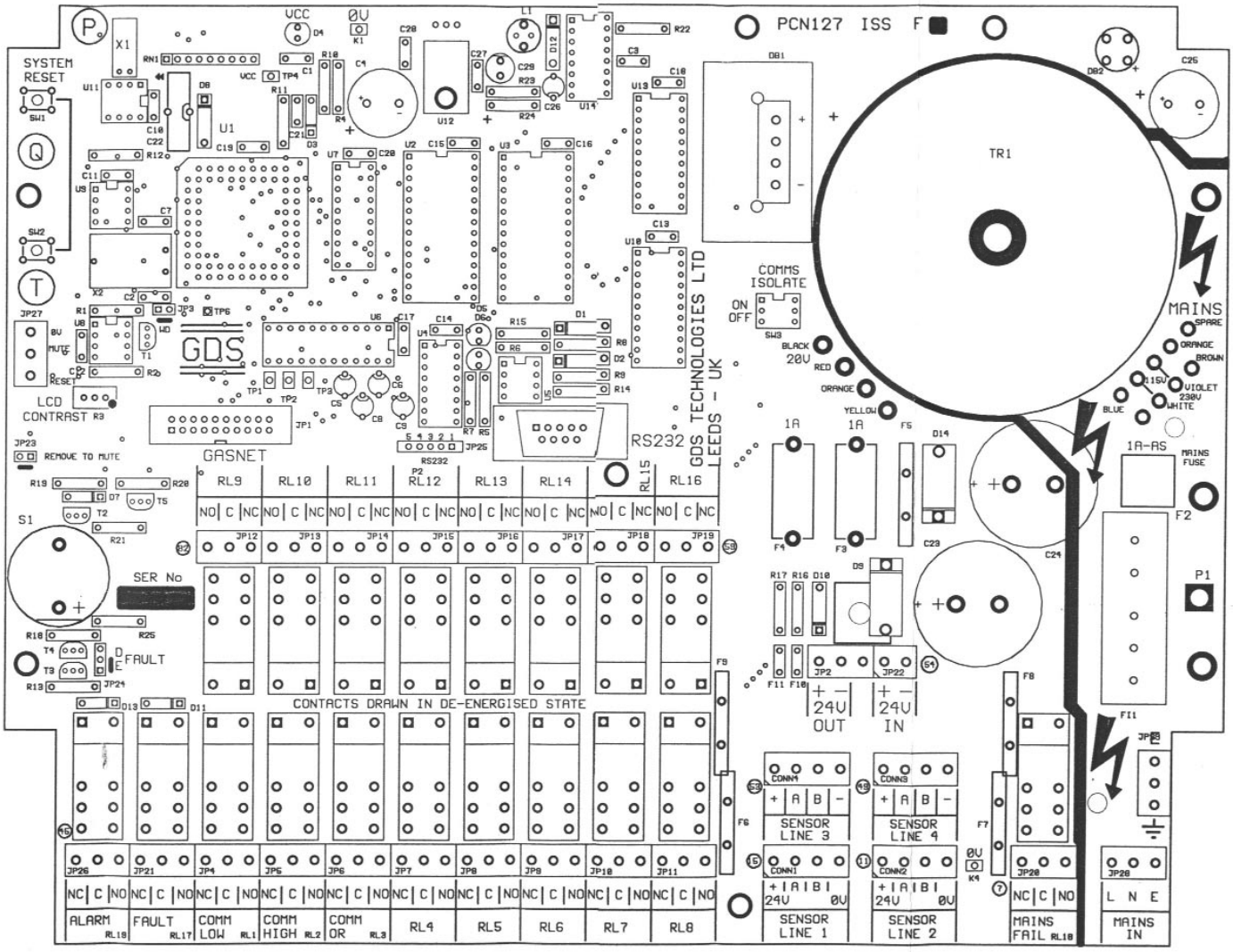
Front Panel Controls



O	**!**	Enables selection of data to be viewed on any given channel
U **D**	↑ ↓	Allows for change of channel and increase or decrease of values
E	^	Must be used in conjunction with ↑ ↓ to enable change
R	-	Reset latched alarms
Z	-	Zero a reading or make alarm relay selection
S	🔕	Silence audible alarm
1	-	Alpha numeric display
2	-	Alarm indicator L.E.D. red
3	-	Fault indicator L.E.D. amber
4	-	Power ON indicator L.E.D. green

Fig 2

Relays shown in normal operating condition



Fuse Listing

F1 – Processor
F2 – Mains Fuse
F3 – 24v DV Out
F4 – Relay Driver
F5 – Sensor Supply – S.R.

F6 –
F7 – Sensor – S.R.
F8 – Line Fuses
F9 –

F10 –
F11 – Address – S.R. Line Fuses

Gas Net - Snoop Box

Description

Any number of SNOOP units may be attached to the network at any point using a 4-core cable and offers four analogue 4~20mA outputs each of which may be driven by any number of the 32 sensors providing a peak reading output.

Four relays are available which may be zoned/voted each relay having a selected sensor grouping of any number of sensors. The number of alarms required to switch the alarm relay in any of the four groups is selectable between 1 and 4.

Operation

To make adjustments to settings: -

1 Pressing the MODE button takes the display into set up
2 Pressing the ↑↓ up or down button moves the field selector arrow indicator
3 Pressing SELECT and ↑↓ up or down buttons allows adjustment of values
4 Pressing MODE and SELECT together changes the screen to normal operating mode
Enter set up mode (see 1).
Select sensor which is to be grouped (see 2) and then (3).
Having selected the sensor number adjust the remaining fields as required (2 and 3).
Repeat for other sensors.

Screen Information

S - Sensor Number (1 ~ 32)
Val - Value % of full scale reading (factory set – 1)
AL - Alarm activated (opposite appropriate sensor)
SG - Sensor Group (1, 2, 3 or 4)
VA - Voting alarm selection (1 ~ 4)
420M - 4~20mA output scaling (factory set max)

Four zone/voting alarm relays D.P.C.O. per relay rated 5A @ 230v AC
Trip point selectable 1 to 4 alarms

Four 4~20mA analogue outputs
Peak reading for any number of sensors

Indicators

Power	Green L.E.D
Alarm	Red L.E.D
Display	Four line alpha numeric

Environmental

Ingress Protection	IP65
Operating Temp	-10 + 50∞C
Humidity	0 – 90 RH

Miscellaneous

Dimension	200W 120H 60D
Terminal Connector	4 mm max.
Sounder	Mutable for each alarm
	Permanent mute option

Fig 3

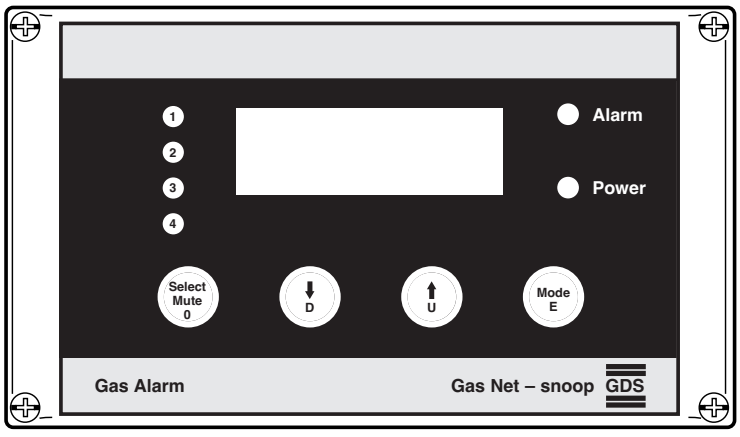
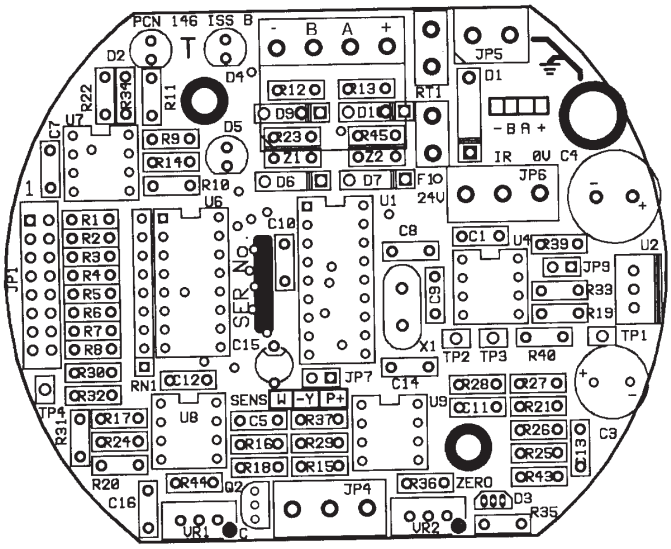
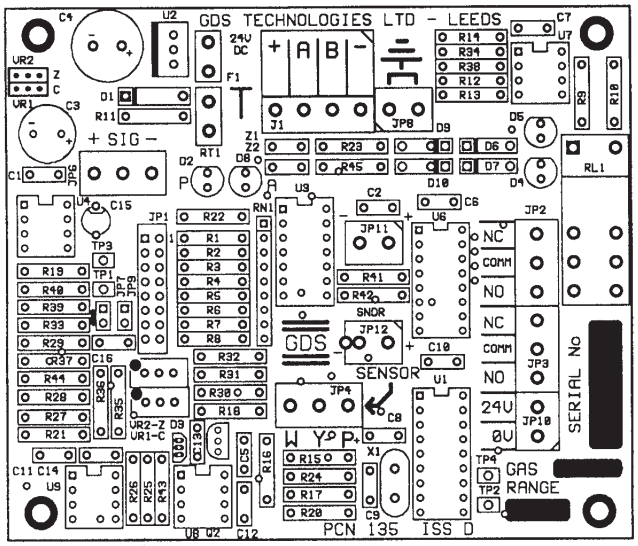


Fig 4

Toxic / Oxygen Sensor Board

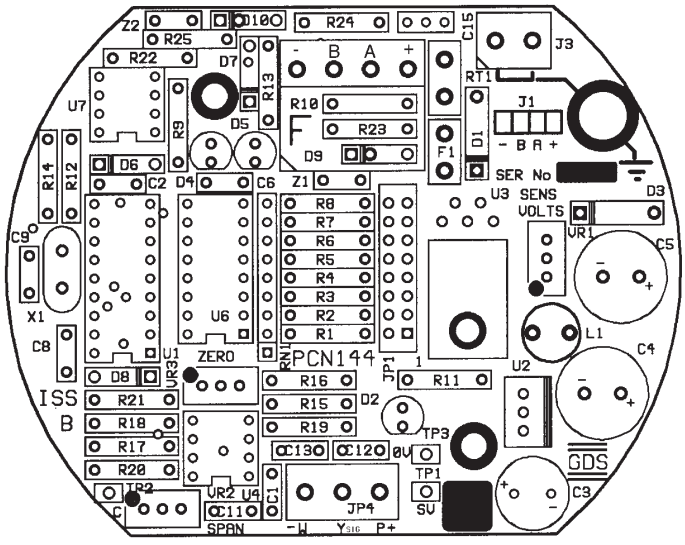


EExd

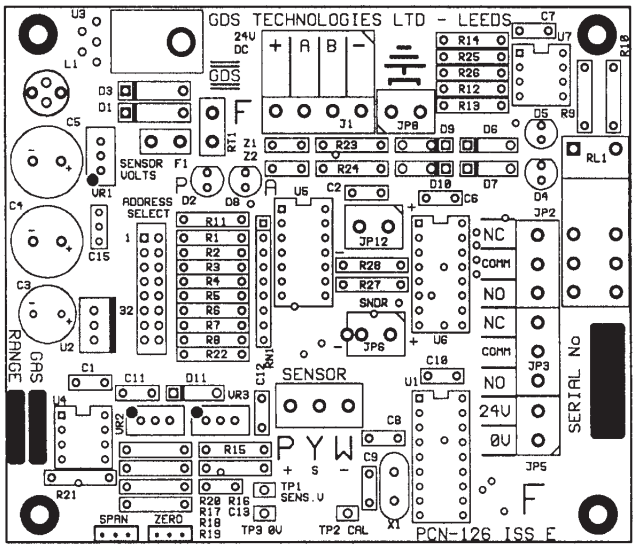


Standard

Flammable / Catalytic Sensor Board



EExd

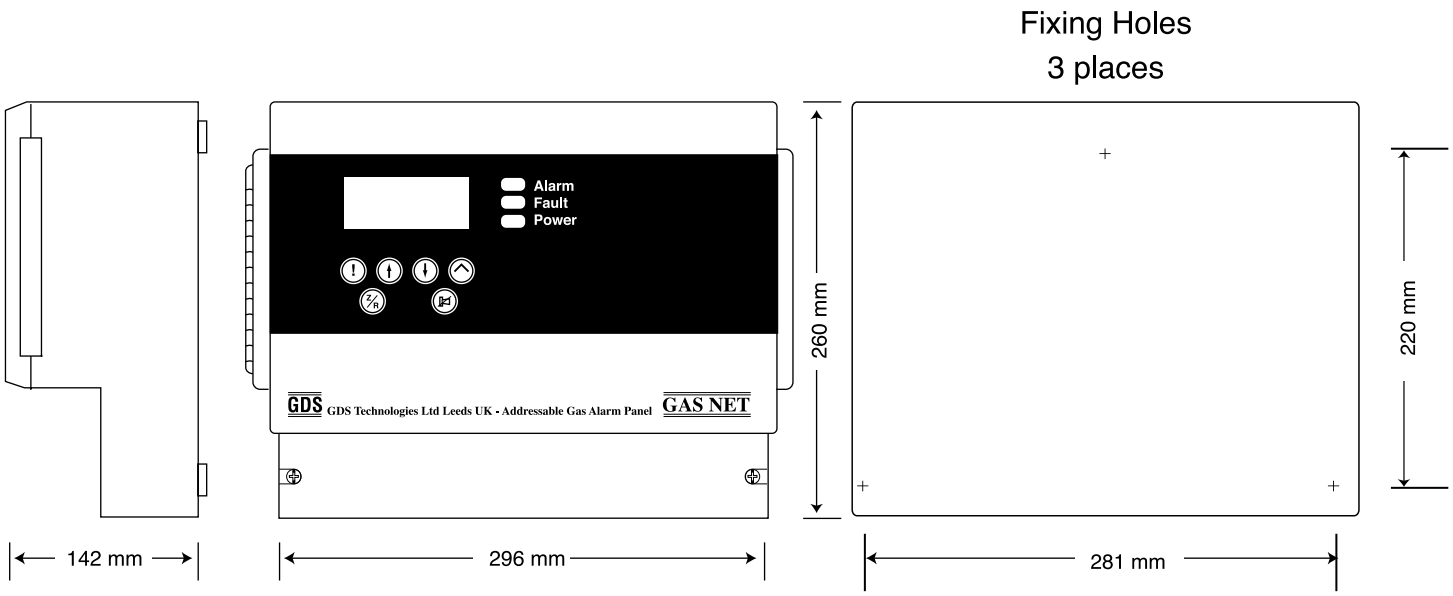


Standard

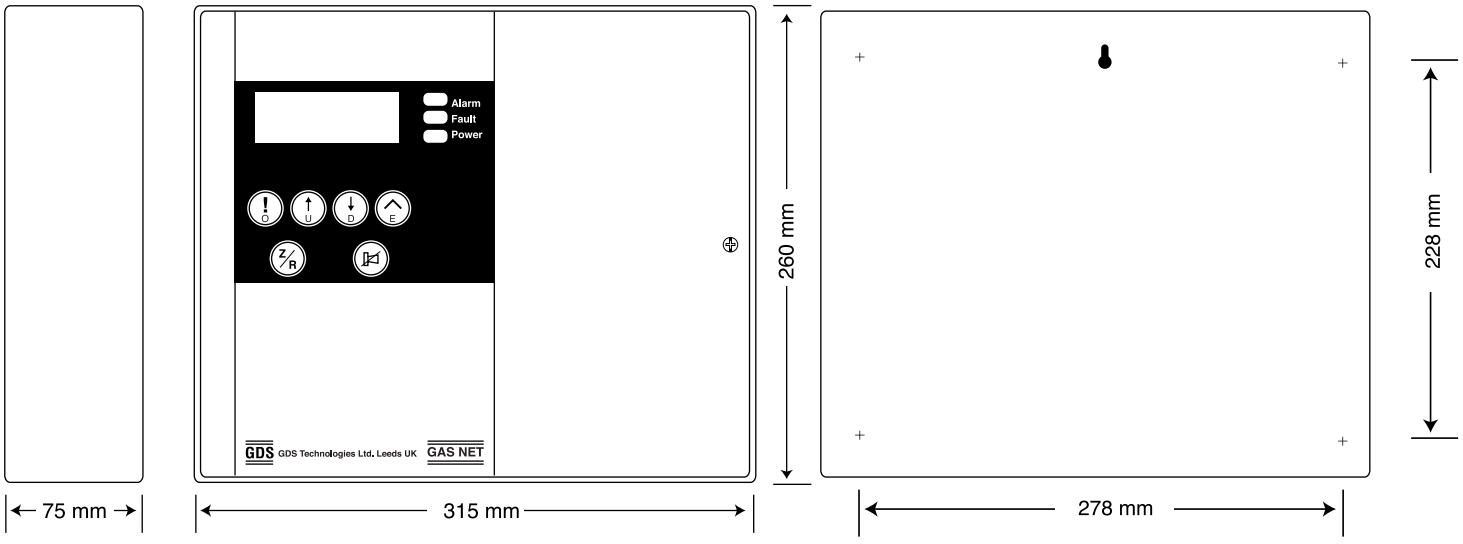
RED ident - **R** = flammable
YELLOW ident - **Y** = toxic
BLUE ident - **B** = oxygen
GREEN ident - **G** = others

Fig 5

Wall Mounting Detail

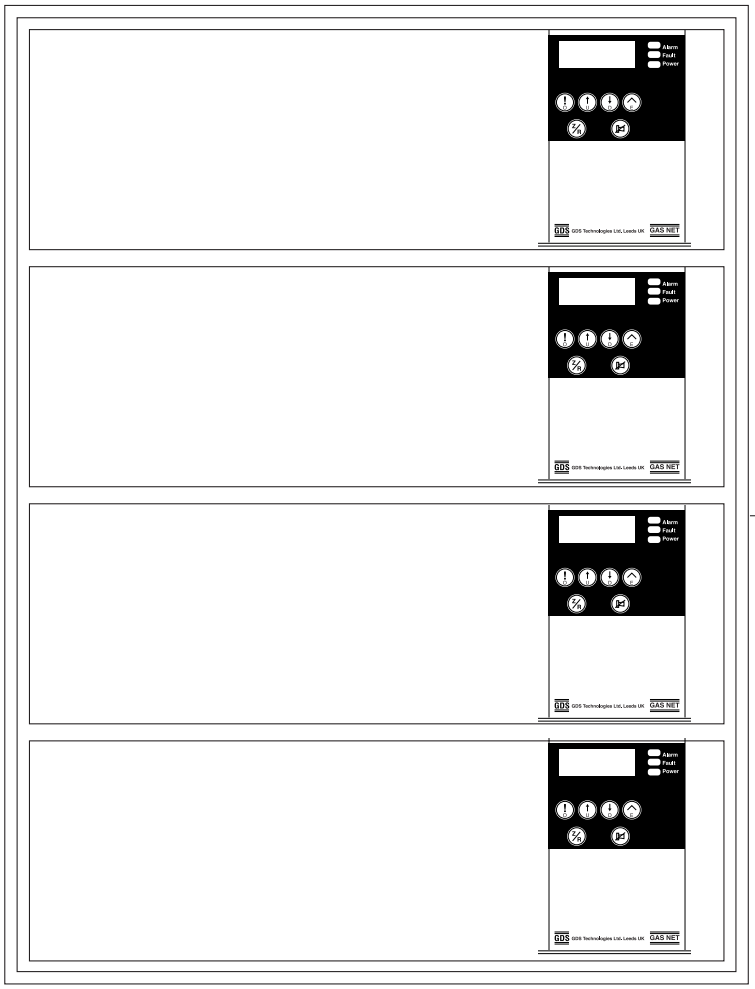


Plastic Enclosure IP65



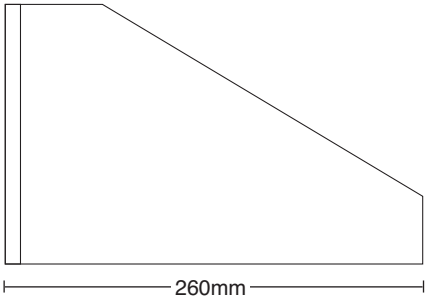
Metal Enclosure IP52

Fig 6

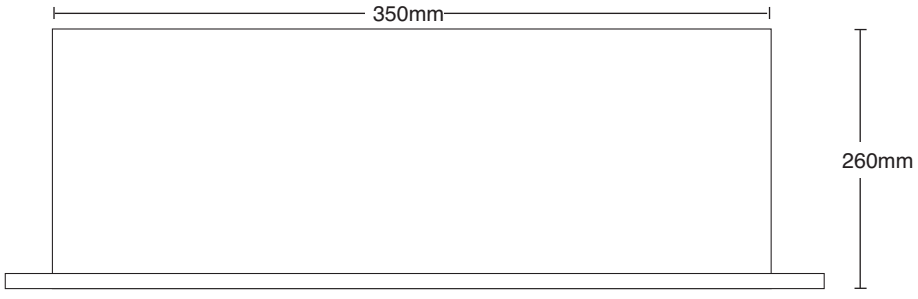


19” 4u 32-Way Gas Net Panels
Standard multi-rack enclosure

End Elevation



Top Elevation



Front Elevation

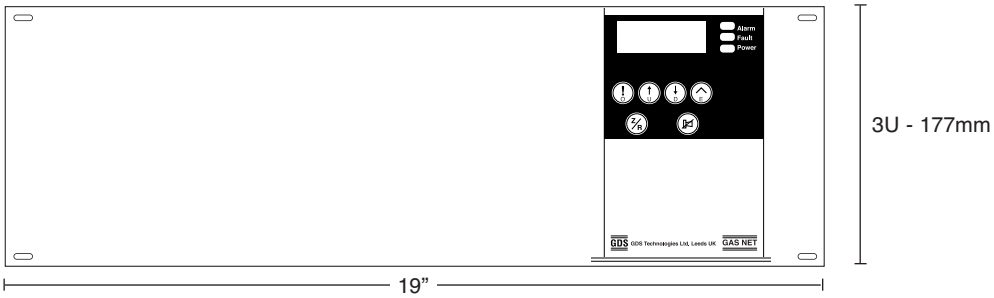
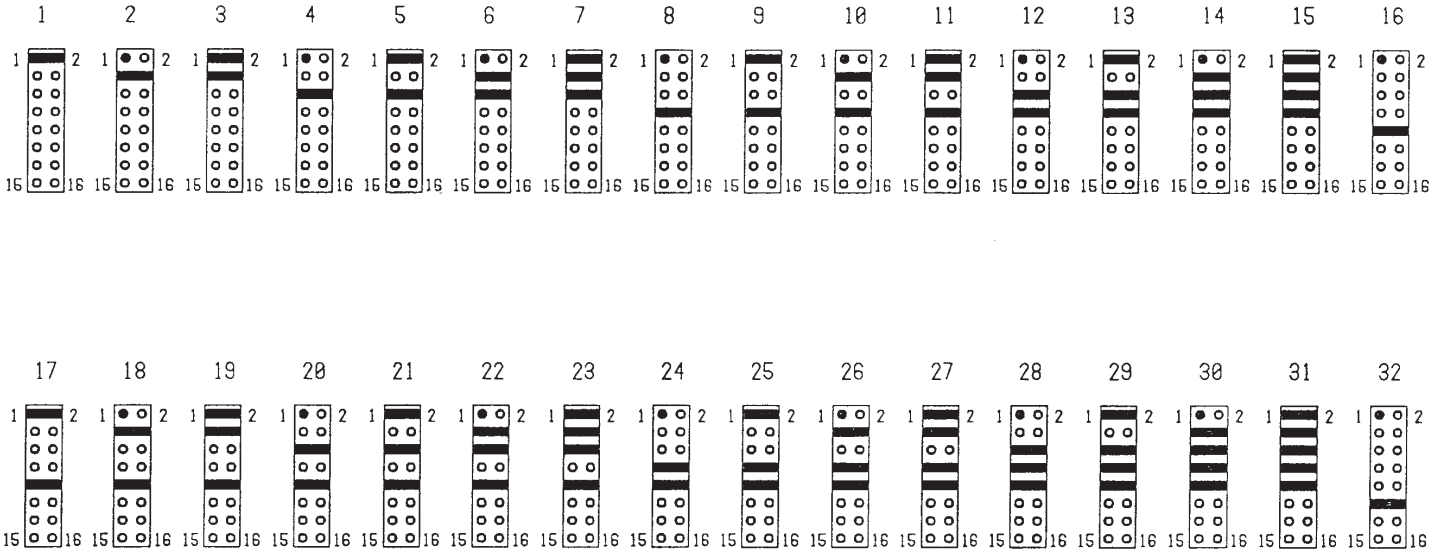


Fig 7

Sensor Circuit Board Address

Sensor Circuit Board Address – 1 to 32

To select sensor No.



BINARY EQUIVALENT			
00000001 = MODULE 1	00001001 = MODULE 9	00010001 = MODULE 17	00011001 = MODULE 25
00000010 = MODULE 2	00001010 = MODULE 10	00010010 = MODULE 18	00011010 = MODULE 26
00000011 = MODULE 3	00001011 = MODULE 11	00010011 = MODULE 19	00011011 = MODULE 27
00000100 = MODULE 4	00001100 = MODULE 12	00010100 = MODULE 20	00011100 = MODULE 28
00000101 = MODULE 5	00001101 = MODULE 13	00010101 = MODULE 21	00011101 = MODULE 29
00000110 = MODULE 6	00001110 = MODULE 14	00010110 = MODULE 22	00011110 = MODULE 30
00000111 = MODULE 7	00001111 = MODULE 15	00010111 = MODULE 23	00011111 = MODULE 31
00001000 = MODULE 8	00010000 = MODULE 16	00011000 = MODULE 24	00100000 = MODULE 32

Fig 8

U
D ↑↓ Allows change of range to be adjusted

O – Pressing select and ↑ or ↓ allows adjustment of values/figures

O – Mute audible alarm

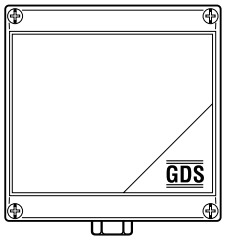
E/O – Pressing MODE and SELECT together changes the screen to normal operating mode (from set up)

20JCVF - SAFE AREA
DETECTOR HEAD/JUNCTION BOX ASSEMBLY

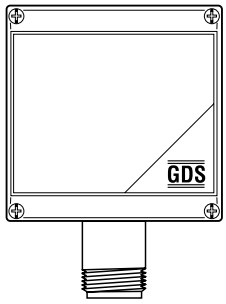
Type - 20J

Ingress Protection	IP65
Material	Polycarbonate VDE 0100/12:7n RFI Screened CE-C373
Finish	Black - alternative light Grey RAL 7035
Entries	Not specified - Top, bottom, sides, rear
Weight	265gms
Dimensions	122mm 120 mm 56mm
Mounting	4 - Internal fixing points

Toxic

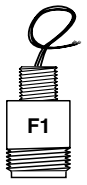


Flammable



3000 CVF - EXPLOSION PROOF - ZONE 1 HAZARDOUS AREA
DETECTOR HEAD/JUNCTION BOX ASSEMBLY

Type - 3000C



Certification	EExd IIC T6 (Zone 1 Hazardous Area) Certificate No 98D1221 CE C372
Ingress Protection	IP53 with sensor spray deflector IP65
Material	Body and cover Grey Cast Iron to BS1452:1977 Cover fixing screws Stainless steel A4 class 80 Allen head captive
Finish	Standard - hot dipped galvanised
Weight	4Kg
Approx. Dimensions	83mm 126mm ∅
Mounting Detail	One entry box – two M5 (138 mm CRS) 35° from vertical Two entry box – two M5 (150 mm CRS) 60° from vertical