

Merlin GDP2-X



8-Channel Gas Detection Control Unit



INSTALLATION & OPERATION MANUAL

Please read these instructions carefully and retain for future use.

These instructions can be downloaded in electronic form on the product website, or a printed version can be ordered free of charge via AGS



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Important Information

Copyrights

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Manufacturer's Warranty

The manufacturer warrants to the original consumer purchaser, that this product will be free of defects in material and workmanship for a period of **3 years** from the date of purchase.

The manufacturer's liability hereunder is limited to replacement of the product with repaired product at the discretion of the manufacturer. This warranty is void if the product has been damaged by accident, unreasonable use, neglect, tampering or other causes not arising from defects in material or workmanship. This warranty extends to the original consumer purchaser of the product only. Any implied warranties arising out of this sale, including but not limited to the implied warranties of description, merchantability and intended operational purpose, are limited in duration to the above warranty period. In no event shall the manufacturer be liable for loss of use of this product or for any indirect, special, incidental, or consequential damages, or costs, or expenses incurred by the consumer or any other user of this product, whether due to a breach of contract, negligence, strict liability in tort or otherwise. The manufacturer shall have no liability for any personal injury, property damage or any special, incidental, contingent, or consequential damage of any kind resulting from gas leakage, fire, or explosion. This warranty does not affect your statutory rights.

During the above warranty period, your product will be replaced with a comparable product if the defective product is returned together with proof of purchase date. The replacement product will be in warranty for the remainder of the original warranty period or for six months – whichever is the greatest.

Disposing of Electrical & Electronic Equipment (WEEE)

When this product has reached the end of its life it must be treated as Waste Electrical & Electronics Equipment (WEEE). Any WEEE marked products must not be mixed with general household waste, but kept separate for the treatment, recovery and recycling of the materials used.

Please contact your supplier or local authority for details of recycling schemes in your area.

Revisions

Every effort is made to ensure the accuracy of this document; however, AGS can assume no responsibility for any errors or omissions in this document or their consequences. AGS would greatly appreciate being informed of any errors or omissions that may be found in the content of this document. For information not covered in this document, or if there is a requirement to send comments/corrections, please contact AGS using the contact details given below.

Safety Statements



Take extra care where this symbol is used throughout this document to understand the nature of potential hazards and how to avoid them.

- ⚠ Please take the time to thoroughly read these instructions which should be retained for future reference.
- ⚠ Detectors are shipped pre-calibrated and configured.
- ⚠ The expected lifetime of a gas sensor is 2-10 years upon initial power up dependant on your target gas and environment. The device will display a message to indicate this time and should immediately be replaced.
- ⚠ It is recommended that this device be commissioned upon installation and serviced annually by a competent person.
- ⚠ Do not apply lighter gas or other aerosols to the device – this will cause extreme damage to the sensors.
- ⚠ High concentrations of alcohol found in many products may damage or affect the gas sensing elements.
- ⚠ This device is designed to detect the gas type displayed on the screen only.
- ⚠ It is not designed to detect smoke, fire or other gases and should not be used as such.
- ⚠ This device provides early warning of the presence of gas, usually before a healthy adult would experience symptoms. This warning is possible provided your alarm is installed and maintained in accordance with these instructions.
- ⚠ Never ignore your device when in alarm.
- ⚠ This device requires a continual supply of electrical power – it will not work without power.
- ⚠ This device should not be used to substitute proper installation, use and/or maintenance of fuel burning appliances including appropriate ventilation and exhaust systems.
- ⚠ Multiple detectors may be required to adequately protect property and persons.
- ⚠ This device does not prevent dangerous gasses from occurring or accumulating.
- ⚠ Actuation of your alarm indicates the presence of dangerous levels of gas.
- ⚠ The device is not intended for use in potentially explosive atmospheres.
- ⚠ Seek fresh air supply and contact your local gas emergency service should you suspect a gas leak.
- ⚠ This unit may not fully safeguard individuals with specific medical conditions. If in doubt, consult a doctor/physician.
- ⚠ Your product should reach you in perfect condition, if you suspect it is damaged, contact your supplier.

Introduction

General Description

The GDP2X is a multi-zone, 8 channel gas detection panel which can be used in many applications such as factories, car parks, shopping centres and most commonly - boiler houses.

It can be used with up to eight (8) AGS TFT range gas detectors for monitoring and detecting gas including carbon monoxide, LP gas and methane. The controller panel can be integrated with a BMS (building management system), a fire panel, other external alarms and remote emergency shut-off buttons.

General Safety Cautions

- ⚠ Failure to observe the following may cause injury to persons and/or property.

Installation must be carried out by a licenced and insured contractor and installed in areas at risk of gas leaks and higher concentrated areas e.g., near boilers, valves, or areas of critical protection, located in positions determined by those who have knowledge of gas dispersion, the process plant system and equipment involved, and in consultation with both safety and electrical engineering personnel.

Final positioning of gas detectors should be indicated by the characteristics of the gas being detected and other environmental factors. Seek advice where necessary. Take in to account the design of the air flow patterns within the area, sensors should be installed in the correct orientation as per the manufacturer's specification, and ease of access should be accounted for to allow for any forms of maintenance throughout its operational life.

Installation must be in accordance with the recognized standards of the appropriate authority in the country concerned. For Europe, see EN 60079-29-2, EN 62990-2 and/or EN44554-4. For installations in North America, the National Electrical Code (NFPA 70) should be strictly observed. All appropriate local and national regulations should be observed.

EMI and RF Interference Considerations

All electronic devices are susceptible to EMI (Electromagnetic Interference) and RFI (Radio Frequency Interference). Our products are designed to reduce the effects of these interferences. However, there are still circumstances and levels of interference that may cause the equipment to respond to these interferences. Reduce the possibility by:

- Avoiding installation locations near high foot traffic and high energy equipment.
- Confirming equipment is properly grounded if required and shielded cabling.

Coverage

50ft radius per detector is a reasonable guide, therefore multiple detectors may be required to adequately protect property and persons. However, coverage should be determined by those who have knowledge of gas dispersion, target gas characteristics, the environment, process plant system(s) and intended functions etc., and in consultation with both safety and electrical engineering personnel.

Positioning

The control panel should be located away from the area that it is monitoring and accessible for both status observation and alarm purposes. The control panel should be located outside of the area that it is monitoring.

There are no specific standards governing gas detector locations (unlike fire detection systems); there are, however, general guidance documents. The most relevant being *IEC 60079-29-2*. Much of what it covers is also relevant to toxic gas & oxygen monitoring equipment. Recommended heights may vary based on air flow and other environmental conditions in addition to the proposed application, location, and target gas.

The composition of the target gas and its density relative to air are used as the basis for the recommended height of sensors. Generally, the installation height of a sensor for a heavy gas (e.g., LPG) would be close to the lowest point in the area, and for a light gas (such as methane or hydrogen) would be close to the highest point in the area.

These typical heights for gas detectors may vary based on application.

Target Gas	Typical Install Height
Carbon Monoxide (CO)	Breathing Zone – 4 - 6ft from ground level.
Nitrogen Dioxide (NO ₂)	Breathing Zone or, Low Level - 1ft from ground level.
Carbon Dioxide (CO ₂)	Breathing Zone - 1700mm (5ft 6") from ground level
Natural Gas (NG) / Methane (CH ₄)	High Level - 300mm (1ft) from ceiling
Propane / Butane (LPG)	Low Level - 300mm (1ft) from ground level
Hydrogen (H ₂)	High Level - 300mm (1ft) from ceiling
Oxygen (O ₂)	*Breathing Zone - 1000-1500mm (3 - 5ft) from ground level

⚠ If you are installing and monitoring Oxygen depletion – consider the density of gas for its application and position the detector accordingly i.e. ground level for high density gases.

⚠ The use of 24V sounder/ strobes are highly recommended.

Observe the following also.

- Ease of access to the equipment for functional testing and servicing.
- How gas may behave due to natural or forced air currents.
- Any regulation/standard/code that locations are bound by.

Mounting Instructions

⚠ The control panel should be accessible for both status observation and alarm purposes.

⚠ Position at a location with minimum noise, vibration, and environmental variation.

⚠ Damage when creating entry points or attempting to remove the circuit board may void any warranty.

⚠ Avoid environmental conditions outside of this specification that could potentially impede the accuracy and operation of the equipment such as condensation; vibration; temperature, pressure, the presence of other gases, electromagnetic interference, and draft zones.

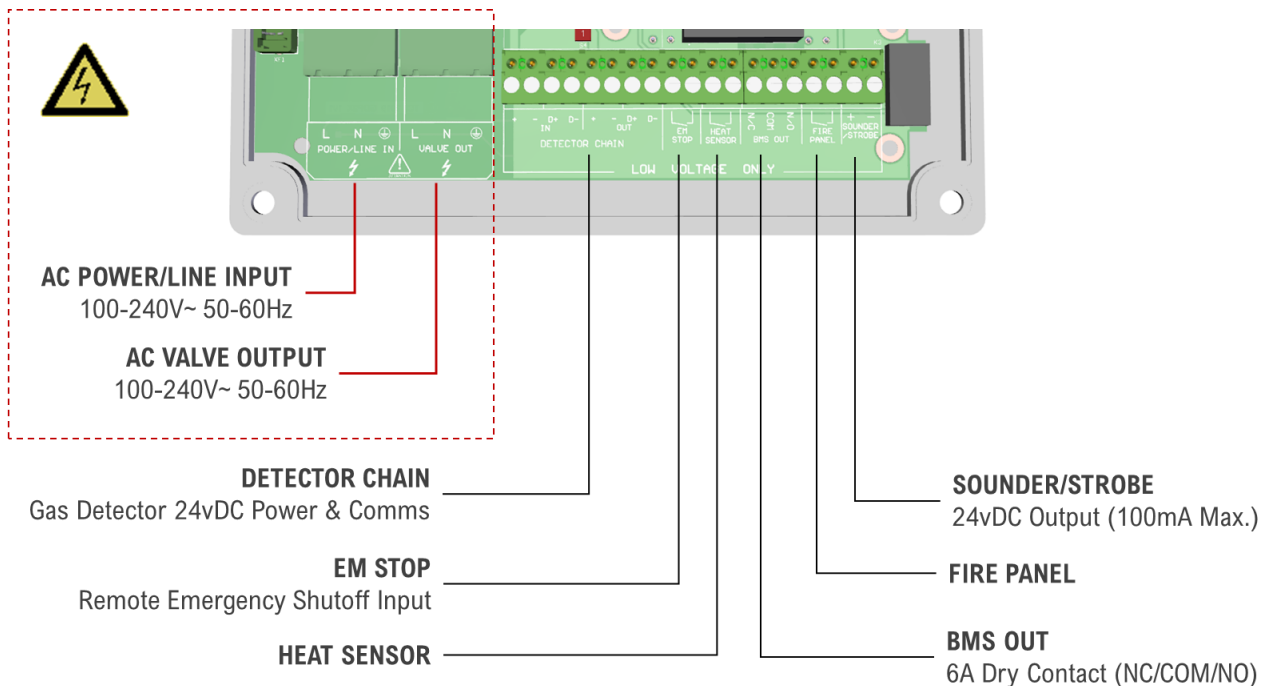
Unpack all the parts!

Designed for surface mounting, it must be installed by a licensed, insured contractor or competent person.

Carefully remove the front cover from the unit by unscrewing the four bolts located at each corner. To do this – use the socket wrench provided. Mark the four screw holes located on the back of the enclosure to the wall and ensure the wall surface is flat to prevent base distortion.

After executing the mounting and the connections – replace the front cover and insert the security caps over the four bolts.

Circuit Board Overview



AC POWER / LINE IN 110V~ mains power supplied to the connector using a 3-core cable fused at 3A. On connecting the mains supply to the panel the power LED indicator will light up – this is located on the front cover.

AC VALVE OUTPUT 110V~ power output can be connected to a gas solenoid valve which can shut the gas supply on alarm status. Fused at 3A. Refer to your valve manual for more information.

DETECTOR CHAIN 24vDC power supply and internal RS485 communication data cables are wired up to 8 detectors, chained in parallel up to approx. 100 yards from the control panel depending on the chain configuration, wire type and condition. For more information see section: *Wiring your detector*.

EM STOP Open/close connection for external shut-off buttons. For multiple shut-off buttons, wire in parallel.

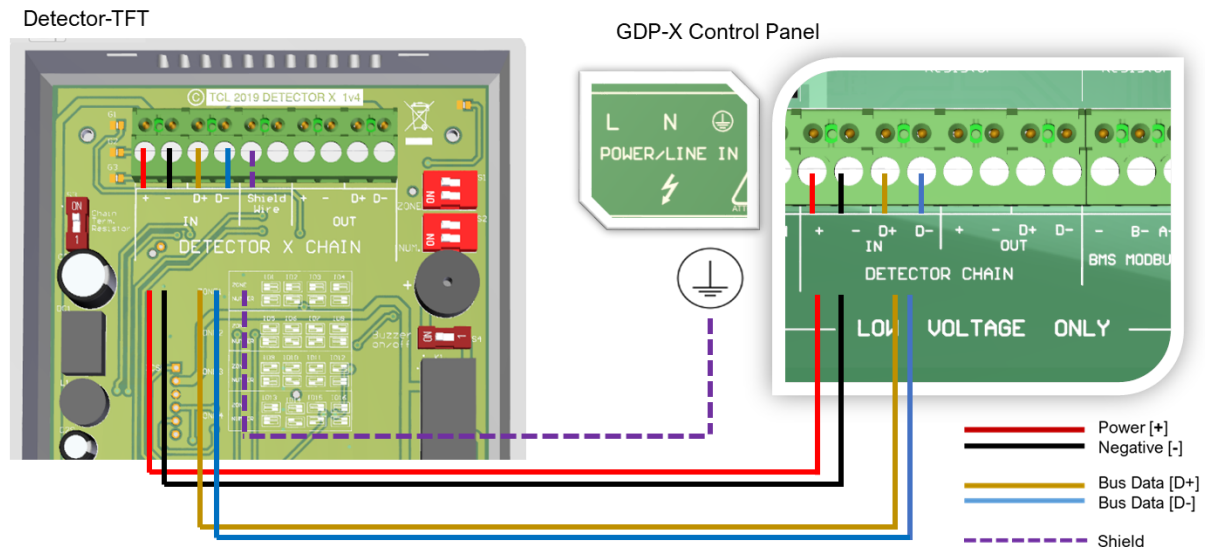
HEAT SENSOR Open/close connections for heat sensors/thermal links.

BMS OUTPUT 6A Dry contact connections are available on the board for Building Management Systems. This is a relay that changes state in alarm, or when the gas line is on/off and can be used in conjunction with the 24vdc output and other external relays that affect other devices and controls such as purge fans and audible alarms etc.

FIRE PANEL Open/close connections for fire alarms/panels.

SOUNDER-STROBE 24vdc output connections for external sounder alarm/strobe to activate in alarm. (100mA max.)

Wiring your Detector



24vDC power (+ / -) and communication (D+ / D-).

[SHEILD WIRE] terminals are used for continuing the chain. Ground shield wires on the control panel (Earth Terminal). Twist the shield wire to avoid stray shield wires. If the detector does not have dedicated shield wire terminals, shield wires connect to the 24vdc negative terminal [-] on both detector and panel.

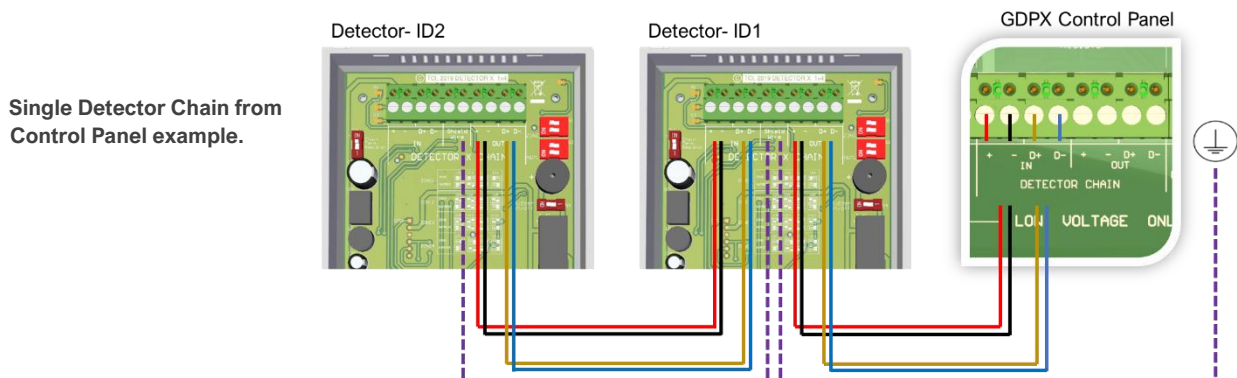
A shielded and twisted 2 or 4 core cable is used to wire the MODBUS terminals [D+ & D-]. The shielding can be of 2 types: braided [mesh of thin conducting wires] or foil (consisting of a thin sheet of metal covering the twisted wires). One example of such cable is BELDEN 3082A. Any cable with similar characteristics can be used to connect all the devices together.

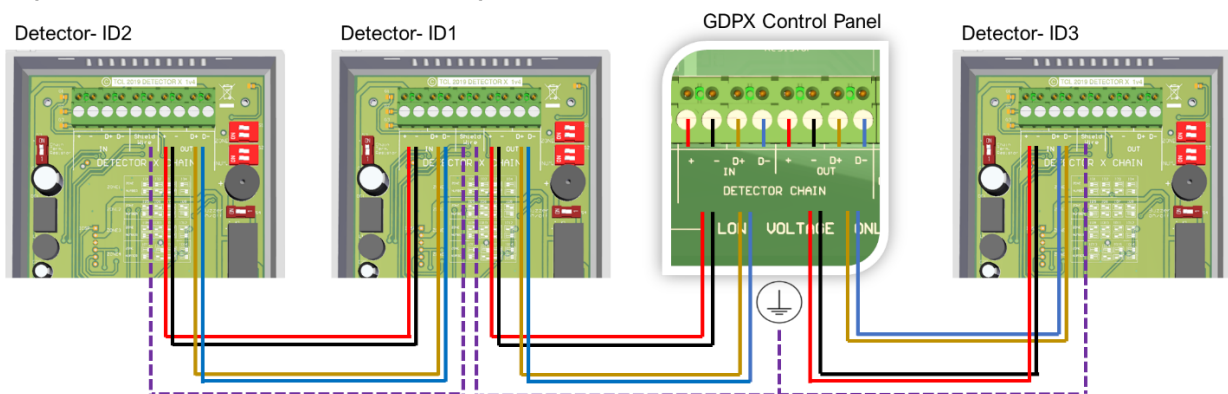
If you are encountering noise or irregular problems with a bus link, the problem is likely related to grounding, incorrect shielding or wiring mains power cables next to data cables.

Creating a Detector Chain

Create a detector chain by connecting detectors in a parallel (daisy chain) method.

Any other way may cause issues or damage to the overall system. Resistor switches should be turned on at each end of a chain – see section 120-ohm Termination.



Split Detector Chain from Control Panel example.

Reversing the [D+] and [D-] connections of any device can lead to the whole system to stop working owing to reverse polarity found on the terminals. To avoid this problem, it is recommended that a cable of same colour should be used to connect all [D+] terminals together and similarly cable of same colour to be used to connect all [D-] terminals together.

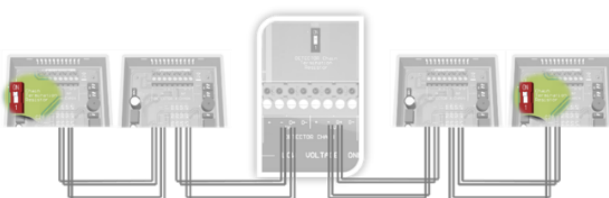
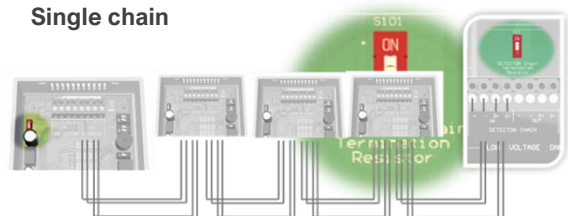
120ohm Termination

Signal communication issues may occur where the bus length is too long, high baud rates are used, or signal reflections are occurring.

To avoid this, terminating at each end of a chain may help the quality of the data signal by turning on the 120-ohm terminal resistor switch.

If a split chain is used, terminate the last detector in each chain.

If a single chain is used, terminate the first device (Panel) and last device (Detector).

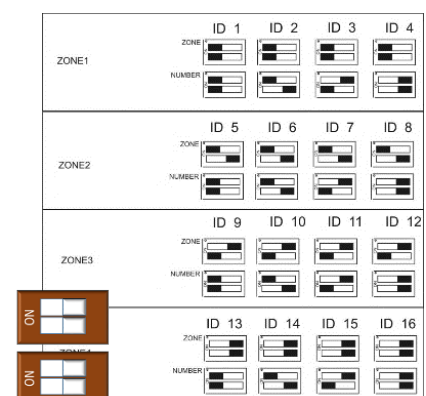
Split chain**Single chain**

Detector ID Switches

- ⚠ We recommend a plan, map and/or marking the detector enclosures detailing ID and location!
- ⚠ ID Switches must be configured for each detector connected to receive and display accurate data!

When wiring multiple detectors, it is important to identify each detector installed for the control panel to receive and display accurate data corresponding with the correct device.

The ID configuration diagram is printed onto detector boards for quick reference as shown opposite. All detectors are factory set to ID1.



Configuration Settings

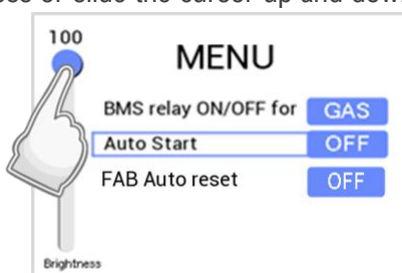
- ⚠ To view, change and save settings, you must provide mains power.
- ⚠ Hazardous voltage! When carrying out any work, must be conducted by a competent person.
- ⚠ Before carrying out any work ensure local regulations and site procedures are followed.

On the circuit board you will find a dipswitch labelled [SETTINGS], when switched on the screen will display the settings menu – you can now configure your detection system.

When the system is configured – turn the SETTINGS switch off and the system will restart.

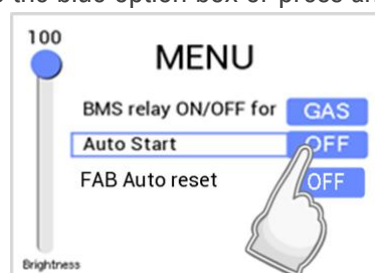
Adjust Screen Brightness.

Press or slide the cursor up and down.



Change/Select Option

Press the blue option box or press and hold.



Settings Options Explained

FUNCTION	OPTION	Explanation	Default
BMS relay ON/OFF for	- GAS - ERROR	GAS - changes relay state with gas valve status only. ERROR - changes relay state upon any alarm condition.	GAS
Auto Start-	- ON - OFF	In the event of a power loss, the system will restart automatically (ON) when restored, or a manual action is required (OFF).	OFF
FAB Auto Reset	- ON - OFF	ON: System resets with the fire panel automatically following fire panel alarm. OFF: Manually reset system following fire panel alarm.	OFF

Trouble Shooting

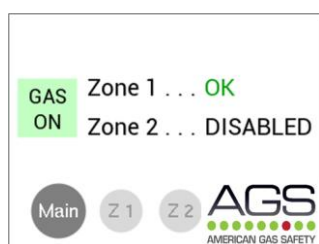
Fault.	Possible Cause/Correction.
Detector not responding	Incorrect wiring or screening of cables. ID switches not properly configured. Termination switches not set up correctly.
Service message	Detector requires service – contact supplier.
End of Life message	Detector requires replacement – contact supplier.

Operation

Initial Power Up (Commissioning)

On connecting mains power, the GDP2X panel will 'warm up' for approximately 60 seconds – during this time the screen will display an 'initialisation' message while system searches for detectors wired to the system.

Main Screen & Zone Information



When the system has finished initialising – the main screen will appear.

The main screen gives an overview of the status of each zone monitored by gas detectors and if the system is OK, or in Alarm.

Switch between zone screens by touching the relevant zone screen, i.e. [Z1] or [Z2].

Each zone can display up to 4 detectors and includes the status of alarms and gas levels.

a	b	c	d	e
ID	Serial Number	Gas	Status	Value
1	123456789103	CO	GOOD	20 ppm
2	123456789103	CO	GOOD	20 ppm
3	123456789103	CO	GOOD	20 ppm
4	123456789103	LPG	GOOD	5.4 LEL%

- a. ID:** The detector identification number
- b. Serial Number:** The unique serial number for that detector.
- c. Gas:** The target gas that the detector is monitoring.
- d. Status:** The status of gas levels, errors and messages.
- e. Value:** The concentration value of gas monitored.

Zone Status Indications

Zone Status	System Condition
ZONE... OK	Gas levels are safe. No error conditions.
ZONE... ATTENTION	Detector(s) are in pre-alarm status or Detector(s) require service or Detector gas sensor(s) end of life.
ZONE... DANGER	Dangerous gas levels have been detected or Detector gas sensor fault has been detected or Detector has lost its signal with the control panel. <i>See section: Alarm Messages.</i>
ZONE... DISABLED	No detector signals received from the zone.
ZONE... -- X --	Detector not installed or Detector not configured correctly.

Alarm Messages

When a detector goes into alarm state, the control panel isolate the gas supply, and the screen will display the ID of the detector in alarm. If two or more detectors enter alarm status, the first detector to send an alarm signal to the control panel will be shown in the top left-hand corner of the screen. Press the relevant zone page for detector information. There are three types of detector alarm.

Detector Alarm ID: 7

Detector Fault ID: 6

Detector Lost ID: 8

Detector Alarm ID: #

If dangerous gas levels are detected, panel will show 'Alarm' and detector ID.

Detector Fault ID: #

If the control panel receives a fault signal from a detector, panel will show 'Fault' and detector ID.

Detector Lost ID: #

If a detector loses communication with the panel, the screen will show 'Lost' and detector ID.

Alarm messages prompted from external devices connected to relevant open/close terminals on the internal board i.e. remote emergency shut off buttons are visible when in alarm state.

The gas supply will be isolated (shut off), and no gas detection details will be available.

After the cause of alarm is rectified, press the reset button.



Maintenance

Cleaning

- ⚠ Concentrations of alcohol found in many products may damage, deteriorate or affect the gas sensing elements such as wine; deodorants; stain removers and thinners. Other gases and substances to avoid are corrosives (i.e. chlorine & hydrogen chloride); alkali metals; basic or acidic compounds; silicones; tetraethyl lead; halogens and halogenated compounds.

Keep your equipment in good working order - follow these basic principles.

- Remove any dust/debris from the outer enclosure regularly using a slightly damp cloth.
- Never use detergents or solvents to clean your device.
- Never spray air fresheners, hair spray, paint or other aerosols near the device.
- Never paint the device. Paint will seal vents and interfere with the device.

Service Mode

This will inhibit all alarms/outputs and signals for a maximum of fifteen (15) minutes, or when manually exited. Service mode may be required when bump testing or servicing gas detectors.

If you are testing all actuation of alarms/outputs and signals, please proceed to bump test detectors only. Refer to your detector manual for more information.

- Access service mode by pressing the AGS logo on the controller (home screen logo only).
- The screen will display a service message prompt.
- Press Yes. (Note: All alarm signals/outputs will be inhibited for fifteen (15) minutes).
- Proceed to test gas detectors.
- Upon completion – exit service mode by pressing the 'Exit' button on screen.



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Specification

General	
Product:	GDP2X: Gas Detection Control Panel
Use:	Indoor, Safe Areas (not to be used in potentially explosive atmospheres)
Indicators (2.8" Touch Screen)	Main Zone Status. ID. Gas Type. Concentration Level. Measured Value. End of Life. Fault. Service.
Screen Brightness	Adjustable 0-100%
Mounting	Wall Mounting
Electrical	
Max. Power Consumption	20W Max (Full Load)
Power Voltage Input Range	100-240VAC 50-60Hz
Gas Valve Output Range	100-240VAC
I/Os	24vdc Detector Power Output 24vdc Power output for strobes/sounders (100mA Max) 3x Open/Close Switches (EM Stop / Heat Sensor / Fire Panel)
Relay(s)	BMS Output: 6A Dry contact (NC/ COM / NO) Gas Valve Output: 3A @ 110vAC (De-energises in Alarm Condition)
Terminal Wire ratings	Copper 18AWG (0.75mm ²) Min. 25 x screw terminals.
Fuse	3.15A
Construction	
Dimensions (H x W x D)	140 x 190 x 62 mm/ 5.51 x 7.48 x 2.44"
Unit Weight (Approx.)	0.72kg / 25.4oz
Housing Material	ABS Polylac - PA765
Environmental	
Ingress Protection	IP65 (Pre-installation)
Storage Conditions	Dry. Cool. Flat
Operating Conditions	-10 ~ 50°C / 14 ~ 122°F 30 ~ 80% rh
Compliance	
EMC / Safety	EN 61326-1 / IEC 61010-1

Installation Details

Please pass this manual to the system owner / user.

Date of Installation:	
Installation Location:	
Organisation:	
Stamp/Signature of the installer:	

We recommend all Merlin gas detection equipment be commissioned by a competent/trained engineer to ensure correct installation and operation. The Merlin range of gas detectors are calibrated when manufactured, however, we strongly recommend the detectors response and alarm signals are tested and validated once installed. This will ensure the equipment performs as intended and is free from any unforeseen damage caused by transit/installation.

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