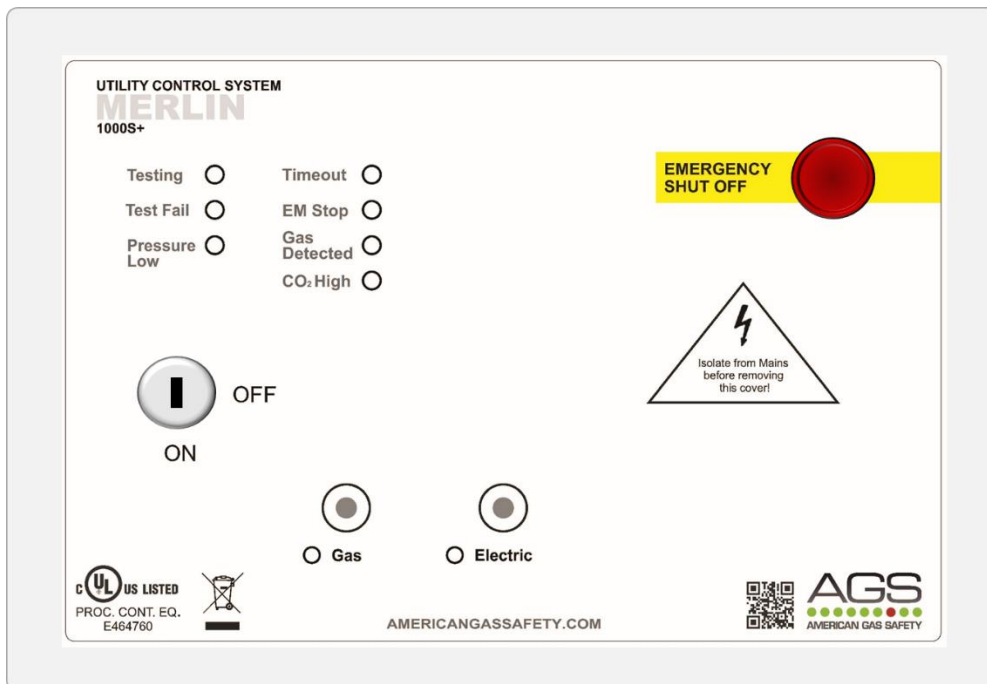# Gas Safety Products

Merlin **1000S+** Gas Utility & Electrical Isolation Controller

Installation, Operation and Maintenance

Read these instructions carefully before operating or servicing

Table of contents

1   GENERAL INFORMATION

The Merlin 1000S+ is a gas shut off, gas detection & electrical isolation utility controller.

The system comprises of a control panel and a gas pressure sensor.
The Merlin 1000S+ can receive connections from remote emergency shut-off buttons, gas detectors and a CO2 monitor. It can also be integrated with a BMS and fire alarm.

It is recommended that the user reads this guide before using the system.

Please do NOT attempt to operate the unit until the contents of this document have been read and are thoroughly understood.

2   INSTALLATION & CONNECTION

2.1   Panel Mounting

The control panel is designed for surface mounting using 4 mounting screws.
Removing the cover on the panel gives access to the circuit board.

The PCB should be removed before drilling entry holes into the case.

A flush mount kit is available, comprising of a mounting bracket and decorative surround strip.
Contact your supplier for more information.

2.2   1000S+ Circuit Board Terminals
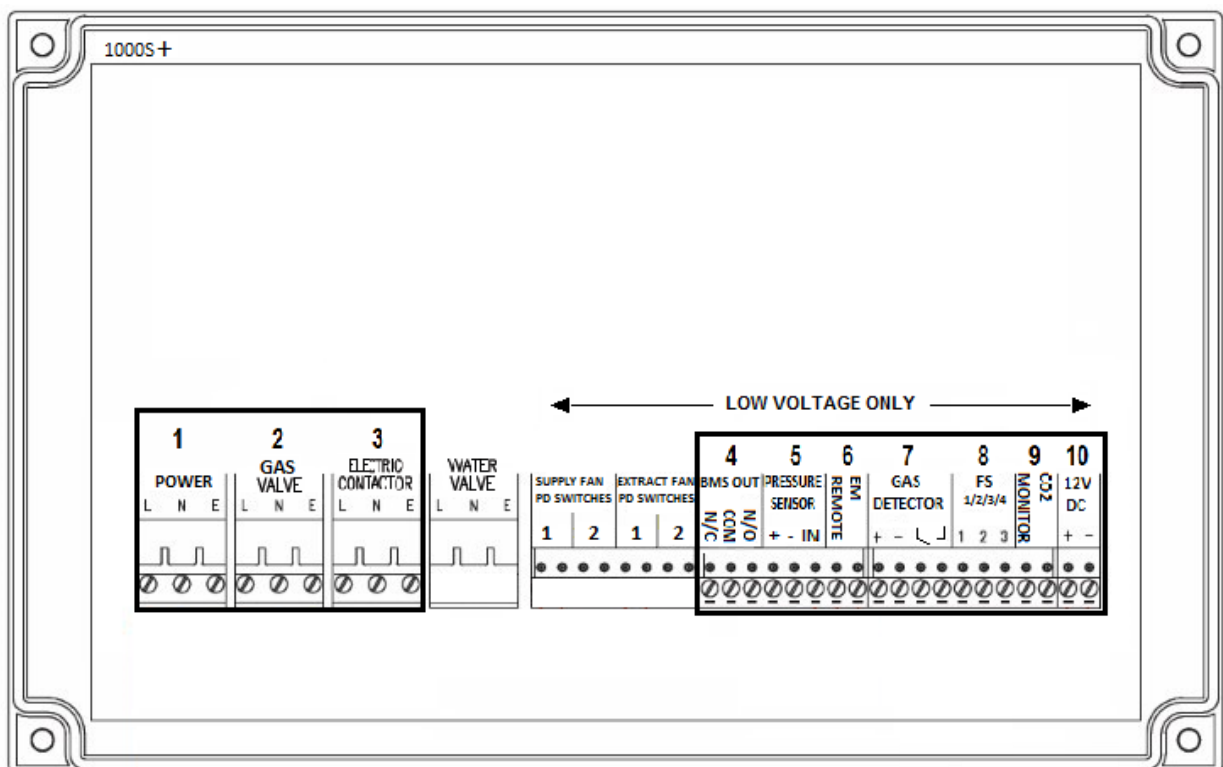
2.3   POWER [1]

A 110-120VAC Single Phase electrical supply should be supplied to the panel.
This should be externally fused at 3 Amps using a fuse or circuit breaker.

2.4   GAS VALVE [2]

This terminal provides a 110-120VAC 3 amp signal to the Gas solenoid valve.
Please consult the solenoid valve installation instructions for further information.

2.5   ELECTRIC CONTACTOR [3]

A 110-120VAC electrical output should be supplied to an electrical contactor.
This will be internally fused at 3 Amps using a fuse or circuit breaker.

2.6   BMS OUT [4]

Terminal connections are available on the circuit board for connections to Building
Management systems. [NC – Normally Closed] [COM - Common] [NO – Normally Open].
These are volt free dry contact connections.
This is a relay that changes state in alarm or when gas is on/off and can be used in conjunction
with the 12VDC output and other external relays that affect other devices and controls such as
purge fans, audible alarms etc.

2.7   PRESSURE SENSOR [5]

The terminal marked [PRESSURE SENSOR] [+ - IN] are wired to the gas pressure transducer which
is screwed into the downstream port on the gas solenoid valve (see Transducer datasheet for
more information).

Pressure Transducer Operating Pressure = 0.17psi min - 1.45psi max
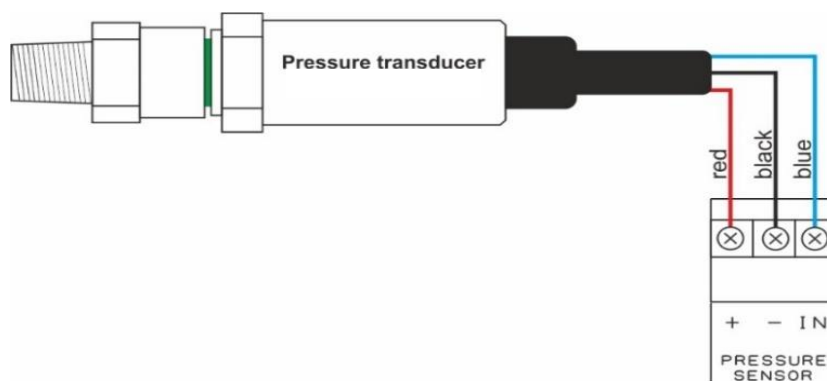
2.8   EM REMOTE [6]

The Remote Emergency Shut Off terminal is linked out as a factory setting.

Remote emergency shut-off buttons should be volt free and wired to the Merlin panel using a
Plenum Security Cable. White, 18/2 (18AWG 2 Conductor), stranded, CMP or similar.

2.9   GAS DETECTOR [7]

These terminals are marked [+   -] and [↰ ↲] and should be volt free dry contact connections.
These can be wired to various Merlin gas detectors.

If no detector is being used, leave the terminal link in place.
For more information / multiple detector wiring, consult the gas detector manual.

2.10   FS 1/2/3/4 [8]

This Fan Switch Output terminal switches when the key is turned on and off.
This can be linked to a fan switch (panel supplied separately) which can provide power to fans when the control panel is switched on.

2.11 CO_2 MONITOR [9]

This terminal can be wired to CO_2 monitor to shut off the system in the event of High CO2 levels.

If no CO_2 monitor is supplied leave the terminal link in [↰ ↲].
For more information, consult the CO2 Monitor manual.

2.12   12VDC [10]

This is a permanent 12v DC output when there is power at the panel and can be used to create a relay switch with the BMS relay output.

Please contact your supplier for further information.

2.13   INTERNAL BUZZER

Operates at 65dB measured 30cm from closed panel.

2.14   PANEL TIMEOUT FACILITY

The panel has a built-in Auto-shut down feature and it will turn itself off after a predefined time.
Auto-shut down timeout is selectable.
There are two Dip-Switches located on the inside facia labelled [Time1] and [Time2].
The gas supply will be cut off at desired time-out.

To select required timeout – configure Dip Switches as follows;
2 HOURS (FACTORY SET)
Time1 Off / Time2 Off
4 HOURS
Time1 On / Time2 Off
8 HOURS
Time1 Off / Time2 On
 NO TIMEOUT
Time1 On / Time2 On *(auto-shut down disabled)*

3   OPERATION

3.1   SYSTEM ON & OFF

1) Turn off all open appliances.
2) Turn the key switch to ON position.
3) To turn the system off, turn the key switch to OFF position.

3.2   LED STATUS

● **POWER**

When the system is connected to the mains supply, the Red LED of the AGS Logo located in the bottom right corner of the panel will illuminate. When no power is present, this LED will not light up.

RED = OK

OFF = No power to 1000S+, a loose ribbon connection or the fuse may not be intact.

● **GAS ON**

When the key switch is turned on, the Merlin 1000S+ will check the installation for gas leaks. If gas proving is successful, the gas valve will open and the green 'Gas On' LED will illuminate.

GREEN = Gas On

OFF = Gas Off

● **ELECTRIC**

When Electric service is turned on, the Electric LED will illuminate BLUE.

BLUE = Electric On

FLASHING = Electric Off, Electric button enabled

OFF = Electric Off, Electric button disabled

● **TESTING**

This LED will illuminate GREEN for approximately 30 seconds when the panel is checking the integrity of the gas installation upon start up.

GREEN = proving the gas line, do NOT operate any appliances

● **TEST FAIL**

Under normal working conditions this LED is off. When the panel detects a gas leak on start-up, the LED will illuminate AMBER. Gas valve will remain closed.

OFF = OK

AMBER = gas proving failed

● **PRESSURE LOW**

Under normal working conditions the LED is off. The LED will illuminate AMBER when pressure of the gas supply drops below 0.17psi for 10 secs. The gas valve will close.

OFF = OK

AMBER = gas supply pressure low.

● **TIMEOUT**

Under normal working conditions this LED is off. This LED will illuminate AMBER when auto-shut down has occurred.

OFF = OK

AMBER = auto-shut down

- **EM STOP**

If an emergency shut off button (either remote or on the panel) is pressed, the LED will illuminate AMBER and the gas will be turned off. The EM Stop button must be re-set before restarting the system.
OFF = OK
AMBER = EM Stop button pressed

- **GAS DETECTED**

Under normal working conditions this LED is off. If the external Merlin detector connected detects gas this will show RED and the Gas valve will turn off.
OFF = OK
RED = Gas detected.

- **CO2 HIGH**

Under normal working conditions this LED is off. If the concentration of CO_2 in the air is at alarm level (relevant detector required), the LED will show RED and the Gas valve will turn off.
OFF = OK
RED = the concentration of CO_2 is at alarm level.

3.3   EMERGENCY SHUT OFF

The Emergency shut off button is located on the front of the panel. There is also a facility for remote shut off buttons to be wired in series.

The Emergency shut off button(s) will cut off the gas supply when activated.
To reinstate the system, the Emergency shut off button(s) will need to be reset and the panel restarted.

3.4   BMS INTERGRATION

The Merlin panel can be integrated with a BMS to make or break a circuit on gas on/gas off, (valve open or valve closed). This will tell the BMS whether or not power is being sent to the solenoid.
There is a dip-switch located on the inside facia of the panel labelled [BMS SEL].
This is factory set in the OFF position which signals the BMS on gas on/gas off.

When switched to the ON position, the panel will only signal the BMS on a fault, i.e. CO2 high level detected, gas detected, EM Stop pressed, etc.

3.5   FIRE ALARM INTERGRATION

The Merlin 1000S+ can be integrated with a fire alarm to shut the gas supply automatically in the event of a fire.
The volt free fire alarm signal can be wired in series with any remote emergency shut off buttons.

If there are no remote emergency stop buttons installed, wire this directly to the terminal marked [EM REMOTE].

3.6   FAN SWITCH INTERGRATION

There is the facility to connect a Fan Switch (FS1 or FS2 sold separately).

The Fan Switch provides the facility to turn the fan(s) ON when the Merlin panel is on and turn the fans OFF when the panel is switched off.

There is a dip-switch located inside the facia of the Merlin panel labelled [EM SEL].
This is factory set in the 'OFF' position which instructs the system to shut down the fan(s) and gas supply on activation of the Emergency shut off button(s).

On installation, this can be switched to the 'ON' position, this will instruct the system to leave the fans on and only shut off the gas supply on activation of an Emergency shut off button.

Note: This option is not available if a Fan Switch is not installed.

3.7   GAS FILL & PROVE TIME

Gas fill and prove times are adjustable.
There are two dip-switches located on the inside facia of the Merlin panel labelled [FILL TIME] and [PROVE TIME].

They are factory set in the OFF position.
Fill and prove time can be changed by switching the relevant dip switch as follows;

[FILL TIME] Switch:

OFF – 5 seconds.

ON – 10 seconds

[PROVE TIME] Switch:

OFF – 30 seconds.

ON – 50 seconds

Once selected - please remove power from the fuse spur for 10 seconds.

3.8   AUTO RESET

The Merlin 1000S+ has a built-in auto reset feature.
There is a dip-switch located on the inside facia of the Merlin panel labelled [Auto Reset].

This is factory set in the 'OFF' position, this means, if you experience a power cut, the panel has to be restarted manually.

This can be switched to the 'ON' position and will instruct the system to restart automatically when power is restored following a power cut or similar situation.

1000S+ WIRING
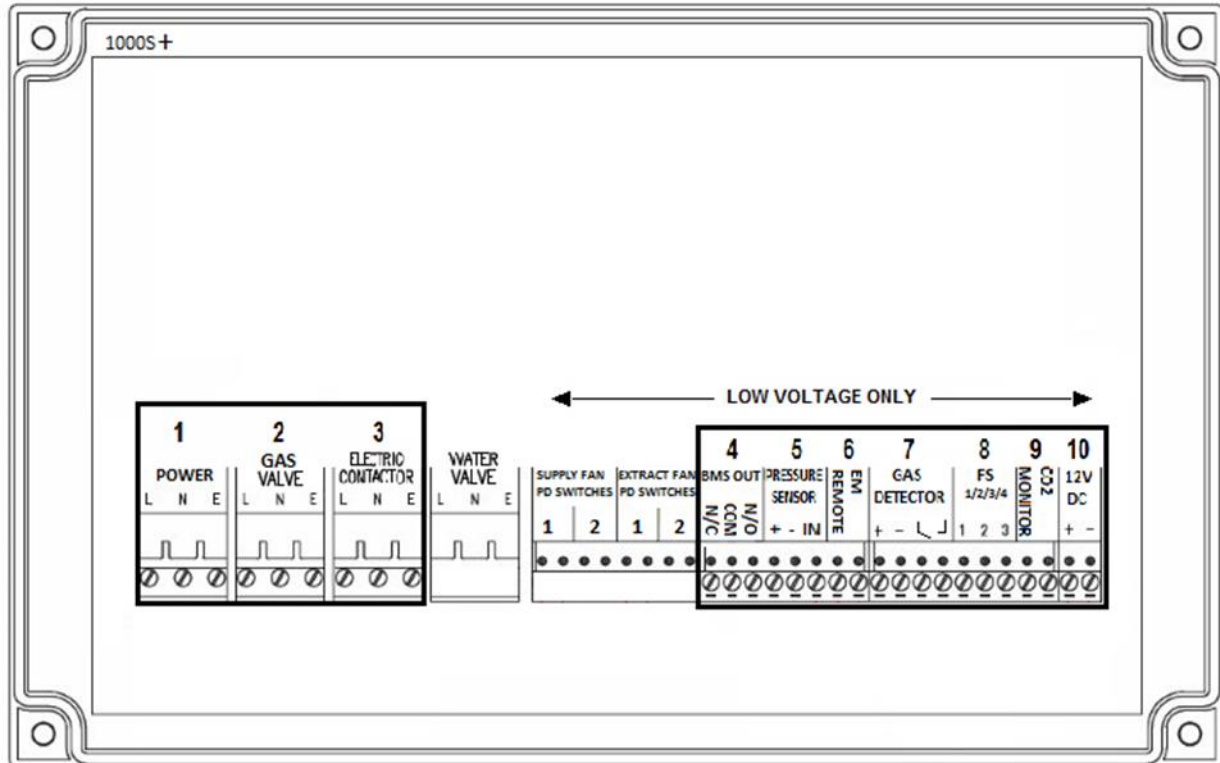
1) [POWER] Mains Input **110-120VAC Single Phase.**
2) [GAS VALVE] Gas Solenoid Valve Power Output, **110-120VAC, Max 3A.**
3) [ELECTRIC CONTACTOR] Electric Contactor Power Output, **110-120VAC, Max 3A.**

4) [BMS OUT] Building Management System output contacts.
   Normally Closed, Common and Normally Open. **Max.1A @ 110-120VAC.**
5) [PRESSURE SENSOR] Gas pressure transducer, power supply and returned signal (supplied).
6) [EM REMOTE] Remote EM Stop buttons and Fire Alarm input wired in series **VOLT FREE**
   (Purchased separately).
7) [GAS DETECTOR] Methane, CO or LPG Detector, power supply and **VOLT FREE**
   (Purchased separately).
8) [FS1/2/3/4] Fan Switch output (purchased separately).
   For wiring instruction see Fan Switch user manual.
9) [CO2 MONITOR] CO2 Monitor (purchased separately). **VOLT FREE**
10) [12VDC] Permanent 12VDC output when there is power at the panel. **50mA max**

   Panel Net Weight: 1200g
   Panel Dimensions: (W) 10'' x (L) 7'' x (D) 2.4''

PLEASE NOTE:
MAINS AND LOW WIRING SHOULD NOT RUN IN THE SAME CONDUIT AS PER THE LOW VOLTAGE DIRECTIVE

INFORMATION ON WASTE DISPOSAL FOR CONSUMERS OF ELECTRICAL & ELECTRONIC EQUIPMENT

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.

CONTACT US:

AGS Head Office
Tel: (727) 608-4375
Fax: (727) 538-4237
info@americangassafety.com