Gas Safety Products

Merlin 1000SW+ Gas, Water & Electrical Isolation Controller

AGS
AMERICAN GAS SAFETY

Installation, operating and maintenance

Table of contents

1 General information 3

2 Installation 3

2.1 Panel Mounting. 3
2.2 Mains Supply....3
2.3 Gas solenoid valve....3
2.4 Electric Contactor....3
2.5 Water Valve....3
2.6 BMS Connections. 3
2.7 Gas Pressure Transducer....3
2.8 Timeout Facility....3
2.9 Remote emergency shut off buttons. 4
2.10 Gas Detector. 4
2.11 FS 123....4
2.12 CO2 Monitor....4
2.13 12v DC. 4
2.14 Internal Buzzer. 4

3 Operation Instructions 4

3.1 How to turn the system on and off 4
3.2 Explanation of LED status....4
3.2.1 Power LED 4
3.2.2 Gas on LED....4
3.2.3 Electric on LED 5
3.2.1 Water on LED....5
3.2.2 Testing LED 5
3.2.3 Test Fail LED 5
3.2.4 Pressure Low LED 5
3.2.5 Timeout LED 5
3.2.6 EM Stop LED 5
3.2.7 Gas Detected LED 5
3.2.8 CO2 High 5
3.3 Using the emergency shut off 6
3.4 BMS integration 6
3.5 Fire alarm integration 6
3.6 Fan switch integration 6
3.7 Gas fill and prove time 6
3.8 Auto reset....6

1000SW+ Wiring Diagram....7

1 General information

The Merlin 1000SW+ is a gas shut off, gas detection, electrical isolation & water utility controller.
The system comprises of a control panel and a gas pressure sensor. The Merlin 1000SW+ 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

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.

2.2 Mains Supply A 110-120VAC electrical supply should be supplied to the panel. This should be externally fused at 3 Amps using a fused spur and should be connected to the terminals marked ”LNE Power IN”

2.3 Gas solenoid valve The gas solenoid valve should be powered using the terminals on the Merlin 1000SW+ marked “LNE to VALVE”.

2.4 Electric Contactor An electrical output will be supplied to an electrical contractor. This will be internally fused at 3 Amps and should be connected to the terminals marked “LNE Electric Contactor”.

2.5 Water Valve The water solenoid valve should be powered using the terminals on the Merlin 1000SW+ marked “LNE WATER VALVE”.

2.6 BMS Connections Terminal connections are available on the circuit board for connections to Building Management systems etc. Detailed on the circuit board as “BMS OUT N/C, COM and N/O” these are volt free connections.

2.7 Gas Pressure Transducer The terminals marked pressure sensor “+ - IN “.These wire to the gas pressure transducer which is screwed into the downstream port on the gas solenoid valve.
Red + positive, Black – negative and Yellow or Blue IN. Please ensure this is wired as instructed.

Minimum Operating Pressure = 0.17psi

Maximum Operating Pressure = 1.45psi

2.8 Timeout Facility The Merlin 1000SW+ has a built-in Auto-shut down feature and it will turn itself off after predefined time. Auto-shut down timeout is selectable. There are two dip-switches located on the inside facia of the Merlin 1000SW+ labelled “Time1” and “Time2”. They are factory set in the ‘off’ position for a 2 hour timeout. On installation, they can be switched to the ‘on’ position to select required timeout.

Time1 Off, Time2 Off – 2 hours
Time1 On, Time2 Off – 4 hours
Time1 Off, Time2 On – 8 hours
Time1 On, Time2 On – no timeout (auto-shut down disabled)
On Auto-shut down gas supply and water will be turned off.

There is a dip-switches located on the inside facia of the Merlin 1000SW+ labelled “Electric”. This is factory set in the ‘off’ position. This will instruct the system to also turn off Electric utility on Auto-shut down. On installation, it can be switched to the ‘on’ position. This will instruct the system not to turn off electric utility when performing Auto-shut down.

2.9 Remote emergency shut off buttons The terminal for remote emergency shut-off buttons is detailed on the circuit board as “EM Remote”. These connections are linked out as a factory setting. Remote emergency shut-off buttons should be volt free and wired to the Merlin 1000SW+ using two-core cable.

Gas supply and electrics will be turned off when EM Stop is pressed.

There is a dip-switches located on the inside facia of the Merlin 1000SW+ labelled “Water”. This is factory set in the ‘off’ position. This will instruct the system to also turn off water utility when EM Stop is pressed. On installation, it can be switched to the ‘on’ position. This will instruct the system not to turn off water utility when EM Stop is pressed.

2.10 Gas Detector The terminals detailed on the circuit board as “Gas Detector”. These connections are “+,-“ and ”⊥⊥” these can be wired to a Merlin Natural gas, Carbon monoxide or LPG detector. If no detector is being used leave the link in between the “⊥⊥”. Other detector types are available.

2.11 FS 123 This 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 the fans when the control panel is switched on.

2.12 CO2 Monitor This terminal can be wired to CO2 monitor to shut off the system in the event of High CO2 levels. If no CO2 monitor is supplied leave the terminal link in.

2.13 12v DC This is a permanent 12v DC output when there is power at the panel.

2.14 Internal Buzzer Operates at 65dB measured 30cm from closed panel.

Note: all low voltage connections should be made using a screened cable. To avoid electrical interference this should not be in the same conduit as mains cable as per the low voltage directive.

3 Operation Instructions

3.1 How to turn the system on and off

1. Turn the key switch to on position.
2. Gas, electric & water will flash for 10 seconds.
3. Press relevant service button to turn required utility on.
4. Turn the key switch to the off position to turn the panel off.

Please Note: All services can be turned on or off only within 10 seconds of the key switch being turned on. After 10 seconds, all utility buttons will be disabled. The user must turn the key off and back on to adjust any services.

3.2 Explanation of LED status

3.2.1 Power LED

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 1000SW+, a loose ribbon connection or the fuse may not be intact.

3.2.2 Gas on LED

When the key switch is turned on, the Merlin 1000SW+ 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

3.2.3 Electric on LED

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

3.2.1 Water on LED

When Water service is turned on, the Water LED will illuminate BLUE.
BLUE = Water On
FLASHING = Electric Off, Electric button enabled
OFF = Electric Off, Electric button disabled

3.2.2 Testing LED

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

3.2.3 Test Fail LED

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

3.2.4 Pressure Low LED

Under normal working conditions the LED is off. Th 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.

3.2.5 Timeout LED

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

3.2.6 EM Stop LED

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

3.2.7 Gas Detected LED

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.

3.2.8 CO2 High

Under normal working conditions this LED is off. If the concentration of CO2 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 CO2 is at alarm level.

3.3 Using the 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, electric and water 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 Integration

The Merlin 1000SW+ 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 Merlin 1000SW+ labelled 'BMS Selection'. This is factory set in the 'off' position which signals the BMS on gas on/gas off. When switched to the 'on' position, the 1000SW+ will only signal the BMS on a fault, i.e. CO2 high level detected, gas detected, EM Stop pressed, etc.

3.5 Fire Alarm Integration

The Merlin 1000SW+ can be integrated with a fire alarm to close 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 is no remote emergency stop buttons installed wire this directly to the terminal marked 'EM REMOTE'.

3.6 Fan Switch Integration

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

The Fan Switch provides the facility to turn on the fan(s) when the key switch on the Merlin 1000SW+ is in the on position and turn the power off to the fan(s) when the key switch on the Merlin 1000SW+ is in the off position.

There is a dip-switch located inside the facia of the Merlin 1000SW+ labelled EM Selection.

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 if required. This will instruct the system to leave the fans on and only shut off the gas supply on activation of the Emergency shut off button(s). Note: This option is not available if Fan Switch is not installed.

3.7 Gas Fill and Prove Time

Gas fill and prove times are adjustable. There are two dip-switches located on the inside facia of the Merlin 1000SW+ labelled "Fill Time" and "Prove Time". They are factory set in the 'off' position. Fill and prove time can be changed by turning the relevant dip switch to on position.

Fill time: Off – 5 secs, On – 10 secs

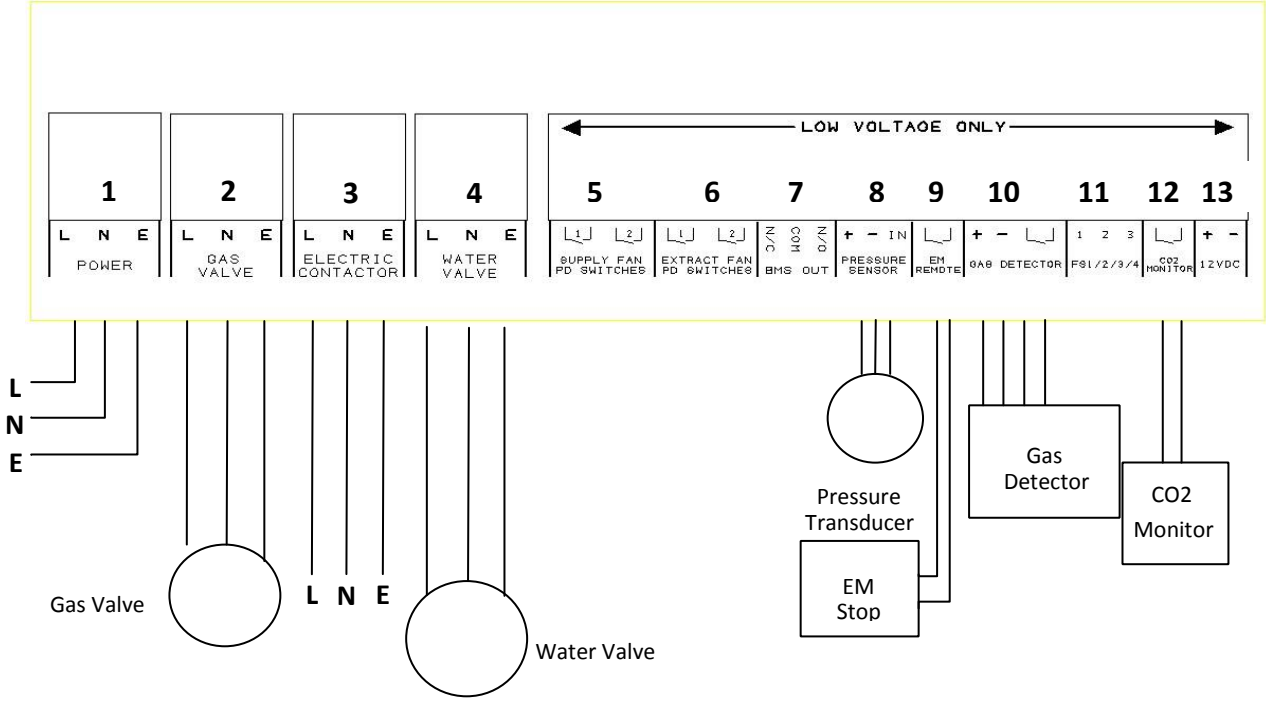
Prove time: Off – 30 secs, On – 50 secs

Once the settings have been changed please remove power from the fuse spur for 10 seconds.

3.8 Auto reset

The Merlin 1000SW+ has a built-in auto reset feature. There is a dip-switch located on the inside facia of the Merlin 1000SW+ labelled "Auto Reset". This is factory set in the 'off' position. When the power is restored after the power cut, the panel has to be restarted manually. On installation, this can be switched to the 'on' position if required. This will instruct the system to restart automatically when power is restored after the power cut.

1000SW+ Wiring Diagram



1. Mains Input 110-120VAC Single Phase.
2. Gas Solenoid Valve Power Output, 110-120VAC, Max 3A.
3. Electric Contactor Power Output, 110-120VAC, Max 3A.
4. Water Valve Power Output, 110-120VAC, Max 3A.
5. Supply Fan PD Switches terminal, this is disabled on this system.
6. Extract Fan PD Switches terminal, this is disabled on this system.
7. BMS output contacts. Normally Closed, Common and Normally Open. Max.1A @ 110-120VAC.
8. Gas pressure transducer, power supply and returned signal (supplied).
9. Remote EM Stop buttons and Fire Alarm input wired in series (purchased separately). **VOLT FREE INPUT**
10. Methane, CO or LPG Detector, power supply and **volt free input** (purchased separately).
11. Fan Switch output (purchased separately). For wiring instruction see Fan Switch user manual.
12. CO2 Monitor (purchased separately). **VOLT FREE INPUT**
13. Permanent 12VDC output when there is power at the panel. **50mA max**

Please note, Mains wires and low voltage wires should not be 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

American Gas Safety is the owner of this document and reserves all rights of modification without prior notice.