S&S™

NORTHERN

Merlin CT1650+

Ventilation Interlock System with Current Monitoring

User Guide

📖 Please read this guide carefully and retain for future use.

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1   General Information

The Merlin CT1650+ is a ventilation interlock system with in-built current monitoring.

The Merlin CT1650+ is designed for use with fans up to 18A running current (Min 0.1) located in commercial kitchens.

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.

1.1   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.

⚠

Important Warning Statements

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.

Your product should reach you in perfect condition, if you suspect it is damaged, contact your supplier.

Information on waste disposal for consumers of electrical & electronic equipment. (EEE)
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.

2 Circuit Board Terminals

2.1 POWER

A 100-240VAC electrical supply should be supplied to the panel. This should be externally fused at 3A.

2.2 GAS VALVE

A 100-240VAC output connection for a gas solenoid valve.

2.3 FAN 1 & FAN 2 LIVE – Current monitoring

Located at the bottom of the main circuit board there are two terminals for fan current monitoring, and these are marked up as [FAN 1 LIVE IN / OUT] & [FAN 2 LIVE IN / OUT].

The live feed from the fan speed controller should be taken through these contacts. Each will monitor its own independent fan.

From a fan controller the live feed should be taken to the [IN] terminal and the [OUT] terminal should wire to the fan motor.

There is an option to set a minimum and maximum running current for the fans to operate on. If the current goes above or below these parameters for 10 seconds or more, the fan fault will alarm, the Panel LED will illuminate and the gas solenoid valve connected will be isolated.

For more information see section 3.6 –'How to set up the current monitors'.

2.4 BMS OUT - Building Management System

This is used for connections to Building Management systems.

This is a relay that changes state in alarm or when gas is on/off and other external relays that affect other devices and controls such as purge fans, audible alarms etc.

Detailed on the circuit board as [TO BMS] normally closed (N/C), common (COM) and normally open (N/O).

These are volt free connections.

2.5 EM REM STOP - Remote emergency buttons

The terminal for remote emergency shut-off buttons is detailed on the circuit board as [EM REM STOP].

These connections are linked out as a factory setting.

Remote emergency shut-off buttons should be volt free and wired to the CT1650+.

2.6   CO$_2$ SENS – Carbon dioxide detector.

The detector will shut off the system when CO_2 gas reaches the alarm level.

Refer to your detector user guide for more information.
If no detector is being used leave the link in.

Other detector types are available.

2.7   PDS: FAN 1 & FAN 2

These are separate to the in-built current monitors and can be used to accept external current monitors or air flow switches if interlocking with more than two fans.

If these are not required, please leave the links in.

2.8   TO FS 1/2 - Fan switches

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.

3   Installation & Operation

3.1   System ON and OFF

- ➢ Turn the Fans On.
- ➢ Turn the key switch to the on position.
- ➢ To turn the system off, turn the key switch to off position.

3.2   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 supply when activated.
To reinstate the system, the emergency shut off button(s) will need to be reset and the panel restarted.

The Emergency shut off button(s) can also switch off the fans when used with a FS1/FS2 using the [EM SEL] switch located on the PCB board of the front fascia and switching ON.
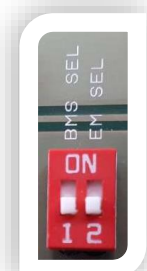
3.3   BMS Integration

The Merlin CT1650+ 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 the kitchen has use of the gas supply.

This can be adjusted using the switch [BMS SEL] located on the PCB board of the front fascia to switch the BMS on gas detection or emergency stop.

3.4   Fire Alarm Integration

The Merlin CT1650+ 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 are no remote emergency stop buttons installed wire this directly to the terminal marked [EM REM STOP].

3.5   Mute Button

Under normal working conditions the panel will activate the sounder alarm in the event of a fault being present. To mute the sounder alarms press the button on the front panel.

3.6   How to setup the current monitors

Setting the minimum & maximum fan current.

  ➤ Turn Fan 1 (F1) switch to ON position.
  ➤ The LCD screen will show Fan 1 current.
       ! - means Fan1 has not yet been calibrated.

  ➤ Set Fan 1 minimum operating current.
  ➤ Press and hold the F1 LOW button.
  ➤ LCD screen will display: F1 LOW SAVED.

  ➤ Set Fan 1 maximum operating current.
  ➤ Press and hold the F1 HIGH button.
  ➤ LCD screen will display: F1 HIGH SAVED.

 Please repeat steps to set min & max current of Fan 2.
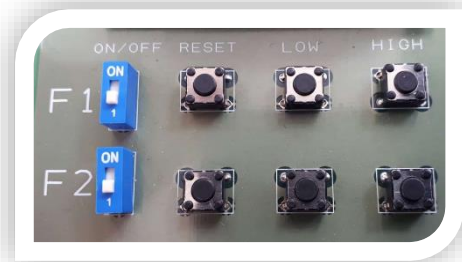
| F1! 10.0A |
| F2 OFF |

| F1 LOW |
| SAVED |

| F1 HIGH |
| SAVED |

⚠ IF YOU ARE ONLY INTERLOCKING WITH ONE FAN, PLEASE LEAVE THE REMAINING [F] SWITCH TO THE '1' or 'OFF' POSITION TO PREVENT NUISANCE TRIPPING.

If the measured current falls below or rises above 10% of the permitted current, the LCD display will show a 'LOW!' or 'HIGH!' message next to the relevant fan and the gas solenoid valve connected will be isolated. To adjust this threshold – see following section.

| F1 LOW! |
| F2 10.5A |

To erase the calibration data press and hold the relevant [RESET] button until '!' appears.

3.7   How to adjust the current monitor thresholds.

The CT1650+ has a factory set 10% dropout threshold for low and high values for both fans. However, it is possible to alter between a 10% to a 40% dropout threshold if required.

Follow these instructions

1. Switch F1 and F2 switch OFF.
2. LCD will display 'F1 and F2 OFF'
3. To change the LOW threshold, press and hold F1 and F2 LOW buttons together
4. The LCD screen will display 'Offset L F1 10%'
5. Select different thresholds by pressing the F1 LOW button
6. After 5 seconds of inactivity the LCD screen will display the new low offset value for F1 (fan 1).
7. Once Fan 1 threshold has been set the LCD screen will prompt setting fan 2 'Offset L F2 10%'.
8. Repeat step 4, 5, 6 as above for Fan 2.
9. Once this has been setup the LCD screen will display the new low offset value for F2 (fan 2).

    Repeat to adjust HIGH threshold as follows

10. To change the high threshold, press and hold F1 and F2 HIGH buttons together
11. The LCD screen will display 'Offset H F1 10%'
12. Select different thresholds by pressing the F1 HIGH button
13. After 5 seconds of inactivity the LCD screen will display the new high offset value for F1 (fan 1).
14. Once Fan 1 threshold has been set the LCD screen will prompt setting fan 2 'Offset H F2 10%'.

    Once you have completed setting the thresholds, switch F1 and F2 switches to ON.
    You will now need to calibrate the fans, see 3.6 'How to set up the current monitors'.

4   Panel LED Status

- **Power**

When the system is connected to the mains supply, the Power LED will illuminate. When no power is present, this LED will not light up.

- **Gas on**

When the fans are running at the correct speed and the key switch is turned on, the Merlin CT1650+ will open the gas valve and the green 'Gas On' LED will illuminate.

GREEN = Gas On

OFF = Gas Off

- **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

- **CO_2 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.

- **Fan 1 OK**

Under normal working the LED will illuminate GREEN. If a fan fault is present on fan1, the LED will be flashing. After 10 seconds of flashing the gas will be shut off.

GREEN = OK

FLASHING = the fan is not running.

- **Fan 2 OK**

Under normal working the LED will illuminate GREEN. If a fan fault is present on fan2, the LED will be flashing. After 10 seconds of flashing the gas will be shut off.
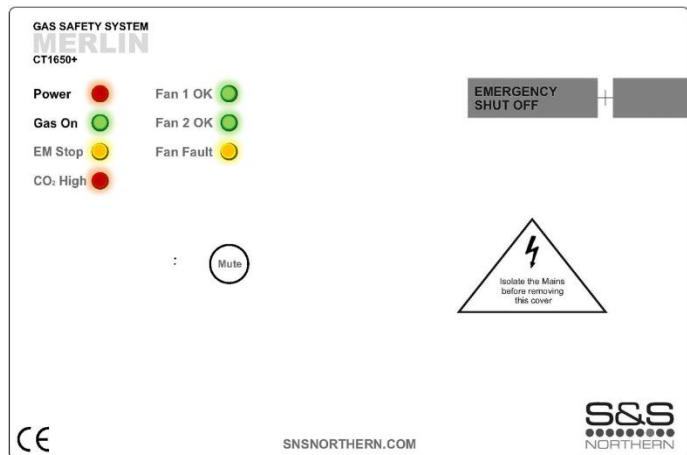
GREEN = OK

FLASHING = the fan is not running

- **Fan Fault LED**

Under normal working conditions this LED is off. If a fan fault occurs for 10 seconds, the LED will illuminate AMBER.
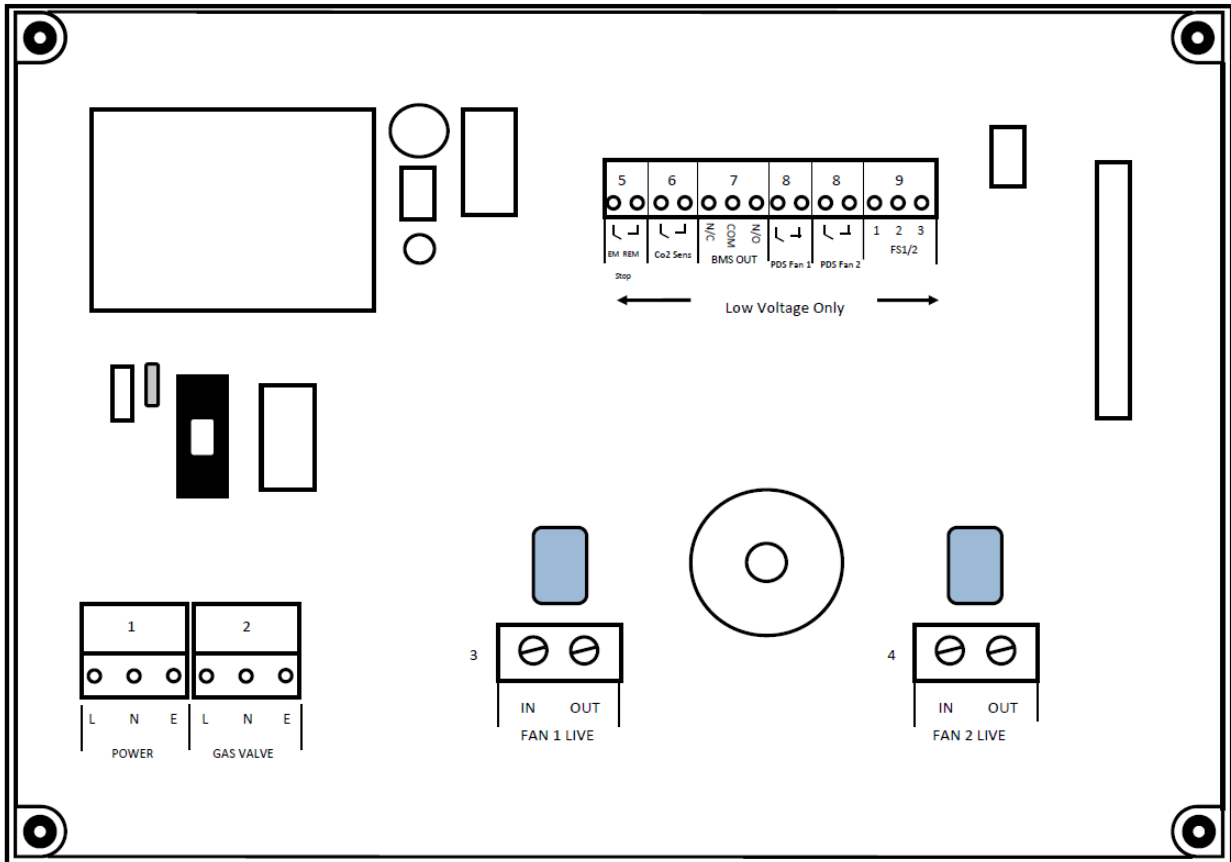
OFF = OK

AMBER = the gas supply has been shut off due to a ventilation fault.

5   CT1650+ Wiring Diagram

1.   POWER: Mains Input 100-240VAC.
2.   Gas Solenoid Valve Power Output, 100-240VAC.
3.   FAN 1 LIVE IN / OUT **MAX 18AMPS**
4.   FAN 2 LIVE IN / OUT **MAX 18AMPS**
5.   EM REM: Remote emergency stop buttons and Fire Alarm input wired in series.
6.   CO2 SENS: CO2 Monitor input (purchased separately).
7.   BMS OUT: output contacts. Normally Closed, Common and Normally Open.
8.   PDS FAN 1 & 2: NC switches for additional external PD switches or current monitors
9.   FS1/2: Fan Switch 12vdc output. For wiring instruction see Fan Switch user manual.
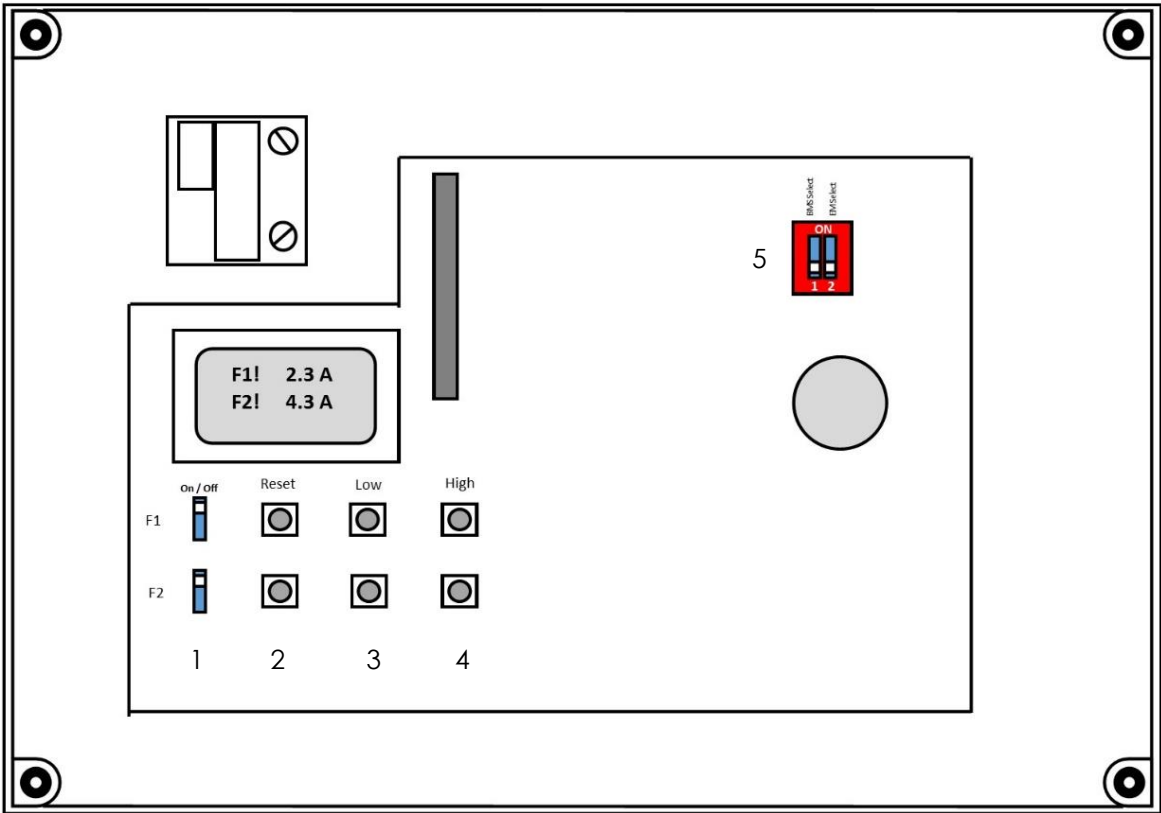
1. F1 & F2: Fan Current Monitor On/Off switches.
2. Fan Current Monitor Reset Button
3. Fan Current Monitor Low Button
4. Fan Current Monitor High Button
5. BMS Selection / EM Selection.

6   Manufacturer's Warranty

3 Year Limited Warranty

Warranty coverage: The manufacturer warrants to the original consumer purchaser, that this product will be free of defects in material and workmanship for a period of three (3) years from date of purchase. The manufacturer's liability hereunder is limited to replacement of the product with repaired product at the discretion of the manufacture. 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.

Warranty disclaimers: 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.

Warranty Performance: 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.

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