Fire Alarm and System Warning Signs
&
Local Control Stations

Installation and Operations Manual

Serial Communications Type

Contents

1. Introduction

SIGNS - The illuminated warning signs provide a clear, visual and audible warning for a fire alarm, extinguishant release, and System inoperative. Signs have two levels of operation in which the top and bottom halves of the sign may be split to show an initial warning and then additional text for a reinforced warning, or both halves can be activated at once.

LOCAL CONTROL STATION (LCS) may be required by standards for an installation. These units can be installed using the serial bus and can be inserted anywhere in the 485 circuit.

A maximum of 7 devices (signs/LCS) can be installed when utilising the 485 Circuit.

1.1. Sign Locations

Locations where signs must be installed are defined by AS 1670. This manual does not replace reading the full standard. Signs should be firmly mounted in appropriate locations. Interior signs are rated IP30 and are designed for indoor use only. Weatherproof Signs are available. Signs are considered by the Sigma XT FIP to be OUTPUT UNIT(S)

"FIRE ALARM/DO NOT ENTER" SIGNS - Installed outside the risk area, adjacent to all egress points and clearly visible to anyone who may enter the risk area.

"FIRE ALARM/EVACUATE AREA" SIGNS - Installed inside the risk area, adjacent to all egress points and clearly visible to all occupants of the risk area.

"EXTINGUISHING SYSTEM INOPERATIVE" SIGNS - Installed adjacent to the FIP and egress points, with additional signs where necessary to be clearly visible to anyone who enters the risk area.

1.2. Local Control Stations (LCS)

LCS should be mounted firmly in an accessible location. The LCS is considered by the Sigma XT FIP to be a STATUS UNIT(S). Status units have monitored inputs to which remote Hold or Mode select switches can be connected.

These inputs are monitored for open and short circuit faults and therefore need to have a 470R 1W trigger resistor connected in series with the activating, normally open switches and 6K8 0.5W end of line monitoring resistors connected across the end of the cables.

Status Units are environmental class A and are designed for indoor use only at temperatures between -5_0C (+/- 3) and $+40_0$C (+/- 2) and with a maximum relative humidity of 95%. The IP rating for the enclosure is IP30. Operation outside of these limits may render the equipment unsafe.

The 6K8 end-of-line monitoring resistors are supplied fitted to the Hold and Mode input terminals

1.3. External Devices

In addition to standard installation rules, there are some additional precautions that must be observed when installing external signs.

SUNLIGHT - If an external sign is mounted in direct sunlight, it may be difficult to see if the sign is illuminated. In this case it may be necessary to install a sun shield to make the illuminated sign visible.

DRIP LOOP - All external devices should be installed with cable penetrations coming through the bottom of the sign, with a drip loop included to avoid the accumulation and ingress of water that may damage the electronics.

## 1.4. Cable Penetrations and Terminations

All cable penetrations into the sign enclosures must be protected by cable glands or bushings. Each sign enclosure features a series of 20mm knockouts to accommodate these cable glands. The max size of cable that the terminals will accommodate is 2.5mm.

When preparing cable terminations, ensure that cables are not going to cross the front surface of the circuit board as this will impair the light output of the unit, and the shadows generated by the cables will be clearly visible when the sign is lit.

THIS CABLE PATH WILL CREATE SHADOWS WHEN THE LIGHTS ARE ACTIVATED.
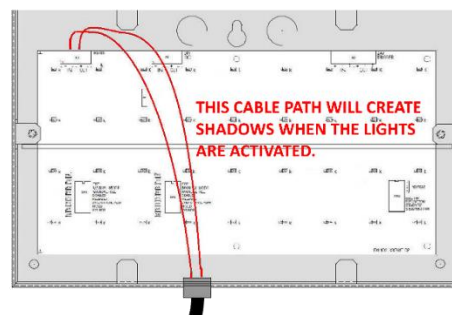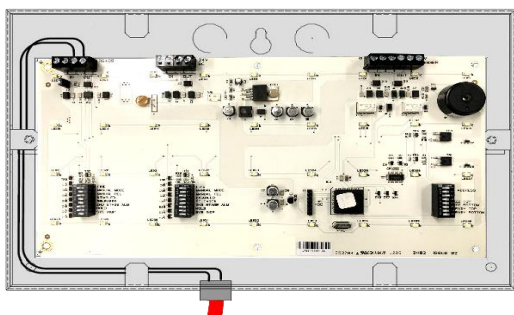
2. Mounting

2.1. Internal Signs
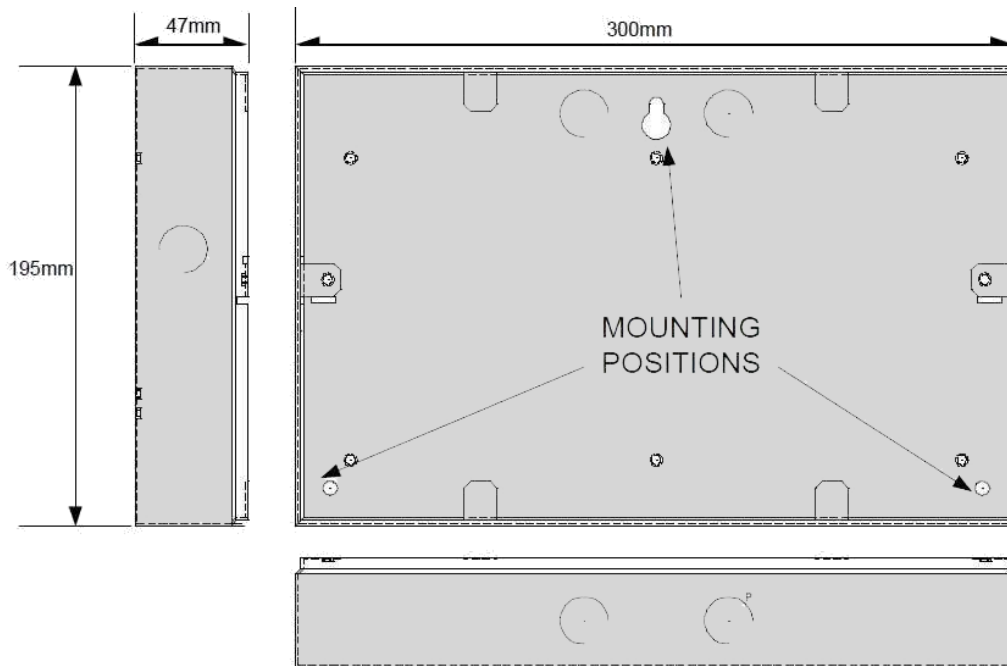
Remove Cover and Internal circuit board.

Mount using suitable fixings.

Select cable entry point and prepare.

Leave enough tail on cable to ensure the cable will not interfere with operation of sign.

2.2. Weatherproof - External Signs

Mount Sunshade.

Remove cover and Internal circuit board

Mount using suitable fixings

ONLY Mount to sunshade surface – if the enclosure is twisted on mounting it will crack over time.

Best practice is to use silicon for securing the lower half of sign.

Select cable entry point and prepare. Cable entry must have cable gland fitted. Preferred entry though base of sign with drip loop in cable.

Leave enough tail on cable to ensure the cable will not interfere with operation of sign.

3. Power and Data Connections

Each status unit requires two cores for power and two cores for data transmission to and from the control panel. A four core cable may be used for these connections. All of these connections are polarity conscious and care should be taken to match the polarity with the corresponding terminals at the control panel.

3.1. Connecting Signs with RS485 Serial

3.1.1. Connecting up to 3 Signs

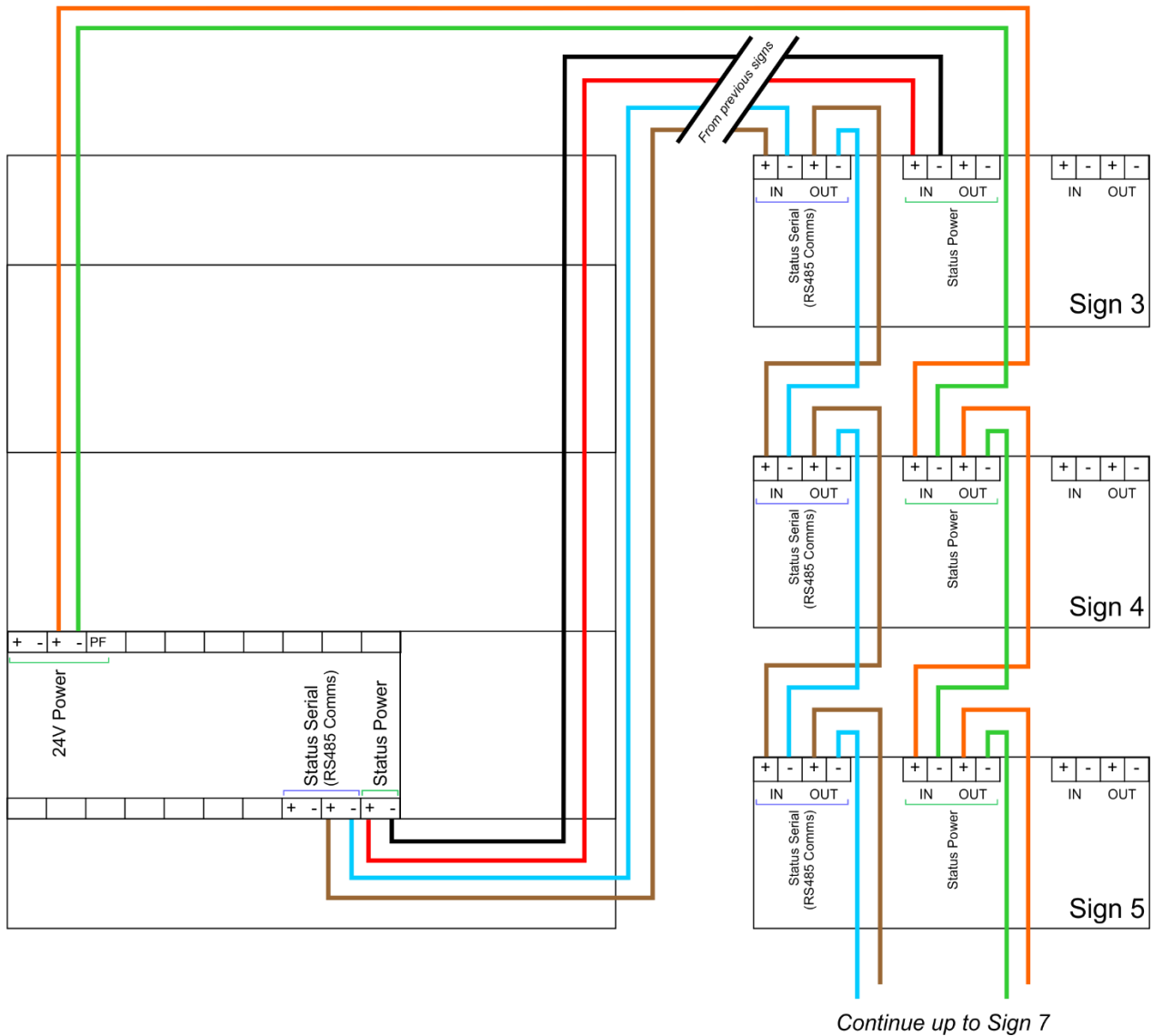For systems requiring up to 3 signs (or devices) to be installed, wiring is as follows:

Notes:
- FIP MUST BE POWERED DOWN BEFORE ANY CHANGES TO SIGNS.
- STATUS POWER - will support a maximum of 3 devices, including both signs and LCS.
- For more than 3 signs, a separate power supply is required from the 24VDC output on the FIP.
- STATUS SERIAL (RS485) - Maximum number of devices, including both Signs and LCS, for the 485 communications is 7.
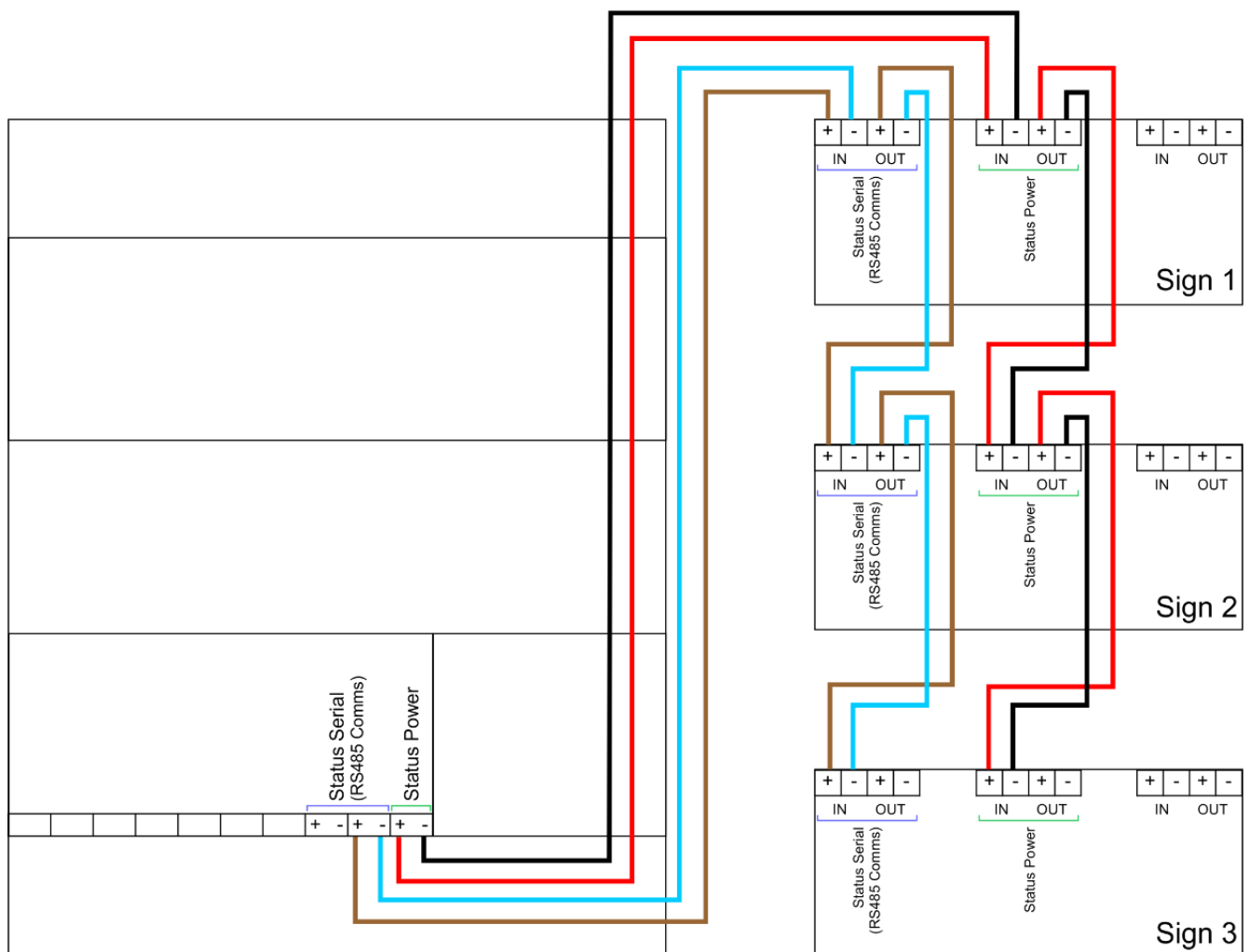
3.1.2. Connecting more than 3 Signs

For systems requiring more than 3 signs (or devices), wiring is as follows:

Notes:
- FIP MUST BE POWERED DOWN BEFORE ANY CHANGES TO SIGNS.
- Connections for the first 3 signs or devices remains the same as the previous wiring diagram.
- For more than 3 signs, a separate power supply is required from the 24VDC output on the FIP.
- STATUS SERIAL (RS485) - Maximum number of devices, including both Signs and LCS, for the 485 communications is 7. RS485 connection remains the same for all 7 devices.


Continue up to Sign 7

4. Connection of Local Control Station (LCS)

4.1. Power and Data Connection

The LCS can be installed in any order on the STATUS SERIAL (RS485) circuit, depending on its location. The LCS must be installed on the STATUS SERIAL (RS485) circuit. It cannot be used as a mimic device. More information is available on the Local Control Station Manual.

For systems requiring a LCS to be installed, wiring is as follows:

Notes:
- FIP MUST BE POWERED DOWN BEFORE ANY CHANGES TO SIGNS.
- If installed as one of the first 3 devices on the STATUS SERIAL (RS485) circuit, STATUS POWER may used for the power supply. STATUS POWER will support a maximum of 3 devices, including both signs and LCS.
- If installed after the first 3 devices on the STATUS SERIAL (RS485) circuit, a separate power supply is required from the 24VDC output on the FIP.
- STATUS SERIAL (RS485) - Maximum number of devices, including both Signs and LCS, for the 485 communications is 7.
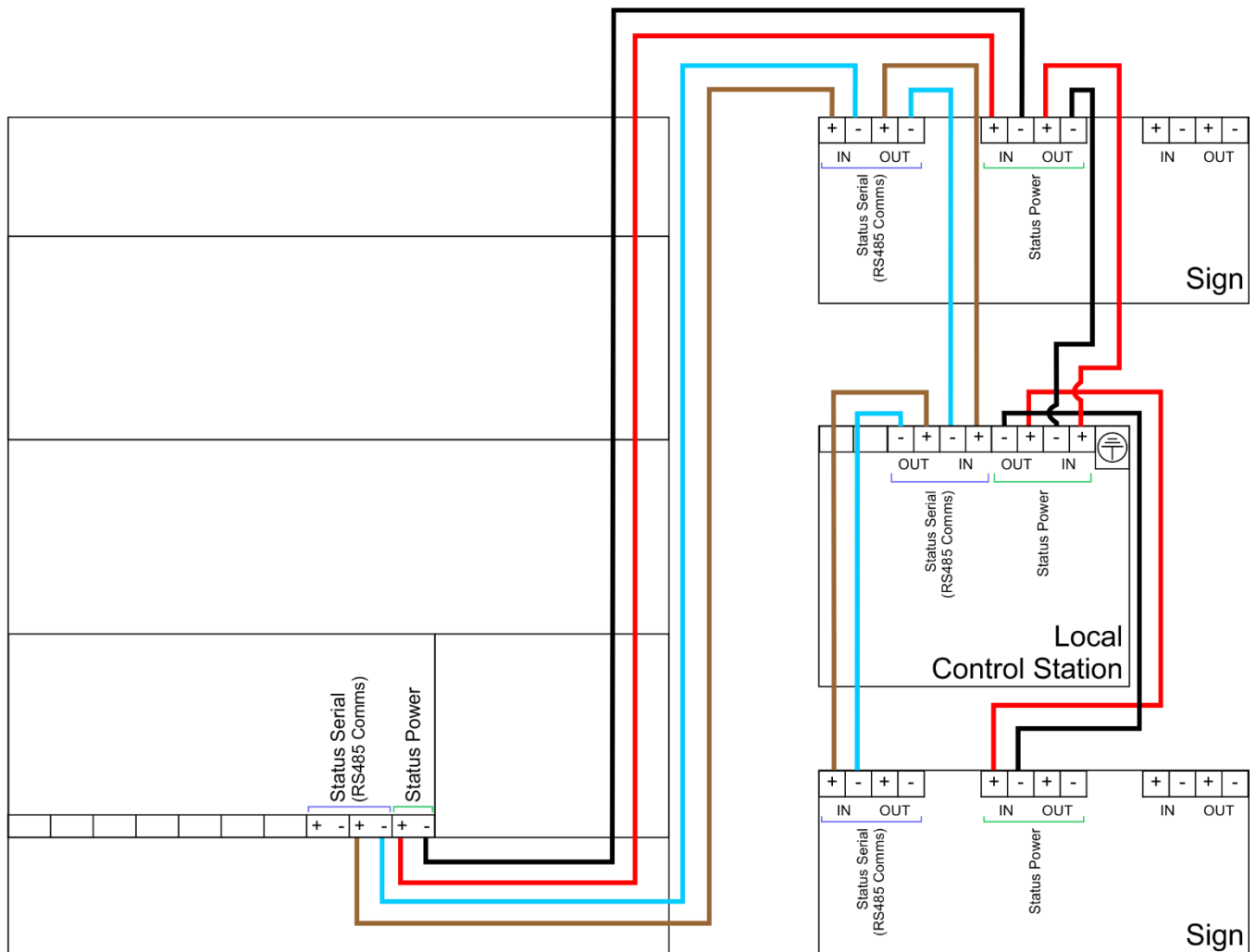
4.2. Connection to Hold and Mode inputs

Status units have monitored inputs to which remote Hold or Mode select switches can be connected. These inputs are monitored for open and short circuit faults and therefore need to have a 470R 1W trigger resistor connected in series with the activating, normally open switches and 6K8 0.5W end of line monitoring resistors connected across the end of the cables.

The 6K8 end-of-line monitoring resistors are supplied fitted to the Hold and Mode input terminals and the 470R trigger resistors are supplied in the accessory bag with the status unit. If either of these inputs are not being used then the end of line monitoring resistors should be left in the Hold and/or Mode terminals.
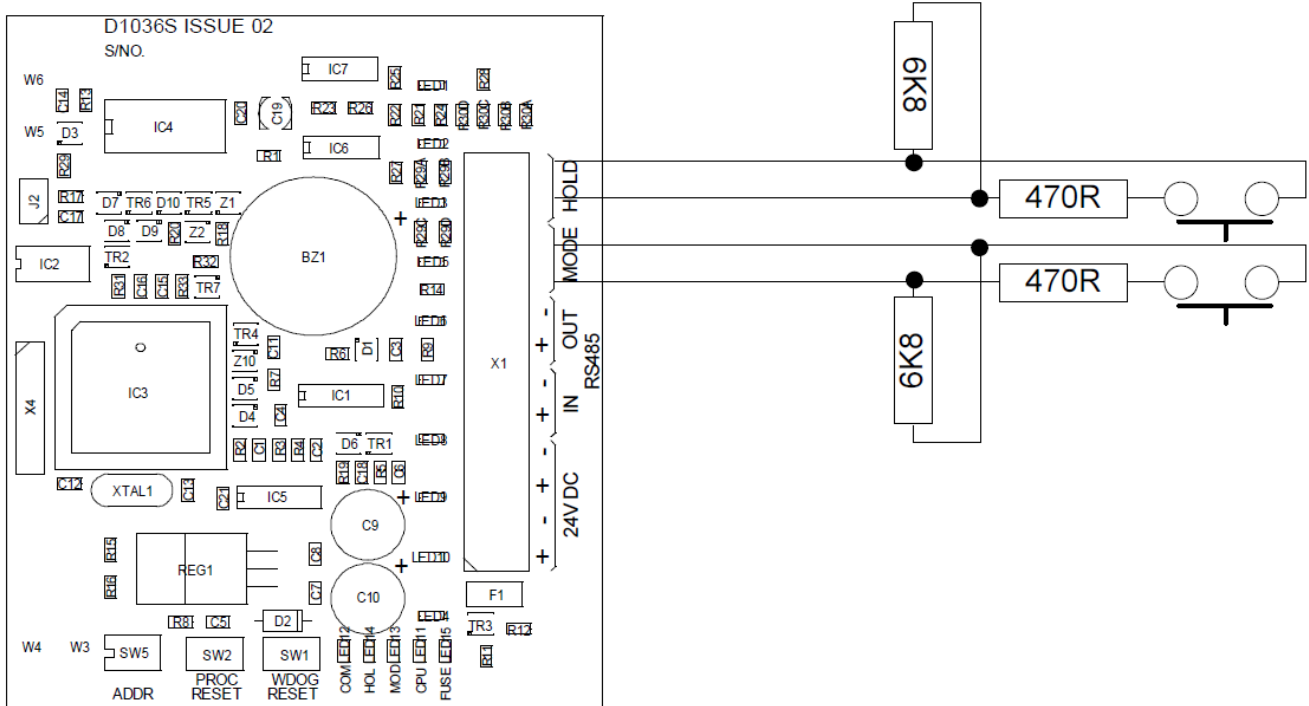
4.3. Mode input

The mode input is provided to allow connection of remote mode switch or to connect to door interlock contacts. The system is designed such that any Manual only mode input on the system that is active (input operated by 470R trigger resistor) will put the system into Manual only mode regardless of the status of any other Mode inputs. Therefore, for the system to be in Automatic and manual mode, all Mode inputs must be inactive.

Indication of the Mode is given on the front of the status unit by the Manual only or Automatic and manual LEDs.

4.4. Hold input

When active (input operated by a 470R trigger resistor) the Hold input allows the extinguishant release countdown timer to be reset to its maximum time. When the input is de-activated the countdown to extinguishant release will re-start at the maximum time that is configured at the panel (0 to 60 seconds).

IMPORTANT NOTE: When there is a fault on the HOLD input then the HOLD function is invoked which means that the extinguishant release will not operate until this condition is cleared.

4.5. Mode select keyswitch

Some models of the status units have a mode select switch. The operation of the Mode select switch is as per the Mode input above.

4.6. Manual release

Where fitted, a manual release button replicates the action of the manual release control at the main control panel and once activated will start the extinguishant release sequence.

A plastic seal is provided in the accessory pack and should be fitted to the manual release flap with a piece of thin wire to provide an indication if the manual release has been tampered with.

3 Processor and watchdog reset switches

4.7. Processor and Watchdog Reset Switches

The status unit is controlled by a microprocessor, which will re-start itself and continue to run if it stops for any reason such as severe electrical interference such as an electrical storm.

To ensure that the unit is not being subjected to continual, undue interference which may affect its proper operation, a CPU fault indicator is latched on and a fault condition signalled to the control panel.

If a processor re-start has occurred this latched fault condition will need to be reset by pressing the WDOG RESET button on the bottom of the PCB.

A switch is also provided to manually re-start the processor PROC RESET. This switch can be used while the status units are connected to the system to ensure that the unit starts up and establishes communication with the panel in a controlled and expected manner.

PROCESSOR RESET

WATCHDOG RESET
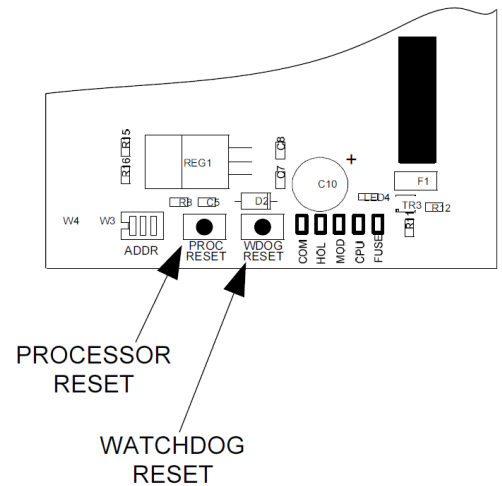
4.8. Internal fault indications

An extinguishant fault indication at the control panel may mean that there are faults at one or more status units. The status unit fault indications are located along the bottom of the PCB and are as follows:

4.8.1. COM

This LED indicates that the data communications connection to the control panel is not present. This may be because the data lines are connected with reverse polarity or are not connected. Check RS485 IN and OUT connections.

4.8.2. LOCK OFF

This LED indicates that the Lock Off input is open or short circuit. Check that the correct end of line resistor is connected to the Lock Off terminals or at the end of the wires connected to the Lock Off terminals and that the Lock Off input is not short circuited, or the wiring open circuited.

IMPORTANT NOTE: When there is a fault on the Lock Off input then the Lock Off function is invoked which means that the extinguishant release will not operate until this condition is cleared.

4.8.3. MOD

This LED indicates that the MODE input is open or short circuit. Check that the correct end of line resistor is connected to the MODE terminals or at the end of the wires connected to the MODE input and that the MODE input is not short circuited.
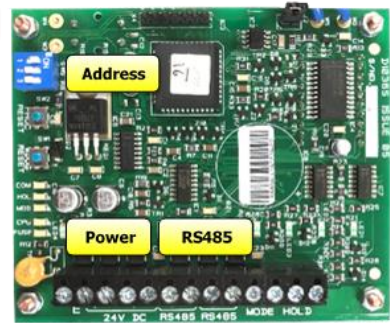
4.8.4. FUSE

This LED indicates that the electronic fuse has operated. Under this condition, the status unit is not operational. This may be due to incorrect polarity of the power connection or a failure on the unit itself.
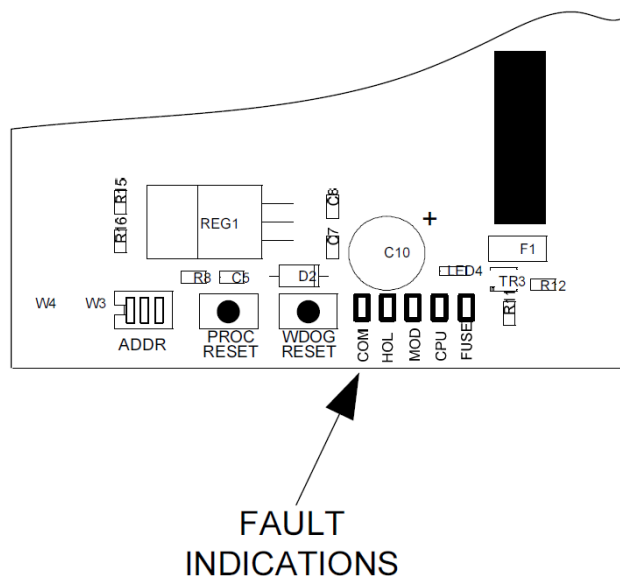
FAULT INDICATIONS
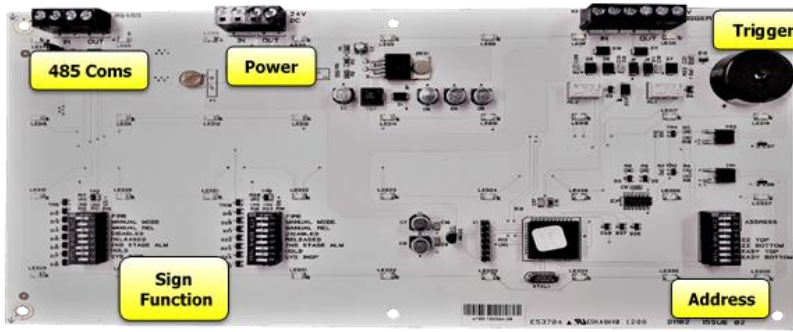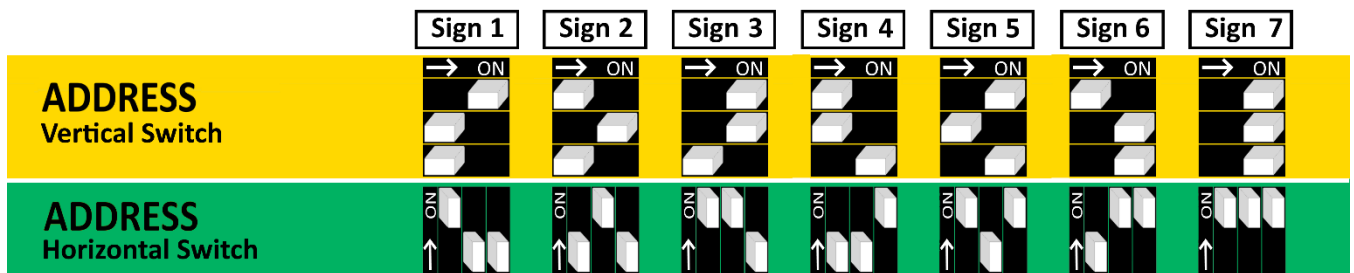
Sign Circuit Board   LCS Circuit Board

5.1. Addressing Devices

Before adding a device to the FIP's programming, each device connected to the STATUS SERIAL (RS485) circuit must be given an individual address. The FIP MUST BE POWERED DOWN BEFORE ANY CHANGES TO DEVICES.

IMPORTANT - Devices with the same address will cause an intermittent fault to be displayed.

5.2. Assigning Sign Function

In addition to addressing, signs connected to the STATUS SERIAL (RS485) circuit require their function to be set using the DIL switches on the bottom of the sign circuit board. The functions of the upper and lower halves of the sign are split across 3 banks of DIL switches. The recommended sign functions for each type of sign are:

6. Adding Devices to FIP Programming

In order to add or remove devices from the FIP programming, the FIP must be in "ACCESS LEVEL 3".

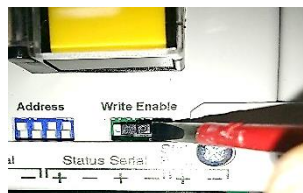The steps to enter "ACCESS LEVEL 3" are as follows:

1. Unlock and open the centre display window. This operates a read switch on the door that enables "ACCESS LEVEL 2". The centre lock opens the display window, allowing for operation of the controls.

2. Unlock and open the main door for the FIP. The top and bottom locks will open the complete cabinet front allowing for full access to the FIP controls. Ensure that the display window is kept open.

3. Move the Write/Enable switch on the lower extinguishant module to the left "Write" position. This enable "ACCESS LEVEL 3" and allows for programming of the signs.
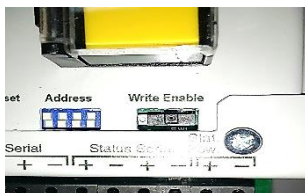
| **Normal – The Slide Switch is to the Right** | **To Access Level 3 – move the Slide Switch to the Left** | **Access Level 3 – The Slide Switch is to the Left** |

> **A "CONFIG WP" Fault will show if the Slide Switch is not returned "ENABLE".**

6.1. Adding / Removing Devices at the FIP

FIP SHOULD BE POWERED DOWN before any changes are made to status units. When the system is first powered on, it will search for connected status units connected to extinguishant module. If status units are connected correctly and detected by the control FIP, the LCD will display:

> **X FAULTS**
> **Enter TO VIEW**

Open the *Display* Window and Press *Enter* on the module to which the status units are connected. Use the "+" button on the module to view the faults. If status units are detected the LCD will display, X = the address of the status unit found.

> **STATUS UNIT X**
> **FAULT**

To accept the status units found, **slide the WRITE ENABLE switch**, on the module to which the status units or ancillary boards are connected to write mode. The LCD will then display, X= the address of the status unit found.

> **STATUS UNIT X**
> **Enter TO ACCEPT**

Then press the *Enter* button, the selected status unit or ancillary board will be added to the system and the next unit to be added will be displayed. Press the *Enter* button on the extinguishant module until all the units have been accepted then slide the *Write Enable* switch to enable mode.

All of the status units found module have now been added and disconnection of any of them will be displayed as a fault on the module and on the detection part of the system. If any status units are disconnected, a Lock Off activated indication will also be displayed at the extinguishant module and all ancillary boards or status units that remain connected. With the *Display Window* Closed, the LCD will display:

> **REMOTE BUS**
> **FAULT**

The Status units which are disconnected will have all their indicators flashing. When additional status units are added, these will be shown on the LCD when the system is powered up.

7. Alternative Sign Arrangements

7.1. Mimic Signs / Connecting more than 7 Signs

In systems that require more than 7 signs, additional signs may be installed by connecting to the 24VDC TRIGGER terminals located in each sign. This allows connected signs to mimic the operation of a sign that is connected to the STATUS SERIAL (RS485) circuit. Note: signs can only mimic other signs of the same type (A "Do Not Enter" Sign can only mimic another "Do Not Enter" Sign).
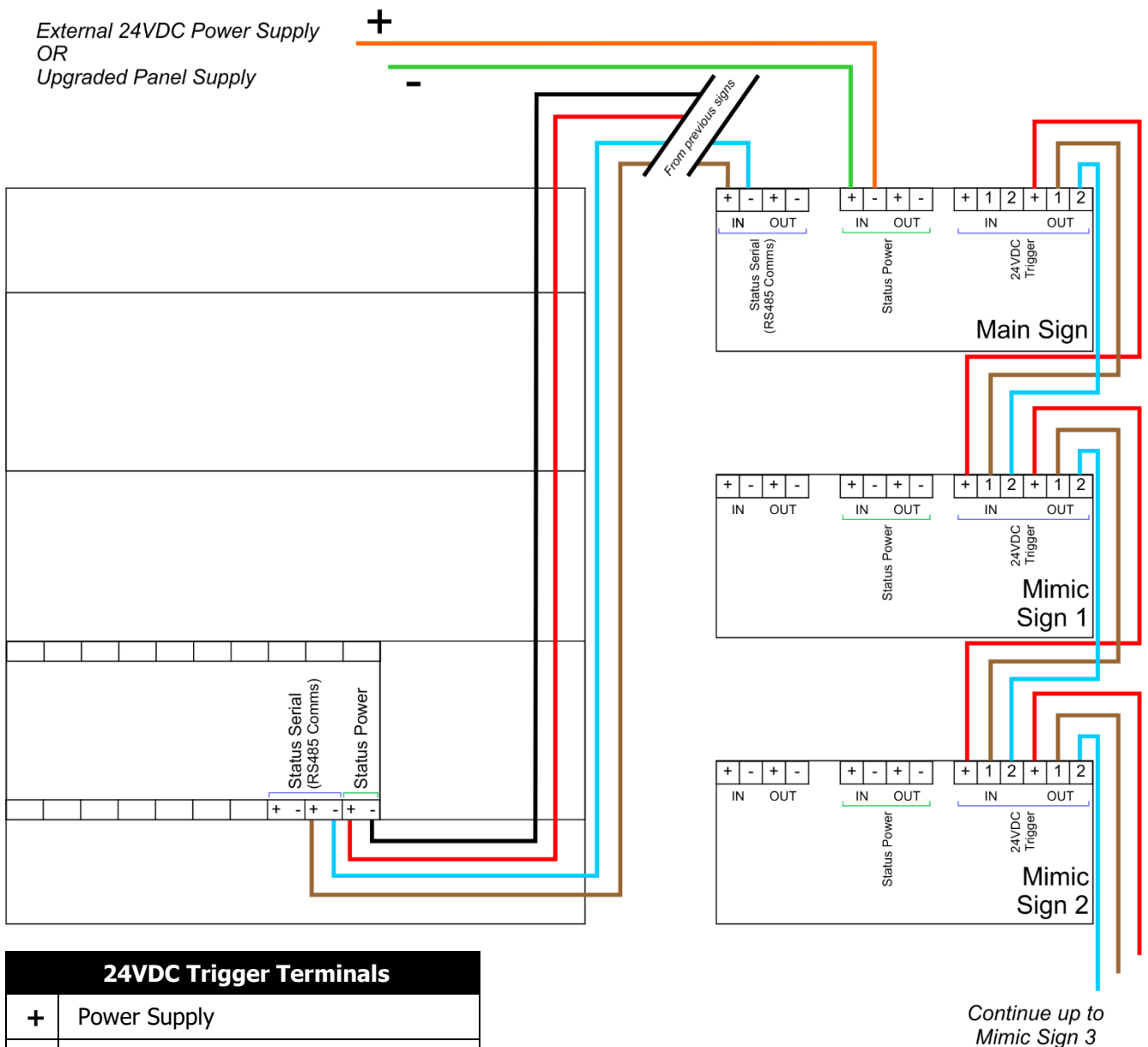
The 24VDC trigger function of each sign connected to the STATUS SERIAL (RS485) circuit can support up to 3 additional signs.

There is no need to configure the address or sign function switches, however the internal buzzer and flashing functions can still be adjusted separately.

IMPORTANT – An additional external power supply OR an upgraded power supply in the FIP is required for any additional devices over the standard maximum of 7 devices. Each sign has a current draw of 140mA. When installing, power supply (including backup supply) must be assessed to ensure that it will be adequate.

While it is possible to use this configuration with fewer than 7 devices, it is not recommended.

The LCS must be installed on the STATUS SERIAL (RS485) circuit. It cannot be used as a mimic device.

| 24VDC Trigger Terminals	
+	Power Supply
1	Controls **LOWER** half of mimic sign
2	Controls **UPPER** half of mimic sign

7.2. Alternative Arrangement of STATUS SERIAL (RS485) Circuit.

The standard arrangement for installing signs is to have a single STATUS SERIAL (RS485) cable connecting the FIP to the signs, as per wiring diagram. However, it can be configured to have 2 separate cables for the RS485 circuit with the FIP effectively in the middle of the circuit rather than at one end.

FIP MUST BE POWERED DOWN BEFORE ANY CHANGES TO SIGNS. If process is done with power connected the is a possibility that a short could occur and damage the FIP.

IMPORTANT - When this configuration is used the LK2 link on the extinguishant module MUST be removed or positioned over 1 pin only, or the FIP will register a fault.

An example of this type of wiring arrangement is as follows:
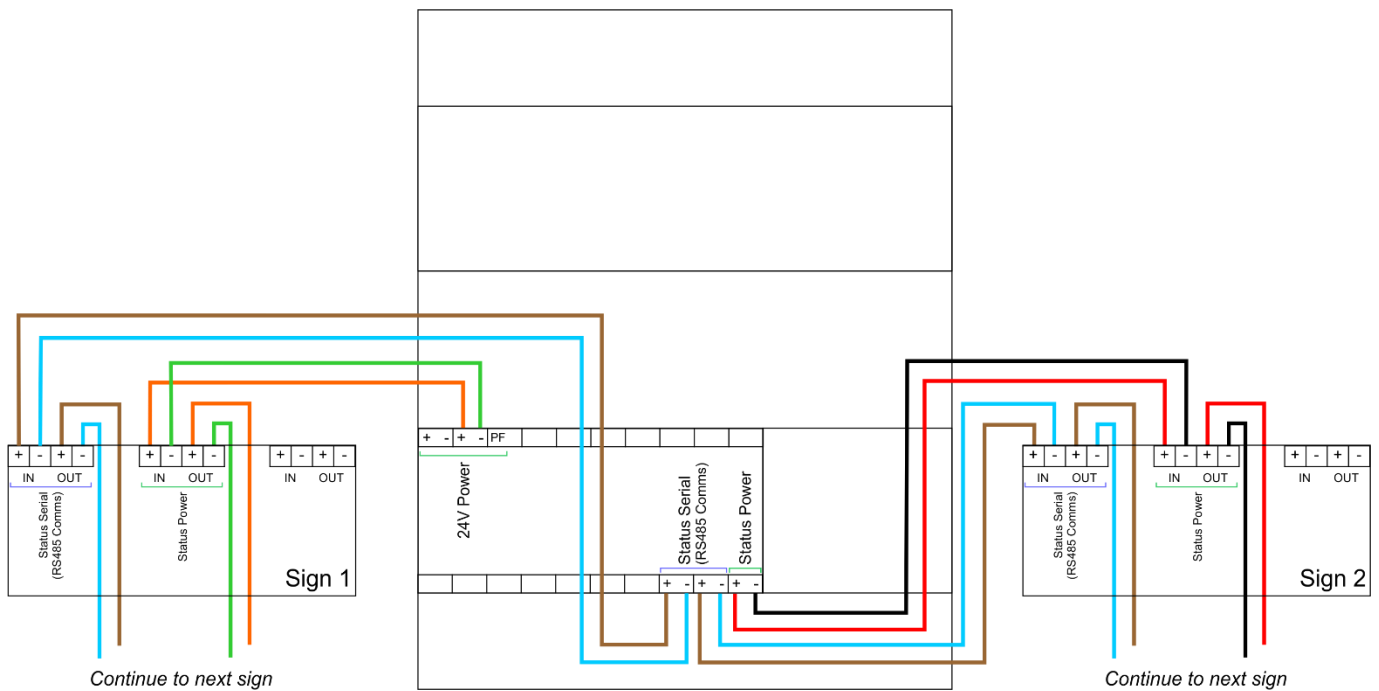
8. Troubleshooting

> **OUTPUT UNIT X   → FAULT**

Output Unit refers to a SIGN, this fault will be

- Address is the same as another device in the 485 circuit
- Power has failed to the sign.
- RS485 signal has failed to the sign.

> **STATUS UNIT X   → FAULT**

Status Unit refers to an LCS, this fault will be

- Address is the same as another device in the 485 circuit
- Power has failed to the LCS.
- RS485 signal has failed to the LCS.

9. Specifications

	Internal Sign	External Sign	Local Control Station
Size	195 x 300 x 50mm	195 x 300 x 50mm	135 x 186 x 50mm
Material	1.2mm steel Epoxy coat	Thermoplastic	1.2mm steel Epoxy coat
IP Rating	IP 40	IP 55	IP 40
Op. Voltage	15V to 30V DC	15V to 30V DC	21 to 30v DC
Current – Quiesant	20 mA	20 mA	60 mA
Current – Alarm State	140 mA	140 mA	70 mA