



# ORION-BCM LSC

## ADDRESSABLE BATTERY CHARGER MODULE WITH INTEGRATED LOOP SOUNDER CIRCUIT

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## INSTALLATION MANUAL

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### OVERVIEW

The ORION-BCM LSC is a self contained EN54-4 Battery Charger Module with an integrated Loop Sounder Circuit that is controlled and monitored through GFE addressable loop. It also incorporates internal Alarm and Fault relays.

When connected to the analogue detection loop of any of GFE's analogue addressable panels, the ORION-BCM LSC occupies two consecutive addresses in the loop. In addition to the PSU output for powering external devices, it also includes a Conventional Sounder output, which substantially increases its scope of usage. Activation of sounder output can be achieved either by addressable system cause-effect programming as a normal addressable sounder or directly at the ORION-BCM (access code required).

An internal monitoring system continuously checks all circuits, ensuring fault detection and notification, listed below. In addition to local notification, status is also reported to addressable system.

- Sounder Circuit Integrity Fault
- Battery Charger Fault (voltage level and charging behaviour)
- Mains Fault (voltage level) and Earth Fault
- Output Supply Voltage Level
- Communications Fault (On the Addressable Panel)
- General System Fault (by the means of independent watchdog system).

## MAIN FEATURES

- Voltage-free inputs to activate built-in Relay for controlling Door Holders and Sounder Circuit
- One supervised Conventional Sounder Circuit
- Dedicated battery charger (Secondary Supply) for Sounder Circuit and Auxiliary Power
- Addressable Loop Interface with fault report feedback (supervision) and sounder activation acknowledgement /control
- Two relays output for Fault (NC) and Fire (SPDT) signal - unmonitored
- Supervised 24V Supply Output with 900mA
- EN54-4 Compliant

ORION-BCM LSC has the following local controls:

- Internal Buzzer Silence
- System Reset
- Lamp Test
- Sounders circuit ON/OFF operation
- Disable Auxiliary Outputs
- Disable Sounders

The ORION-BCM LSC Module will reset each time the Addressable Loop is restarted as an integrating part of the whole Addressable system.

## IMPORTANT SAFETY NOTES

- This equipment must only be installed and maintained by a suitably qualified and technically competent person;
- This equipment must have an Earth Connection;
- A basic knowledge and training in the installation of Fire Detection systems is assumed;
- The Fire Detection system should be designed by a suitably qualified person with reference to the Local Regulations and Guidance from the fire Officer where applicable.

## MOUNTING PANEL

The ORION-BCM LSC housing is designed for either surface or semi-recessed mounting. Cable entry points are provided at the top and back of the housing. Do not drill additional holes as cables could then interfere with the PCB or standby battery position. Maintain separation between the incoming AC mains cable and the low voltage detector and sounder cabling.

The panel should be fixed to the wall using the 4 mounting holes provided and No 8-10 countersunk screws. Any dust created during the fixing process must be kept out of the control panel and care must be taken not to damage any wiring or components.



## CABLE TYPES

System wiring should be installed in accordance with National Standards and wiring regulations.

To protect against electrical interference we recommend the use of screened cables throughout the system. Separate cables should be used for sounder circuits, the use of multi-core cables to carry sounder circuits is not recommended. The cable screens should be terminated and connected to Earth at the panel only.

Maximum cross section of cables to use is 2.5mm<sup>2</sup> to avoid damaging the terminals in the control panel.

Mains wiring should be 3 core 1mm<sup>2</sup> to 2.5mm<sup>2</sup> fed from an isolating circuit breaker of 6A. This should be secure from unauthorized operation and be marked "Fire Alarm Do Not Switch Off". The mains supply must be exclusive to the fire panel.

## SOUNDER CIRCUIT WIRING

There is only one conventional sounder circuit available on the ORION BCM LSC (S1). The maximum current available for sounder circuit is 900mA.

All sounders must be polarized; non-polarized sounders will indicate a fault on the sounder circuit.

The sounder circuit can be activated from the Addressable Panel, by direct activation from ORION-BCM LSC Panel button (access level 2) or by remote input (EV).

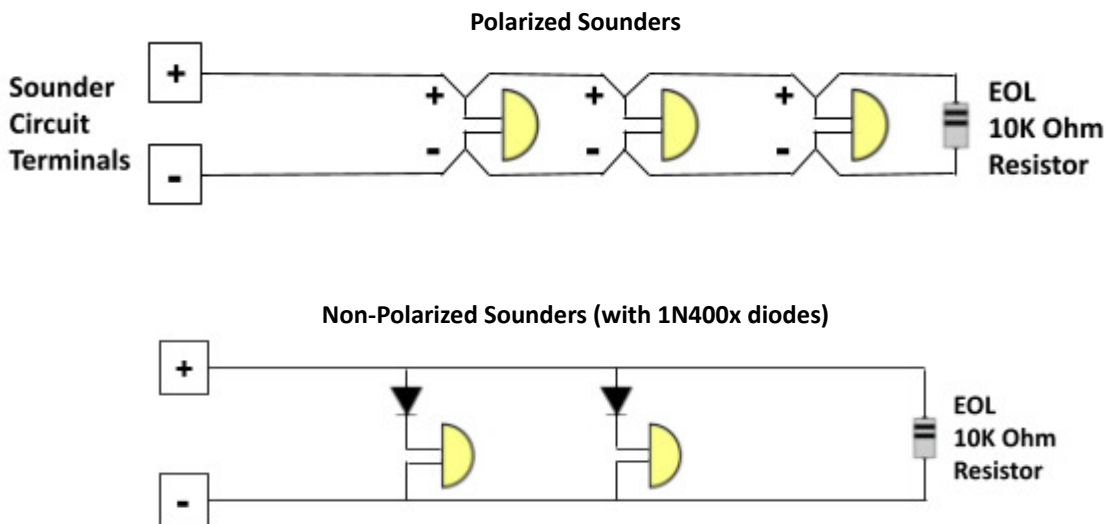
**NOTE: The Fire output Relay will also be activated in case of Sounder Circuit ON.**

An end of line resistor (10k Ohm) which is supplied with the panel, must be inserted in the last sounder for cable monitoring. If a sounder circuit is not used, the EOL resistor should be fitted in the control panel sounder output.

The sounder circuits are protected against short circuits, the electronic fuse will reset when the short circuit is removed and the control panel is reset.

The wiring for each sounder circuit should be terminated in their respective terminals and the cable screens connected to earth.

Typical sounder circuit wiring diagram:



## OUTPUTS

### Auxiliary Power

28V DC max 900mA, short circuit protected, supervised. The output is protected against short circuit by an electronic fuse which resets when the fault is cleared and the panel is reset.

### Auxiliary Relay Contact Fire

Provides "Fire/Sounder Active" signal to external devices. This is activated through direct panel sounder button activation. Relay contact changeover 2A @ 30V DC resistive / 0.25A @ 230V AC resistive. Active until Reset or Sounder OFF.

### Auxiliary Relay Contact Fault

Provides Fault signal to external devices. Relay NC contact 2A @ 30V DC resistive / 0.25A @ 230V AC resistive. Also Active for microprocessor fault. Active until Reset and all faults are cleared. Relay contact will open when any fault is present on the system. The wiring for each output should be terminated in their respective terminals and the cable screens connected to earth.

## INPUTS

To activate the inputs, a shunt must be made between the Common "C" and the input to be activated by the means of a dry contact switch (no voltage).

### INPUT "DE" - Fire Relay

The "DE" input will activate the Fire Relay. Connect it to "C" input for activation.

### INPUT "EV" - Sounder Circuit

The "EV" input will activate the Sounder Circuit. Connect it to "C" input for activation.

***NOTE: "EV" always activate S1 even if sounders are disabled.***

## CONNECTING THE PANEL

The mains supply should be routed away from the other cables and enter the control panel adjacent to the mains terminal block.

Wiring to the Mains supply should only be undertaken by a suitably qualified and competent person

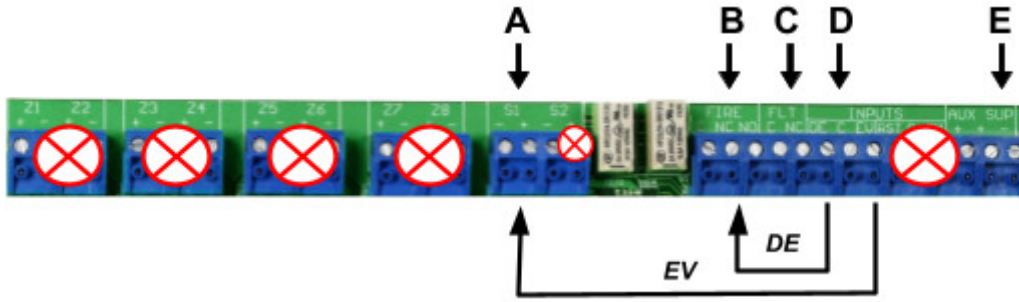
Depending on ORION-BCM load and standby requirements, two 12 volt valve regulated lead acid batteries with the capacity up to 7Ah may be fitted in the housing. The batteries should be wired in series (24V) using the supplied link. Take care not to short circuit the battery terminals.

Check sounder wiring for continuity. Short or open circuit indications must be rectified before connecting to the control panel. All cable testing must be carried out with a Multimeter.

**WARNING: Do not use a Megger when devices are connected.**

Induced voltage higher than 1 Volt indicates possible cable problems or bad earth connection and must be rectified before connection.

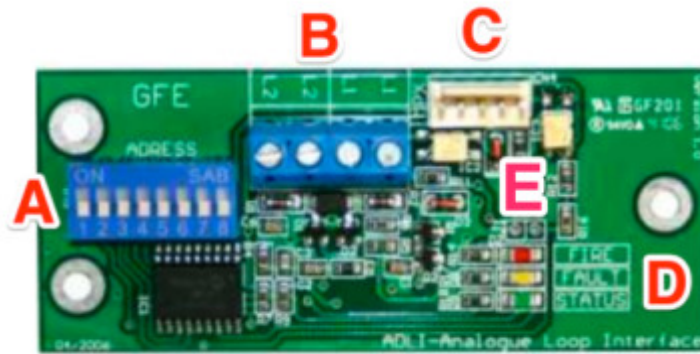
## Mainboard Connections



- A – Sounder Circuit (monitored)
- B – Auxiliary Fire Relay (non-monitored)
- C – Auxiliary Fault Relay (non-monitored)
- D – DE (Fire Relay) and EV (Sounder) direct activation (non-monitored)
- E – Auxiliary Supply Output (monitored)

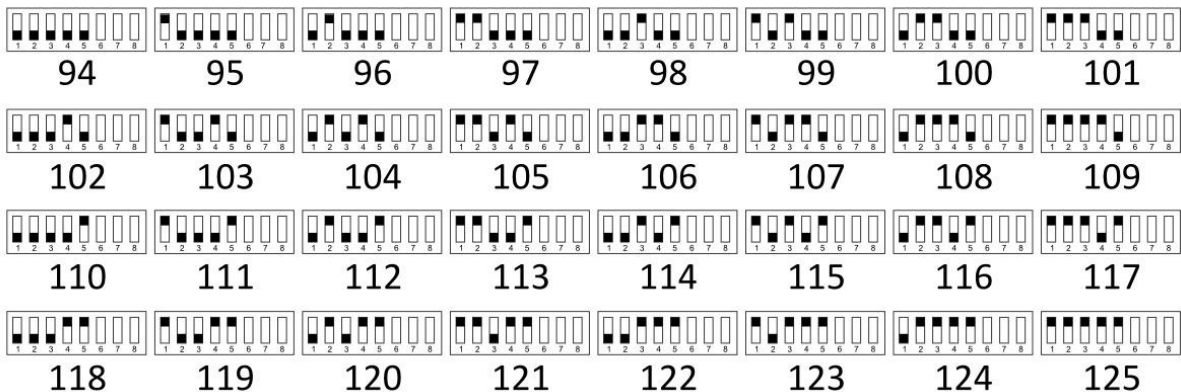
## Addressable Interface (ADLI-BCM) Connections

The following board is placed inside the box



- A – DIL Switch for address assignment (Address to the Analog Loop)
- B – Analog Loop Connection (Input and Output)
- C – Connection to the ORION-BCM LSC Main Panel (Data connector)
- D – LED Status Indicators
- E – Jumper (Not Used - must be fitted)

## DIL SWITCH ADDRESS ASSIGNMENT



# OPERATION AND OVERVIEW



## STATUS LEDs

**FAULT** - LED used to indicate any FAULT condition present on panel.

**DISABLED** - Used to indicate that the panel has features that have been disabled in Access Level 2.

**SUPPLY** - Used to indicate the presence of supply. In Access Level 2 this LED will flash also at a rate of once per second.

**SYSTEM FAULT** - This LED will be lit when there is a processor failure or other System Fault.

## FAULTS

**SUPPLY FAULT** - This LED will be ON whenever the Main Supply has been removed or has dropped below 20 Volts.

**BATTERY FAULT** - Indicates that there is low voltage level on the batteries or the battery charger circuit has failed.

**AUX SUPPLY FAULT** - Indicates that the Auxiliary Supply has a fault.

**EARTH FAULT** - When this indicator is ON there is leakage current flowing from the earth connection/ wiring and any conductor incoming into the panel.

## CONTROLS

**(1) BUZZER SILENCE** - At Access Level 1 this button is used to silence the panel's internal buzzer. To access Level 2 the Buzzer must be silenced

**(2) RESET** - Press this button to reset the panel at access Level 2.

**(3) LAMP TEST** - Press this button at access level 1 or 2 to test all LED indicators and the panel's internal buzzer. Release when test is finished.

**(4) SOUNDERS** - Only on Level 2 access, press once to activate/silence sounders. If sounders are active (previously pressed), by pressing this button again will stop the sounders. Auxiliary Fault Relays is not affected by this action.

**NOTE:** When reset, all LEDs will flash and relays will pulse.

## DISABLEMENTS

These buttons are only active at Level 2 access.

These buttons have a toggle action. One press will disable the particular action and another press will re-enable it.

When a particular function is disabled, its associated LED will be activated.

**OUTPUTS AUXILIARY** - Use this button to disable or re-enable auxiliary relays (Fire and Fault).

**DISABLE SOUNDER** - Use this button to disable or re-enable Conventional sounder circuit (S1).

## Internal Addressable Interface (ADLI-BCM)

ORION-BCM LSC occupies two consecutive addresses on the addressable loop, each one reporting as follow:

- Address programmed in DIL switch is recognized as a SOUNDER
- Addressing range must be between 94 and 125.
- Previous address is automatically assigned as an I/O.

**Example:** If DIL-Switches are all set to OFF (address 94), address 93 will be automatically assigned as an I/O unit, while address 94 will be recognized as a SOUNDER.

## Addressable Connection LED Status Information (ADLI-BCM)

LED	DESCRIPTION
RED	Indication of Sounder Circuit activation or Fault
YELLOW	Indication of Fault presence
GREEN	Indication (pulsing) each time address is pooled

## Addressable Analog Values

The following analog values are the ORION-BCM LSC represent the conditions reported to the Addressable System.

ANALOG VALUE	DESCRIPTION
<i>IO unit (DIL switch address)</i>	
21	NORMAL – No Faults present
4	FAULT – Communication with ORION-BCM LSC
2	FAULT – System Fault (Battery, Mains, Earth, etc.) External Supply Fault
<i>Sounder (consecutive address)</i>	
17	ACTIVATED – Sounder circuit ON
16	NORMAL – Sounder circuit OFF
8	FAULT – Sounder Circuit Fault (open/short circuit, etc.)
4 (see NOTE)	FAULT – Communication with ORION-BCM LSC

**NOTE:** This status is only reported by the addressable panel. ORION-BCM LSC doesn't report fault and fault relay is not activated.

## ACCESS LEVELS

There are two levels of Access in the ORION-BCM LSC.

### Level 1: General user controls

This lower level allows the user to:

- Perform a lamp test
- Silence Internal buzzer
- Put the panel into Access Level 2 if in possession of the required access code

### Level 2: Authorized user controls (AUTH MODE CODE: 2244)

This higher level allows the user to:

- Silence and Activate sounder circuit
- Reset after Fault
- Silence Internal Buzzer
- Test status LEDs
- Disable/ Enable the following:
  - o Sounders Conventional Output
  - o Auxiliary Outputs - Fire/Sounder Relay and Fault Relay

Level 2 Access is gained by entering the code 2244 using the numbered buttons.

***NOTE: If any Fault event have occurred these must be acknowledged by pressing the Buzzer Silence button before code entry will be accepted.***

If the code is not completed within 20 seconds of the last key press, the system reverts to Level 1.

Once this mode is entered the GREEN LED (SUPPLY) will flash once every 0.5 seconds.

To exit this mode at any time, press the RESET button. The panel will revert to Access Level 1.

## COMMISSIONING

### Preparation

1. Check sounder cables and ensure all field connections are made. Ensure that all EOL Resistor are fitted to the last sounder of each circuit
2. Connect sounder lines to panel
3. Remove the mains fuse
4. Connect mains supply according to local mains voltage Ensure good earth connection
5. Fit batteries (do not connect)
6. Insert mains fuse
7. Connect batteries - observe correct polarity



**DANGER**  
**EXTERNAL VOLTAGE**

### Commissioning

1. If all is normal only the Green "supply" LED should be illuminated
2. If any Faults are indicated they should be corrected before proceeding
3. Initiate lamp test and confirm LEDs and internal buzzer operation
4. Test each key for correct functioning
5. Test all sounders, relays etc. for proper operation

## TESTING FIELD EQUIPMENT

### Testing Sounders

1. Introduce the Level 2 Access code (2244) with the Buzzer OFF.
2. Initiate sounder pressing Sounders Activate/ Silence
3. Press again to stop

### Testing Relay Outputs

With the Addressable system in normal operating mode, activate a Fire Alarm and confirm operation of Fire relays. Test if manual button Sounder activation, also activates the Fire relay.

On the Fault Relay test, generate a fault (example: remove the sounder circuit EOL or remove Mains Power) and verify the Fault relay operation.

***NOTE: Communication faults between ORION-BCM LSC and the Addressable System will only be signaled at the Addressable panel. Fault relay will not activate if ADLI-BCM is unplugged.***



## STANDBY BATTERY CALCULATION

Battery capacity should be between 2 x 2.4 Ah 12V DC and 2 x 7 Ah 12V DC.

The battery Ah required for a given installation is calculated from the following formula:

$$\left( 38\text{mA} \times \frac{\text{Standby time required in hours}}{\text{divided by 1000}} \right) + \left( \frac{\text{Alarm \& Aux. Supply Outputs in Amps}}{\text{(sounder \& aux. supply load)}} \times \text{Alarm time in hours} \right) + 20\%$$

Round the result to the next available battery size. Quiescent current of the panel with everything is found by adding the standby current of all connected devices to the standby current of the panel (38mA). Consult the manual for the individual devices to confirm the standby current.

## Troubleshooting - Fault Indications

**Troubleshooting work of any fault on the panel should only be carried out by qualified technicians.**

### General Fault

The General fault LED is illuminated whenever there is a fault on the system. It is always lit along with at least one other fault indicator which gives more detail relating to the fault.

### Power Supply Faults - Supply Fault

Associated with a low voltage (below 20V) present at the input of the power supply or the removal of the main power supply. Measure voltage levels and verify electrical mains fuse.

### Battery Fault

This fault is present when there is a voltage below 20 V DC at the battery terminals or if there is a battery charger problem. Charger problems can be caused by panel's hardware failure or batteries that have not been connected in the specified manner as indicated in this manual, in the installation section. Verify if batteries are properly connected. Measure the voltage at the battery terminals and replace if it is below 21V DC. Remember to verify also the main electrical fuse.

**DON'T SHORT CIRCUIT BATTERY TERMINALS IN ORDER TO VERIFY BATTERY CHARGE ONLY USE BATTERIES THAT ARE LEAD ACID VRLA TYPE 12VDC.**

### Aux Supply Fault

This fault will show when the voltage at the auxiliary supply output is below 20 Volts DC. This can be caused by the current limit for this output being exceeded. This output is limited to 900mA. Other causes for faults at this point are short circuits in the wiring or faulty hardware attached to this supply output. Verify voltage, if below the required acceptable level remove wiring connected to this output. If voltage now returns to normal this confirms that connected equipment or cable is damaged.

### Earth Fault

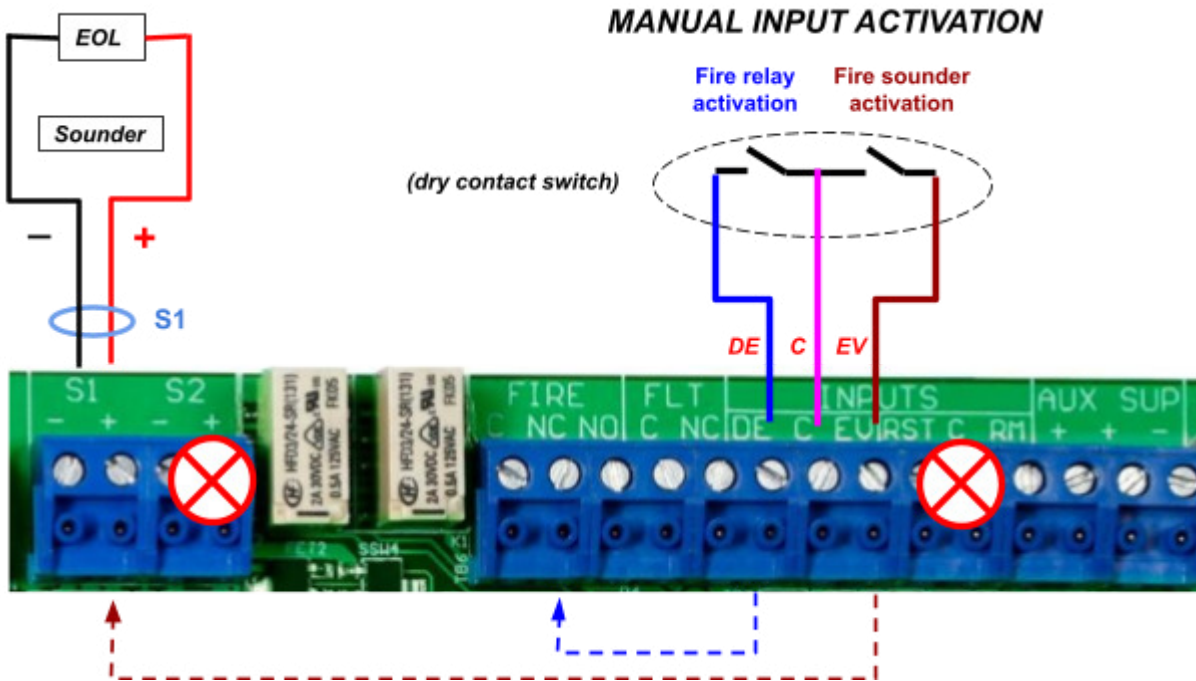
This FAULT will indicate that there is some level of current leakage between any of the wire conductors and the EARTH connections. VERIFY WIRING.

### System Fault

This FAULT indicates that there is a fault at the main processor level. In this particular fault, the panel's main board needs to be replaced or repaired.

### Example of application (External switch Sounder Activation)

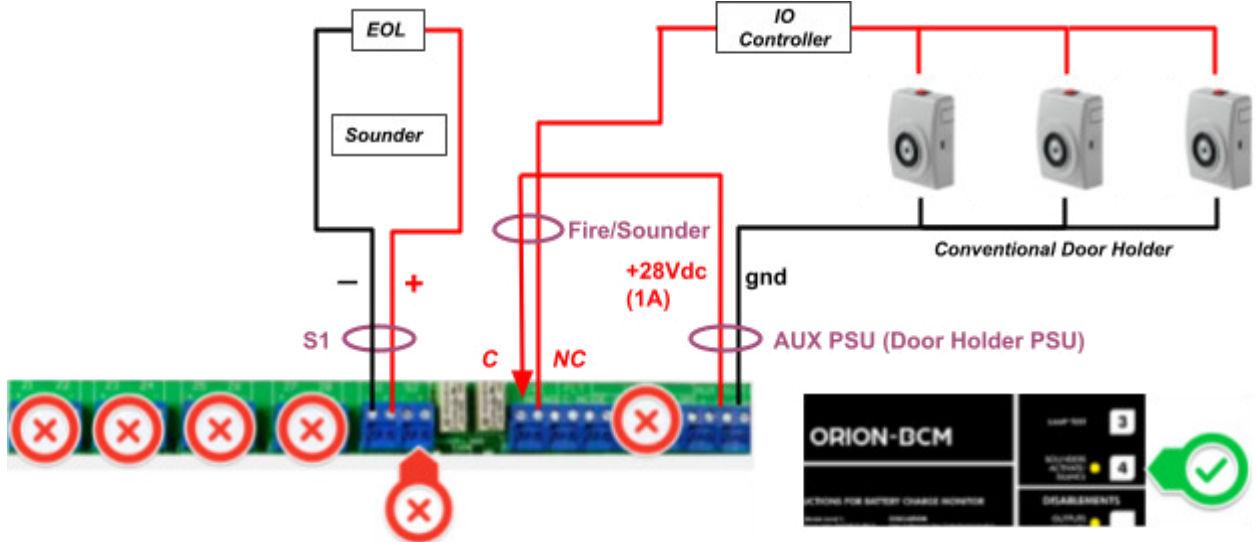
This implementation has the ability to, by using two external independent switches on the inputs, overlap (the addressable order) the Sounder Output or the Fire Alarm Relay state.



**NOTE:** Alternatively both “DE” and “EV” could be connected in parallel, so that the Fire Relay and S1 actuate simultaneously using only one “dry contact switch”.

### Example of application (Door Holder)

This implementation has the ability to, by pressing the Orion-BCM sounder activation key, manually release all door holders connected to the AUX PSU in addition to the Programmed Sounder activation.



**NOTE:** It will “release” connected Door Holders in case of local ORION-BCM Sounder Activation (by activation of Fire Relay).

## TECHNICAL SPECIFICATIONS

POWER SUPPLY	
MAINS SUPPLY VOLTAGE	230 +10% -15% V AC
INTERNAL POWER SUPPLY	Min. 21V DC - Max. 30V DC (28.5V DC nominal) Max. Ripple 1 Vpp
TOTAL OUTPUT CURRENT	1,7A @ 230V AC
MONITORED SUPPLY AND BATTERY CHARGER	Yes
BATTERIES MONITORED	Yes
BATTERIES MAX. INTERNAL RESISTANCE	1 Ohm
MAX BATTERY SIZE	2 x 12V 7AH VRLA - Sealed Lead Acid Batteries Min. Voltage 21,0V DC (Vb min) - Max. Voltage 27,2V DC
MAINS FUSE	4 A - 250V Slow Blow - 20 mm
BATTERY FUSE	1.6 Amp Resettable - Electronic Fuse
MAX CURRENT DRAW FROM BATTERY (MAINS FAILURE)	1.5 Amp Max. @ Max. Operating Temperature
SOUNDER CIRCUIT	
NUMBER OF CIRCUITS	1
END OF LINE RESISTOR VALUE	10K Ohms
MONITORING	Open and Short Circuit
ALARM VOLTAGE	27.5V DC
SOUNDER CIRCUIT FUSE	1.1 Amp resettable (Electronic Fuse)
MAX. CURRENT AVAILABLE	900mA @ 27.5V DC Nominal
AUXILIARY OUTPUTS	
DC POWER OUTPUT	27.5V DC Nominal - Max. Current Drawn 900 mA
FIRE RELAY	Active in Fire condition, 2A @ 30V DC resistive / 0.25A @ 230V AC resistive, SPDT
FAULT RELAY	Active in Fault condition, 2A @ 30V DC resistive / 0.25A @ 230V AC resistive, NC
DIMENSIONS	
SIZE	273 (L) x 107 (W) x 404 (H) mm
WEIGHT	1,7 Kg / 7 kg (inc. 2 x 7 AH 12 V batteries)
OPERATING TEMPERATURE	-10°C to +50°C
MAX RELATIVE HUMIDITY	95% non condensing
ADDRESSABLE LOOP INTERFACE	
SUPPLY VOLTAGE	17V to 30V DC
SUPPLY CURRENT	1.2mA Quiescent - 3mA Alarm or Fault



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