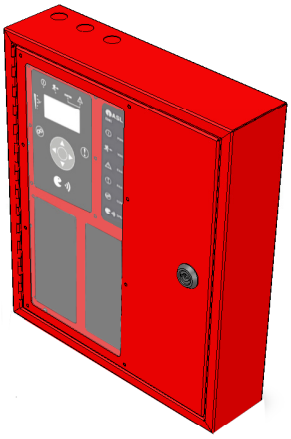
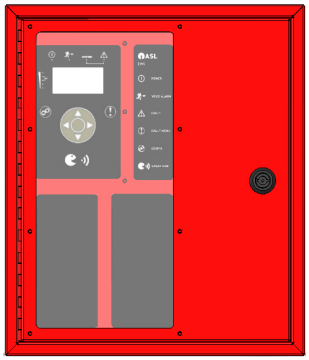
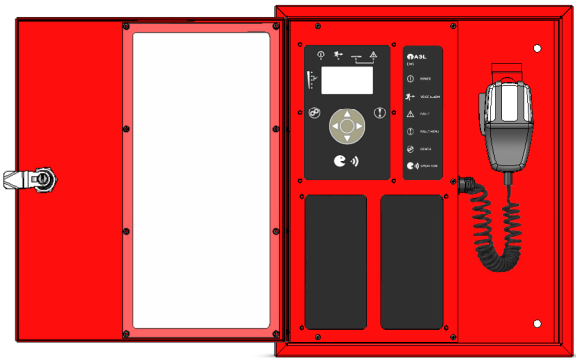
EMS01 Mk2

All-Call Emergency Microphone Station







See other variants on page 3

Installation Guide

ASL Document Ref.: U-0664-0405.doc
Issue: 02 complete, approved - Date: 02/05/13
Part Number: M0664_93

This equipment is designed and manufactured to conform to the following EC standards:

EMC: EN 55103-1/E1-E5 + A1, EN 55103-2/E5, EN 50130-4, EN 50121-4, EN 61000-6-3 + A1, EN 61000-6-4 + A1, EN 55022/B, ENV 50204

Safety: EN 60065 + A12

Pollution degree 2

Voice Alarm: When installed in a Voice Alarm system designed in accordance with the ASL Rack Mount Voice Alarm Systems EN 54 & ISO 7240 System Design Guide (T-0667-0016) and configured as described in its user documentation, this equipment meets the requirement of EN 54-16, ISO 7240-16 and BS 5839-8.

Failure to use the equipment in the manner described in the product literature will invalidate the warranty.

A 'Declaration of Conformity' statement to the above standards is available on request.

This product must be disposed of in accordance with the WEEE directive.

Contents

Additional User Documentation:

1. ASL Rack Mount Voice Alarm Systems EN 54 & ISO 7240 System Design Guide (T-0667-0016)
2. Additional reference information are available from the ASL's website at www.asl-control.co.uk

Application Solutions (Safety and Security) Limited
Unit 17 Cliffe Industrial Estate
Lewes - East Sussex
BN8 6JL - UK
Tel: +44(0)1273 405411 Fax: +44(0)1273 405415

www.asl-control.co.uk

QUALITY ASSURED FIRM
CERTIFICATE NUMBER 96-LON-AQ-041

Link-up

1 Technical Specification Summary

Supply Voltage Range ..... 15 – 40 V DC or PoE (42 – 57 V DC)[1]
Current Consumption (at 24 V DC) ..... 90 mA (min., all LEDs off, LCD display backlight off, sounder off)
165 mA (max., all LEDs on, LCD display backlight on and sounder on)[2]

Emergency Microphone ..... EN 54-16, ISO 7240-16 and BS 5839-8 compliant

Microphone ..... fist with built-in PTT button
LED Indicators ..... Speak Now / Power / Voice Alarm / System fault / Fault / Speech volume bargraph
LCD Display ..... 128 x 64 pixels / 58 mm x 29 mm view area / English text
Control Buttons ..... capacitive touch buttons
Navigation Wheel ..... LCD display navigation and selection / fault clearing
Menu Controls ..... LCD display mode selection / fault acknowledgement
Speaker ..... built-in speaker for fault indication

ASL PA/VA System Connections[3] ..... for 2 hosts
2 x microphone interfaces (RJ45) and 1 x auxiliary microphone interface (RJ45)
Audio Output ..... analogue audio / balanced / 0 dBu nominal / 220 Ω
Surveillance Tone ..... 20 Hz
Microphone Control Data ..... EIA RS485 / 19200 baud
Hardware Bypass Interface[4] ..... Push-To-Talk switch and Speak Now LED

IP Connection[5] ..... 1 x 100BASE-T Ethernet (RJ45)
Audio Output ..... VoIP audio
Control Data ..... microphone and IP network connection
Others ..... firmware upgrade and microphone configuration

Facilities[6]
Message Storage ..... 10 messages of 40 seconds each (minimum) on a micro-SD card
Custom Language ..... stored on a micro-SD card
Store and Forward ..... announcement of up to 60 seconds

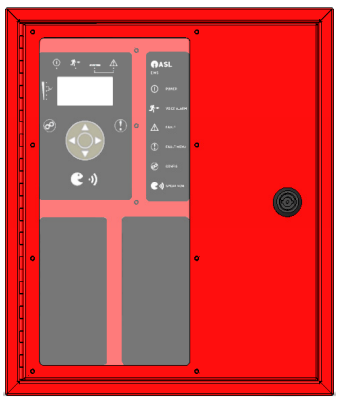
Format / Colour ..... wall mounting metal box / red RAL3020
Dimensions (H x W x D) / Weight ..... 402.4 mm x 344 mm x 95 mm / 5.8 kg
Cable Entry Knock-outs / Mounting Holes ..... 20 mm ∅ / 9 mm ∅

Temperature (storage and operating) ..... –20 °C to +55 °C (storage) / –10 °C to +55 °C (operation)
Humidity Range ..... 0% to 95% non-condensing
Ingress Protection IP30

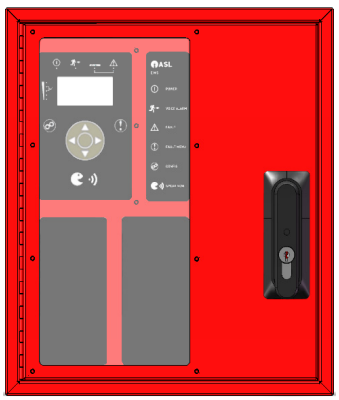
Variants

EMS01 ..... standard build (analogue interfaces)
EMS01-IP ..... standard build (analogue and IP interfaces)
EMS01-EC ..... EMS01 with door fitted with a swing lock with a euro-cylinder

EMS01 / EMS01-IP



EMS01-EC



[1] PoE (Power over Ethernet) does not provide EN 54-16, ISO 7240-16 or BS 5839-8 compliance

[2] Maximum current consumption with fault sounder set to default level. Additional 40 mA if fault sounder is set to maximum level

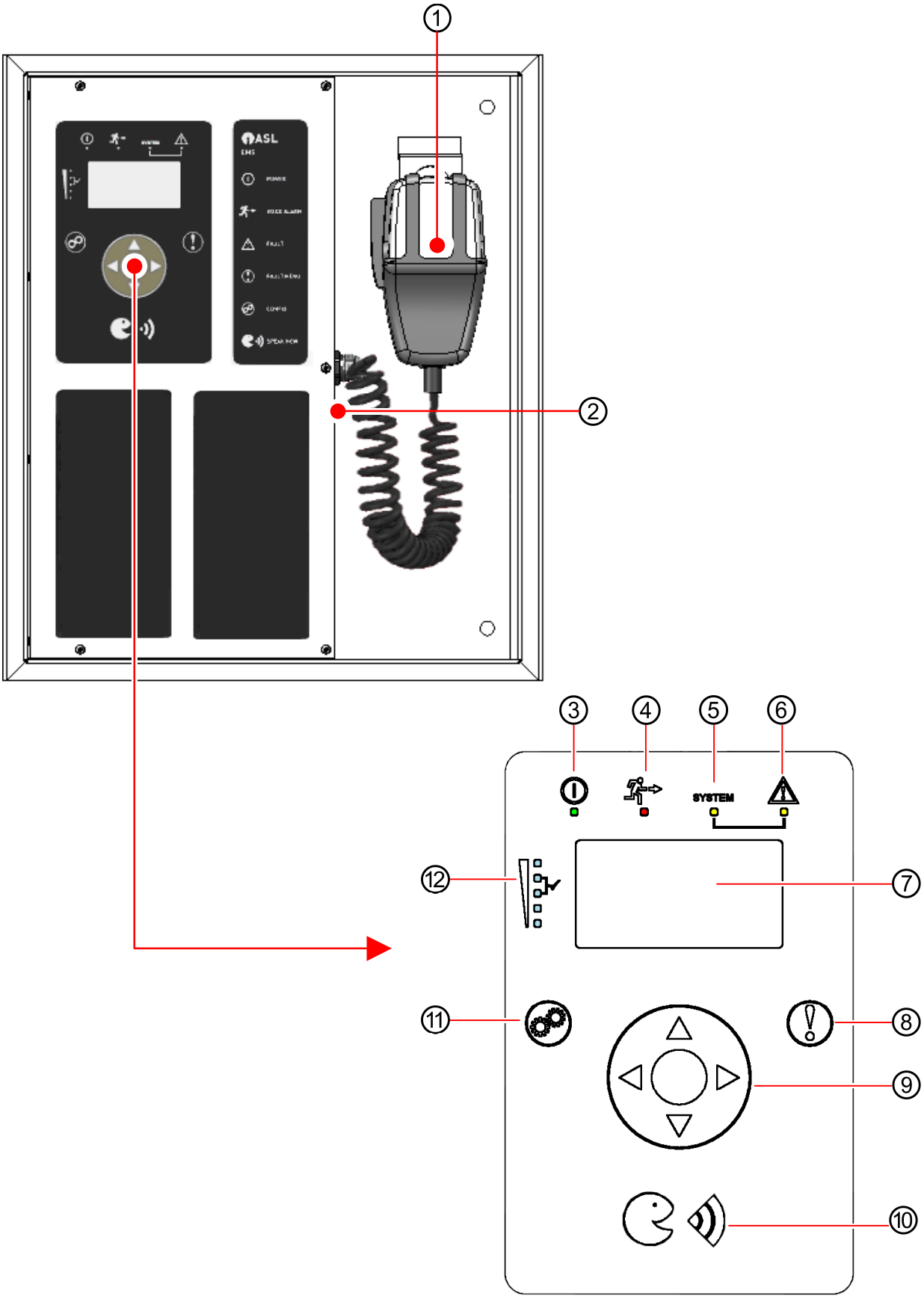
[3] ASL PA/VA systems (refer to ASL for connectivity and software compatibility details): VAR4/12/20, VAR8, VAR8-ACU, and VIPEDIA-12

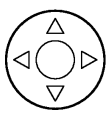
[4] Hardware bypass is only provided on inputs 1 and 2 of ASL Voice Alarm Routers. Hardware bypass is only provided on inputs 1 and 2 of ASL Voice Alarm Routers. If connected to any Router other input, the EMS will operate normally, but without this function

[5] IP interface does not provide EN 54-16, ISO 7240-16 or BS 5839-8 compliance at the time of publication of this Installation Guide. Note that Ethernet connectivity is enabled for the EMS01-IP variant with an additional IP licence

[6] Refer to ASL for availability

2 Front Panel Indicators and Controls

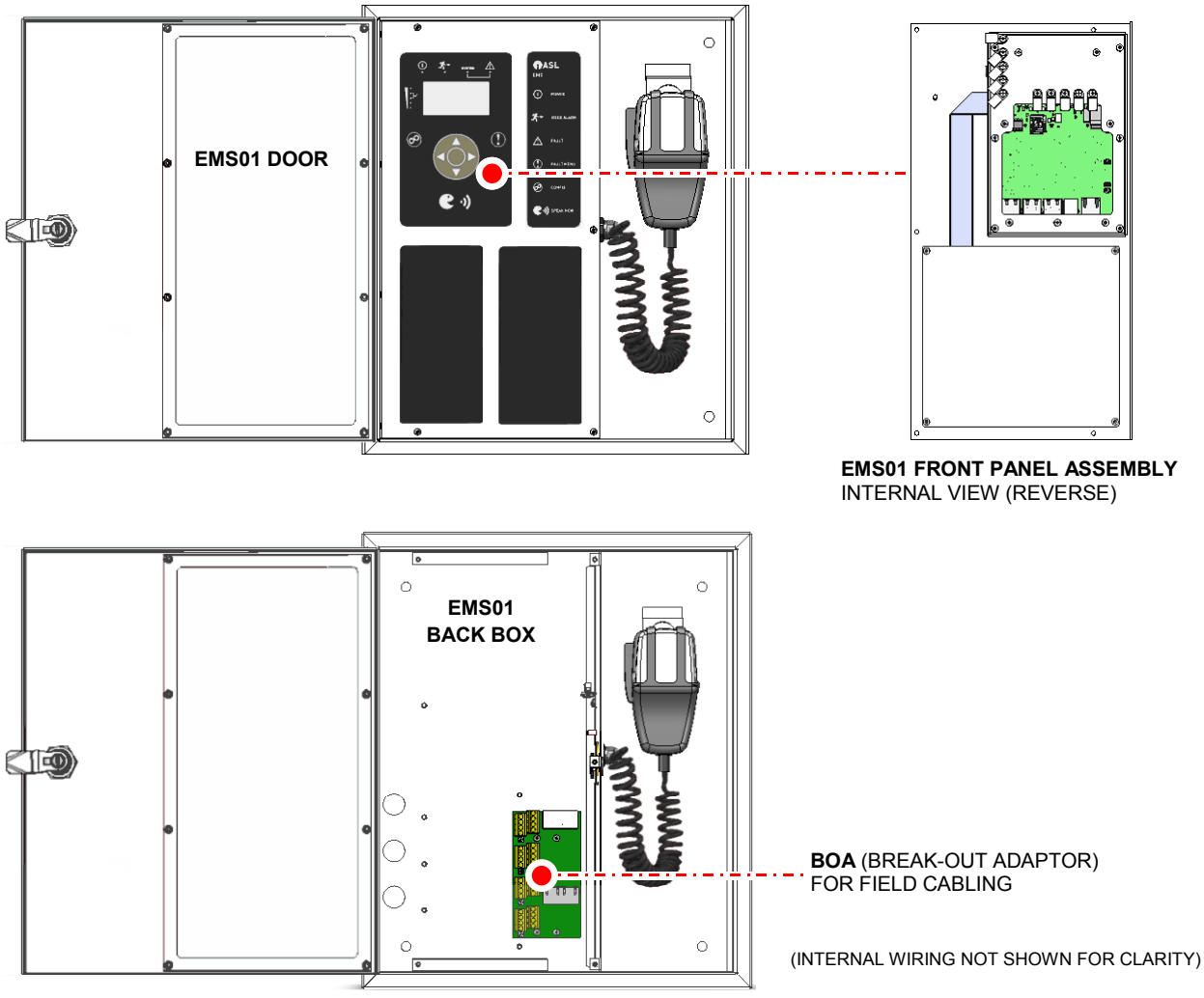


Item	Indicator/Control		Description
①	Microphone		Fist microphone with integral Push To Talk (PTT) button
②	Alarm Sounder (right side of front panel box)		Sounds to indicate a new fault. It can be silenced by pressing the Fault Menu button. The alarm sounder is automatically muted during announcements from the EMS01.
③		Power On LED (green)	Lit if the unit is receiving DC power.
④		Voice Alarm LED (red)	Lit to indicate that a Voice Alarm condition is present in the PA/VA system.
⑤	SYSTEM	System Fault LED (yellow)	Lit to indicate that a system fault has been detected in the PA/VA system. This requires immediate action as part(s) of the system used for emergency functions may have been affected. A system fault will always cause the "fault" LED to be lit as well. A system fault is triggered by a failure of any processor or memory, critical to the Voice Alarm system, including those of the EMS01 itself. A communication fault between the connected Router and any equipment or device that has been configured at the Router and that is critical to Voice Alarm functions will also trigger a system fault. Note that this does not indicate that the EMS01 or the system is not operational, but it indicates that it may not be fully operational. A system fault will be present, for example, if a communication error between the EMS01 and the Router has been detected. An all-call announcement from the EMS01 is still possible in the presence of a communication error.
⑥		Fault LED (yellow)	Lit to indicate that a fault has been detected in the PA/VA system. Flashes if a fault has not yet been accepted. Note that this does not indicate that the EMS01 or the system is not operational, but it indicates that it may not be fully operational. A fault may be present with a fully operational system, for example, if an amplifier has failed but has been automatically replaced by a standby amplifier.
⑦	LCD display		Backlit transflective graphic display for information, configuration and operation.
⑧		Menu selection button	Toggles between fault and operation menus. Accepts all current faults reported at the connected PA/VA System, steadies the flashing "fault" LED indication, and turns off the audible alarm until a new fault condition occurs.
⑨		Navigation wheel	Navigation controls: up (▲), right (▶), down (▼) and left (◀) Selection control: • Touches in the centre are interpreted as "select" • Fast menu scrolling: clockwise or anti-clockwise strokes • In the Fault menu, touching in the centre clears all faults reported at the connected PA/VA System and sets all connected equipment to the "no faults" state, which also cancels any amplifier changeovers in effect. Any persistent faults will be reported again on the next monitoring cycle.
⑩		Speak Now LED (blue)	When the PTT button is pressed and the chime (if programmed at the ASL PA/VA system) has finished, the Speak Now LEDs illuminate to indicate that the announcement can be made. Any attempt to make an announcement prior to this indicator illuminating will fail.
⑪		Menu selection button	Toggles between configuration and operation menus.
⑫		LED bargraph (blue)	Speech level indication with target level marking (✓).

3 Installation

3.1 Main Components

Figure 1 Main components



3.2 Equipment and Tools

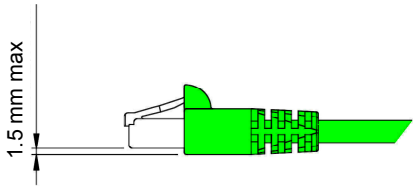
- The EMS01 unit
- Suitable cable glands/conduit fixings (20 mm diameter cable entry knock-outs provided), preferably with cable screen earthing facilities
- A small flat bladed screwdriver (3.5 mm)
- A Pozidriv screwdriver (No. 1)
- Suitable wire cutters, strippers and cable ferrules
- Suitable fixings and tools for wall mounting (fixing hole diameter 9 mm)
- Sealant

3.3 External Cabling

Connection	Signals	Cable Description	Type
Router Connection	Audio	1 x 2-core, twisted, screened, 1.0 mm	Low Smoke and Fume (LSF) Fire rated cable (e.g. Pirelli FP200) Fire resistant equivalents of standard CAT5 cable can be used
	Microphone data	1 x 2- core, twisted, screened, 1.0 mm	
	Power supply	1 x 2-core, twisted, screened, 1.0 mm	
Auxiliary Router Connection	Hardwired PTT	1 x 2-core, twisted, screened, 1.0 mm	Low Smoke and Fume (LSF) Fire rated cable (e.g. Pirelli FP200) Fire resistant equivalents of standard CAT5 cable can be used
	Speak Now	1 x 1-core, twisted, screened, 1.0 mm	
Ethernet Connection	Ethernet and PoE	LAN cable	Fire resistant equivalents of standard CAT5 cable for emergency microphone applications

1) All cable ends to be fitted with suitable bootlace for connection to the Break-Out Adaptor (BOA)
2) For EMC compliance:
   - Screened cables must be used where specified
   - All field cable screens must be connected to the back box
   - All screen tails must be less than 3 cm

1) Refer to BS7671 (Requirements for Electrical Installations) or other appropriate local standards for guidelines on maximum potential cable lengths given the actual installation parameters.
2) Emergency Microphones must have dual power supply: one supply connected to ROUTER 1 port and the second supply to ROUTER 2 port.
3) In applications where cables are directly connected to the RJ45 connectors located on the back of the front panel, note that RJ45 plugs with excessively bulky rubber boot will not fit these connectors. The maximum rubber boot dimension is shown below.

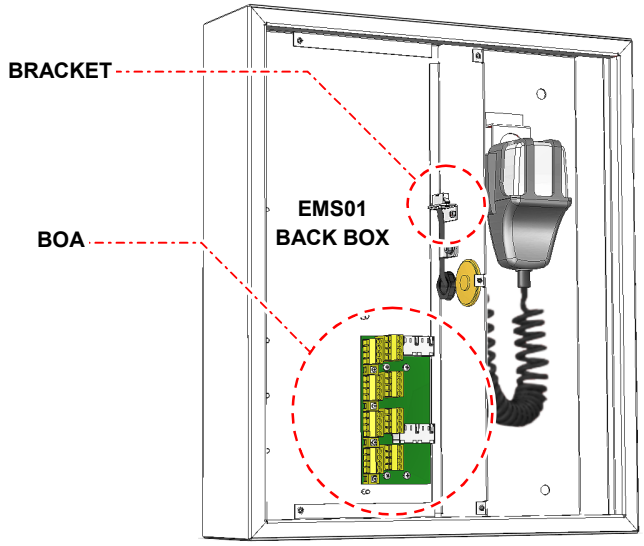


3.4 Recommended Installation Procedure

> ⚠ Please read and observe the safety information guidelines available on the product and in Section "6 Safety and Precautions" (page 19) prior to installation. Failure to follow these guidelines may cause personal injury and/or damage to the equipment.

1. Open the EMS01 door using the key provided.
2. Remove the EMS01 front panel assembly; see Figure 2 (page 8).

Figure 2 Flying and patch leads connection points



1) Undo 5 x M3 screws (Pan Head Pozidriv, 6 mm length).

2) Unplug the flying lead from the bracket located on the inner wall of the back box and the patch leads from the RJ45 connectors on the Break-Out Adaptor (BOA).

(INTERNAL WIRING NOT SHOWN FOR CLARITY)

3. Store the front panel assembly and fixing screws safely.
4. Choose the required cable entry point or points on the EMS01, and remove the appropriate knock-outs at the chosen positions; see Figure 7 (page 18) for cable entry point positions.
5. Mount the EMS01 back box on the wall; see Figure 7 (page 18) for mounting hole positions.

> ⚠ Mount the EMS microphone at eye height for best viewing angle of the LCD display.

6. Take the EMS01 front panel assembly and configure the microphone as required; see Figure 3 (page 10).

   If used, insert the micro-SD card into the card holder.

7. Connect the field cabling to the screw-in terminals on the Break-Out Adaptor (BOA) that is secured to the EMS01 back box.

   Refer to Section "4 Connections" (page 14) for details.

> ⚠ For EMC compliance ensure that:
> - All field cabling screens are connected to the back box. This should be via one of the SCREEN screw-in terminals provided on the Break-Out Adaptor.
> - All cable tails are less than 3 cm.

8. Ensure all swarf is removed from the enclosure.

9. Re-install the EMS01 front panel assembly.

a. Plug the flying lead to the bracket located on the inner wall of the EMS01 back box and the patch leads to the appropriate RJ45 connectors on the Break-Out Adaptor (BOA); see Figure 2 (page 8).

The patch leads and RJ45 connectors are colour-coded for easy installation.

b. Fix the EMS01 front panel assembly using 5 x M3 screws (Pan Head Pozidriv, 6 mm length) ensuring that no leads are trapped between the front panel and the back box.

10. Power the unit on from the central equipment rack or PoE.

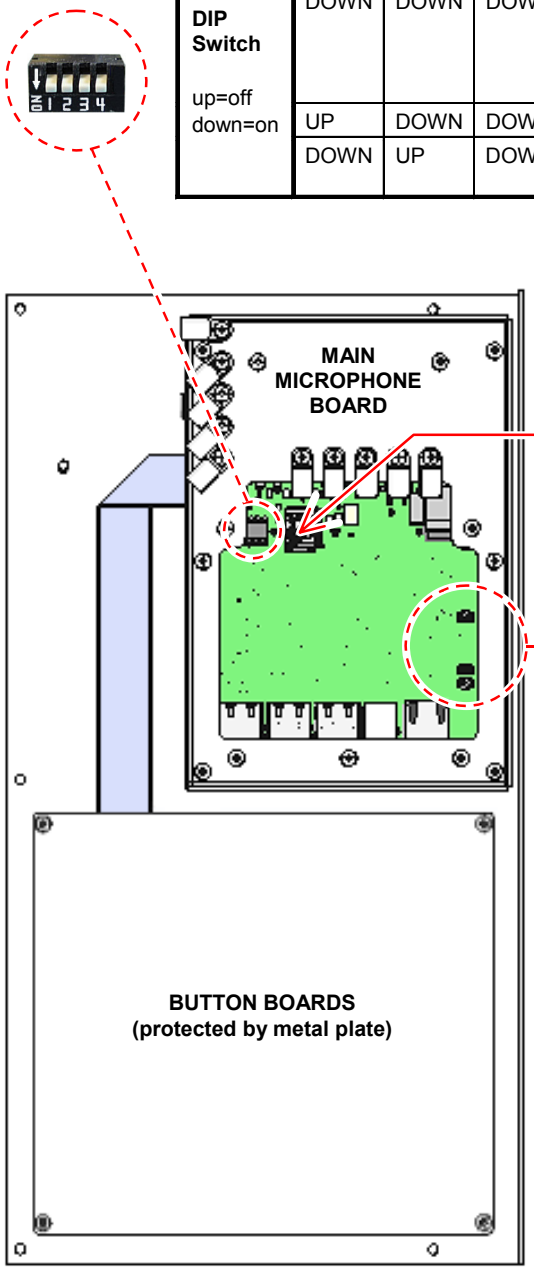
11. Commission the microphone.

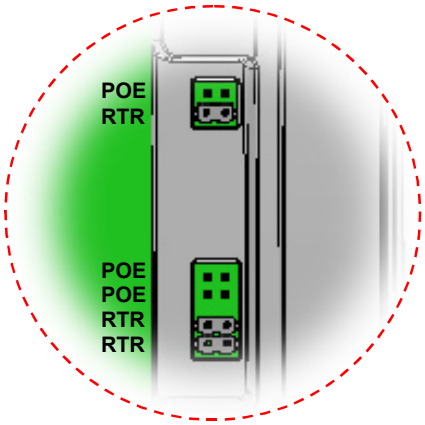
12. Close and lock the door using the key provided.

3.5 Microphone Settings

Figure 3 Configuring the microphone

DIP Switch up=off down=on	SW 1	SW 2	SW 3	SW 4	Microphone Configuration
	DOWN	DOWN	DOWN	DOWN	Standard ASL microphone operation (default): • Must be used for EN54-16 compliance • Firmware upgrade and configuration: via the Ethernet port • Configuration via User Interface: read only
	UP	DOWN	DOWN	DOWN	Bootloader mode: for firmware download via the USB port
	DOWN	UP	DOWN	DOWN	Configuration via User Interface: read and write (for commissioning only)





POE Links	RTR Links	Power Supply Configuration
Not fitted	Fitted	DC power supply via Router connections
Fitted	Not fitted	Power over Ethernet

1) Power over Ethernet does not provide EN54-16 compliance
2) Disconnect power before changing link settings
3) POE and RTR links must NOT be fitted simultaneously

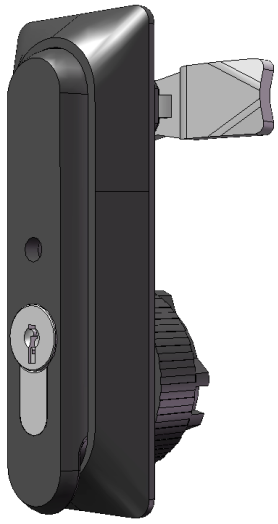
(INTERNAL WIRING NOT SHOWN FOR CLARITY)

EMS FRONT PANEL ASSEMBLY
(REAR VIEW)

3.6 Retrofitting the Door Lock

The lock on the EMS01 door may be retrofitted with a swing lock with a euro-cylinder as described below.

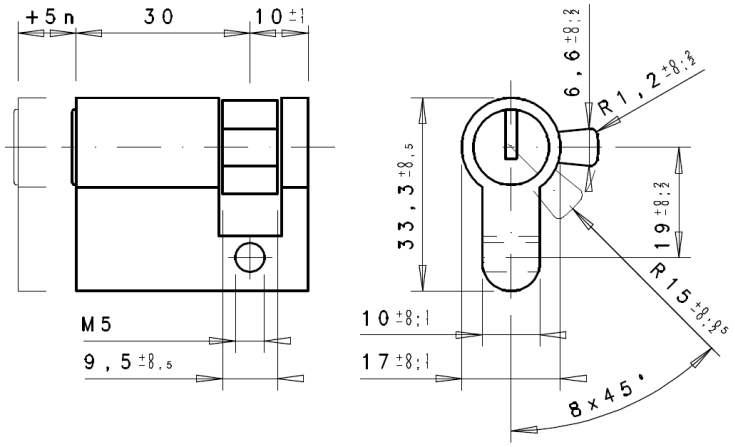
> The EMS01 will turn into EMS01-EC once the door lock is retrofitted with the swing lock specified below.



(The front cover has been removed to show the euro-cylinder)

The following parts MUST be used:

1) Swing lock from Camlock Systems Ltd[1] with or without euro-cylinder:
   - PN 001-2-00-94: lock supplied with 4 mm reverse cam (14.5 mm grip), no euro-cylinder fitted
   - PN 001-2-01-94: lock supplied with 4 mm reverse cam (14.5 mm grip), with keyed alike euro-cylinder
   - PN 001-2-02-94: lock supplied with 4 mm reverse cam (14.5 mm grip), with random keyed euro-cylinder
2) If you choose to fit your own euro-cylinder, it must have the dimensions specified below.



3) Screw used to secure the cylinder to the lock: M5 countersunk screw with 16 mm length including the countersunk.

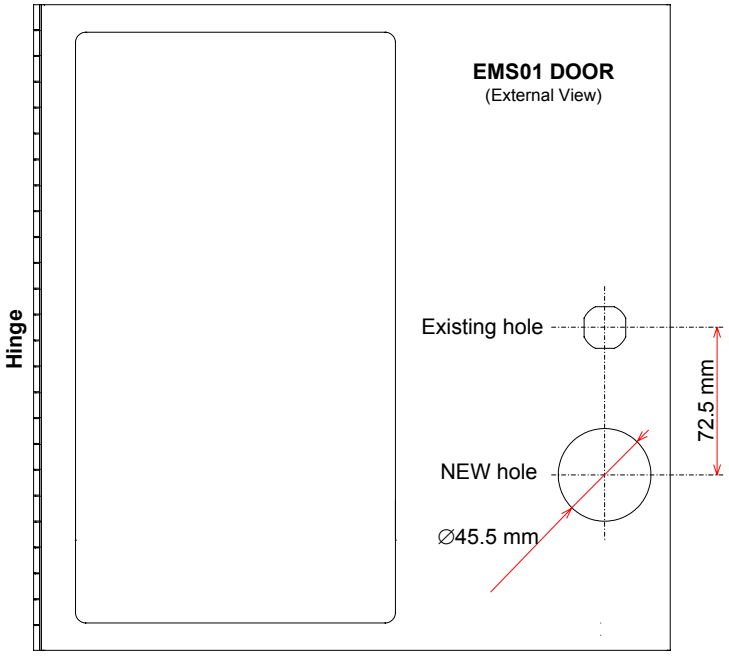
Tool Requirement:

- Tools suitable for cutting a 45.5 mm hole in 1.5 mm mild steel, e.g. “Q-Max” type hole punch
- AF spanners
- Flat bladed screwdrivers (medium and large)
- Pozidriv screwdriver (No. 1)
- Deburring tool
- Masking tape

[1] Camlock Systems Ltd
3 Park View
Compton Industrial Estate
Eastbourne – East Sussex – BN23 6QE – UK

Instructions to retrofit the door lock:

1. Open the EMS01 door using the key provided.
2. Remove the door by undoing 4 x M3 screws (Countersunk Pozidriv, 6 mm length).
3. Remove the supplied lock by removing the cam and then undoing the locking nut.
4. Cut an extra hole (45.5 mm diameter) in the position shown below.



You may use the following procedure to cut the extra hole.

a. Cover the outer face of the door with masking tape.

b. Mark and punch the centre position of the extra hole.

c. Using progressively larger drill bits, create a pilot hole.

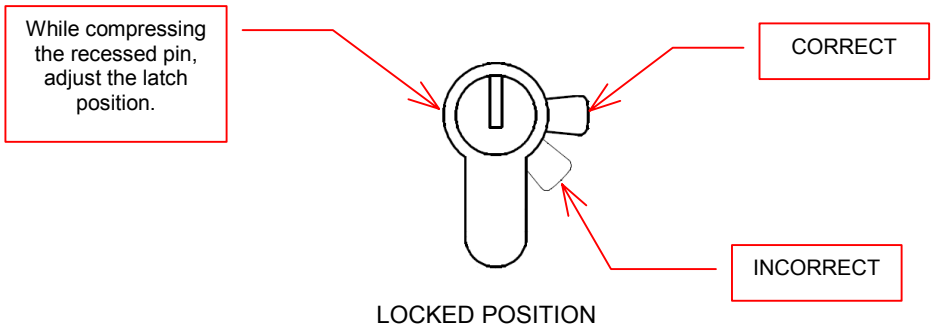
d. Position a 45.5 mm hole cutter in the pilot hole and cut out a 45.5 mm diameter hole.

If a smaller hole cutter is used, then use a deburring tool to achieve a 45.5 mm hole.

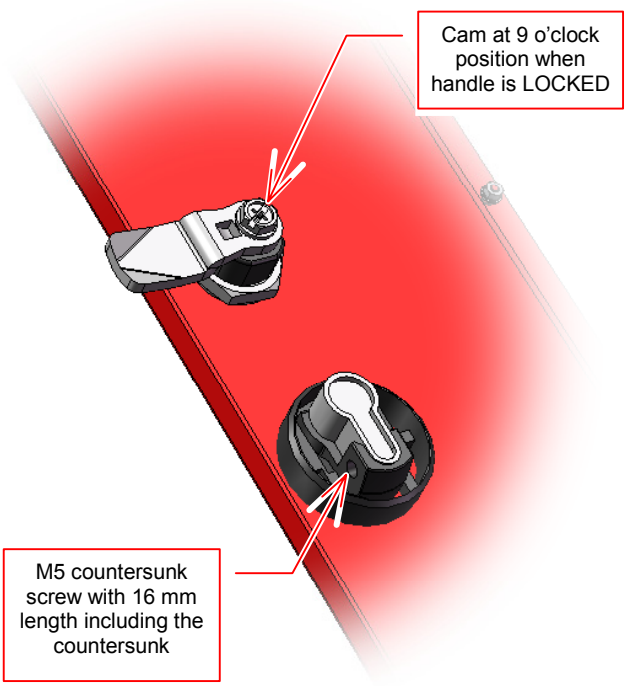
e. Remove masking tape and clean the door.

5. Take the swing lock and remove the cam, the locking nut and the cylinder cover if supplied fitted.
6. If the lock is supplied with a cylinder, then remove the cylinder.
7. Take the cylinder and check the position of the cylinder's latch.

   When the key is in the LOCKED position, the cylinder's latch should be positioned as shown below. If required, adjust the position of the cylinder's latch.

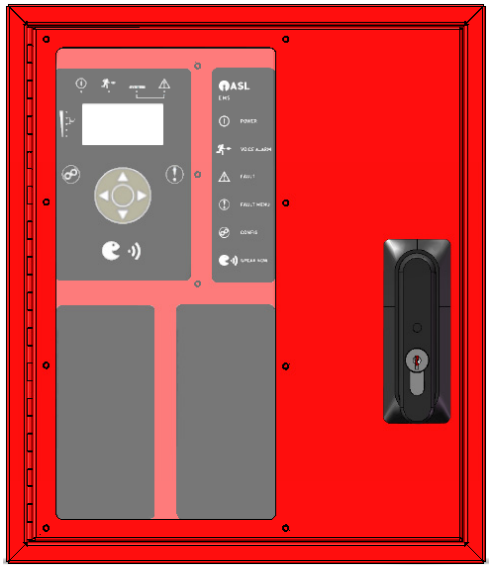


8. Carefully feed the swing lock through the lock holes on the door.
9. Secure the swing lock to the door using the locking nut – DO NOT OVERTIGHTEN.
10. Re-fit the cam ensuring it is at 9 o'clock position when the lock handle is LOCKED.
11. Insert the cylinder and secure it using a M5 screw.
12. Re-fit the cylinder cover and tighten it.



13. Re-fit the door to the EMS01 back box using 4 x M3 screws (Countersunk Pozidriv, 6 mm length) provided.
14. Check the operation of the new lock.

EMS01-EC



4 Connections

Figure 4 Break-Out Adaptor (BOA) terminal allocation

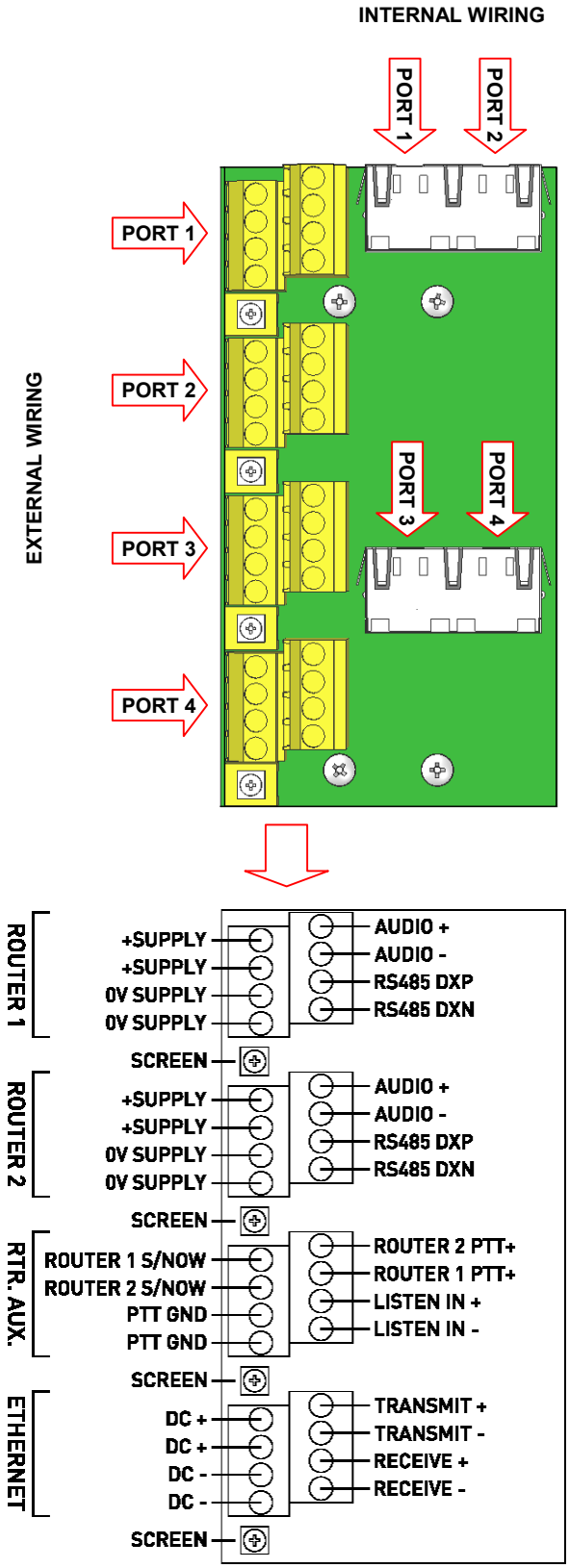
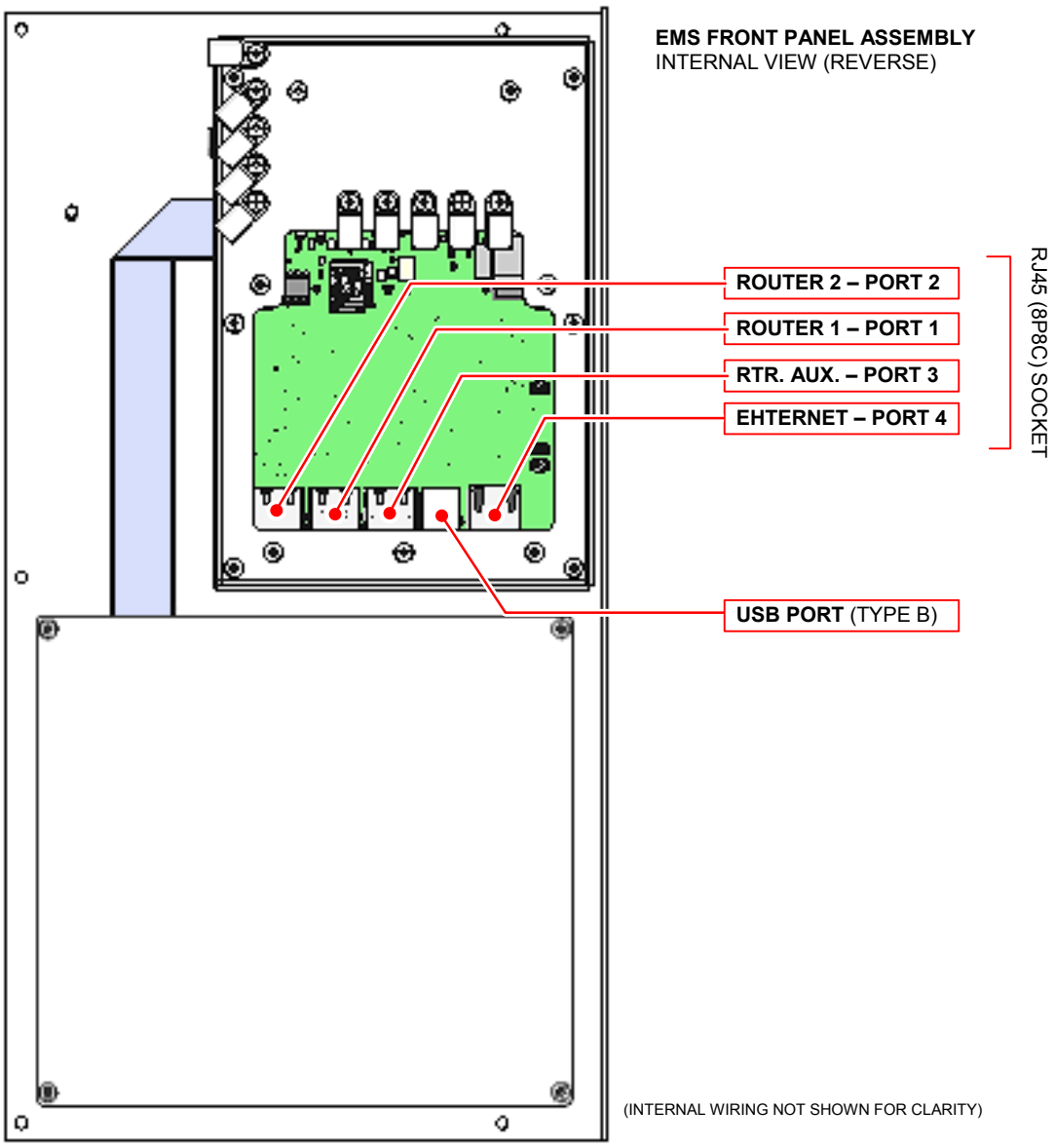


Figure 5 Connections to the front panel RJ45 connectors



ROUTER 1 – PORT 1			
Pair	**RJ45 Pin**	**Signal**	**Description**
PAIR-1+	1	AUDIO +	Balanced audio output (+ve / 0 dBu nominal / 220 Ω)
PAIR-1-	2	AUDIO -	Same as above, but -ve
PAIR-2+	3	RS485 DXP	RS485 Data+ (19200 baud)
PAIR-2-	6	RS485 DXN	Same as above, but Data-
PAIR-3+	4	+ SUPPLY	+V supply input (15 to 40 V DC from equipment rack)
PAIR-3-	5	+ SUPPLY	+V supply input (15 to 40 V DC from equipment rack)
PAIR-4+	7	0V SUPPLY	0 V supply
PAIR-4-	8	0V SUPPLY	0 V supply

- PORT 1 is used for connection to a Router as standard
- For EN 54-16, ISO 7240-16 or BS 5839-8 compliance, the microphone must have dual power supply: one supply connected to ROUTER 1 and the second supply to ROUTER 2
- DC power supply via Router (RTR) connections: see Figure 3 (page 10) for required link settings

ROUTER 2 – PORT 2			
Pair	**RJ45 Pin**	**Signal**	**Description**
PAIR-1+	1	AUDIO +	Balanced audio output (+ve / 0 dBu nominal / 66 Ω)
PAIR-1-	2	AUDIO -	Same as above, but -ve
PAIR-2+	3	RS485 DXP	RS485 Data+ (19200 baud)
PAIR-2-	6	RS485 DXN	Same as above, but Data-
PAIR-3+	4	+ SUPPLY	+V supply input (15 to 40 V DC from equipment rack)
PAIR-3-	5	+ SUPPLY	+V supply input (15 to 40 V DC from equipment rack)
PAIR-4+	7	0V SUPPLY	0 V supply
PAIR-4-	8	0V SUPPLY	0 V supply

- PORT 2 is used if the microphone is connected to both 'A' and 'B' Routers
- For EN 54-16, ISO 7240-16 or BS 5839-8 compliance, the microphone must have dual power supply: one supply connected to ROUTER 1 and the second supply to ROUTER 2
- DC power supply via Router (RTR) connections: see Figure 3 (page 10) for required link settings

RTR. AUX. – PORT 3			
Pair	**RJ45 Pin**	**Signal**	**Description**
PAIR-1+	1	ROUTER2 PTT+	Push-To-Talk switch to Router 2 (internally fitted with 6k8/470 Ω resistors)
PAIR-1-	2	ROUTER1 PTT+	Same as above, but to Router 1
PAIR-2+	3	LISTEN IN +	Listen-in audio from Router (+ve / 0 dBu nominal / 10 kΩ)
PAIR-2-	6	LISTEN IN -	Same as above Listen-in, but –ve
PAIR-3+	4	ROUTER 1 S/NOW	Cathode of Speak Now indicators with built-in 2k2 Ω series resistor from Router 1 (anode is internally connected to 15-40 V supply)
PAIR-3-	5	ROUTER 2 S/NOW	Same as above, but from Router 2
PAIR-4+	7	PTT GND	ROUTER 1 or ROUTER 2 PTT: connection to 0 V or Router PTT-
PAIR-4-	8	PTT GND	Same as above

- Hardware bypass (PTT and SPEAK NOW) is provided on inputs 1 and 2 of ASL Voice Alarm Routers
- Routers with All Call LED connection: a pull up resistor (10 kΩ / 0.25 W) to +V supply is required in order to suppress the All Call LED fault

ETHERNET – PORT 4			
Pair	**RJ45 Pin**	**Signal**	**Description**
PAIR-1+	1	TRANSMIT +	100BASE-T Ethernet
PAIR-1-	2	TRANSMIT -	100BASE-T Ethernet
PAIR-2+	3	RECEIVE +	100BASE-T Ethernet
PAIR-2-	6	RECEIVE -	100BASE-T Ethernet
PAIR-3+	4	DC +	+V supply input (PoE: 42 – 57 V DC)
PAIR-3-	5	DC +	+V supply input (PoE: 42 – 57 V DC)
PAIR-4+	7	DC -	0 V supply
PAIR-4-	8	DC -	0 V supply

- Ethernet and PoE (Power over Ethernet) connections do not provide EN 54-16, ISO 7240-16 or BS 5839-8 compliance
- PoE: see Figure 3 (page 10) for required link settings

USB PORT			
Pin No.	**Signal**		**Description**
1	VBUS	TRANSMIT +	+V supply input
2	D–	TRANSMIT -	Negative Data Channel
3	D+	RECEIVE +	Positive Data Channel
4	GND	RECEIVE -	Ground

5 Mechanical Dimensions

Figure 6 Mechanical dimensions

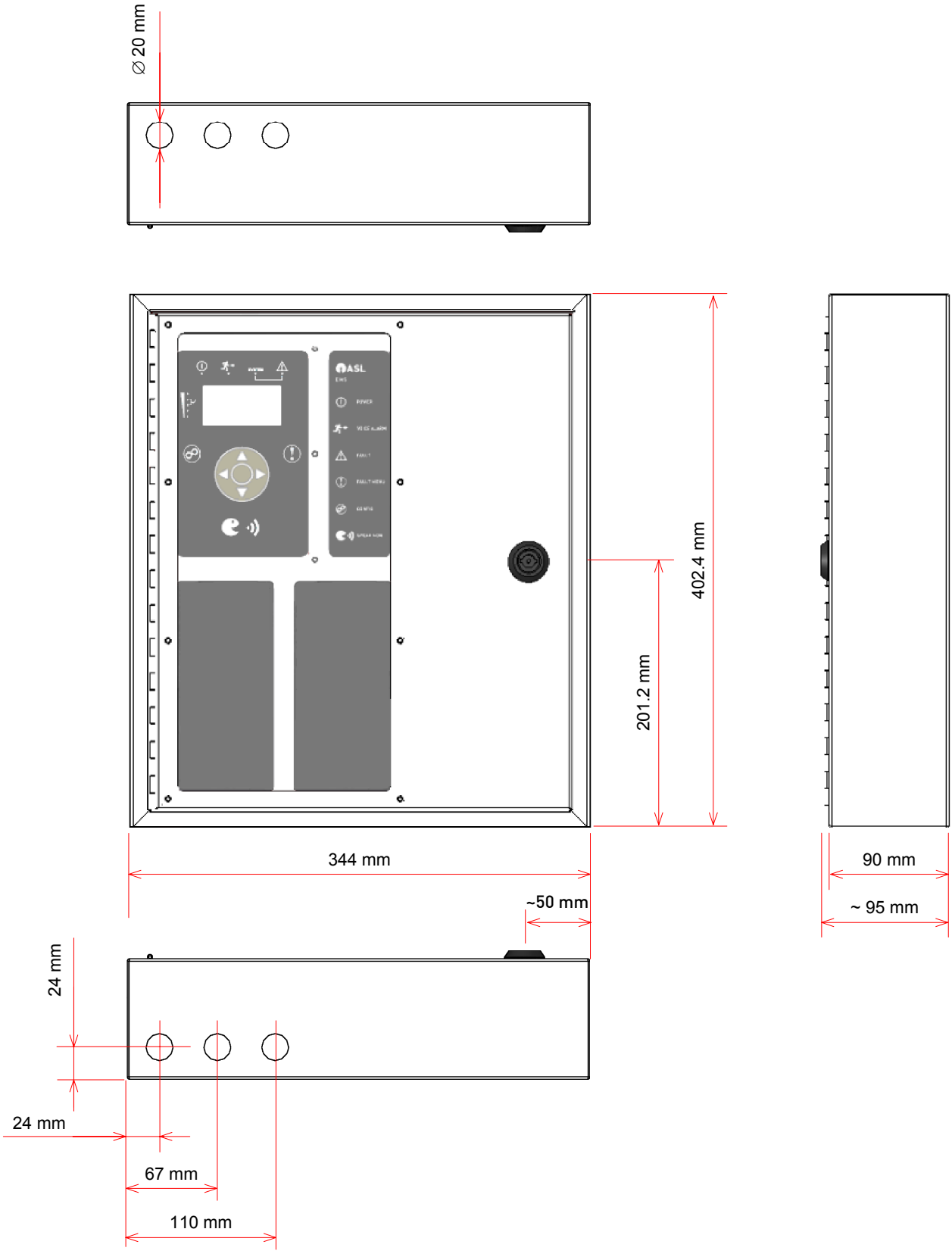
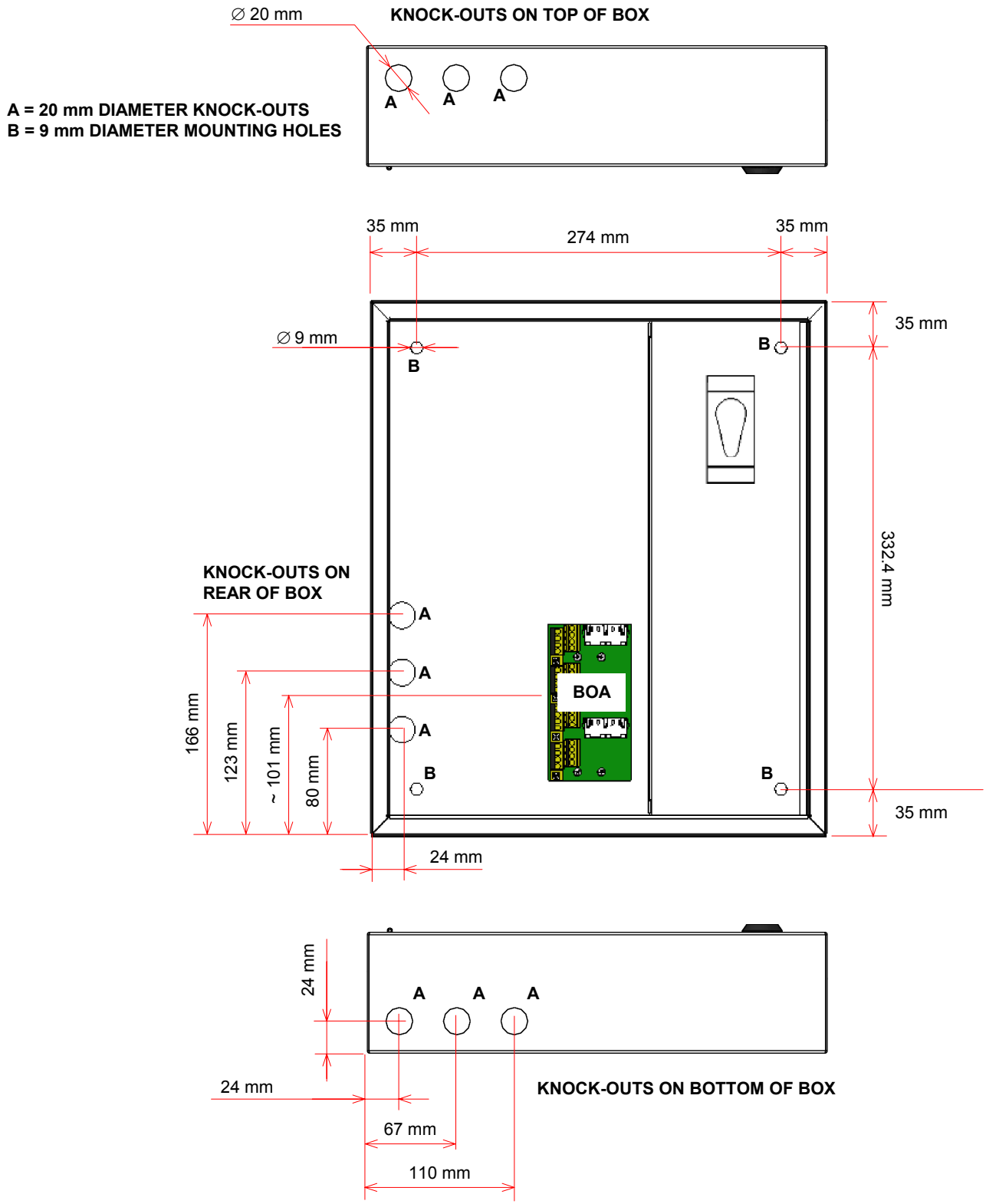


Figure 7 Cable entry and fixing hole positions



6 Safety and Precautions

Observe all safety information both on the product and in this section.

Environmental

The temperature and humidity ranges shown in the specifications for this product must not be exceeded.

This equipment must not be installed in an area that is subject to a corrosive atmosphere, excessive moisture or may allow water or other liquids to come into contact with the unit or its external connections.

Electrical Safety

> Ensure power supply cabling is adequately rated.
>
> Always replace blown fuses in the supply to this equipment with the correct type and rating.

ESD Precautions

This product contains static-sensitive devices. Observe ESD precautions when handling the front panel assembly.

EMC

In the close proximity of some radio frequency transmitters, the signal to noise ratio of this product may be reduced. If this occurs, ensure adequate system RF earthing or re-locate the equipment or signal cables.

Unpacking and Handling

The equipment should be unpacked and inspected immediately on receipt. If damage has occurred please advise your carrier or supplier.

> This equipment contains electronic devices that are sensitive to electrostatic discharge. Please take precautions to avoid damage to the electronics by static electricity.

It is advisable to retain the original equipment packing in the event that the equipment ever needs returning for service.

Ensure that the name and address of the Authorised Distributor from whom you purchased the unit is recorded on the “Service and Warranty” page of this manual for future reference.

Packing for Return for Repair

> All electronics assemblies must be properly packed in ESD protective packing for transport, to prevent physical and ESD damage.

> The filler material used for packing for return for repair must be antistatic or static dissipative, as this may come into contact with exposed connectors, wiring, or PCB assemblies. The use of non-conductive filler material may cause damage to the electronic assemblies reducing their operational life, or even destroying them.

Advice on packing the product for return can be provided by ASL.

Service and Warranty

Name and Address of Authorised Distributor:

This product carries a full warranty. For full details of warranty and service agreements, please contact the Authorised Distributor who supplied the product to you.

Exclusions

The warranty does NOT cover:

1. Customer misuse, including incorrect installation.
2. Damage other than manufacturing defects.
3. Transit / Courier damage.
4. Incorrect voltage or power supply used.
5. Incorrect input signal.
6. Abnormal environmental operating conditions.
7. Damage incurred by accident, fire, lightning or other hazard.
8. Modification to the unit or inexpert / attempted repair.
9. No fault found – where no fault can be found after extensive testing, indicating user error or failure in ancillary equipment.
10. Electronic assemblies which are improperly packed when returned for repair or service.

Should any of the above apply, Application Solutions (Safety and Security) Limited reserves the right to raise any relevant charges to the customer.

Application Solutions (Safety and Security) Limited shall not be liable for any indirect, special or consequential loss or damage (including without limitation any loss of profits) arising from the use of this product or for any breach of this warranty.

In the interest of continual product development, Application Solutions (Safety and Security) Limited reserves the right to make changes to product specification without notice or liability.

ASL
safety, security & control