

**SAP02**

**Station Announcement Point**





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

EMC EN55103-1, EN55103-2, EN50121-4, EN61000-6-2, EN61000-6-3

Safety EN60065

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, and a list of auxiliary equipment used for compliance verification, is available on request.



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



This product is RoHS compliant.

Copyright © 2009 Application Solutions (Safety and Security) Limited

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](http://www.asl-control.co.uk)



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



All rights reserved.

Information contained in this document is believed to be accurate, however no representation or warranty is given and Application Solutions (Safety and Security) Limited assumes no liability with respect to the accuracy of such information.

# Contents

<b>1</b>	<b>Description .....</b>	<b>5</b>
<b>2</b>	<b>Operation .....</b>	<b>6</b>
2.1	Control and Indicators .....	6
2.2	Console Operation.....	8
2.2.1	Live Announcements via a Fist Microphone.....	8
2.2.2	Live Announcements via a Radio Microphone .....	10
<b>3</b>	<b>Installation .....</b>	<b>12</b>
3.1	SAP02 Components .....	12
3.2	Installation Requirements .....	15
3.2.1	Equipment and Tool Requirements .....	15
3.2.2	Cabling Requirements .....	15
3.2.2.1	Cabling to a VAR Router.....	15
3.2.2.2	Cabling to an Intellevac DAU or ACU .....	15
3.2.2.3	Antenna Cabling.....	16
3.3	Recommended Installation Procedure .....	17
<b>4</b>	<b>Connections .....</b>	<b>25</b>
4.1	DIN Rail Terminal Allocation.....	25
4.1.1	Original SAP02 Back Box .....	25
4.1.2	SAP02 From Panel Fitted into SAP01 Back Box.....	26
4.2	Commissioning Port Connection .....	27
4.3	Radio Microphone Receiver Connections .....	28
4.4	Connection to a VAR Router in an Equipment Rack.....	28
4.5	Connection to a Wall-Mount Intellevac DAU or ACU .....	30
<b>5</b>	<b>Radio Microphone Receiver Settings .....</b>	<b>31</b>
5.1	Radio Microphone Receiver Frequency Selection .....	31
5.2	Radio Microphone Receiver Pilot Tone Detection Set-up.....	32
5.3	Radio Microphone Receiver Squelch Level Selection .....	33
<b>6</b>	<b>Commissioning the SAP02 .....</b>	<b>34</b>
6.1	Obtaining the Router's Input Number .....	34
6.2	Configuring the Microphone Type .....	34
6.3	Configuring the PTT Button .....	35
6.3.1	PTT Button Zone Selection.....	35
6.3.2	PTT Button Cough Timeout (only on VAR Router).....	35
6.4	Configuring the Microphone Audio Parameters .....	35
6.4.1	Microphone Input Gain .....	35
6.4.2	Microphone Surveillance Tone Detection .....	36
6.4.3	Microphone Relative Output Gain.....	37
6.4.4	Microphone Equalisation .....	38
6.4.5	Microphone Fade Up and Down Times .....	39
6.4.6	Microphone Pre-Announcement Chime.....	40
6.5	Configuring the Microphone Control Parameters.....	41
6.5.1	Microphone Priority .....	41
6.5.2	Microphone Class .....	42
6.5.3	Microphone Name.....	42
6.5.4	Busy and Select Indication LEDs Mode (ACU and VAR8-ACU only) .....	43
<b>7</b>	<b>Fault Finding.....</b>	<b>44</b>
<b>8</b>	<b>Maintenance .....</b>	<b>46</b>
8.1	SAP02 Build Standard Version.....	46
8.2	Powering the SAP02 On and Off.....	47
8.2.1	Original SAP02 Back Box – Terminal 4 .....	47
8.2.2	SAP02 Front Panel Fitted to SAP01 Back Box – Terminal 2 .....	48
8.2.2.1	Power Supply via Disconnect Terminal .....	48
8.2.2.2	Power Supply via Signal Terminal .....	48

8.3	Removing the SAP02 Front Panel/Electronics Assembly .....	49
8.4	Installing the SAP02 Front Panel/Electronics Assembly .....	50
8.5	Radio Microphone Receiver Channel, Pilot Tone Detection, and Receiver Squelch Level Configuration .....	52
8.6	SAP02 Front Panel/Electronics Assembly Replacement .....	53
8.7	SAP01 Upgrade.....	55
<b>9</b>	<b>Product Specification .....</b>	<b>59</b>
9.1	SAP02.....	59
9.2	RMR02 Radio Microphone Receiver (optional).....	60
<b>10</b>	<b>Mechanical Dimensions .....</b>	<b>61</b>
<b>11</b>	<b>Safety and Precautions .....</b>	<b>62</b>
11.1	Environmental.....	62
11.2	ESD .....	62
11.3	Electrical Safety.....	62
11.4	Unpacking and Handling .....	62
<b>12</b>	<b>Accessories .....</b>	<b>63</b>
<b>13</b>	<b>Spare Parts .....</b>	<b>64</b>
<b>14</b>	<b>Appendix – Antenna Types .....</b>	<b>65</b>
<b>15</b>	<b>Reference Documents .....</b>	<b>66</b>
<b>16</b>	<b>Index.....</b>	<b>67</b>
	<b>Service and Warranty .....</b>	<b>69</b>

# 1 Description

The SAP02 Station Announcement Point is housed in an IP65 vandal resistant, lockable wall-mounting box. It is designed to work with the whole range of ASL Voice Alarm and Public Address systems, and is normally used for making announcements to station platforms. The unit features indicators for 'Busy' and 'Speak Now'.

The SAP02 supersedes the earlier SAP01 Station Announcement Point and its mechanical design provides improved protection against water ingress, is more robust internally, and provides easier installation and operation. Additionally the back box has a splash protected drain hole to provide drainage of unprevented ingress of liquid.

A processor within the Station Announcement Point interfaces all LEDs and switches to the Router by means of a serial interface, while microphone audio is provided as a balanced 0 dBu (nominal) analogue signal. The unit features a built-in signal limiter to accommodate varying operator technique. The microphone's processor is also responsible for generating an outgoing low-frequency surveillance tone which is used to monitor the audio connection to the Router, while microphone capsule monitoring is performed by injection and monitoring of a signal such that either open or short circuit of the capsule or associated wiring will indicate a fault.

The SAP02 can optionally house a RMR02 Radio Microphone Receiver to enable remote (Radio Microphone) announcements to be made in addition to the SAP's standard local (Fist Microphone) announcements. Both microphones are normally available for making announcements without prior selection, although the Radio Microphone can be disabled using a push button on the internal front panel if required. Front panel LEDs indicate whether the Radio Microphone is enabled, and whether it is being used.

The RMR02 is a high quality, fully synthesised diversity receiver, capable of working on ten frequencies that are selectable via an internally accessible rotary switch. Additional circuitry for pilot tone detection prevents announcements from unauthorised transmitters. The pilot tone frequency is unique to this receiver. Thus only announcements from transmitters able to provide the same pilot tone, such as the ASL RPA01 Transmitter, are broadcast to the system, while announcements from unauthorised transmitters are blocked<sup>1</sup>. This security feature can however be disabled for compatibility with transmitters that do not provide the pilot tone.

The RMR02 provides phantom power for mast-head amplifiers which is ideal for demanding RF environments. The phantom power is current limited so that a short circuit on one antenna does not disable the other.

Four Radio Microphone Receiver squelch levels are available to enable optimum RF set-up. This enables the operator to adjust the squelch threshold level so that noise signals are blocked.

The ASL ANT04 Low Profile Antenna and ANT03 Whip Antenna are choices of antenna for use with the Radio Microphone Receiver.

The ASL ANC01 Radio Microphone Antenna Combiner unit can be used with the Radio Microphone Receiver when more than two antennae are needed to provide adequate coverage in the PA zone.

Refer to the ANT03 Product Overview [Table 11-5], ANT04 Product Manual [Table 11-6], and ANC01 Product Manual [Table 11-7] for further details.

The SAP02 also provides a connection port for an optional remote commissioning link, which enables system commissioning from the platform using a laptop computer.

Field connections are provided on the inside rear panel of the back box by DIN rail mounted terminals.

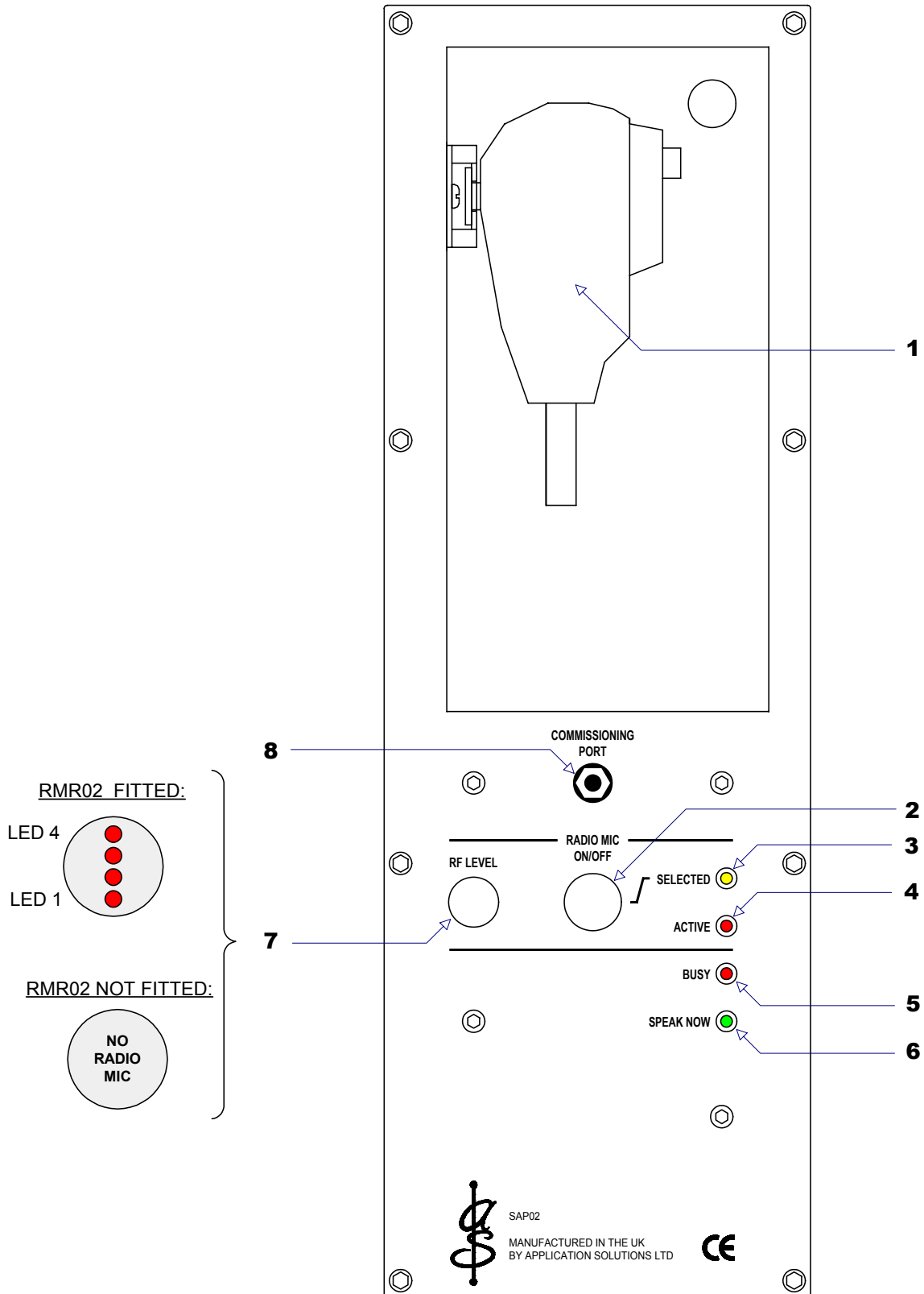
---

<sup>1</sup> Announcements from non-tone locked transmitters are completely blocked with Radio Microphone Receiver modules of Build Standard (BS) 2B or later. With earlier Build Standards of Radio Microphone Receiver module the audio from non-tone locked transmitters is muted but they can still make chimes and silent routes. These silent routes can still be blocked; please refer to Application Solutions (Safety and Security) Limited for further details.

## 2 Operation

### 2.1 Control and Indicators

Figure 1 SAP02 Front Panel



## 1 **Fist Microphone with integral PTT button**

When the PTT button is pressed, it activates the zone selection as programmed at the Router, opens the microphone channel, and triggers the pre-announcement chime (if programmed at the Router), ready for the paging announcement.

When the PTT button is released, the microphone channel is closed and the routes are terminated.

## 2 **RADIO MIC – ON/OFF Button**

An electronically latched button which is used to enable or to disable the Radio Microphone when a Radio Microphone Receiver is installed. In this case the RADIO MIC – SELECTED LED indicates the Radio Microphone selection state.

When the RMR02 Radio Microphone Receiver is not fitted the button is not functional.

## 3 **RADIO MIC – SELECTED LED (yellow)**

When a RMR02 Radio Microphone Receiver is fitted, this LED illuminates to indicate that the Radio Microphone is enabled by the RADIO MIC – ON/OFF button:

- ON = Radio Microphone enabled.
- OFF = Radio Microphone disabled.

The LED is permanently turned off when a RMR02 Radio Microphone Receiver is not fitted.

## 4 **RADIO MIC – ACTIVE LED (red)**

When a Radio Microphone Receiver is fitted, and the Radio Microphone is selected by the RADIO MIC – ON/OFF button, this LED illuminates to indicate that an announcement from a Radio Microphone is in progress:

- ON = Announcement from a Radio Microphone is in progress.
- OFF = No announcement from a Radio Microphone is in progress.



The LED flashes green (fast) to indicate loss of communication.

The LED is permanently turned off when a RMR02 Radio Microphone Receiver is not fitted.

## 5 **BUSY LED (red)**

When the BUSY LED is lit this indicates that the zone (or one or more of the group of zones) addressed by the microphone is already in use by another input. This microphone can only select the zone if the other input is of a lower priority.

If a higher priority input selects a zone during a paging announcement from the SAP02, then the zone will be deselected for the SAP02, and the BUSY LED will illuminate. The announcement will continue to any other zones if the SAP02 addresses a group of zones.

## 6 **SPEAK NOW LED (green)**

When the Press To Talk button is pressed, and the chime (if programmed at the Router) has finished, the SPEAK NOW LED illuminates to indicate that the announcement can be made.

## 7 **RADIO MIC – RF LEVEL LEDs**

These LEDs are only present when a RMR02 Radio Microphone Receiver is fitted. The RMR02 is optional. The LEDs indicates the received RF signal level:

- LED 4 = –72 dBm (uppermost), high signal strength
- LED 3 = –78 dBm
- LED 2 = –84 dBm
- LED 1 = –92 dBm, low signal strength
- No LEDs lit = no signal

## **BLANKING PLATE**

A blanking plate is fitted when a RMR02 Radio Microphone Receiver is not installed.

## 8 **COMMISSIONING PORT**

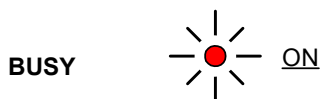
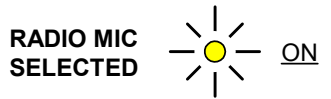
A RS485 port which enables system commissioning from the platform using a laptop computer. This port allows the Router RS232 host control port to be extended to the SAP02 (via suitable RS485 conversion at the central PA equipment).

## 2.2 Console Operation

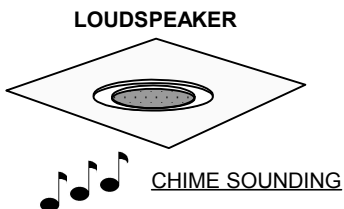
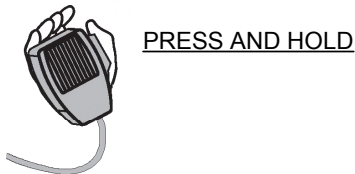
### 2.2.1 Live Announcements via a Fist Microphone



The fist microphone has higher priority than the Radio Microphone, and will override a Radio Microphone announcement when used concurrently.



#### PRESS TO TALK BUTTON



**1.** Access the internal front panel by unlocking and opening the cabinet door with the associated KABA key.

**2.** Unhook the Fist Microphone from its retaining clip.

**3.** If the Radio Microphone is enabled (**RADIO MIC – SELECTED LED=ON**), ensure that there is no announcement in progress from a Radio Microphone.

This is indicated by the **RADIO MIC – ACTIVE LED** on the internal front panel as follows:

OFF: No announcement in progress.

ON: Announcement in progress.

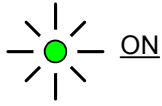
**4.** If the **BUSY LED** is illuminated, it indicates that an announcement is already in progress on the associated platform zone. However if the announcement source is of lower priority than the SAP02, you may override this announcement.

**5.** At a suitable time initiate the announcement by pressing and holding the PTT button integral with the Fist Microphone.

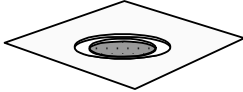
**6.** If programmed at the Router, the pre-announcement chime will sound.



**SPEAK NOW**



**LOUDSPEAKER**



ANNOUNCEMENT  
IN PROGRESS

**PRESS TO TALK BUTTON**



RELEASE TO FINISH

7. When the chime has finished (if programmed at the Router), the **SPEAK NOW** LED will illuminate. If no chime has been programmed then the **SPEAK NOW** LED will illuminate immediately.

Once the **SPEAK NOW** LED has illuminated you can make the announcement.

#### **Recommendations for Optimum Results**

- a. Speak slowly and clearly while observing the correct positioning of the microphone in relation to your mouth.
- b. Speak at a normal conversational level with the mouth directly adjacent to the Fist Microphone capsule.

8. When finished release the PTT button. Once the PTT button is released the system automatically resets ready for the next announcement.

If no further announcements are to be made, then replace the Fist Microphone onto its retaining clip, and close and lock the SAP02 cabinet door.

## 2.2.2 Live Announcements via a Radio Microphone



- Announcements via a Radio Microphone is only possible when a RMR02 Radio Microphone Receiver is fitted.
- Announcements via a Radio Microphone will be overridden by an announcement from the front panel Fist Microphone when used concurrently.

Different types of Radio Microphone Transmitters are compatible with the RMR02 Radio Microphone Receiver, however the following procedure can generally be used. For detailed information, please refer to the appropriate user documentation for your Radio Microphone Transmitter [Table 11].

- 1.** In order to be able to make announcements from a Radio Microphone, it must be enabled through the **RADIO MIC – ON/OFF** button on the SAP02 internal front panel.

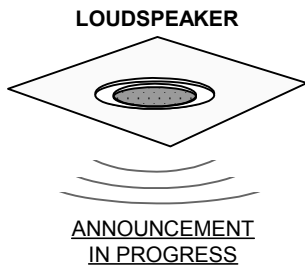


The **RADIO MIC – SELECTED** LED on the SAP02 internal front panel indicates the current selection:

OFF: Radio Microphone disabled.

ON: Radio Microphone enabled.

Note that to access the internal front panel, the cabinet door must be unlocked and opened using the associated KABA key.



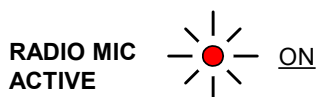
- 2.** If in the audio zone into which the broadcast will be made, then listen for any existing broadcast, and, if appropriate, wait for this to end before starting your broadcast.

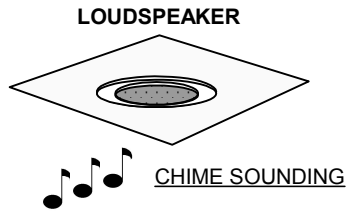
**PRESS TO TALK BUTTON**



- 3.** To initiate an announcement, press and hold the PTT (Press To Talk) button on the Radio Microphone Transmitter.

The **RADIO MIC – ACTIVE** LED on the SAP02 internal front panel illuminates. This will be visible only if the user is at the SAP02.

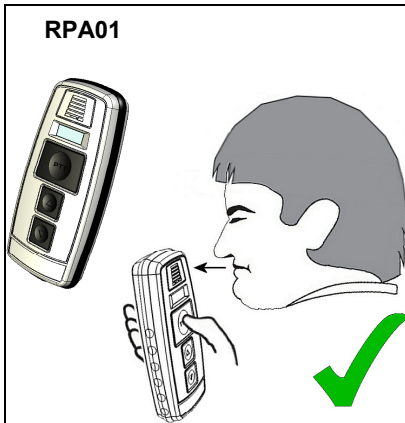




- 4.** Assuming a higher priority source is not already broadcasting to the associated platform zone, a chime will sound (if configured at the Router).

Note that the Radio Microphones do not themselves have a SPEAK NOW indication, therefore it is useful to configure a chime, as feedback to the operator that a route has been made and to give a clue for the start of the announcement.

After the chime has ended you can make your broadcast.



- 5.** Talk in a normal speaking voice, observing the correct positioning of your specific microphone.

**Recommendations for Optimum Results:**

- Announcements underneath a speaker should be avoided due to the possibility of feedback.
- Face towards the nearest receiver antenna.
- Speak slowly and clearly observing the correct positioning of the microphone in relation to your mouth.
- Observe the recommendations for your specific Radio Microphone as described on its own user documentation.



**PRESS TO TALK BUTTON**

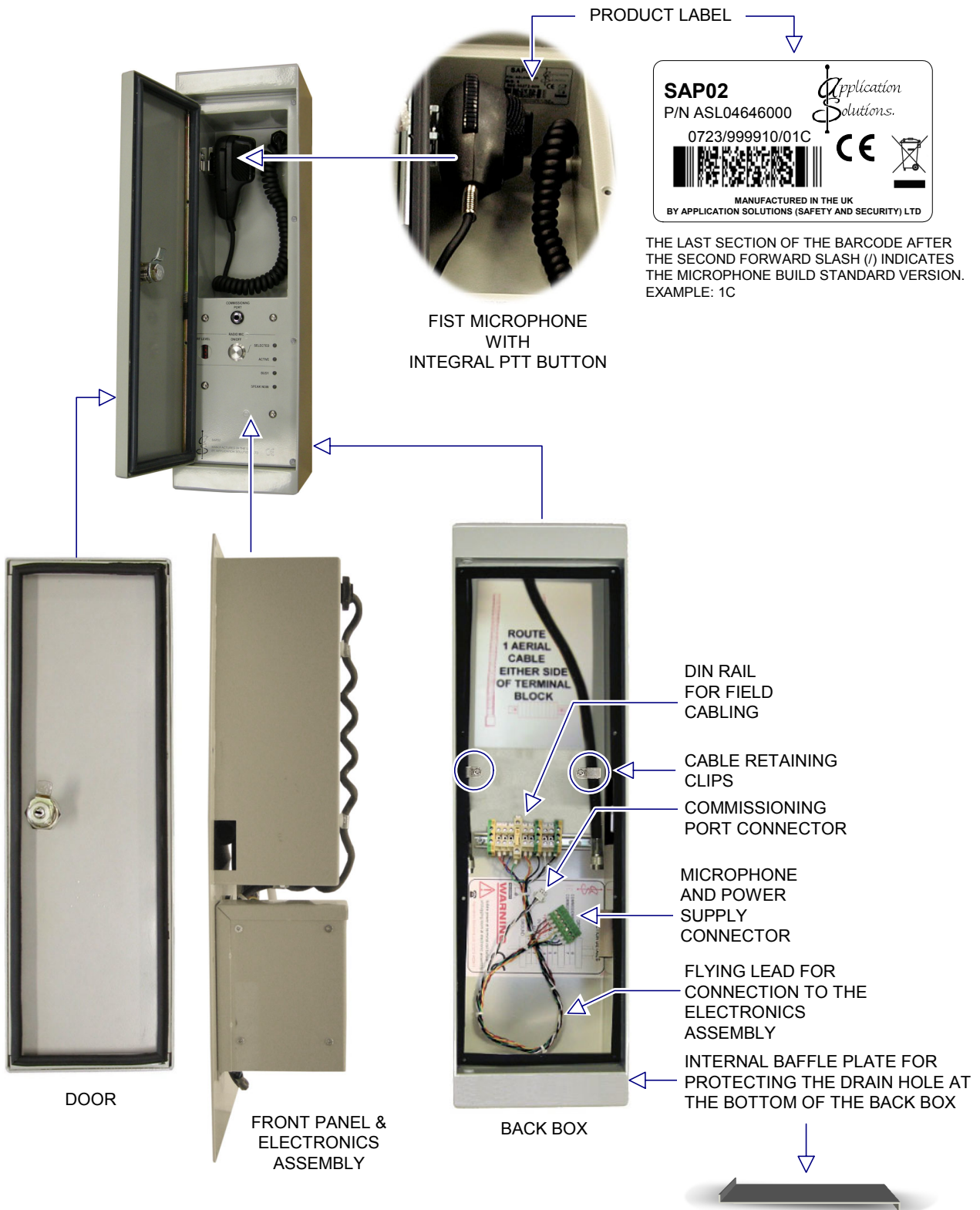


- 6.** When finished, release the PTT button. As soon as the PTT is released the system automatically resets, and the **RADIO MIC – ACTIVE LED** on the SAP02 internal front panel is turned off, indicating that the system is ready for the next announcement.

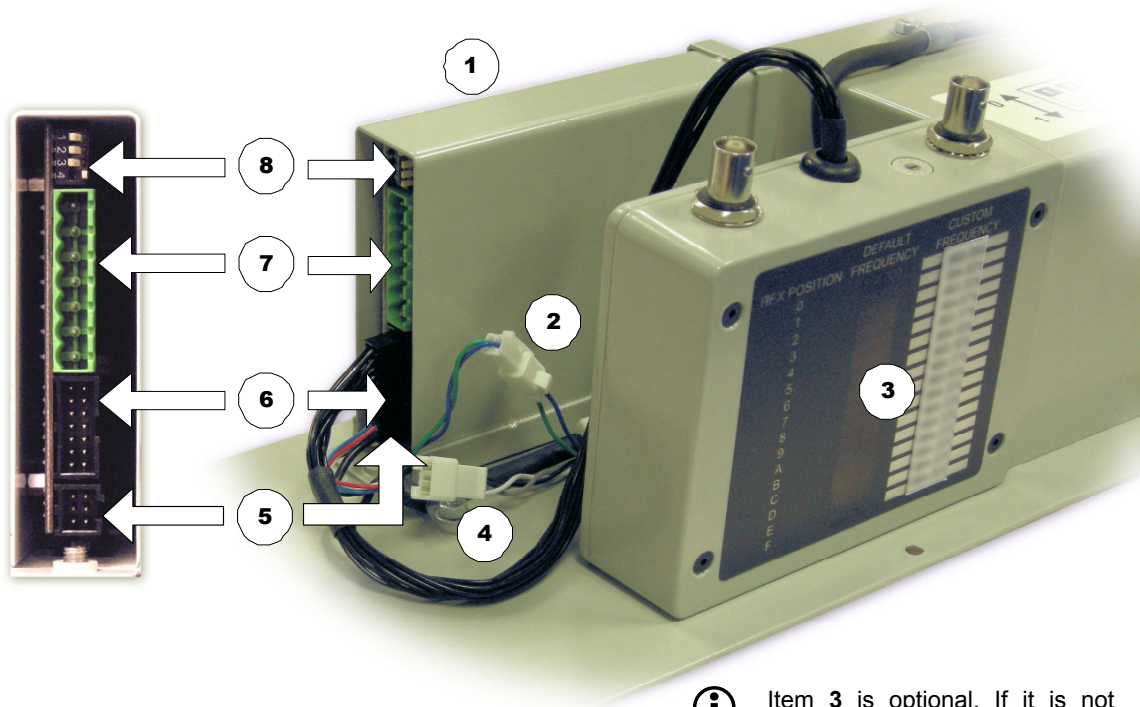
### 3 Installation

#### 3.1 SAP02 Components

Figure 2 SAP02 Main Components

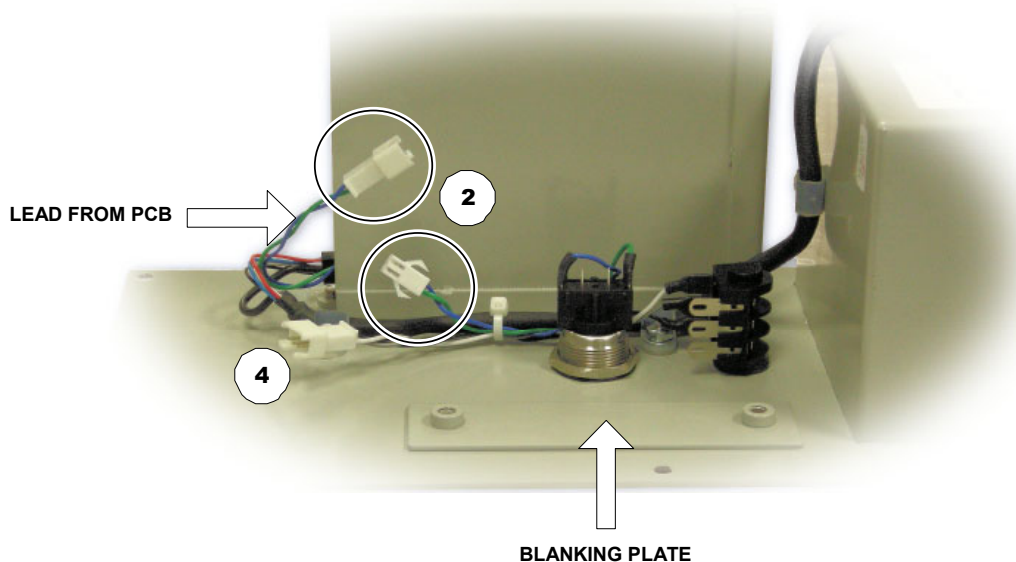


**Figure 3** SAP02 Front Panel/Electronics Assembly Connection with Radio Microphone Receiver



**i** Item 3 is optional. If it is not present a blanking plate will be fitted to the front panel in its place, and the lead from the SAP02 PCB (2) will be disconnected from the front panel as shown in [Figure 4](#).

**Figure 4** SAP02 Front Panel/Electronics Assembly Connection without Radio Microphone Receiver



- 1** Microphone PCB enclosed in a protective metal box.
- 2** Lead connecting the microphone PCB to the front panel.
- 3** RMR02 Radio Microphone Receiver.
- 4** Commissioning port connector.  
For connection of the flying lead to the back box DIN rail terminals.
- 5** Connector for connection of the Fist Microphone.
- 6** Connector for connection of a RMR02 Radio Microphone Receiver ( **3** ) to the microphone PCB.  
Used only when a RMR02 Radio Microphone Receiver is fitted.
- 7** Microphone and power supply connector.  
For connection of the flying lead to the back box DIN rail terminals.
- 8** 4-way DIP switch for:
  - Adjustment of the Radio Microphone Receiver squelch level.
  - Configuration of pilot tone detection.
  - Configuration via Router (future use).Used only when a RMR02 Radio Microphone Receiver is fitted.



The SAP02's preferred Line Replaceable Unit (LRU) is the whole front panel and the electronics assembly, including the Radio Microphone Receiver when it is fitted.



## 3.2 Installation Requirements

### 3.2.1 Equipment and Tool Requirements

- The SAP02 unit.
- Suitable cable glands/conduit fixings, preferably with cable screen earthing facilities.
- A stripping tool and cable connectors for the preparation of the co-axial Radio Microphone antenna cables.  
Suggested tools: RS 453-870 for RG58 cable, or Gigatronix GCT-0519 for H1000/RG213 cable.
- A small flat bladed screwdriver.
- A 2.5 mm Allen key or driver.
- Suitable wire cutters, strippers and cable ferrules.
- A drill with bits and hole cutters suitable for cutting 2 mm mild steel, for the back box mounting holes and cable glands.
- Suitable fixings and tools for wall mounting.
- Sealant.

### 3.2.2 Cabling Requirements

#### 3.2.2.1 Cabling to a VAR Router

Signals	Cable Description	Suggested Type
Audio	1 x 2 core, twisted, screened	Overall foil screened 4 pair.
Microphone Data (Mic Data)	1 x 2 core, twisted, screened	Low Smoke and Fume (LSF).
Commissioning Data (Optional)	1 x 2 core, twisted, screened	CAT 5 STP can be used up to 500 m without adverse cross-talk. Fire Rated equivalent can be used.
Power	1 x 2 core, screened, 1 mm	Overall foil screened 2 pair. Low Smoke and Fume (LSF). Fire Rated equivalent can be used.
	For cable-run limitations and alternative cable types, please refer to Application Solutions (Safety and Security) Limited for advice.	
	For EMC compliance: <ul style="list-style-type: none"> <li>• Screened cables must be used where specified.</li> <li>• All field cable screens must be connected to the back box.</li> <li>• All screen tails must be &lt;3 cm.</li> </ul>	

#### 3.2.2.2 Cabling to an Intellevac DAU or ACU

Please refer to the Intellevac System Installation Guides [[Table 11-12, 13](#)].

### 3.2.2.3 Antenna Cabling

Antenna cabling is required when a Radio Microphone Receiver is fitted to the SAP02.



Please note that the following coaxial antenna cables have been chosen for their compact size and ease of assembly. Failure to use these parts may make final assembly difficult or impossible.



The antenna cabling must not be kinked or folded at any part of the run, including inside the SAP02 back box, or it will impair or prevent reception of the microphone signal.



Section “[14 Appendix – Antenna Types](#)” provides information on antenna choices and mounting.

The following coaxial antenna cables are recommended:

- RG58 type (recommended for short runs up to 10 m):
  - Required connectors: Two suitable low-profile right-angle BNC crimp plugs  
Type: Telegartner J01000A1257 or RS 112-1883
  - Required tools: Crimp tool for these plugs, e.g. RS 453-870
- H1000 type (recommended for longer runs up to 30 m):
  - Required connectors: Two TNC crimp plugs  
Type: Gigatronix TN15-0519-C06
  - Required tools: Gigatronix GCT-0519 crimp tool for the TNC plugs
  - Required accessories: A pair of ASL RG58 adaptor leads



- 1) The pair of RG58 adaptor leads is NOT supplied either with the SAP02 or the Radio Microphone Receiver, and need to be ordered separately from Application Solutions (Safety and Security) Limited quoting RADIO-MIC-LEADS.

The leads are specified as follows:

- Long lead length: approx. 270 mm
- Short lead length: approx. 190 mm
- Termination to the Radio Microphone Receiver: right-angle BNC crimp plug
- Termination to the RG213 or H1000 antenna cabling: straight TNC jack
- Cable: RG58



- 2) RG213 type may also be used for longer runs but generally has poorer performance than H1000 type.



### 3.3 Recommended Installation Procedure



Please read and observe the instructions and guidelines in Section “11 Safety and Precautions” (page 62) prior to installation. Failure to follow these instructions and guidelines may cause personal injury and/or damage to the equipment.



The SAP02 Build Standard Version is indicated on the label located on the top part of the first microphone enclosure as shown in Figure 2. This should be quoted in all enquiries regarding the unit.


1. Open the SAP02 door using the associated KABA key.
2. Remove the SAP02 door by compressing the hinge pin; see Figure 5.  
This can be done by inserting a small screwdriver into the holes in the pin.  
Take care to ensure that the hinge pin's plastic bushes in the back box are not loosened.

**Figure 5** SAP02 Door and Front Panel Fixing



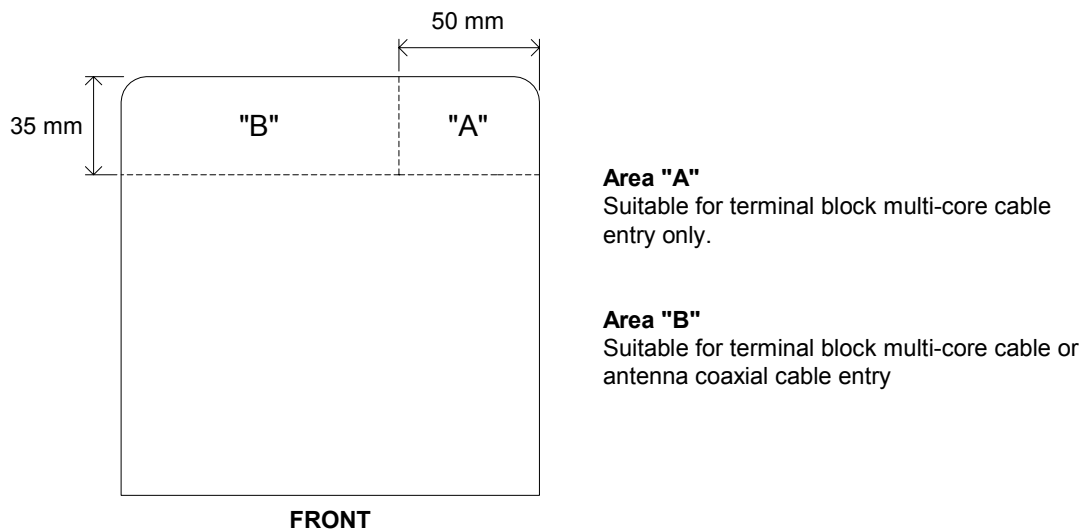
3. The SAP02 front panel/electronics assembly is normally supplied disconnected from the back box in a separate box. When the SAP02 electronics/front panel is supplied fitted to the back box it must be removed from the back box as follows:
  - a. Remove the SAP02 front panel assembly by removing the 8 off M4 Allen screws; see Figure 5.
  - b. Disconnect the SAP02 front panel assembly by unplugging the flying lead from the multi-way connectors on the electronics assembly.
  - c. Store the front panel assembly, door and fixing screws safely.

4. Drill holes in the back box for cable gland or conduit entry and wall mounting, according to the particular installation conditions.
  - a. Wall mounting holes: refer to [Figure 30](#) for SAP02 mechanical dimensions.
  - b. Cable gland or conduit entry holes if the Radio Microphone Receiver is installed: observe the following recommendations.

 • The SAP02 is primarily designed for top entry of cables. Please refer to Application Solutions (Safety and Security) Limited if a different cable entry positioning is required.

• It is vital that the cable glands or conduit are positioned within the area shown in the [Figure 6](#). Failure to do so will cause difficulty when fitting the front panel/electronics assembly.

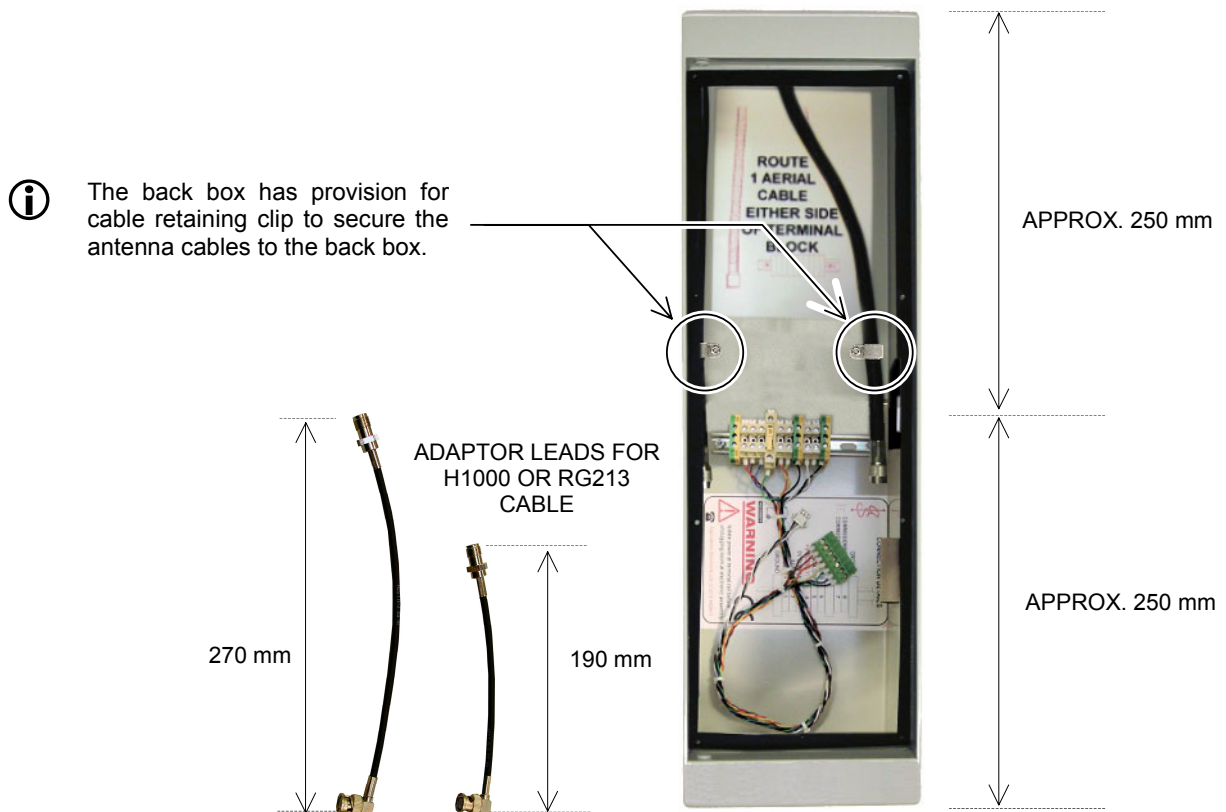
**Figure 6** Positioning of Cable Glands or Conduits on the Top (outside view of top from above)



5. Deburr all newly drilled holes in order to prevent any damage to the cabling.
6. Mount the SAP02 on the wall.
7. Ensure that the power supply from the central equipment rack, or wall mount Intellevac DAU or ACU is turned off.
8. Feed the installation cables into the unit through the cable glands or conduit.

- 9.** If a RMR02 Radio Microphone Receiver is fitted, feed the antenna cables through the cable glands or conduits, cut to length, and terminate according to the cable type being used; see [Figure 7](#):
- a.** RG58 type:  
Terminate to the Receiver unit using low-profile Telegartner right-angle BNC plugs or equivalent.
  - b.** H1000 (or RG213) type:  
Terminate using Gigatronix TNC plugs or equivalent, and then connect to the Receiver unit using ASL long and short adaptor leads.
- Note that the pair of adaptor leads is not supplied either with the SAP02 or the Radio Microphone Receiver and need to be ordered separately from ASL quoting RADIO-MIC-LEADS.

**Figure 7** Recommended Routing of Antenna Cables



1. Ensure that the antenna cables are routed either side of the terminal block as shown. Failure to do so will cause difficulty when fitting the front panel/electronics assembly.
2. The antenna cabling must not be kinked or folded at any part of the run, including inside the SAP02 back box, or it will impair or prevent reception of the microphone signal.


- 10.** Seal the mounting holes and cable entry points.



Ensure that mounting holes and cable entry points are adequately sealed to preserve the unit's IP rating.

**11.** Connect the field cabling to the DIN rail.

Refer to Section “[4.1 DIN Rail Terminal Allocation](#)” (page 25).

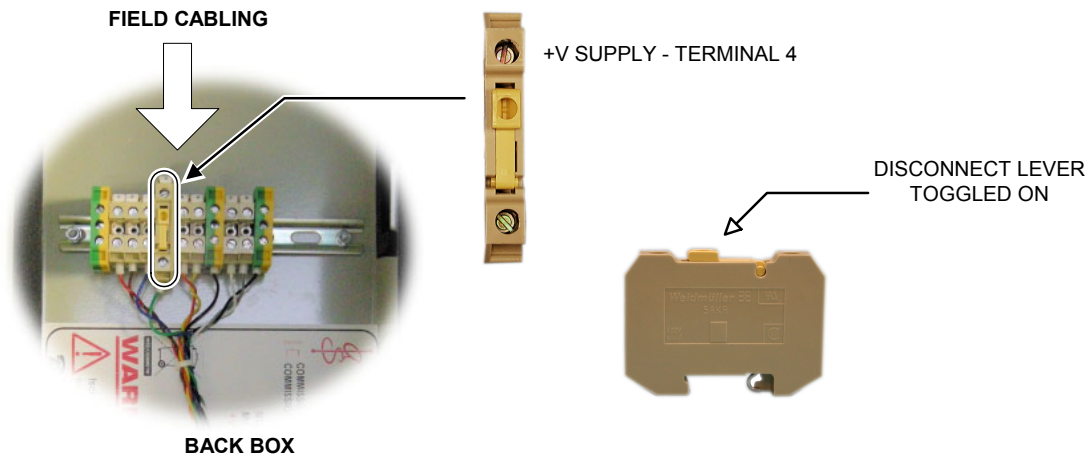
 For EMC compliance ensure that:

- All field cabling screens (apart from Radio Microphone antenna cables) are connected to the back box. This should be via the DIN rail GROUND terminal.
- All screen tails are <3 cm.

**12.** Ensure all swarf is removed from the enclosure.

**13.** Ensure that the DIN rail power supply disconnect lever is toggled on as shown in [Figure 8](#).

**Figure 8** Power Supply Terminal



**14.** If a RMR02 Radio Microphone Receiver is fitted, adjust the Receiver as follows; see [Figure 9](#):

- a.** Select the correct RF frequency via internal rotary switch.

Refer to Section “[5.1 Radio Microphone Receiver Frequency Selection](#)” (page 31) for frequency configuration.

- b.** Disable (or enable) the pilot tone detection as required by setting DIP switch 1 on the SAP02 PCB.

Refer to Section “[5.2 Radio Microphone Receiver Pilot Tone Detection Set-up](#)” (page 32) for pilot tone detection set-up.



The Radio Microphone Receiver is supplied with pilot tone detection **enabled** as standard for secure use with the ASL RPA01 Radio Microphone Transmitters.

This configuration will block or mute announcements from Radio Microphone Transmitters that do not provide the required pilot tone (non-tone locked transmitters) as follows:

- Radio Microphone Receiver modules of Build Standard (BS) 2B or later:

This will completely block announcements from Radio Microphone Transmitters that do not provide the required pilot tone, such as the ASL RADIO-MIC-TX.

- Earlier Build Standards of Radio Microphone Receiver module:

The audio from non-tone locked transmitters is muted but they can still make chimes (if programmed at the Router) and silent routes. These silent routes can be blocked as detailed in ASL Technical Note 39; please refer to Application Solutions (Safety and Security) Limited for further details.

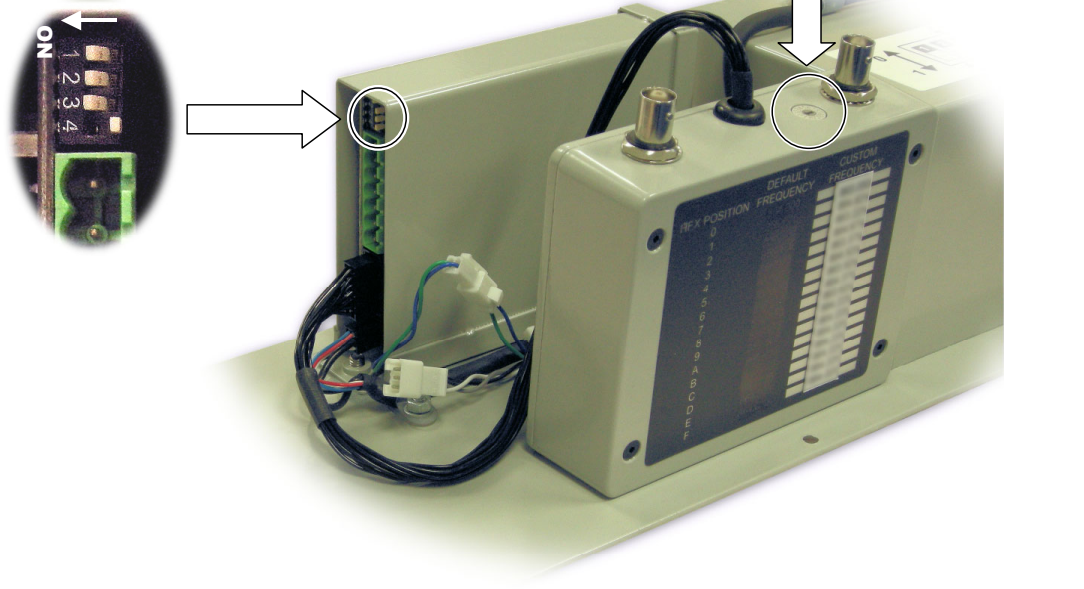
- c.** Select the squelch level via DIP switches 2 to 4 on the SAP02 PCB as required.

Refer to Section “[5.3 Radio Microphone Receiver Squelch Level Selection](#)” (page 33) for squelch level set-up.

**Figure 9** Radio Microphone Receiver – Controls

**DIP SWITCH:**

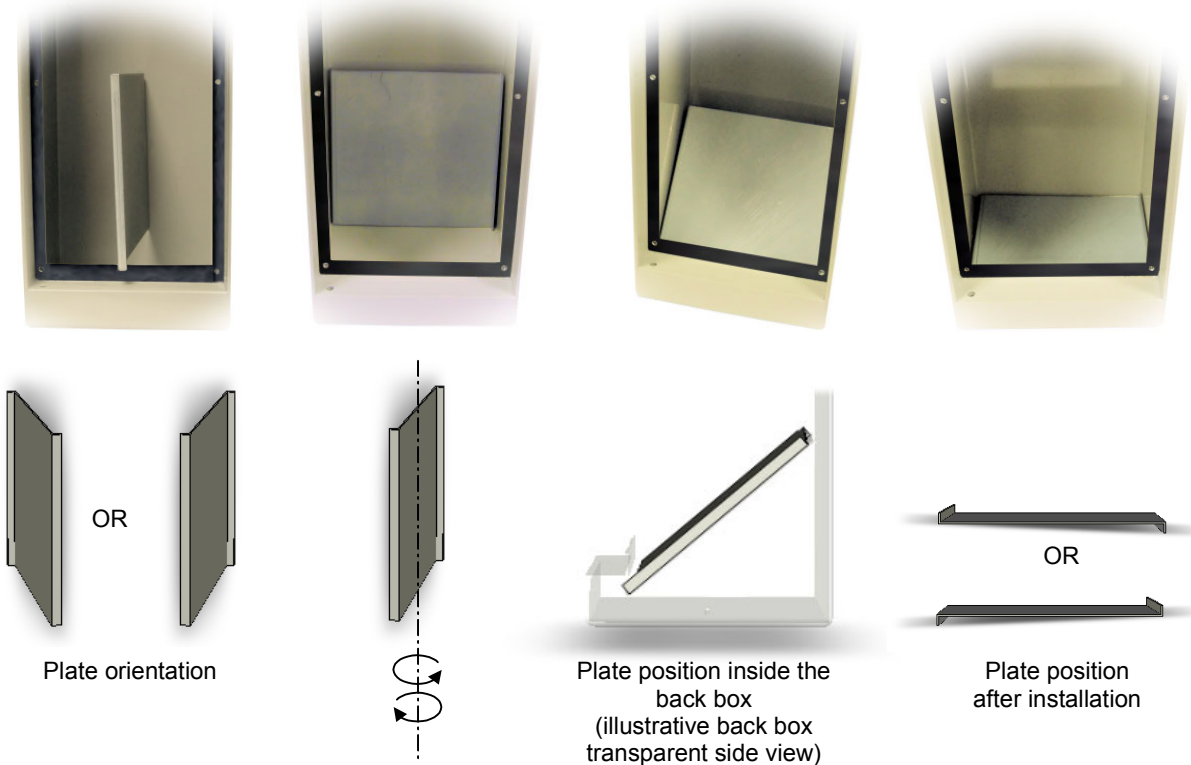
- SQUELCH LEVEL SELECTION
- PILOT TONE DETECTION CONFIGURATION
- FUTURE USE: CONFIGURATION VIA ROUTER



**15.** Fit the baffle plate into the back box; see [Figure 10](#).

**Figure 10** SAP02 Baffle Plate Installation


- 1.** Insert the plate into the back box observing plate orientation.
- 2.** Rotate the plate.
- 3.** Fit the plate underneath the back box front edge at the bottom.
- 4.** Drop the plate. It will easily fit to the back box bottom.

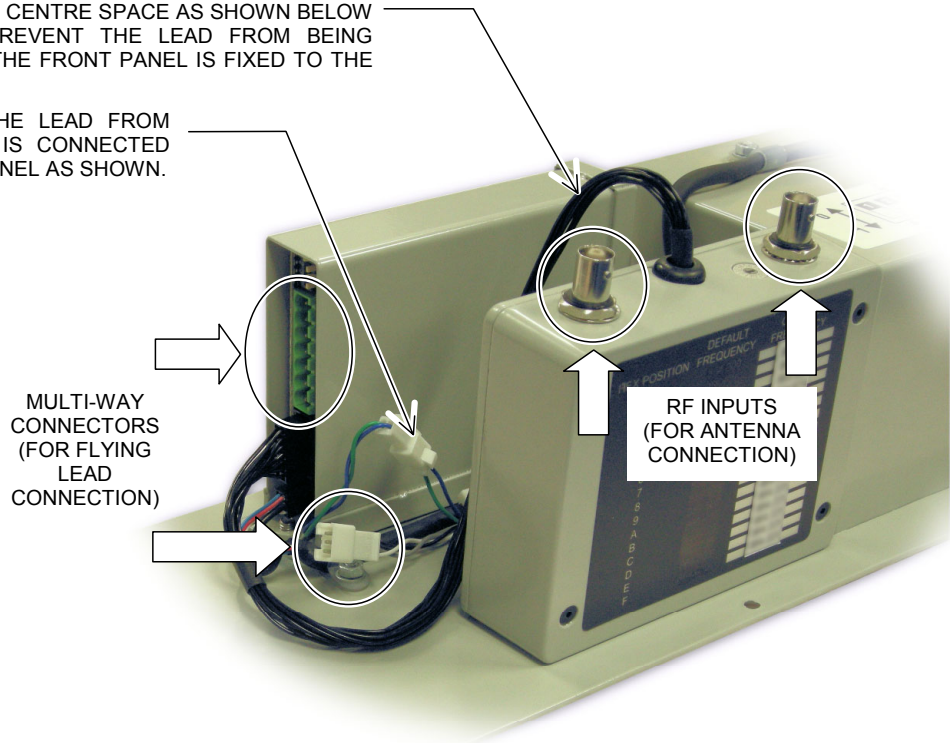


- 16.** Reconnect the front panel assembly by plugging the flying leads to the multi-way connectors on the electronics assembly; see [Figure 11](#) or [Figure 12](#).

**a.** RMR02 Radio Microphone Receiver fitted:


**Figure 11** SAP02 Front Panel/Electronics Assembly Connection with RMR02

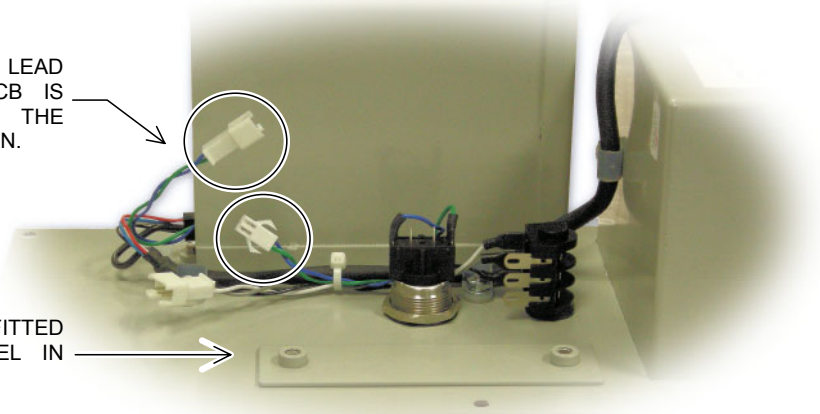
-  1. POSITION THE LEAD CONNECTING THE RMR02 TO THE SAP02 PCB IN CENTRE SPACE AS SHOWN BELOW IN ORDER TO PREVENT THE LEAD FROM BEING TRAPPED WHEN THE FRONT PANEL IS FIXED TO THE BACK BOX.
2. ENSURE THAT THE LEAD FROM THE SAP02 PCB IS CONNECTED TO THE FRONT PANEL AS SHOWN.



**b.** RMR02 Radio Microphone Receiver not fitted:

**Figure 12** SAP02 Front Panel/Electronics Assembly Connection without RMR02

-  1. ENSURE THAT THE LEAD FROM THE SAP02 PCB IS DISCONNECTED FROM THE FRONT PANEL AS SHOWN.
2. A BLANKING PLATE IS FITTED TO THE FRONT PANEL IN PLACE OF THE RMR02.



- 17.** If a RMR02 Radio Microphone Receiver is fitted, connect the antenna cables to the Receiver RF inputs; see [Figure 11](#).
- 18.** Fix the front panel assembly back in place using the 8 off M4 Allen screws; see [Figure 5](#) (page 17).

- 19.** Re-fit the door; see [Figure 5](#) (page [17](#)).



Make sure that BOTH plastic bushes are tightly fitted to the door fixing holes in order to preserve the unit's IP rating.

- 20.** Power the unit on from the central equipment rack, or wall mount Intellevac DAU or ACU.
- 21.** Commission the microphone as described in Section "[6 Commissioning the SAP02](#)" (page [34](#)).
- 22.** Close and lock the door using the KABA key.



## 4 Connections

### 4.1 DIN Rail Terminal Allocation

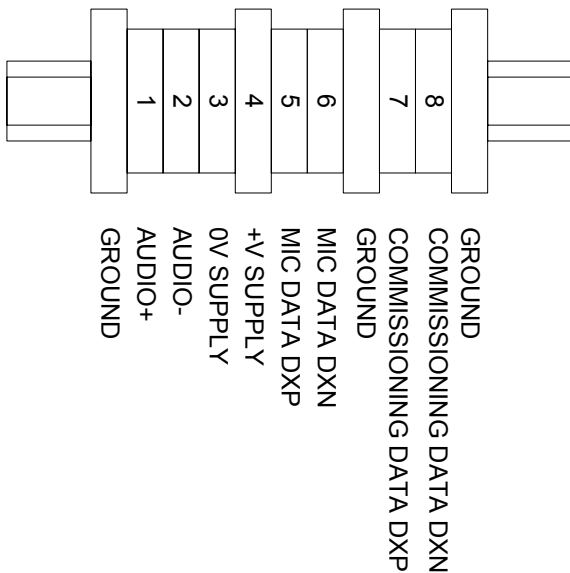


Original SAP02 back boxes differ from the earlier SAP01 back boxes in that the DIN rail terminal allocation for the site wiring connections are different. Beware of this if working with both SAP02 and SAP01 back boxes. There is also a baffle plate and drain hole at the bottom of the original SAP02 back boxes which were not present in the SAP01 back boxes.

In order to identify the unit observe the terminal allocation label internal to the back box.

#### 4.1.1 Original SAP02 Back Box

**Table 1** SAP02 – Terminal Allocation (Fitted into SAP02 Original Back Box)



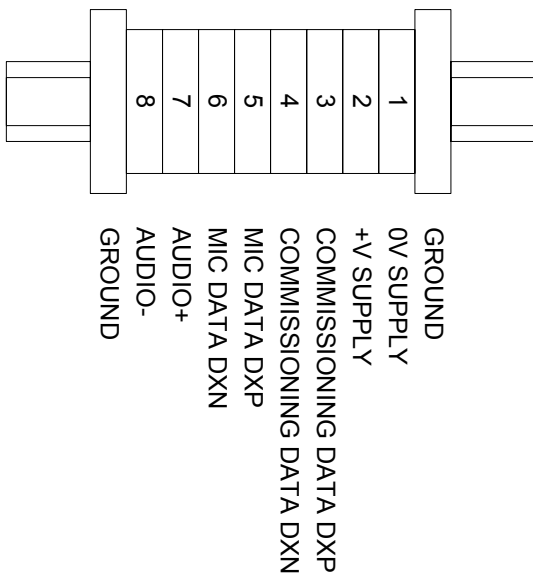
Signal	Description
GROUND	Connection for cable screen (bonded to DIN rail)
AUDIO+	+VE Balanced Audio Output Level: 0 dBu (nominal) Output impedance: 66 $\Omega$
AUDIO-	-VE As above
0V SUPPLY	0V supply from system
+V SUPPLY	+V supply (18 V - 40 V)
MIC DATA DXP	Data+ Microphone control data EIA RS485 19200 baud
MIC DATA DXN	Data- As above
GROUND	Connection for cable screen (bonded to DIN rail)
COMMISSIONING DATA DXP	Data+ Optional commissioning data port EIA RS485 9600 baud
COMMISSIONING DATA DXN	Data- As above
GROUND	Connection for cable screen (bonded to DIN rail)

### 4.1.2 SAP02 From Panel Fitted into SAP01 Back Box



- This is the earlier SAP01 back box DIN rail terminal allocation, which will be used for any SAP02 front panel and electronics assembly that are fitted as spare replacements into original SAP01 installed back boxes.
- Note that the connections on the flying leads from the SAP02 and SAP01 back boxes to the front panel are unchanged. Therefore a SAP02 front panel and electronics assembly can replace a SAP01 front panel simply by plugging the original SAP01 back box flying leads onto the SAP02 electronics assembly.

**Table 2** SAP02 – Terminal Allocation (Fitted into SAP01 Back Box)



Signal	Description
GROUND	Connection for cable screen (bonded to DIN rail).
0V SUPPLY	0V supply from system
+V SUPPLY	+V supply (18 V - 40 V)
COMMISSIONING DATA DXP	Data+ Optional commissioning data port EIA RS485 9600 baud
COMMISSIONING DATA DXN	Data- As above
MIC DATA DXP	Data+ Microphone control data EIA RS485 19200 baud
MIC DATA DXN	Data- As above
AUDIO+	+VE Balanced Audio Output Level: 0 dBu (nominal) Output impedance: 66 Ω
AUDIO-	-VE As above
GROUND	Connection for cable screen (bonded to DIN rail).

## 4.2 Commissioning Port Connection



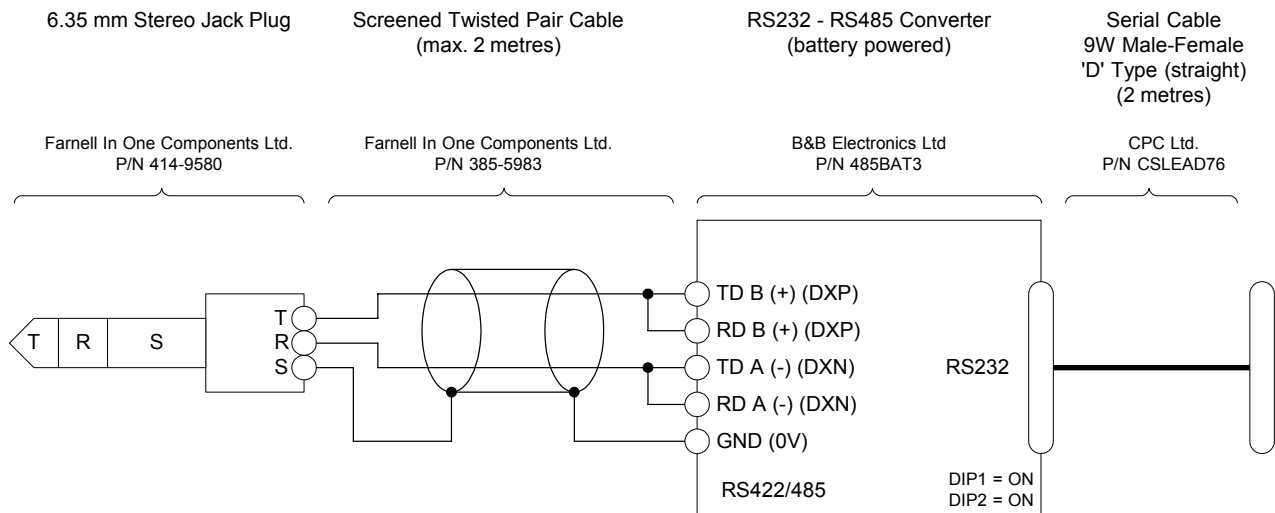
PIN	Signal	Description
T (Tip)	Commissioning Data DXP	Data+ EIA RS485 9600 baud
R (Ring)	Commissioning Data DXN	Data- EIA RS485 9600 baud
S (Sleeve)	GND	0V Reference

- 6.35 mm TRS Jack.
- RS485-RS232 conversion is required for connection to a host PC.

### Commissioning Port Cable

The following drawing describes the connections between the SAP02 Commissioning Port and the host PC, with suggested suppliers' part numbers. This adaptor cable assembly is available from Application Solutions (Safety and Security) Limited by quoting CBL01.

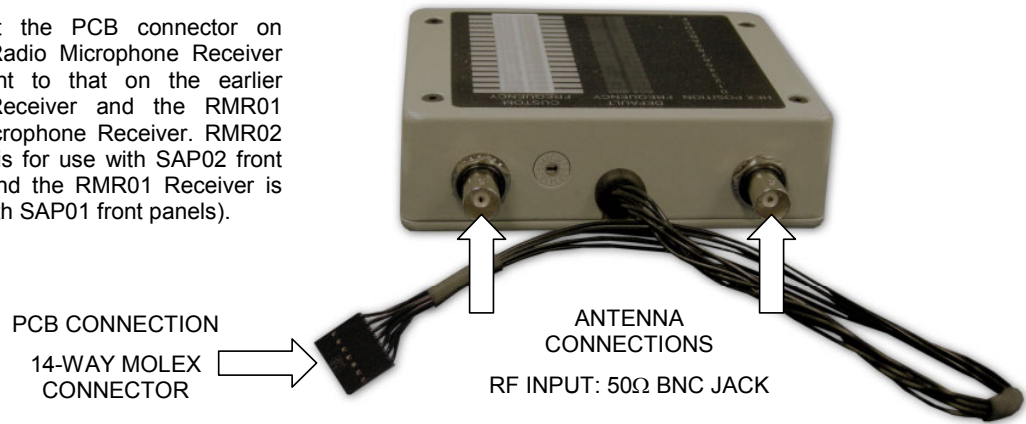
**Figure 13** Commissioning Port Cable



### 4.3 Radio Microphone Receiver Connections

**Figure 14** RMR02 Radio Microphone Receiver

**i** Note that the PCB connector on RMR02 Radio Microphone Receiver is different to that on the earlier SAP01 Receiver and the RMR01 Radio Microphone Receiver. RMR02 Receiver is for use with SAP02 front panels (and the RMR01 Receiver is for use with SAP01 front panels).



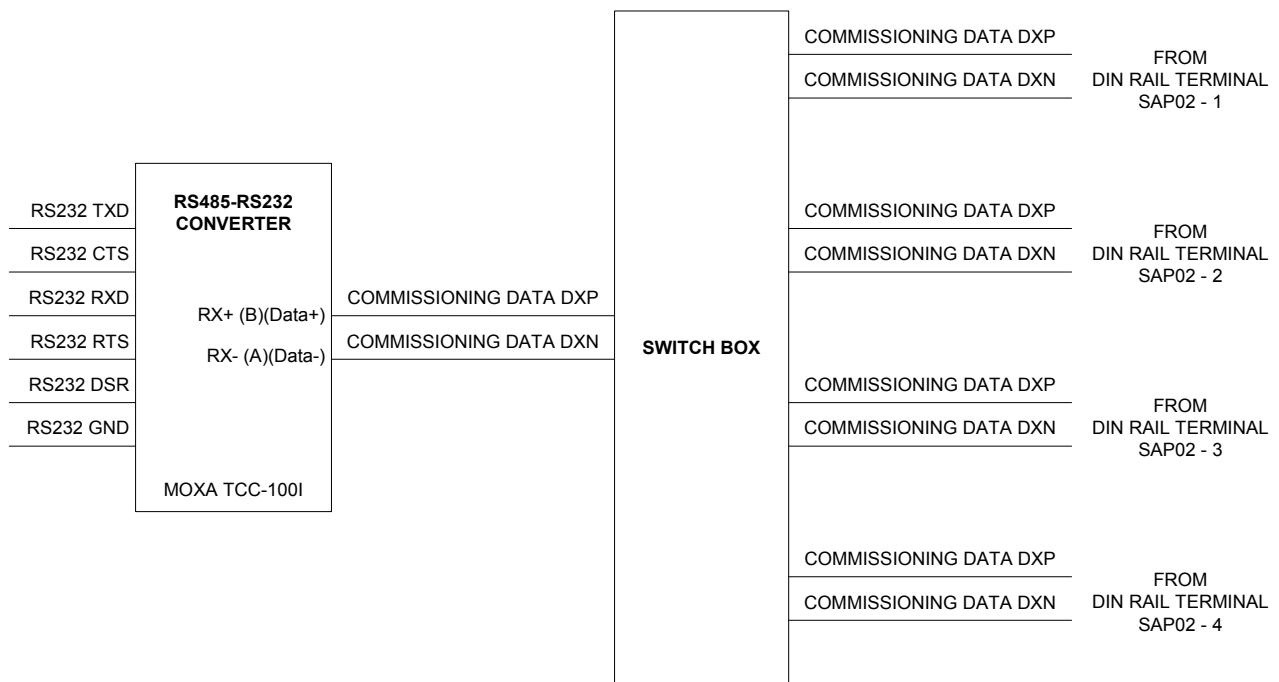
### 4.4 Connection to a VAR Router in an Equipment Rack

Figure 15 shows an example of connection of the SAP02 commissioning port to the VAR Router RS232 port via appropriate RS485 conversion. The switch box enables up to four SAP02 units to be connected to the VAR Router RS232 port.

Figure 16 shows an example of DIN rail terminal layout and connection within the equipment rack where the VAR Router is installed. Note that the actual DIN rail and terminal position in the rack depends on the rack specific design, cable entry direction, etc.

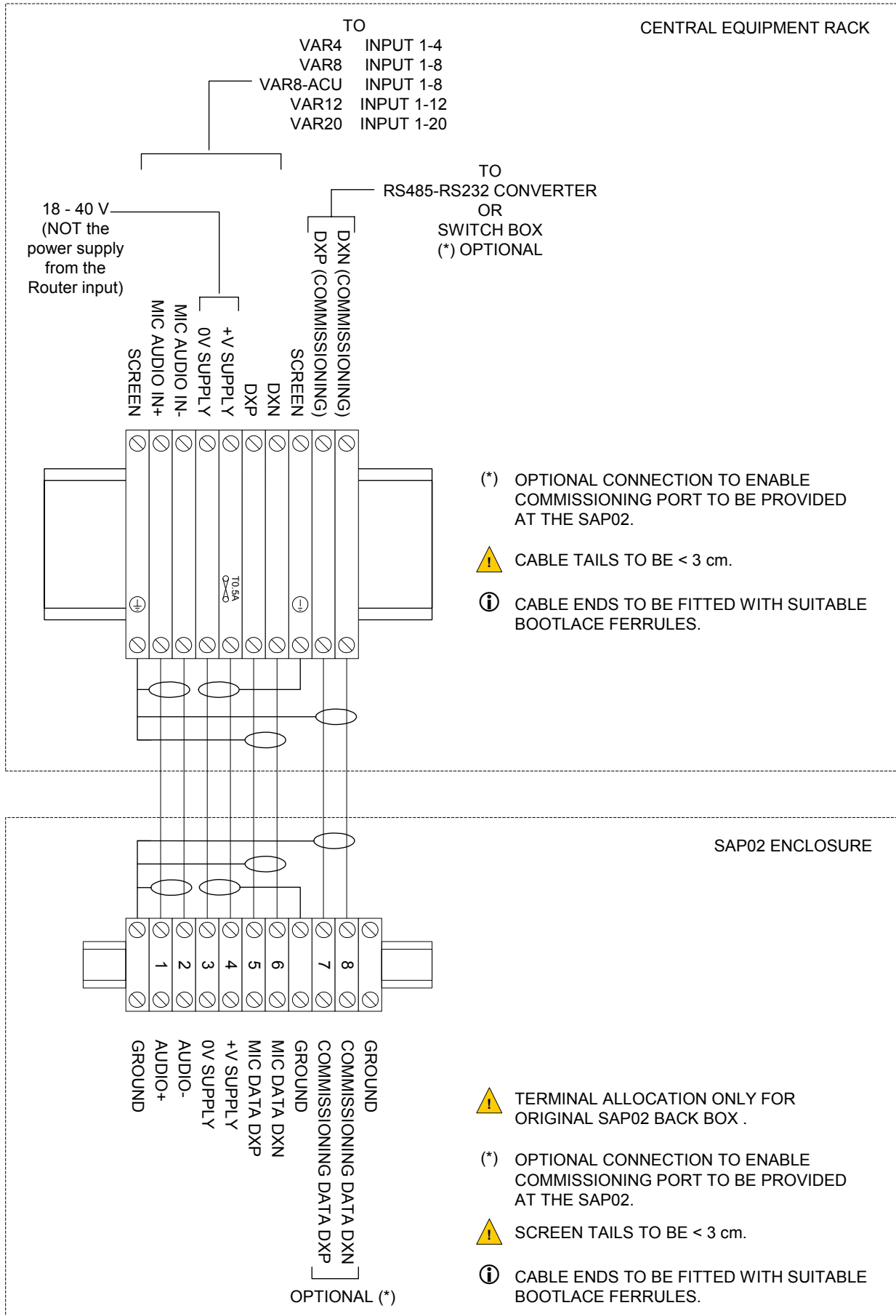
Refer to Section “3.2.2.1 Cabling to a VAR Router” for recommended cabling.

**Figure 15** Commissioning Port Connection to VAR Router (Example)



**i** SWITCH BOX IS USED WHEN MULTIPLE SAP02 UNITS ARE CONNECTED TO THE VAR ROUTER

Figure 16 Connection to the VAR Router (Example)

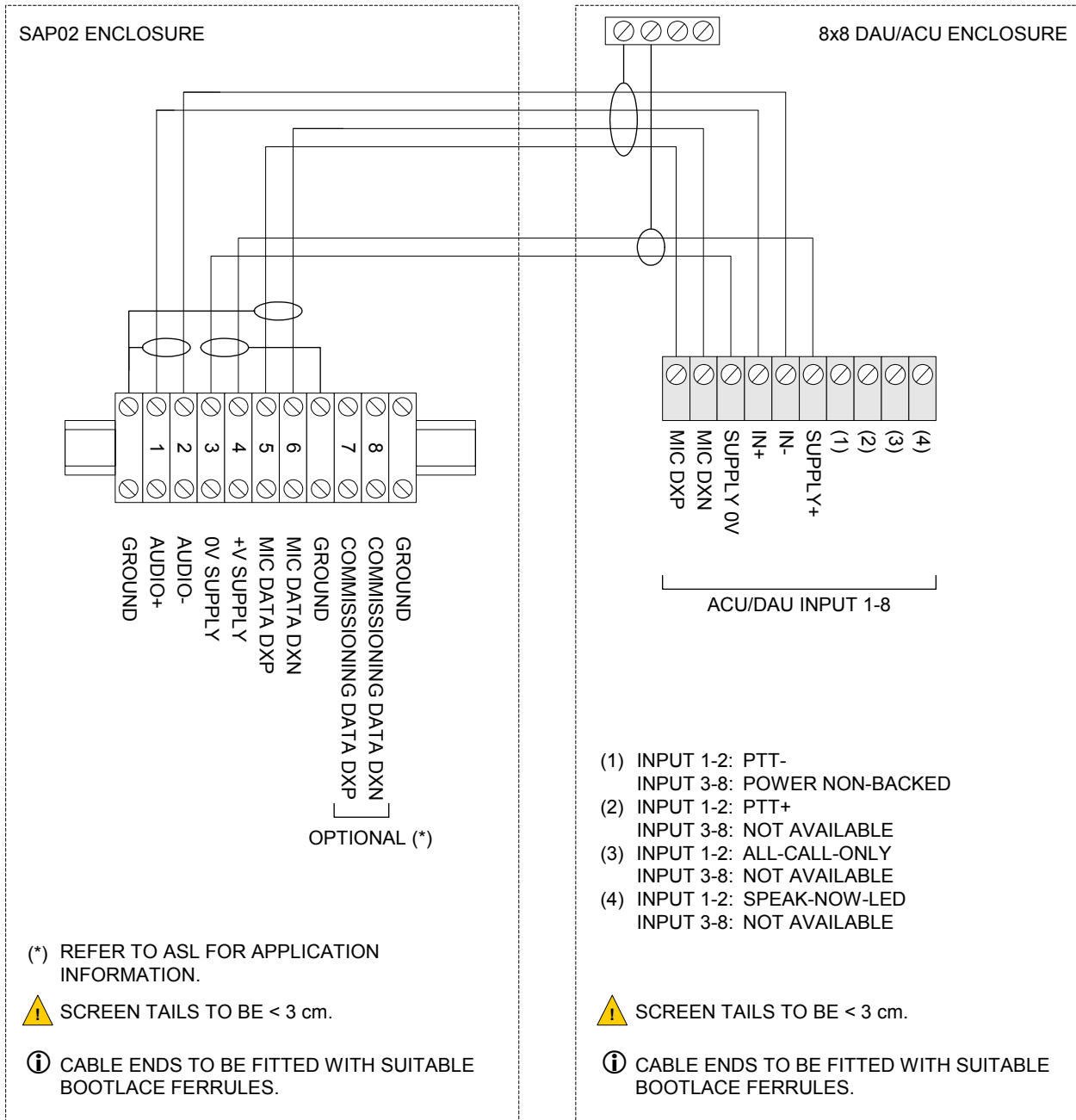


## 4.5 Connection to a Wall-Mount Intellevac DAU or ACU

The following drawing shows an example of connection to an Intellevac DAU or ACU.

Please refer to the Intellevac System Installation Guides [Table 11-12, 13] for recommended cabling.

**Figure 17** Connection to the Intellevac ACU or DAU (Example)



## 5 Radio Microphone Receiver Settings

### 5.1 Radio Microphone Receiver Frequency Selection

The Receiver frequency is selected using the rotary switch; with the future option of setting it by the Router configuration by positioning the DIP switch 2 as described in [Table 4](#) and [Table 5](#).

The switch is located on the upper face of the Radio Microphone Receiver module inside the SAP.

**Table 3** Radio Microphone Receiver Frequency Selection

Frequency Selection Switch Position	Corresponding Radio Microphone Transmitter Channel Number	
	0	1
	1	2
	2	3
	3	4
	4	5
	5	6
	6	7
	7	8
	8	9
	9	10
	A to F	10

**i** Frequencies in the Channel 70 licence free band. Available from Application Solutions (Safety and Security) Limited on request.

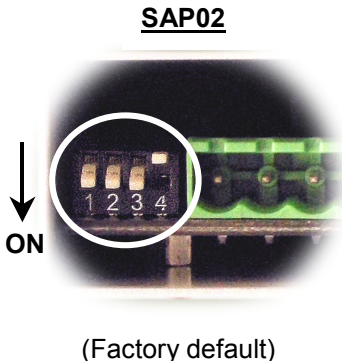
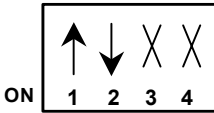
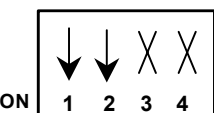
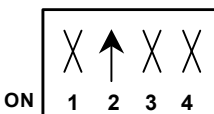
## 5.2 Radio Microphone Receiver Pilot Tone Detection Set-up

The Receiver is supplied with pilot tone detection enabled as standard. This means that announcements from Radio Microphone Transmitters that do not provide the required pilot tone will be blocked. The pilot tone detection can be disabled in order to allow announcements from non-tone locked transmitters, and the squelch level can be adjusted in order to minimise the interference of in-band signals although this should not be necessary with the pilot tone detection enabled.

The pilot tone detection is enabled or disabled by DIP switch 1 on the microphone PCB, with the future option of setting it via the Router configuration; see [Table 4](#).

The squelch level is adjusted as described in Section “[5.3 Radio Microphone Receiver Squelch Level Selection](#)” (page 33).

**Table 4** Radio Microphone Receiver Pilot Tone Detection Selection

DIP Switch Positions		Pilot Tone Detection Setting
 <p style="text-align: center;"><b>SAP02</b></p> <p style="text-align: center;">↓ ON</p> <p style="text-align: center;">(Factory default)</p>	 <p>ON</p>	<p>Pilot tone detection <b>disabled</b>.</p> <p>This configuration enables announcements from Radio Microphone Transmitters regardless of whether they provide the pilot tone or not.</p>
	 <p>ON</p> <p>(Factory default)</p>	<p>Pilot tone detection <b>enabled</b>.</p> <p>This is the factory default setting, for secure use with the ASL RPA01 Radio Microphone Transmitters.</p> <ul style="list-style-type: none"> <li>Radio Microphone Receiver modules of Build Standard (BS) 2B or later:                     <p>This will completely block announcements from Radio Microphone Transmitters that do not provide the required pilot tone, such as the ASL RADIO-MIC-TX.</p> </li> <li>Earlier Build Standards of Radio Microphone Receiver module:                     <p>The audio from non-tone locked transmitters is muted but they can still make chimes (if programmed at the Router) and silent routes. These silent routes can be blocked as detailed in ASL Technical Note 39; please refer to Application Solutions (Safety and Security) Limited for further details.</p> </li> </ul>
	 <p>ON</p>	<p>For future use.</p> <p>This switch position will be used to set the pilot tone detection, the squelch level, and the frequency selection to be controlled through the Router configuration.</p>



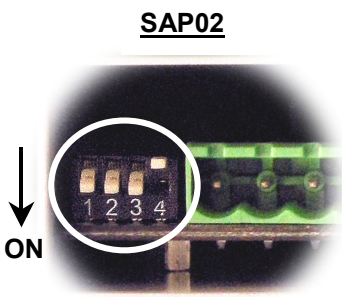
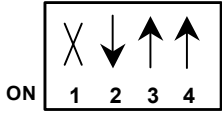

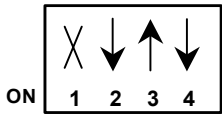
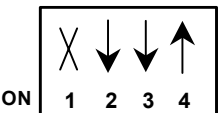
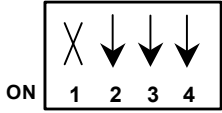

### 5.3 Radio Microphone Receiver Squelch Level Selection

The squelch level switch sets the minimum RF signal strength that can be received. This is set to a level that receives the Radio Microphone transmissions while rejecting external interference.

If there is any interference then the squelch level should be set to the least sensitive setting in order to minimise interference. However if this causes the Radio Microphone transmissions to not be received then it can be made more sensitive in steps until the Radio Microphone transmissions are received correctly.

The squelch level is set by DIP switches 3 and 4; with the future option of setting it by the Router configuration.

**Table 5** Radio Microphone Receiver Squelch Level Selection – SAP02

DIP Switch Positions		Receiver Squelch Level		Received RF Signal Strength
 <p>(Factory default)</p>	 <p>ON</p>	Least sensitive -76 dBm		Strong signal required
	 <p>ON</p>	-86 dBm		Weak signals received
	 <p>ON (Factory default)</p>	-93 dBm		
	 <p>ON</p>	Most sensitive -99 dBm		
	 <p>ON</p>	For future use. This switch position will be used to set the squelch level, the pilot tone detection, and the frequency selection to be controlled through the Router configuration.		

## 6 Commissioning the SAP02

For operational details refer to your system specific documentation:

- VAR4/12/20 Routers: [Table 11-8]
- VAR8 Router: [Table 11-9]
- VAR8-ACU: [Table 11-10]
- Intellevac ACU or DAU: [Table 11-11]



The following details are correct for the current VAR Router, DAU, and ACU software versions at the time of publication:

- VAR Router: CP 4.1.470
- Intellevac DAU: CP V1.5.115
- Intellevac ACU: CP V1.5.114
- VAR8: CP V1.5.115
- VAR8-ACU: CP V1.5.114

If any difficulties are encountered, then refer to Application Solutions (Safety and Security) Limited for advice quoting the software version of your system. The software version is displayed via the **Configuration**→**System**→**Misc**→**Software** menu.

Configure the SAP02 from the Router Configuration Tool, or system front panel as described in the following sections.

### 6.1 Obtaining the Router's Input Number

Check the system design documentation to find the Router audio input number being used for the SAP02.

This input number will be required throughout this commissioning procedure, being referred as *nn*.

### 6.2 Configuring the Microphone Type

Menu: **Configuration**→**System**→**Router**→**Inputs**→**Mic/Line**→<I/P #*nn* – *input name*>

Where *nn* is the Router input number found in Section “6.1 Obtaining the Router's Input Number” (page 34).

Configure the SAP02 as **Single Button Microphone**.

## 6.3 Configuring the PTT Button

### 6.3.1 PTT Button Zone Selection

Menu: **Configuration**→**System**→**Router**→**Inputs**→**Mic/Line**→<I/P #nn – input name>  
 →**Single Button Microphone**→**PTT**→**PTT Zones**

Possible values: 'Not-Selected' or 'Selected'

System default configuration: 'Not-Selected'

Select the output or group of outputs to which audio (microphone) is to be routed when the PTT button is pressed.

Consult the system design documentation for which outputs are used for which audio zones. Note that to simplify this process the Router may have had the output names changed to zone names in the **Configuration**→**System**→**Router**→**Outputs** menu.

### 6.3.2 PTT Button Cough Timeout (only on VAR Router)

Menu: **Configuration**→**System**→**Router**→**Inputs**→**Mic/Line**→<I/P #nn – input name>  
 →**Single Button Microphone**→**PTT**→**Cough**

Possible values: 0 to 50. Multiply by 0.1 to have the time in seconds.

System default configuration: '0'

The cough timeout is the time length the PTT button may be released before the route is closed down. The audio path is muted immediately when the PTT button is released, allowing the operator to cough without it being broadcast. If the PTT button is re-pressed within the coughing time, the announcement will continue as normal. By default it is set to '0' and may be modified up to 5 seconds as required.

## 6.4 Configuring the Microphone Audio Parameters

### 6.4.1 Microphone Input Gain

VAR4/12/20 Menu: **Configuration**→**System**→**Router**→**Inputs**→**Mic/Line**  
 →<I/P #nn – input name>→**Single Button Microphone**→**Audio**→**Gain**→**PreAmp**

DAU/ACU/VAR8/VAR8-ACU Menu: **Configuration**→**System**→**Router**→**Inputs**→**Mic/Line**  
 →<I/P #nn – input name>→**Single Button Microphone**→**Audio**→**Gain**→**Input**

Possible values: –63dB to 0dB (1dB steps)

System default configuration: –14 dB on VAR4/VAR12/VAR20

–20 dB on ACU and VAR8-ACU

The input gain of each audio input should normally be set so that all inputs are balanced, and give the same output level on any one output. The output gains are then balanced to give the same gain on all outputs.

1. Initially ensure that the microphone input gain is set to its default value of:
  - VAR4/12/20: –14 dB
  - DAU/ACU/VAR8/VAR8-ACU: –20 dB
2. Ensure that the line sensitivity (**Sens.**) is set to its default option, which is 'Line'. This menu option is only available in the VAR Router.

## 6.4.2 Microphone Surveillance Tone Detection

Menu: **Configuration**→**System**→**Router**→**Inputs**→**Mic/Line**→<I/P #nn – input name>  
 →**Single Button Microphone**→**Audio**→**Surv**

Possible values: –40dB to 0dB (1dB steps)

System default configuration: '–40dB'

If this surveillance is enabled, then in the absence of a surveillance tone, an Input Audio fault will be raised and logged. This would indicate that the microphone audio connection is broken, or is a poor connection.



On VAR4/12/20 the microphone input gain affects the surveillance tone, therefore the surveillance tone detection should only be set after configuring the microphone input gain; see Section “[6.4.1 Microphone Input Gain](#)” (page 35).

The detection threshold level is adjustable as follows.

1. Configure **Mode=LF** and **Level (dB)=–40**, enabling the Router to detect the presence of the low frequency surveillance tone that is generated by ASL microphones.
2. Clear any existing faults by pressing the FAULT CLEAR button on the system front panel.
3. Make sure that no fault is reported for the SAP02. Any fault reported by the SAP02 at this stage should be cleared; see Section “[7 Fault Finding](#)” (page 44).
4. Raise the surveillance tone level slowly (1 dB step) from –40 dB until the “IPXX AUDIO INPUT” fault is reported. Where XX is the Mic/Line input to which the SAP02 is connected.
5. Set the surveillance tone level to 4 dB below the level that caused the fault to be reported.  
 E.g. if a –18 dB level causes the fault, then set the surveillance tone level to –22 dB.
6. Make sure that no fault is reported for the SAP02.

### 6.4.3 Microphone Relative Output Gain

VAR4/12/20 Menu: **Configuration→System→Router→Inputs→Mic/Line**

→<I/P #*nn* – *input name*>→**Single Button Microphone→Audio→Gain→O/pGains**

DAU/VAR8 Menu: **Configuration→System→Router→Inputs→Mic/Line**

→<I/P #*nn* – *input name*>→**Single Button Microphone→Audio→Gain→Output**

Possible values: –40dB to 0dB (1dB steps)

System default configuration: '0dB'

Normally all input gains will be set to 'balance' each of the inputs, and the output gain will be set to give the required level at each output. However, if any input is desired to have a different gain for a particular output or outputs, then these inputs can be given a different gain relative to each appropriate output. This is the 'Relative Output Gain' setting, and can be used to e.g. avoid feedback for a microphone which is located in one of its output zones.

Note that to simplify this process the Router displays the output name, and that the output names may have been changed to zone names in the **Configuration→System→Router→Outputs** menu.



- This setting is not required on Audio Control Units (ACU).
- Before carrying out this adjustment the input gains of all audio sources and the output gains for all zones and other audio outputs must be set-up to 'balance' each input and output.

Ensure that the Relative Output Gain for each output is set to the default level (0 dB), and then for each output in the system configure the Relative Output Gain as follows:

1. Disable any ANS for the output associated with the SAP02, by setting it to 'Off':

Menu: **Configuration→System→Router→Outputs→<O/P #*nn* – *output name*>→ANS**

Where *nn* is the output number and the *output name* is the configured output name, which may have been changed to zone names.

Consult the system design documentation for zones associated with the SAP02. These associated zones are as programmed in Section [“6.3.1 PTT Button Zone Selection”](#) (page 35).

2. Ensure that the Night Time Volume Control is inactive, by setting it to 'Off':

Menu: **Configuration→System→Router→Noise→Off**

3. Ensure that all Volume Controls are set to maximum volume, i.e., control at position '11'.

4. Make broadcasts from both the Fist Microphone and Radio Microphone and confirm that they are free of acoustic feedback.

5. If feedback is encountered or volume adjustment is required in a particular zone (or one or more of the group of zones) even though all inputs have been balanced, and all outputs have been set to the correct volume for all other inputs, then reduce the Relative Output Gain for the associated output until the feedback is eliminated.

VAR4/12/20 Menu: **Configuration→System→Router→Inputs→Mic/Line**  
**→<I/P #nn – input name>→Single Button Microphone→Audio→Gain→O/pGains**

DAU/ACU/VAR8/VAR8-ACU Menu: **Configuration→System→Router→Inputs→Mic/Line**  
**→<I/P #nn – input name>→Single Button Microphone→Audio→Gain→Output**

6. Re-enable any ANS for the output associated with the SAP02, by setting it to 'On':

Menu: **Configuration→System→Router→Outputs→<O/P #nn – output name>→ANS**

7. If required, activate the Night Time Volume Control, by setting it to 'On':

Menu: **Configuration→System→Router→Noise→On**

8. Set all Volume Controls to the required volume.

#### 6.4.4 Microphone Equalisation

Menu: **Configuration→System→Router→Inputs→Mic/Line→<I/P #nn – input name>**  
**→Single Button Microphone→Audio→EQ**

Possible values:                      HF (High Frequency) section:    –12dB to +12dB (1dB steps)  
    MID (Mid Frequency) section:    –12dB to +12dB (1dB steps)  
    LF (Low Frequency) section:    –12dB to +12dB (1dB steps)

System default configuration: '0dB'

A 3-band equaliser is provided on Mic/Line inputs in order to balance the input tone. This equaliser has a shelving HF (treble) adjustment, shelving LF (bass) adjustment, and a fixed MID section adjustment.

A High Pass filter is also configurable. This would typically be used on microphone inputs to prevent excessive 'pop' noise.

Configure the 3-band equaliser and the High Pass filter as required.



This setting should not be used to set the equalisation for a particular output. Outputs have their own equaliser setting.

## 6.4.5 Microphone Fade Up and Down Times

Menu: **Configuration**→**System**→**Router**→**Inputs**→**Mic/Line**→<I/P #nn – input name>

→**Single Button Microphone**→**Audio**→**Fade**

Possible values: 00 to 50 (Time in tenths of a second. Divide by ten for the time in seconds.)

System default configuration: 'Up=00' and 'Down=00'

It is possible to specify a fade up and fade down time for each Mic/Line input or Music input. This can be set to provide the desired changeover fading, e.g. when a broadcast interrupts background music, or a lower priority broadcast.

This is typically used on background music where a slow fade-up, in particular, is desirable.

The Fade Down time is:

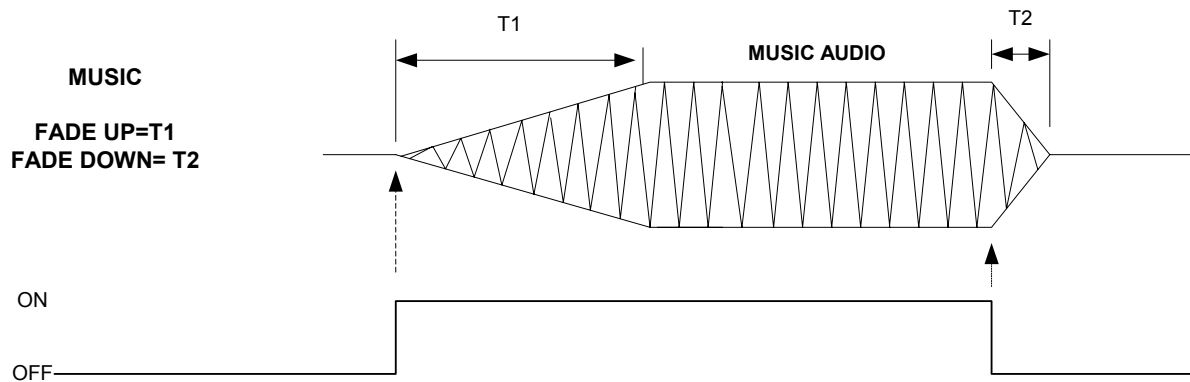
- The time it takes for the signal to fade down when turned off (un-routed);
- The time it takes for the signal to fade down before an overriding broadcast is made in its place

The Fade Up time is the time the signal takes to fade up when:

- Turned on (routed);
- Override removed.

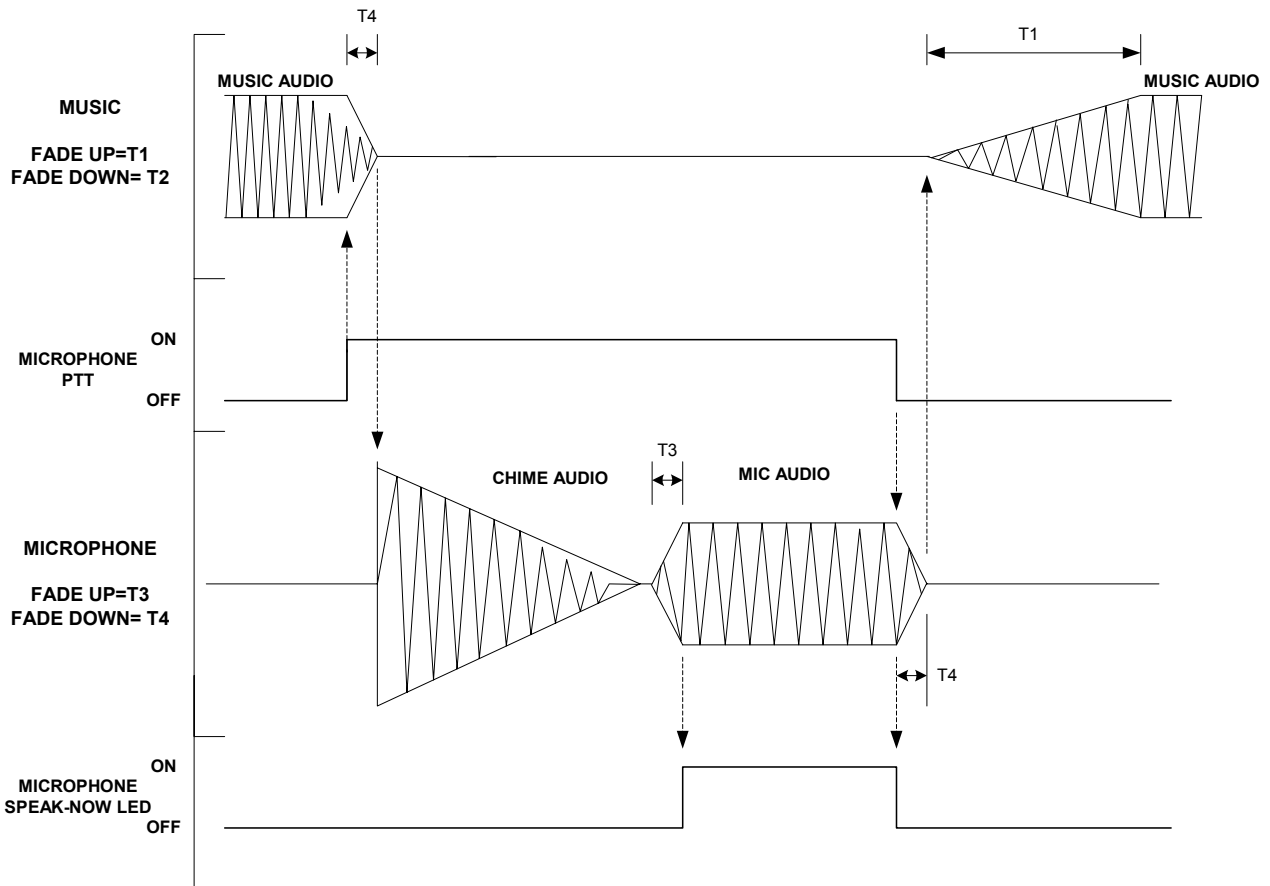
The diagram in [Figure 18](#) illustrates the sequence of events during the enabling and disabling of a single audio source (e.g. background music).

**Figure 18** Sequence of Events for Single Audio Source



The diagram in [Figure 19](#) illustrates the sequence of events during the override of a background music source by a Paging Microphone with chime.

Note that the background music Fade Down time ( $T_2$ ) is not used in this instance. Instead the microphone Fade Down time ( $T_4$ ) is used to fade out the background music before the microphone broadcast starts, as well as to fade out the microphone at the end of its broadcast.

**Figure 19** Sequence of Events for Paging Microphone Chime Overriding a Background Music

Configure the microphone signal fade up and down times as required.

### 6.4.6 Microphone Pre-Announcement Chime

Menu: **Configuration**→**System**→**Router**→**Inputs**→**Mic/Line**→<I/P #nn – input name>

→**Single Button Microphone**→**Audio**→**Chime**

Possible chime level: –40dB to 0dB (1dB steps)

Possible chime types:  
 'Chime-1': one chime  
 'Chime-2': two chimes  
 'Chime-3': three chimes  
 'Off': none

System default configuration: 'Type=Off' and 'LEVEL (dB) –12'

A pre-announcement chime may be configured to any Mic/Line input. If configured, then the chime will be triggered when the input source is routed. However the actual audio input will only be routed when the chime is complete. The chime level is also configurable.



## 6.5 Configuring the Microphone Control Parameters

### 6.5.1 Microphone Priority

Menu: **Configuration**→**System**→**Router**→**Inputs**→**Mic/Line**→<I/P #nn – input name>

→**Single Button Microphone**→**Ctrl**→**Pri**

Possible priority levels: 01 to 19 (01 is the highest priority)

System default configuration: Fire or Zoned Fire Microphone on input 1 – '01'

Fire or Zoned Fire Microphone on input 2 – '02'

Paging Microphone on VAR4/VAR12/VAR20 – '07'

Paging Microphone on DAU/VAR8/ACU/VAR8-ACU – '11'

The input priority is used to resolve conflicts when two or more inputs try to broadcast to the same output. In this case the input with the highest priority will be able to broadcast to this particular output, and the others will not. The priority also determines if the user may be overridden by other users during broadcast to an output.

Note that when the microphone is connected to an ACU, the ACU uses the priority to arbitrate the use of the network channels, and then each slave unit (DAU or VAR Router) in the network uses its own priority configuration for local arbitration.

Set the priority of the microphone input as required. Consult the system design documentation to find the correct priority.



Care should be taken in ensuring that Fire Microphones, and Alarm and Emergency DVAs have a high priority, and non-emergency sources, such as non-emergency DVAs, Paging Microphones, and music sources, have low priorities. This is to ensure that these emergency inputs can override normal inputs.

The system default priorities are set to help this by ensuring that by default Fire Microphones have the highest priorities in the system: priority '01' being assigned to a Fire Microphone connected to input 1, and priority '02' to a Fire Microphone connected to input 2.

## 6.5.2 Microphone Class

Menu: **Configuration**→**System**→**Router**→**Inputs**→**Mic/Line**→<I/P #*nn* – *input name*>

→**Single Button Microphone**→**Ctrl**→**Pri**→**Class**

Possible values: 'High Priority Emergency', 'Low Priority Emergency', or 'Non Emergency'

System default configuration: EVACUTE DVA: 'High Priority Emergency'

ALERT DVA: 'Low Priority Emergency'

Other inputs: 'Non Emergency'

This setting is explained below, however for the SAP02 this setting should be configured to 'Non Emergency'.

- On VAR4/VAR12/VAR20:

The emergency class is used to control the VAR Router's Remote Fault Output, when this is configured as 'Emergency DVA Active Indicator', as follows:

- The Remote Fault Output is activated if an emergency audio input such as ALERT or EVACUATE DVAs is routed to any output.
- The Remote Fault Output is not activated if all outputs are routed to non-emergency audio inputs such as Paging Microphones or music, or are not routed.



Incorrect changes to this setting may result in an inappropriate indication of the VAR Router's Remote Fault Output when this is configured for 'Emergency DVA Active Indicator'.

- In an Intellevac Network:

The emergency class is also used by the ACU and any Zoned Fire Microphones connected to it to indicate the emergency DVA message status of any zone group which is configured for a Zone Select button. This indication is done by control of the zone's 'Busy' and 'Select' LEDs, as described in Section "6.5.4 Busy and Select Indication LEDs Mode (ACU and VAR8-ACU only)" (page 43).

In an Intellevac Network, the Mic/Line input class should be set to 'Non Emergency' regardless of microphone type in order to provide the appropriate indication of the emergency DVA message status on the ACU's front panel.

## 6.5.3 Microphone Name

Menu: **Configuration**→**System**→**Router**→**Inputs**→**Mic/Line**→<I/P #*nn* – *input name*>

→**Single Button Microphone**→**Name**

Possible values: alphanumeric string of up to 12 characters

System default configuration: The default input name may vary according to software version.

*nn* is the Router input number found in Section "6.1 Obtaining the Router's Input Number" (page 34).

Where *nn* is the Router input number found in Section "6.1 Obtaining the Router's Input Number" (page 34).

This name is for reference only in the Router settings and may be modified as required. It can be any alphanumeric string of up to 12 characters.

## 6.5.4 Busy and Select Indication LEDs Mode (ACU and VAR8-ACU only)

Menu: **Configuration**→**System**→**Router**→**Inputs**→**Mic/Line**→<I/P #nn – input name>  
 →<Zoned Fire Microphone or Paging Microphone>→**Ctrl**→**LEDs**

Possible values: 'Busy Standard', or 'Busy Class'

System default configuration: 'Busy Class' on Zoned Fire Microphones

'Busy Standard' on Fire, Paging, and Single Button Microphones

This setting is explained below, however for the SAP02 this setting should be configured to 'Busy Standard'.

Normally a Zoned Fire Microphone (such as the standard SMC01 units) connected to an ACU (Audio Control Unit) is configured to drive the 'Busy' (red) and 'Select' (green) LEDs of a zone select button to indicate the emergency DVA message status of the zone (either one or more of the group of zones controlled by this button). Whereas Single Button Microphones (such as the SAP02) are configured to drive these LEDs in the standard mode, i.e., to indicate the zone 'Busy' and 'Select' conditions in similar fashion to when the microphone is connected to a VAR Router. These modes are detailed as follows.

- 'Busy Class' mode:

The 'Busy' and 'Select' LEDs of a zone select button indicate the emergency DVA message status of the zone (either one or more of the group of zones controlled by this button) configured for this zone select button according to the emergency class of the currently routed audio sources.

The 'Busy' and 'Select' LEDs are driven as follows:

- The 'Busy' LED is turned ON continuously if any output in the group configured for the button is connected to an input that has been configured as a High Priority Emergency source.  
The 'Select' LED is turned ON continuously.
- The 'Busy' LED flashes ON and OFF repeatedly if any output in the group configured for the button is connected to an input that has been configured as a Low Priority Emergency source, and no output in the group is connected to a High Priority Emergency source.  
The 'Select' LED is turned ON continuously.
- The 'Busy' LED is turned OFF if any output in the group configured for the button is connected to an input that has been configured as a Non Emergency Priority source, and no output in the group is connected to a High or Low Priority Emergency source.  
The 'Select' LED is turned ON continuously.
- The 'Busy' LED is turned OFF if all outputs in the group configured for the button are not connected to any input.  
The 'Select' LED is turned OFF.

Normally the emergency class is set-up as follows:

- EVACUATE DVA: High Priority Emergency
- ALERT DVA: Low Priority Emergency
- Other audio sources (microphone, auxiliary DVAs, music): Non Emergency

Therefore the ACU (or the Zoned Fire Microphone) will show all evacuation zones with a steady 'Busy' LED, all alert zones with a flashing 'Busy' LED, and all other zones without the 'Busy' LED lit.

This is the default setting for Zoned Fire Microphones.

- 'Busy Standard' mode:

The 'Busy' LED of a zone select button is turned ON continuously to indicate that the zone (either one or more of the group of zones controlled by this button) configured for this zone select button is already in use by another input, and the 'Select' LED indicates the zone selection state.

The input emergency class has no effect on the LED indication.

This is the default setting for Fire Microphones.

## 7 Fault Finding

**Table 6** SAP02 Faults – VAR4/12/20

Operational Fault Symptom	Fault Description	Fault Code(s) Reported at the VAR4/12/20	Suggested Action
Total loss of live audio announcement from a single microphone, though the microphone still appears to be functional.	Input audio surveillance	IPXX AUDIO INPUT XX=01 to 20	<ul style="list-style-type: none"> <li>• Check audio cabling or power supply cabling between microphone and Router.</li> <li>• Replace microphone console.</li> <li>• Replace Router.</li> </ul>
Total loss of live audio announcement from a single microphone, though the microphone still appears to be functional.	Mic capsule fault	IPXX MIC CAPSULE XX=01 to 20	<ul style="list-style-type: none"> <li>• Check continuity of microphone capsule and any associated wiring, if faulty then replace capsule if possible.</li> <li>• Replace microphone console.</li> <li>• Replace Router.</li> </ul>
Total loss of all functionality on a single microphone.	Mic comms fault	IPXX MIC COMMS XX=01 to 20  (SAP02 front panel: fast flashing green ACTIVE LED.)	<ul style="list-style-type: none"> <li>• Check data cabling or power supply cabling between microphone and Router.</li> <li>• Replace microphone console.</li> <li>• Replace Router.</li> </ul>
No operational failure on initial fault report. Total loss of all functionality on a single microphone if subsequent fault reports within one hour.	Mic CPU reset	IPXX MIC COMMS XX=01 to 20  (SAP02 front panel: fast flashing green ACTIVE LED.)	<ul style="list-style-type: none"> <li>• A one-off occurrence may be experienced due to EMI or transients.</li> <li>• Repeated occurrences indicate faulty microphone electronics, so replace microphone console.</li> </ul>
Total loss of all functionality on a single microphone.	Mic RAM error	IPXX MIC FAULT-09 XX=01 to 20 (Mic Processor stops)	<ul style="list-style-type: none"> <li>• A one-off occurrence may be experienced due to EMI or transients.</li> <li>• Repeated occurrences indicate faulty microphone electronics, so replace microphone console.</li> </ul>
Total loss of all functionality on a single microphone.	Mic ROM error	IPXX MIC FAULT-09 XX=01 to 20 (Mic Processor stops)	<ul style="list-style-type: none"> <li>• Replace microphone console.</li> </ul>

**Table 7** SAP02 Faults – Intellevac Units, VAR8, and VAR8-ACU

<b>Operational Fault Symptom</b>	<b>Fault Description</b>	<b>Fault Code(s) Reported at the Intellevac Units/ VAR8/VAR8-ACU</b>	<b>Suggested Action</b>
Total loss of live audio announcement from a single microphone, though the microphone still appears to be functional.	Input audio surveillance	IPXX AUDIO INPUT XX=01 to 08	<ul style="list-style-type: none"> <li>• Check audio cabling or power supply cabling between microphone and Router.</li> <li>• Replace microphone console.</li> <li>• Replace Router.</li> </ul>
Total loss of live audio announcement from a single microphone, though the microphone still appears to be functional.	Mic capsule fault	MIC<n> MIC CAPSULE n=01 to 08	<ul style="list-style-type: none"> <li>• Check continuity of microphone capsule and any associated wiring, if faulty then replace capsule if possible.</li> <li>• Replace microphone console.</li> <li>• Replace Router.</li> </ul>
Total loss of all functionality on a single microphone.	Mic comms fault	MIC<n> MIC COMMS n=01 to 08  (SAP02 front panel: fast flashing green ACTIVE LED.)	<ul style="list-style-type: none"> <li>• Check data cabling or power supply cabling between microphone and Router.</li> <li>• Replace microphone console.</li> <li>• Replace Router.</li> </ul>
No operational failure on initial fault report. Total loss of all functionality on a single microphone if subsequent fault reports within one hour.	Mic CPU reset	MIC<n> MIC COMMS n=01 to 08  (SAP02 front panel: fast flashing green ACTIVE LED.)	<ul style="list-style-type: none"> <li>• A one-off occurrence may be experienced due to EMI or transients.</li> <li>• Repeated occurrences indicate faulty microphone electronics, so replace microphone console.</li> </ul>
Total loss of all functionality on a single microphone.	Mic RAM error	MIC<n> FAULT 09 n=01 to 08 (Mic Processor stops)	<ul style="list-style-type: none"> <li>• A one-off occurrence may be experienced due to EMI or transients.</li> <li>• Repeated occurrences indicate faulty microphone electronics, so replace microphone console.</li> </ul>
Total loss of all functionality on a single microphone.	Mic ROM error	MIC<n> FAULT 09 n=01 to 08 (Mic Processor stops)	<ul style="list-style-type: none"> <li>• Replace microphone console.</li> </ul>

## 8 Maintenance

The SAP02 should be tested with the PA/VA system for correct operation, at maximum intervals of three months, and as part of the system maintenance schedule.

There are no routine maintenance tasks for the SAP02 except for operational testing, however.

The following sections describe maintenance tasks, which can be carried out when required.



Please read and observe the instructions and guidelines in Section “[11 Safety and Precautions](#)” (page [62](#)) when carrying out any maintenance tasks. Failure to follow these instructions and guidelines may cause personal injury and/or damage to the equipment.

### 8.1 SAP02 Build Standard Version

The SAP02 label located on the top part of the first microphone enclosure indicates the unit's Build Standard Version as shown in [Figure 2](#).

It is important to know the SAP02 Build Standard Version for maintenance purposes, and to ensure that the unit has the correct functions. The Build Standard Version should be quoted in all enquiries regarding the unit.

## 8.2 Powering the SAP02 On and Off

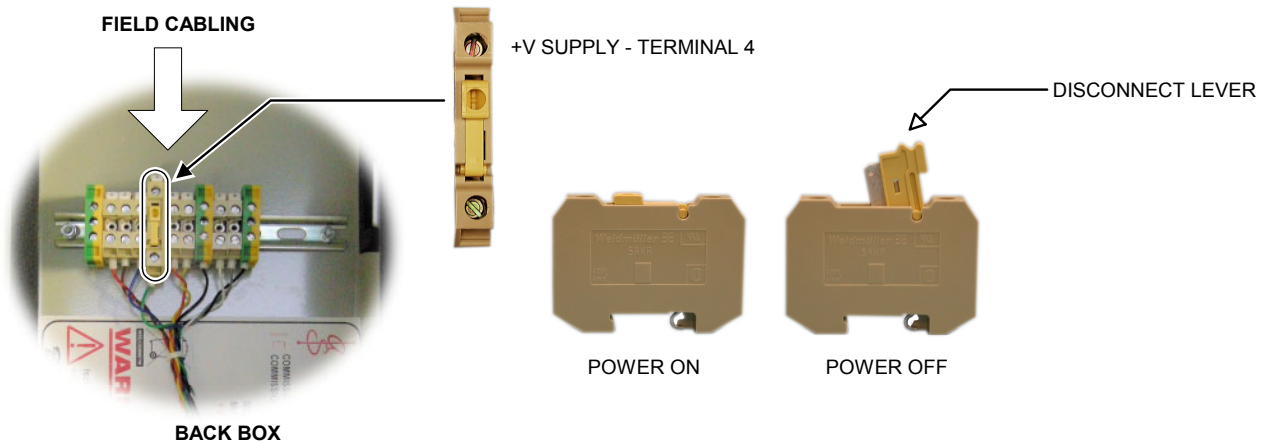


- The SAP should always be powered off before being disconnected. Failure to do so may damage the VAR Router, DAU, or ACU connected to the SAP02.
- Original SAP02 back boxes differ from the earlier SAP01 back boxes in that the DIN rail terminal allocation for the site wiring connections are different. Beware of this if working with both SAP02 and SAP01 back boxes. Observe carefully the DIN rail terminal allocation on the back box before powering the unit on and off:
  - Original SAP02 back box: Power supply terminal = 4
  - SAP02 front panel fitted to SAP01 back box: Power Supply terminal = 2

### 8.2.1 Original SAP02 Back Box – Terminal 4

Powering the SAP02 is done by toggling the disconnect lever of the power supply DIN rail terminal (4) in or out, as shown in [Figure 20](#).

**Figure 20** Power Supply via Disconnect Terminal

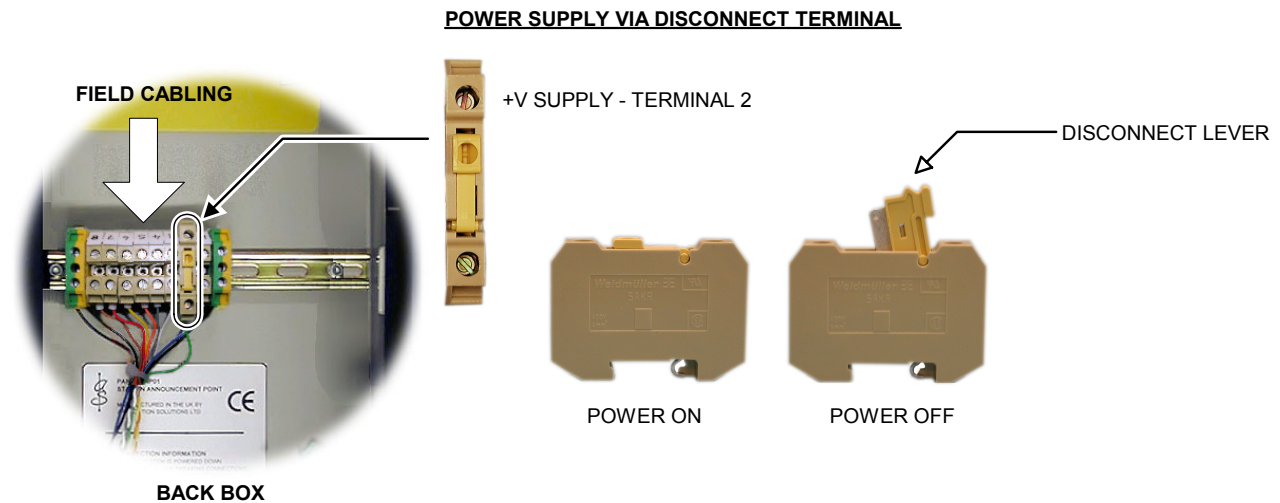


## 8.2.2 SAP02 Front Panel Fitted to SAP01 Back Box – Terminal 2

### 8.2.2.1 Power Supply via Disconnect Terminal

Powering the SAP02 is done by toggling the disconnect lever of the power supply DIN rail terminal (2) in or out, as shown in [Figure 21](#).

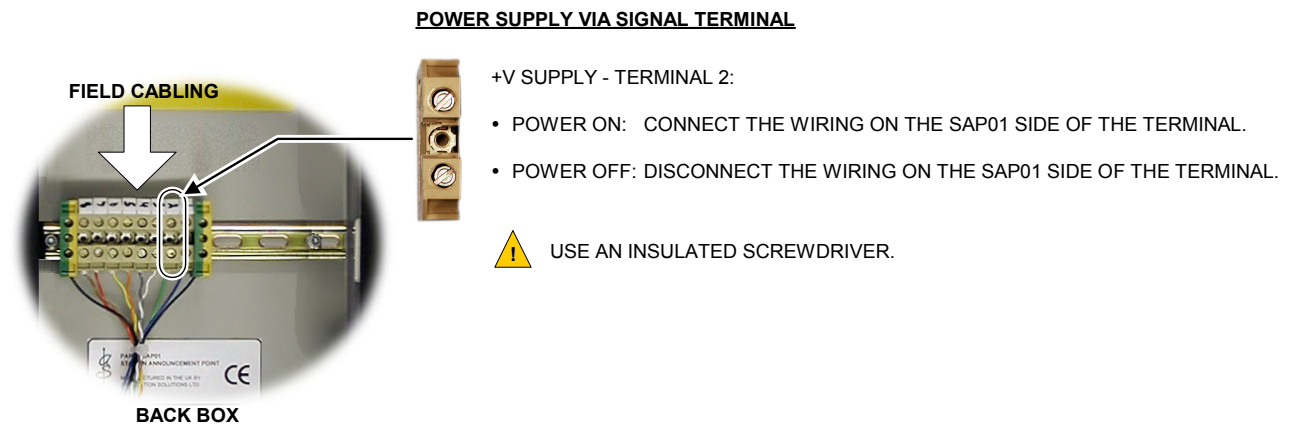
**Figure 21** Power Supply via Disconnect Terminal



### 8.2.2.2 Power Supply via Signal Terminal

Power the SAP02 on or off by connecting or disconnecting the power supply wiring from DIN rail terminal 2 as shown in [Figure 22](#). Alternatively where the installation permits, powering on or off can be done by connecting or isolating the power using fused DIN rail terminals at the equipment rack.

**Figure 22** Power Supply via Signal Terminal





### 8.3 Removing the SAP02 Front Panel/Electronics Assembly

For maintenance purposes the SAP02's preferred Line Replaceable Unit (LRU) is the whole front panel and the electronics assembly, including the Radio Microphone Receiver when it is fitted. Therefore the whole unit should be returned for repair as a single item. The following procedure describes how to remove the SAP02 Front Panel/Electronics Assembly.

The following tools are required to replace the Front Panel/Electronics Assembly:

- A small flat bladed screwdriver.
- A 2.5 mm Allen key or driver.

#### Removing the Front Panel/Electronics Assembly:

1. Open the SAP02 door using the associated KABA key.
2. Remove the SAP02 door by compressing the hinge pin; see [Figure 23](#).  
This can be done by inserting a small screwdriver into the holes in the pin.  
Take care to ensure that the hinge pin's plastic bushes in the back box are not loosened.

**Figure 23** SAP02 Door and Front Panel Fixing



3. Remove the SAP02 front panel assembly by removing the 8 off M4 Allen screws; see [Figure 23](#).
4. Power the unit off as described in Section “[8.2 Powering the SAP02 On and Off](#)” (page 47).
5. Disconnect the SAP02 front panel assembly by unplugging the flying leads from the multi-way connectors on the electronics assembly.
6. If a RMR02 Radio Microphone Receiver is fitted disconnect the antenna cables connected to the Receiver.
7. Store the front panel assembly, door and fixing screws safely.

## 8.4 Installing the SAP02 Front Panel/Electronics Assembly

The following procedure describes how to install the SAP02 Front Panel/Electronics Assembly into the back box.

The following tools are required to replace the Front Panel/Electronics Assembly:

- A small flat bladed screwdriver.
- A 2.5 mm Allen key or driver.

### Installing the Front Panel/Electronics Assembly:

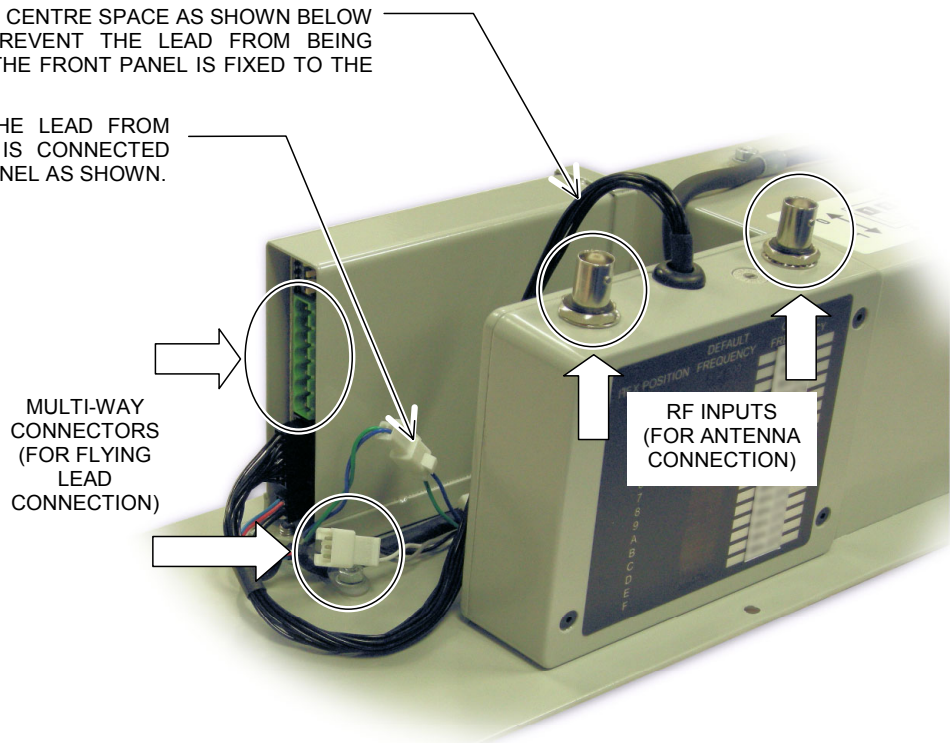
1. Connect the new front panel assembly by plugging the flying leads to the multi-way connectors on the electronics assembly; see [Figure 24](#) or [Figure 25](#).

- a. RMR02 Radio Microphone Receiver fitted:

**Figure 24** SAP02 Front Panel/Electronics Assembly Connection with RMR02

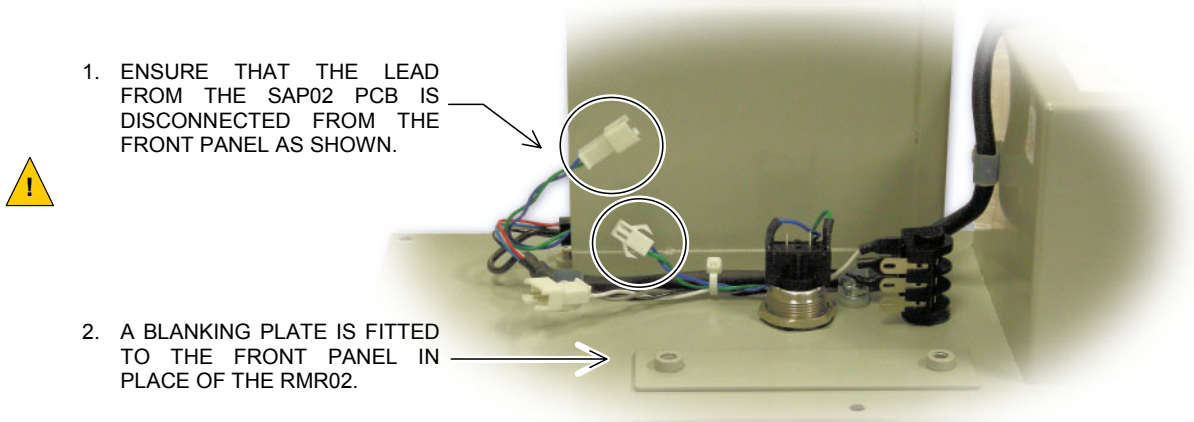


1. POSITION THE LEAD CONNECTING THE RMR02 TO THE SAP02 PCB IN CENTRE SPACE AS SHOWN BELOW IN ORDER TO PREVENT THE LEAD FROM BEING TRAPPED WHEN THE FRONT PANEL IS FIXED TO THE BACK BOX.
2. ENSURE THAT THE LEAD FROM THE SAP02 PCB IS CONNECTED TO THE FRONT PANEL AS SHOWN.




**b.** RMR02 Radio Microphone Receiver not fitted:

**Figure 25** SAP02 Front Panel/Electronics Assembly Connection without RMR02



2. If a RMR02 Radio Microphone Receiver is fitted, connect the antenna cables to the Receiver RF inputs; see [Figure 24](#).
3. Power the unit on as described in Section “[8.2 Powering the SAP02 On and Off](#)” (page 47).
4. Fix the front panel assembly back in place using the 8 off M4 Allen screws; see [Figure 23](#) (page 49)
5. Re-fit the door; see [Figure 23](#) (page 49).

 Make sure that BOTH plastic bushes are tightly fitted to the door fixing holes in order to preserve the unit's IP rating.

6. When finished, close and lock the door using the KABA key.

## 8.5 Radio Microphone Receiver Channel, Pilot Tone Detection, and Receiver Squelch Level Configuration

The following procedure describes how to adjust the Radio Microphone Receiver Squelch Level or/and the Receiver Channel after installation.

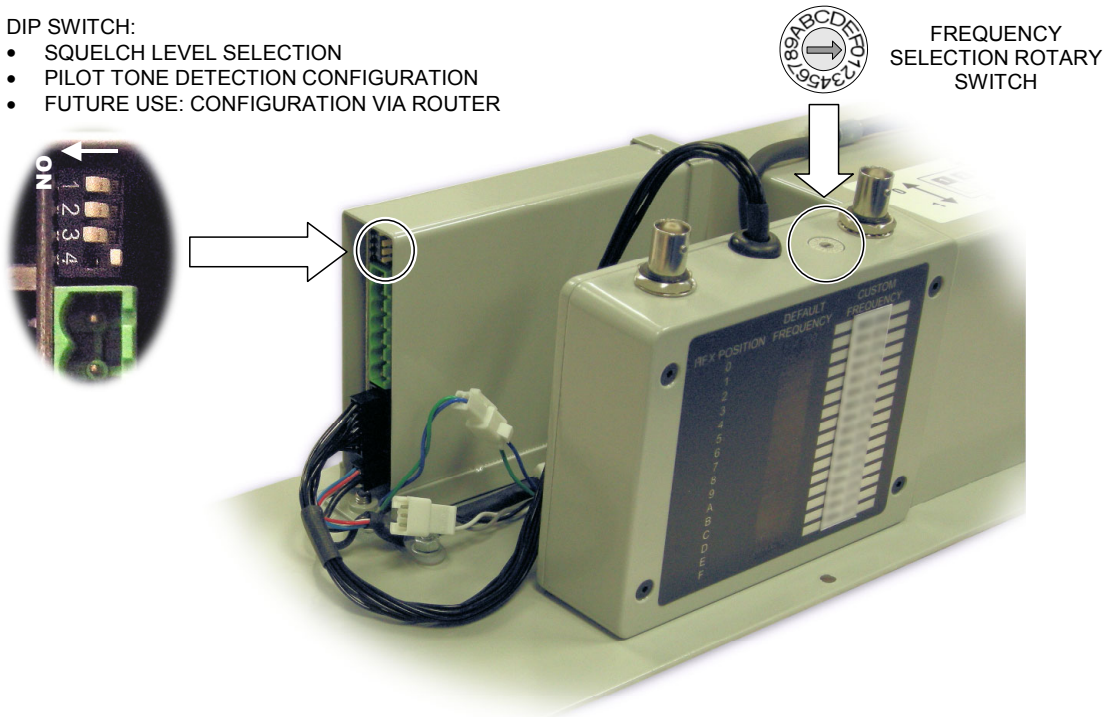
### Adjusting the Radio Microphone Receiver:

1. Remove the SAP02 front panel and electronics assembly (if not already done) following the procedure described in Section “[8.3 Removing the SAP02 Front Panel/Electronics Assembly](#)” (page 49).

**Figure 26** Radio Microphone Receiver Controls

DIP SWITCH:

- SQUELCH LEVEL SELECTION
- PILOT TONE DETECTION CONFIGURATION
- FUTURE USE: CONFIGURATION VIA ROUTER



2. The controls required in the following configurations are shown in [Figure 26](#).
3. If required, select the new Receiver Channel RF frequency via the internal rotary switch. Refer to Section “[5.1 Radio Microphone Receiver Frequency Selection](#)” (page 31) for frequency configuration details.
4. If required, enable or disable the pilot tone detection by setting DIP switch 1 on the SAP02 PCB. Refer to Section “[5.2 Radio Microphone Receiver Pilot Tone Detection Set-up](#)” (page 32) for pilot tone detection set-up details.
5. If required, select the squelch level by setting DIP switches 2 to 4 on the SAP02 PCB. Refer to Section “[5.3 Radio Microphone Receiver Squelch Level Selection](#)” (page 33) for squelch level set-up details.
6. Perform any additional configuration required, and then re-fit the front panel and electronics assembly following the procedure described in Section “[8.4 Installing the SAP02 Front Panel/Electronics Assembly](#)” (page 50).

## 8.6 SAP02 Front Panel/Electronics Assembly Replacement

The replacement of the SAP02 front panel and the electronics assembly is described in the following procedures.

The following tools are required to replace the Front Panel/Electronics Assembly:

- A small flat bladed screwdriver.
- A 2.5 mm Allen key or driver.

### Removing the Old SAP02 Front Panel/Electronics Assembly:

Remove the SAP02 front panel and electronics assembly if not already done following the procedure described in Section “[8.3 Removing the SAP02 Front Panel/Electronics Assembly](#)” (page 49).

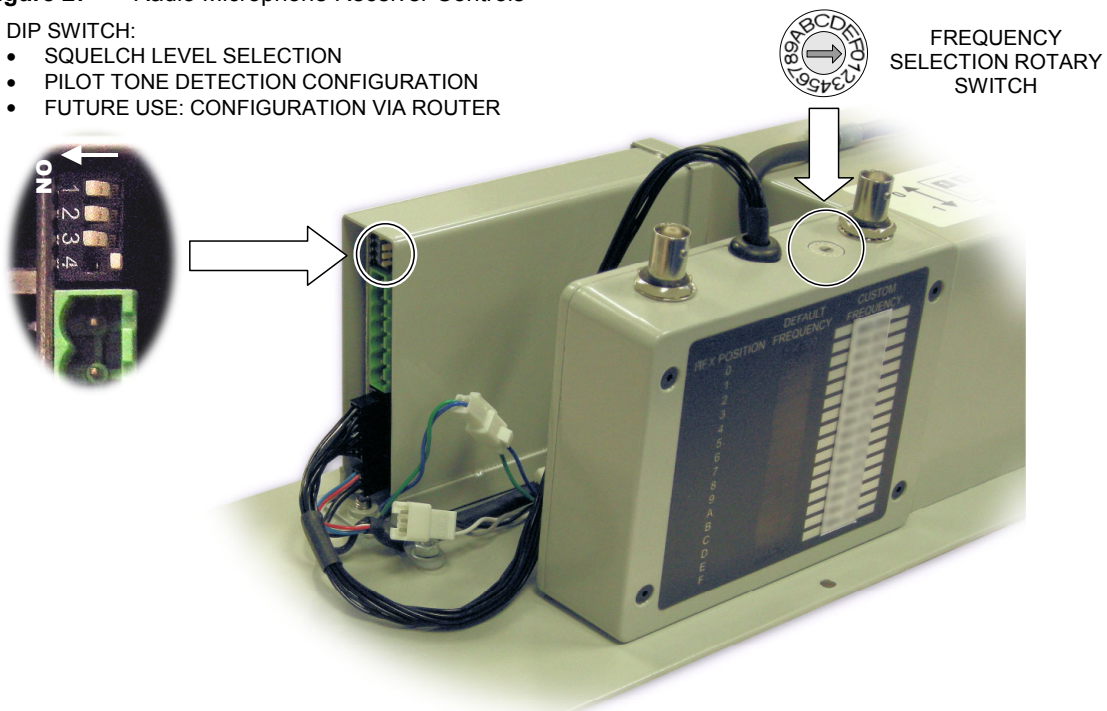
### Installing the New SAP02 Front Panel/Electronics Assembly:

1. If a Radio Microphone Receiver is fitted, ensure that the new Receiver has the same settings as the old one by (see [Figure 27](#)):
  - a. Selecting the same RF frequency configured in the Front Panel via the internal rotary switch.  
Refer to Section “[5.1 Radio Microphone Receiver Frequency Selection](#)” (page 31) for frequency configuration details.
  - b. Configuring the same pilot tone detection setting configured in the old Front Panel via DIP switch 1 on the SAP02 PCB.  
Refer to Section “[5.2 Radio Microphone Receiver Pilot Tone Detection Set-up](#)” (page 32) for pilot tone detection set-up details.
  - c. Configuring the same squelch level configured in the old Front Panel via DIP switches 3 and 4 on the SAP02 PCB.  
Refer to Section “[5.3 Radio Microphone Receiver Squelch Level Selection](#)” (page 33).

**Figure 27** Radio Microphone Receiver Controls

DIP SWITCH:

- SQUELCH LEVEL SELECTION
- PILOT TONE DETECTION CONFIGURATION
- FUTURE USE: CONFIGURATION VIA ROUTER



2. Re-fit the front panel and electronics assembly following the procedure described in Section “[8.4 Installing the SAP02 Front Panel/Electronics Assembly](#)” (page 50).

**Configuring and Testing the New SAP02 Front Panel/Electronics Assembly:**

- 1.** Due to slight differences that may exist on the hardware, re-commission the microphone audio parameters as described in Section “[6 Commissioning the SAP02](#)” (page 34):
  - a.** Microphone surveillance tone detection: see step [6.4.2](#).
  - b.** Microphone relative output gain: see step [6.4.3](#).
  - c.** Microphone equalisation: see step [6.4.4](#).
- 2.** Clear any existing faults by pressing the FAULT CLEAR button on the system front panel.
- 3.** Make sure that no fault is reported for the SAP02, refer to Section “[7 Fault Finding](#)” (page 44).

## 8.7 SAP01 Upgrade

The SAP02 front panel and electronics assembly fit into a SAP01 back box without any modification. Therefore it is possible to upgrade a SAP01 installation to SAP02 keeping the previously installed SAP01 back box and its wiring.

The rack modifications required to upgrade a SAP01 installation to SAP02, and the front panel replacement procedure are described in the following sections.



The SAP01 back box does not provide drainage for unprevented ingress of liquid.



The SAP01 back box DIN rail terminal allocation is different from SAP02 back box. However this only affects the installation wiring. The connectors on the flying leads from the back box to the front panel on the SAP02 and SAP01 are the same, so a swap from a SAP01 front panel to a SAP02 front panel can be done by simply plugging the SAP01 back box flying leads onto the SAP02 front panel.

Observe the terminal allocation shown on the label internal to the back box.

The following tools are required to replace the Front Panel/Electronics Assembly:

- A small flat bladed screwdriver.
- A 2.5 mm Allen key or driver.

### Modifying the Equipment Rack:

1. Replace power supply fuse at the equipment rack DIN terminals from F0.5A to T0.5A.

### Removing the SAP01 Front Panel/Electronics Assembly:

1. Open the SAP01 door using the associated KABA key.
2. Remove the SAP01 door by compressing the hinge pin; see [Figure 28](#).  
This can be done by inserting a small screwdriver into the holes in the pin.  
Take care to ensure that the hinge pin's plastic bushes in the back box are not loosened.

**Figure 28** SAP01 Door and Front Panel Fixing



3. Remove the SAP01 front panel assembly by removing the 8 off M4 Allen screws; see [Figure 28](#).
4. Power the unit off as described in Section “[8.2 Powering the SAP02 On and Off](#)” (page 47).
5. Disconnect the SAP01 front panel assembly by unplugging the flying lead from the multi-way connectors on the electronics assembly.
6. If the Radio Microphone Receiver is fitted disconnect the antenna cables connected to the Receiver.



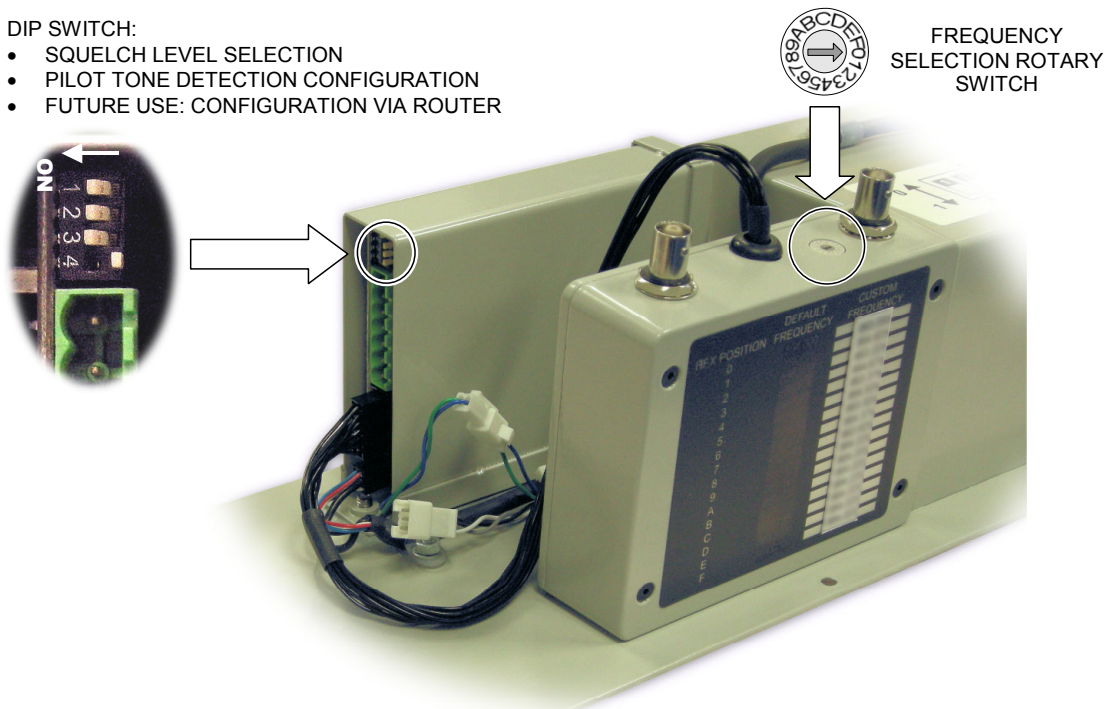
### Installing the New Front Panel/Electronics Assembly:

1. If a Radio Microphone Receiver is fitted, ensure that the new Receiver has the same settings as the old one (see [Figure 29](#)):
  - a. Select the same RF frequency configured in the old Front Panel via the internal rotary switch.  
Refer to Section “[5.1 Radio Microphone Receiver Frequency Selection](#)” (page 31) for frequency configuration details.
  - b. Disable the pilot tone detection as required by setting DIP switch 1 on the SAP02 PCB.  
The Receiver is supplied with the pilot tone detection enabled as standard for secure use with the ASL RPA01 Radio Microphone Transmitters. This means that announcements from Radio Microphone Transmitters that do not provide the required pilot tone will be blocked<sup>2</sup>.  
Refer to Section “[5.2 Radio Microphone Receiver Pilot Tone Detection Set-up](#)” (page 32) for pilot tone detection set-up details.
  - c. Configure the same squelch level configured in the old Front Panel via DIP switches 2 to 4 on the SAP02 PCB.  
Refer to Section “[5.3 Radio Microphone Receiver Squelch Level Selection](#)” (page 33) for details.  
Note that the position of the DIP switches are different on SAP01 PCB, as shown in [Table 8](#) (page 58).  
If upgrading a SAP01 which does not support squelch level selection, then configure the new SAP02 Front Panel with the required squelch level setting.

**Figure 29** Radio Microphone Receiver Controls

**DIP SWITCH:**

- SQUELCH LEVEL SELECTION
- PILOT TONE DETECTION CONFIGURATION
- FUTURE USE: CONFIGURATION VIA ROUTER



2. Re-fit the front panel and electronics assembly following the procedure described in Section “[8.4 Installing the SAP02 Front Panel/Electronics Assembly](#)” (page 50).

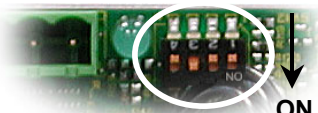
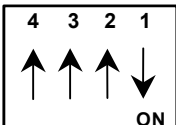
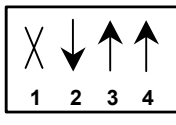


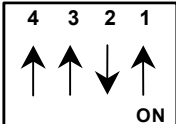
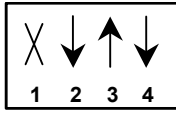

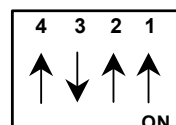
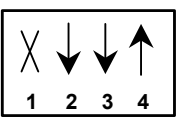
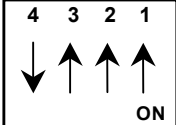
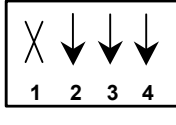
<sup>2</sup> Announcements from non-tone locked transmitters are completely blocked with Radio Microphone Receiver modules of Build Standard (BS) 2B or later. With earlier Build Standards of Radio Microphone Receiver module the audio from non-tone locked transmitters is muted but they can still make chimes and silent routes. These silent routes can still be blocked; please refer to Application Solutions (Safety and Security) Limited for further details.

**Configuring and Testing the New SAP02 Front Panel/Electronics Assembly:**

1. The SAP01 configuration via system front panel or PC Configuration Tool can be used by the SAP02, however due to hardware differences, the following microphone audio parameters need to be re-commissioned, as described in Section “6 Commissioning the SAP02” (page 34):
  - a. Microphone surveillance tone detection  
See Section “6.4.2 Microphone Surveillance Tone Detection” (page 36).
  - b. Microphone relative output gain  
See Section “6.4.3. Microphone Relative Output Gain” (page 37).
  - c. Microphone equalisation  
See Section “6.4.4. Microphone Equalisation” (page 38).
2. Clear any existing faults by pressing the FAULT CLEAR button on the system front panel.
3. Make sure that no fault is reported for the SAP02, refer to Section “7 Fault Finding” (page 44).

**SAP01 Reference Data:**

**Table 8** Radio Microphone Receiver Squelch Level Selection – Conversion from SAP01 to SAP02

DIP Switch Positions			Receiver Squelch Level	Received RF Signal Strength	
Location on PCB	Original SAP01 Settings	Equivalent SAP02 Settings			
<p><b>SAP01</b></p>  <p>(Factory default)</p>	 <p>ON</p>	 <p>ON</p>	Least sensitive -76 dBm		
	 <p>ON</p>	 <p>ON</p>	-86 dBm		
<p><b>SAP02</b></p>  <p>(Factory default)</p>	 <p>(Factory default)</p>	 <p>(Factory default)</p>	-93 dBm		
	 <p>ON</p>	 <p>ON</p>	Most sensitive -99 dBm		

Refer to Table 5 (page 33) for further details on SAP02 squelch level settings.

## 9 Product Specification

### 9.1 SAP02

---

#### General

---

Supply Voltage Range.....	18 – 40 V DC
Current Consumption without RMR02 Radio Microphone Receiver	
Min., all LEDs off .....	110 mA @ 24 V DC supply
Max., all LEDs on .....	125 mA @ 24 V DC supply
Current Consumption with RMR02 Radio Microphone Receiver	
Min., no announcement.....	260 mA @ 24 V DC supply
Max., all LEDs on .....	295 mA @ 24 V DC supply
Audio Output.....	0 dBu balanced (nominal)
Output Impedance .....	66 $\Omega$
Microphone Control Data.....	EIA RS485 / 19200 baud
Commissioning Port Data.....	EIA RS485 / 9600 baud

---

#### Others

---

Colour .....	Agate Grey RAL7038 Low Smoke and Fume, Zero Halogen
--------------	--

---

#### Dimensions and Weight

---

Dimensions (H x W x D) .....	500 mm x 150 mm x 151.5 mm
Weight.....	10.4 kg max.

---

#### Environmental

---

Temperature (storage and operating) .....	-5 °C to +50 °C
Humidity Range .....	0% to 93% Non-condensing
Ingress Protection.....	IP65 With door closed, and back box fixing and cable entry holes sealed

---

#### Safety and EMC

---

EMC.....	EN55103-1, EN55103-2, EN50121-4, EN61000-6-2, EN61000-6-3
Safety.....	EN60065

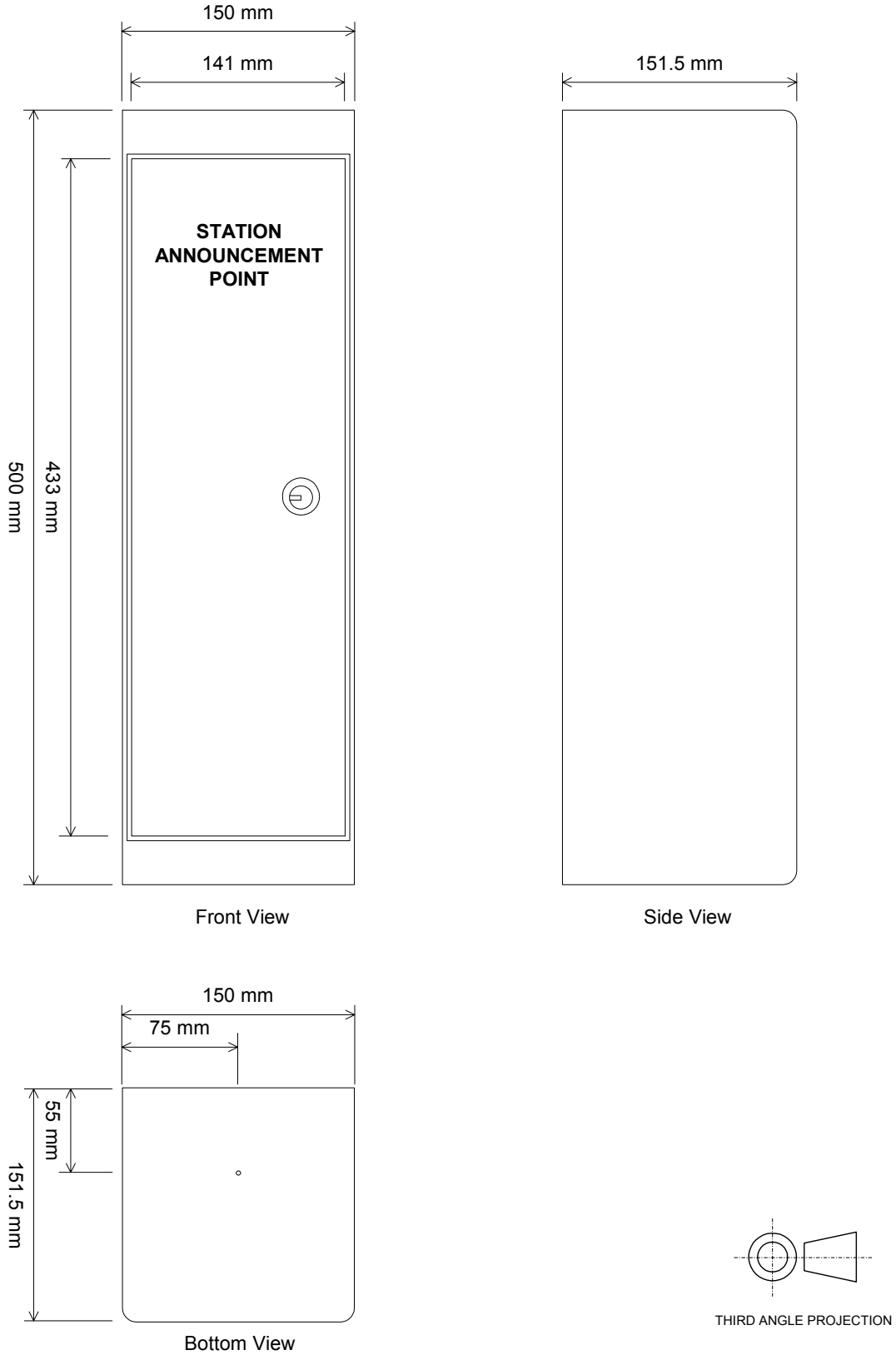
## 9.2 RMR02 Radio Microphone Receiver (optional)

### General

Supply Voltage Range.....	12 – 18 V DC
Current Consumption	
Idle.....	245 mA@ 12 V
Max., all LEDs on .....	265 mA @ 12 V
Phantom Power .....	9.3 V nominal
Phantom Power Current Limit .....	44 mA
Audio Output Level .....	-10 dBu ( $\pm 1.5$ dB) for 22 kHz deviation, 1 kHz mod
THD .....	< 1.3%
Audio Frequency Response .....	70 Hz – 18 kHz, -3 dB
Sensitivity.....	Better than -107 dBm for 12 dB SINAD
Signal / Noise Ratio .....	>100 dBA
Squelch Level .....	4 levels (selectable)
Status LED Thresholds	
LED4 (uppermost when the Receiver is mounted in the SAP) .....	-74 dBm
LED3.....	-79 dBm
LED2.....	-86 dBm
LED1.....	-93 dBm
Operating Frequencies .....	10 frequencies in the Channel 70 licence free band selectable by internal rotary switch <i>Frequencies available from ASL on request</i>

# 10 Mechanical Dimensions

**Figure 30** Mechanical Dimensions



## 11 Safety and Precautions

### 11.1 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.

When installed in accordance to the instructions in this document, the unit with door closed provides IP65 ingress protection.

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.

### 11.2 ESD

This product contains static-sensitive devices. Observe ESD precautions when working on the equipment with the cover removed.

### 11.3 Electrical Safety

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

### 11.4 Unpacking and Handling

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

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.

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

Advice on packing the product for return can be provided by Application Solutions (Safety and Security) Limited.

## 12 Accessories

**Table 9** SAP02 Accessory List

ASL Part Number	Additional Information
RADIO-MIC-LEADS	Adaptor lead pair Function: Adaptor leads (long and short) to connect the Microphone Receiver to RG213 or H1000 antenna cable. Location: Back box Manufacturer/Supplier: Application Solutions (Safety and Security) Limited Manufacturer/Supplier Part No.: RADIO-MIC-LEADS Manufacturer/Supplier Description: Adaptor lead pair (long and short)
RMR02	Radio Microphone Receiver Function: Radio Microphone Receiver, fixing screws, and washers. Location: Front panel (internal to the back box) Manufacturer/Supplier: Application Solutions (Safety and Security) Limited Manufacturer/Supplier Part No.: RMR02 Manufacturer/Supplier Description: Radio Microphone Receiver
CBL01	RS232/485 Commissioning Port lead Function: Interface from PC to SAP02 Commissioning Port. Location: Front panel Manufacturer/Supplier: Application Solutions (Safety and Security) Limited Manufacturer/Supplier Part No.: CBL01 Manufacturer/Supplier Description: RS232/485 Commissioning Port lead

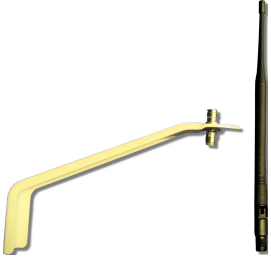

## 13 Spare Parts

**Table 10** SAP02 Spare Part List

ASL Part Number	Additional Information
A0464646	Complete back box assembly Function: Houses the SAP02 front panel and electronics assembly. Location: NA Manufacturer/Supplier: Application Solutions (Safety and Security) Limited Manufacturer/Supplier Part No.: A0464646 Manufacturer/Supplier Description: Complete back box assembly
A0464647	Complete front panel and electronics assembly (less Radio Microphone Receiver) Function: Provides SAP02 microphone functions. Location: Back box Manufacturer/Supplier: Application Solutions (Safety and Security) Limited Manufacturer/Supplier Part No.: A0464647 Manufacturer/Supplier Description: Complete front panel and electronics assembly
K0464640	SAP02 Front panel blanking plate Function: Blanking plate used when the Radio Microphone Receiver is not fitted. Location: Front panel Manufacturer/Supplier: Application Solutions (Safety and Security) Limited Manufacturer/Supplier Part No.: K0464640 Manufacturer/Supplier Description: Blanking plate
A0464602	SAP02 door Function: Protect SAP02 front panel and electronics assembly. Location: Back box (front side) Manufacturer/Supplier: Application Solutions (Safety and Security) Limited Manufacturer/Supplier Part No.: A0464602 Manufacturer/Supplier Description: Complete SAP02 door (with hinge pin)
205296	KABA key Function: Lock/unlock cabinet door. Location: Front panel Manufacturer/Supplier: Kaba UK Ltd. Manufacturer/Supplier Part No.: KEY M62613 Manufacturer/Supplier Description: KABA master key



## 14 Appendix – Antenna Types

Type	Description
<p><b>ANT03</b></p> 	<ul style="list-style-type: none"> <li>• Whip radio microphone antenna</li> <li>• Frequency: 840 – 875 MHz</li> <li>• Connector: TNC, jack</li> <li>• Antenna size: 242 mm length</li> <li>• Bracket size: max-48 mm min-35 mm x 244 mm</li> <li>• For further details refer to the Product Overview, [<a href="#">Table 11-5</a>].</li> </ul>
<p><b>ANT04</b></p> 	<ul style="list-style-type: none"> <li>• Low profile omnidirectional radio microphone antenna</li> <li>• Flame retardant LSZH ABS enclosure</li> <li>• Frequency: 840 – 880 MHz</li> <li>• Connector: N type, jack</li> <li>• Antenna size: 27.98 mm x 70.61 mm x 193.26 mm</li> <li>• For further details refer to the Product Manual, [<a href="#">Table 11-6</a>].</li> </ul>

## 15 Reference Documents

Additional reference information may be found in the following documentation, available from the “Data Downloads” page of Application Solutions (Safety and Security) Limited website:

[www.asl-control.co.uk/downloads](http://www.asl-control.co.uk/downloads)

**Table 11** Reference Documents

Ref. No	Title	Filename Ref	Origin
1	RPA01 Radio Microphone Transmitter Product Manual	U-0618-0086	ASL
2	RMR02 Radio Microphone Receiver Kit Product Manual	U-0618-0085	ASL
3	SAP01 Station Announcement Point	U-0464-0414	ASL
4	RADIO-MIC-TX Radio Microphone Transmitter Product Manual	U-0464-0515	ASL
5	ANT03 Product Overview	U-0464-0322	ASL
6	ANT04 Product Manual	U-0464-0248	ASL
7	ANC01 Product Manual	U-0464-0247	ASL
8	VAR Router Operation Manual	Refer to ASL quoting the SW version of your unit for appropriate guide	ASL
9	VAR8 Operation, Commissioning, Fault Finding, and Maintenance Guide	Refer to ASL quoting the SW version of your unit for appropriate guide	ASL
10	VAR8-ACU Operation, Commissioning, Fault Finding, and Maintenance Guide	Refer to ASL quoting the SW version of your unit for appropriate guide	ASL
11	Intellevac SW Commissioning and Operation Guide	Refer to ASL quoting the SW version of your unit for appropriate guide	ASL
12	8x8 DAU200 / DAU400 Installation Guide	U-0518-0852	ASL
13	8x8 ACU and ACS Series Installation Guide	U-0518-0854	ASL

## 16 Index

### A

accessory.....	63
announcement	
chime.....	7, 8
priority .....	8
antenna	
combiner unit.....	5
low profile .....	5
whip.....	5

### B

background music.....	39
button	
radio mic on/off.....	7

### C

commissioning .....	7, 34
commissioning port .....	7, 27
connection	
antenna cable routing .....	19
flying lead .....	14
gland position .....	18

### D

dimensions.....	61
-----------------	----

### E

equaliser	
3-band .....	38

### H

high pass filter.....	38
-----------------------	----

### L

led	
radio mic active .....	7, 8
radio mic selected .....	7, 8
signal level .....	7
speak now .....	7, 9
zone busy.....	7, 8

### M

microphone	
audio parameters .....	36, 38, 39, 40
chime .....	40
class .....	42
control parameters .....	41, 42
equalisation .....	38
fade up and down.....	39
input gain .....	35
led mode.....	43
monitoring.....	5
name .....	42
priority.....	41
ptt button .....	35
ptt button cough time.....	35
router input .....	34
surveillance tone .....	5, 36

### P

packing.....	69
--------------	----

### R

radio microphone receiver	
frequency.....	5, 21
pilot tone.....	14, 32, 57
signal level indicator.....	7
squellch level.....	5, 14, 21, 33

### S

spare parts .....	64
station announcement point.....	5
build standard version .....	13, 23, 46
components.....	12
electronics assembly.....	13, 23, 28

### U

upgrade.....	26, 48, 55
--------------	------------

### W

warranty .....	2, 69
----------------	-------

This page intentionally left blank.

## 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.



Application Solutions (Safety and Security) Limited

[www.asl-control.co.uk](http://www.asl-control.co.uk)