

Radio Front End (RFE) Installation Guide



Aidcall operates a policy of continual product improvement and reserves the right to modify the specification of its products.

If any variation to the details in this document are suspected please contact Aidcall's Technical Support.

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1. PRODUCT OVERVIEW

Touchsafe Pro RFE's are used to transmit and receive radio signals to/from all the wireless devices on the Nursecall system. A maximum of 64 RFE's can be installed per site; up to 32 "Network Nodes" are fitted inside or connected to Display Panels plus a further 32 "Wireless Nodes" can be deployed in remote locations throughout the building. Wireless Nodes effectively "fill the gaps" between Network Nodes to complete the Digimesh network and provide a radio route back to the Master Panel from any wireless device on the site.

Network Nodes are Line Powered RFE's with a hardwired power and data connection to a Display Panel.

Note: a Display Panel with a factory fitted internal RFE counts as one Network Node.

Wireless Nodes (or Remote RFE's) are generally Mains Powered RFE's that have no hardwired data connection to a Display Panel. Multiple wireless nodes may be required to achieve full radio coverage throughout the building. The total number and positioning of these wireless nodes will be determined by an RF site survey prior to commencing the installation.

Wireless Nodes require a local mains supply or a hardwired connection to a 12V DC supply; this can be taken from any Display Panel, the AVI/TCR bus or an additional battery backed PSU. Each Display Panel must have one fully connected (power and data) Network Node; this can be a factory fitted internal RFE or an external Line Powered RFE.

2. IMPORTANT SAFETY INSTRUCTIONS

	Read and understand these instructions before use. Keep these instructions for future reference.
	Take care when working on step ladders during installation or service.
	Do not disassemble this product when connected to a power source. Isolate the mains supply on the ZNC555 model before removing the covers.
	No user serviceable parts inside. Refer all servicing to qualified service personnel.
	ZNC550 models should only be connected to a battery backed 12V DC supply. ZNC555 models should only be connected to a 220-240VAC 50/60Hz mains supply. ZNC560 models should only be used with Plug Top PSU Model No. UT20-120125B or FAS006P090005.
	Danger of explosion if the rechargeable battery is incorrectly replaced. Use only manufacturer approved battery as identified in this manual. Refer replacement to qualified service personnel.
	This product should be located at least 2 metres away from other electronic equipment. Failure to provide this separation may result in reduced radio range.
	Do not locate this product above a radiator or other heat source.
	Do not expose to direct sunlight.
	Do not submerge in water and do not use in damp or humid conditions.
	Do not expose this product to dripping or splashing water. Liquids can cause a failure and/or a fire hazard.
	Clean with a hard-surface disinfectant wipe or a damp cloth and a non-abrasive cleaning product. Polish with a dry duster. DO NOT use a wet cloth.
	Avoid using harsh, abrasive, or corrosive cleaning agents or detergents (e.g. scouring powders, bleaches, polishes, etc.) when cleaning this product.
	At the end of its life this product should be disposed of and recycled in accordance with the environmental regulations. See the Regulatory Information in section 3 below.

3. REGULATORY INFORMATION

	We declare this product complies with the relevant UK legislation on condition that it is used in the manner intended, and in accordance with the current installation standards and/or the manufacturer's recommendations. A copy of the full UKCA Declaration of Conformity is available on request.
	We declare this product complies with the relevant European legislation on condition that it is used in the manner intended, and in accordance with the current installation standards and/or the manufacturer's recommendations. A copy of the full CE Declaration of Conformity is available on request.
	This symbol on the product indicates it is classed as Electrical or Electronic Equipment and should not be disposed of with other commercial waste at the end of its working life. The Waste of Electrical and Electronic Equipment (WEEE) Directive (2012/19/EU) has been put in place to recycle products using the best available recovery and recycling techniques to minimise impact on the environment, treat hazardous substances and avoid increasing landfill. For product disposal please contact your supplier and check the terms and conditions of the purchase contract and ensure this product is not mixed with other commercial waste for disposal.
	This symbol on batteries indicates separate collection. Batteries contain chemicals that can be hazardous to health and the environment and should not be disposed of in the waste bin. The EU Directive (2006/6/EC) has been put in place to ensure the safe disposal and recycling of batteries. Return used batteries to your supplier or drop-off at your local municipal waste recycling depot.

4. MAINTENANCE & CARE

For peace of mind and to ensure your system is maintained to the highest standard Aidcall recommend an annual maintenance contract. This will provide vital assistance in times of need from a nationwide team of trained Service Engineers who specialise in wireless Nursecall systems.

A preventative maintenance visit (PMV) is also available from Aidcall, this covers the replacement of all batteries, a full system test, software updates (where applicable) and a Service Certificate.

For more information on Maintenance Contract Packages and PMV's please contact our customer services team on 01670 357431 or visit our website; <https://www.aidcall.co.uk/maintenance/>

MONTHLY MAINTENANCE

RFE's do not require any regular maintenance. If any RFE's show signs of external damage they should be replaced immediately by a Service Engineer. Products needing repair can be returned via the website; <https://www.aidcall.co.uk/returns-procedure/>

ANNUAL MAINTENANCE

RFE models which include a rechargeable standby battery should be tested every year by a Service Engineer and replaced every 5 years. The same applies to RFE's connected to separate battery backed PSU's. See Section 10 for details of battery types.

5. RFE OPTIONS

There are 3 different models of Touchsafe Pro RFE;

Description	Part No.
Touchsafe Pro Line Powered RFE	ZNC550
Touchsafe Pro Mains Powered RFE	ZNC555
Touchsafe Pro Plug Top PSU Powered RFE	ZNC560

LINE POWERED RFE's

Line Powered RFE's (Network Nodes) require a hardwired power and data connection from a Display Panel without an internal RFE. These RFE's do not contain a standby battery i.e. power will be maintained during a mains failure from the Display Panel's battery backed PSU.

ZNC550 Line Powered RFE



2 Pair Cable (Max 100m)

ZNC510/ZNC515 Panel with No RFE



Alternatively, they can also be used as Remote RFE's (Wireless Nodes) provided they are powered from a separate battery backed 12V DC PSU, a Display Panel aux 12V output or the AVI/TCR network.

ZNC550 Line Powered RFE



1 Pair Cable (Max 100m)

E40121 12V PSU inc Battery Standby



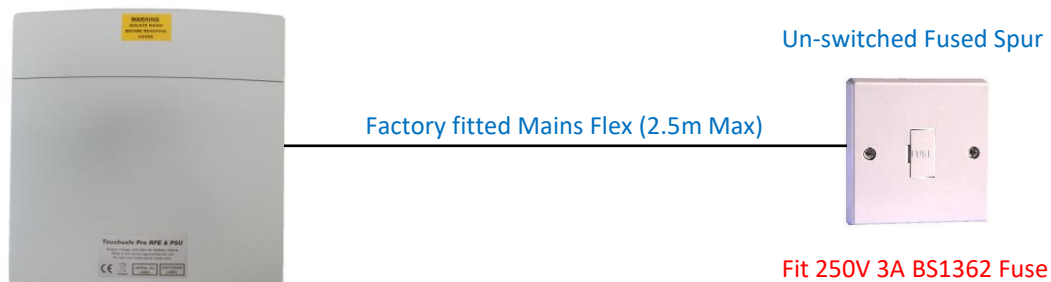
If Line Powered RFE's are connected to the AVI/TCR network check the power supply is not being overloaded by the additional 100mA current requirement of each RFE.

5. RFE OPTIONS

MAINS POWERED RFE's

Mains Powered RFE's require connection to the Mains Supply via a local un-switched fused spur. Mains Powered RFE's are factory fitted with 2.5 metres of 3 core mains flex, they are wireless nodes and do not require a hardwired data connection to a Display Panel. They contain a rechargeable standby battery to maintain operation in the event of a mains failure.

ZNC555 Mains Powered RFE



PLUG TOP PSU POWERED RFE's

Plug Top PSU Powered RFE's require connection to the Mains Supply via a local un-switched 13A mains socket. These are wireless nodes and do not require a hardwired data connection to a Display Panel. They contain a rechargeable standby battery to maintain operation in the event of a mains failure.

ZNC560 Plug Top PSU Powered RFE



Plug Top PSU Powered RFE's should only be used in locations where the mains socket is out of sight or its impossible for the PSU to be accidentally unplugged. Should the PSU be unplugged and the battery runs flat the DigiMesh Network may be broken.

PLUG WRAP



Fit the red plug wrap around the Plug Top PSU module as an extra deterrent against its un-authorized removal.

6. RFE FEATURES

The key features of the RFE options are identified below;

ZNC550 Line Powered RFE



Wall Mounted ABS Enclosure
180 x 180 x 48mm (HxWxD)

Internal RFE PCB and Di-Pole
Antenna

Requires a hardwired data and
low voltage power connection

ZNC555 Mains Powered RFE



Wall Mounted ABS Enclosure
220 x 220 x 50mm (HxWxD)

Factory Fitted 2.5m Mains Flex

Internal SMPSU and
Rechargeable Battery

Internal RFE PCB and Di-Pole
Antenna

Requires a local mains supply
(unswitched fused spur)

ZNC560 Plug Top PSU Powered RFE



Wall Mounted ABS Enclosure
180 x 180 x 48mm (HxWxD)

Plug Top PSU Module with
2.9m Lead

Internal Rechargeable Battery

Internal RFE PCB and Di-Pole
Antenna

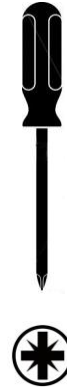
Requires a local mains supply
(unswitched 13A socket)

7. REMOVING THE COVER

Remove the 2 No. M3 x 10mm screws from the top face of the RFE enclosure...



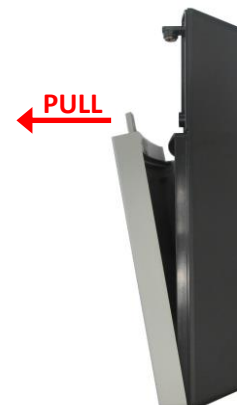
A Pozi screwdriver will be required



Lift off the smaller top cover and remove the 2 Pozi screws holding the lower cover...



With the 2 screws removed pull the top edge of the lower cover towards you and it will un-clip itself from the bottom edge fixings

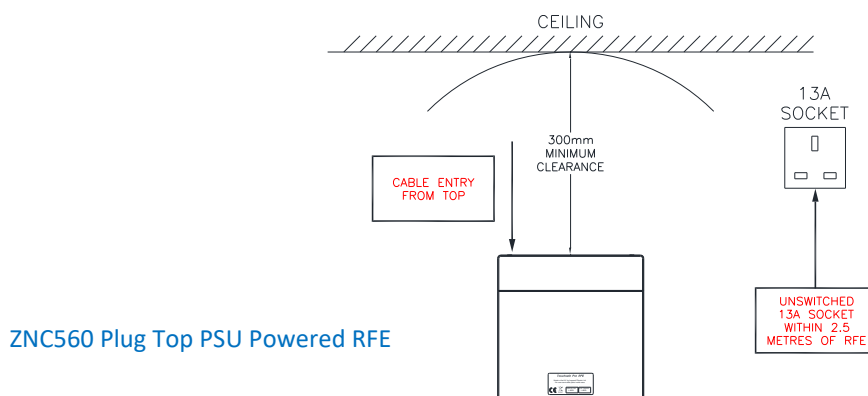
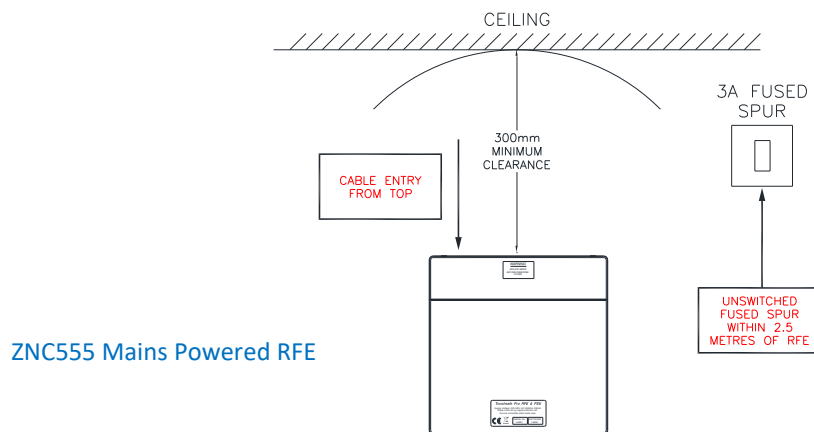
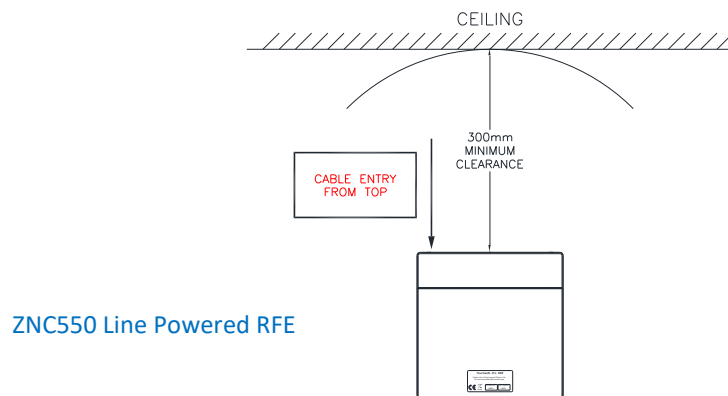


RFE's should only be opened during installation and service – they must be screwed shut at all other times to prevent the risk of electric shock. Never leave a live RFE unattended with the covers removed.

8. RFE INSTALLATION

RFE's are suitable for indoor locations only – **NEVER** fit an RFE externally.

RFE's should be fixed to the wall so the top of the enclosure is a minimum of 300mm from the ceiling.



IMPORTANT: AVOID LOCATING ALL RFE's...



WITHIN 2 METRES OF
OTHER ELECTRONIC
EQUIPMENT



DIRECTLY ABOVE A
HEATER



IN DIRECT SUNLIGHT



NEAR TO SPLASHING
WATER

8. RFE INSTALLATION

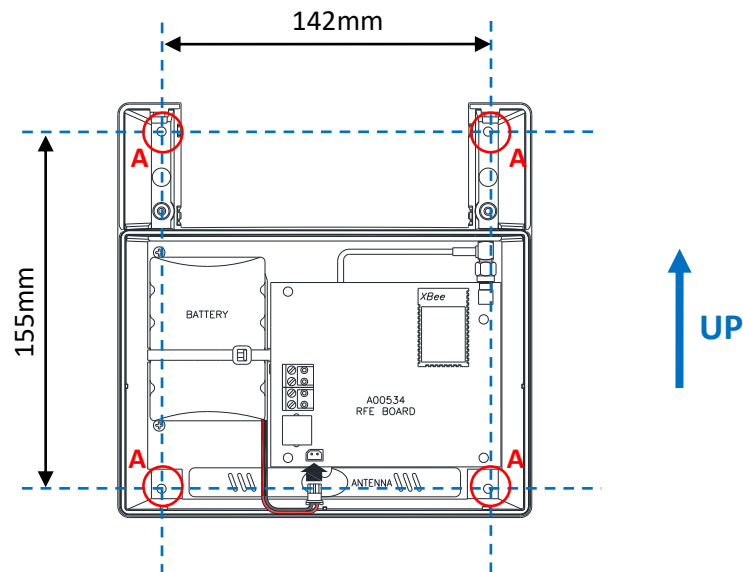
The total number and positioning of the RFE's will be determined by an RF site survey prior to commencing the installation. Construction materials such as foil backed plasterboard, reinforced concrete or stone walls will reduce range. Environmental conditions such as high levels of transmission at nearby frequencies or emissions from other electrical equipment may further reduce range. Clear line-of-sight will give best range. A typical radio range of 100 to 150 metres radius can be expected.

Undo the fixing screws and remove both parts of the RFE cover as described in Section 7.

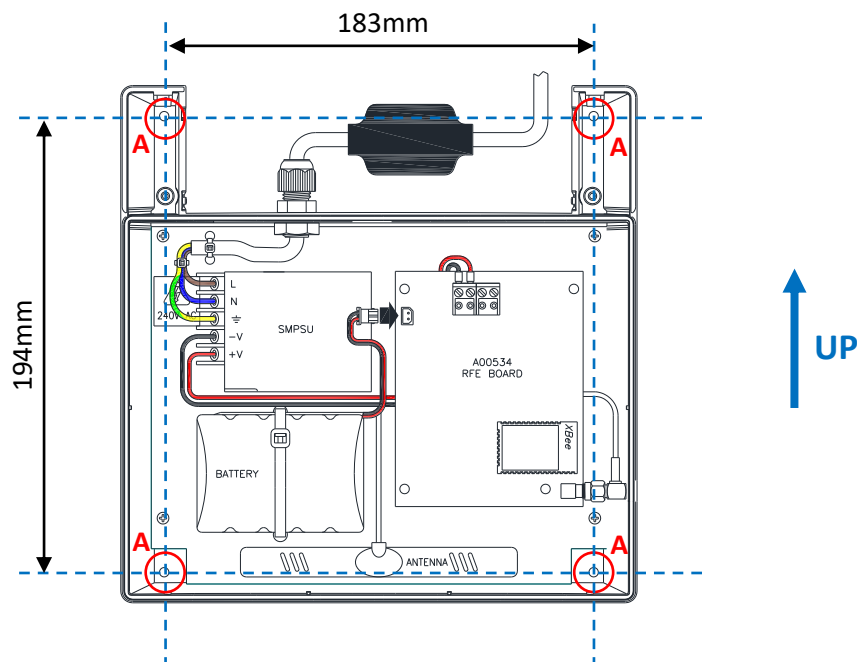
Select the best location as shown on the previous page.

Fix the RFE to the wall with 4 x No.6 x 1" Pozi screws through the 4 corner fixing holes "A" shown below.

ZNC550 & ZNC560 RFE's



ZNC555 RFE



8. RFE INSTALLATION

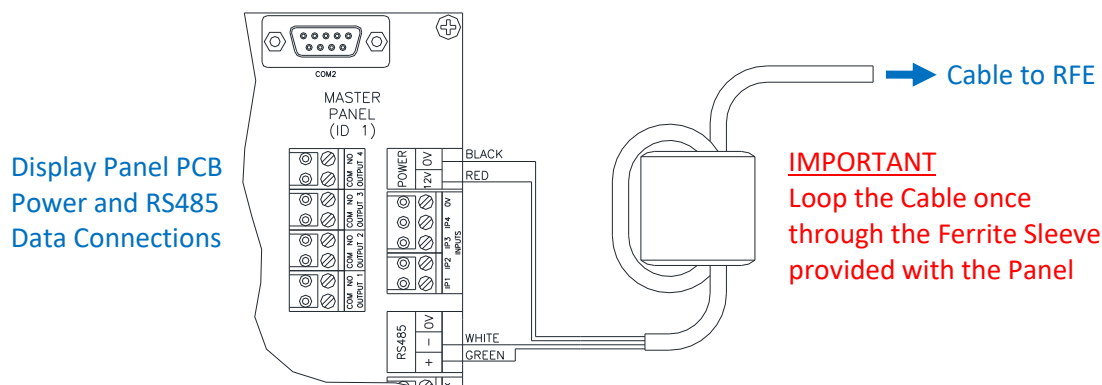
ZNC550 LINE POWERED RFE's

The power & data connection from the Display Panel should be wired using LSF (Low Smoke and Fume) 2 Pair 22AWG individually screened pairs of data cable (Belden Type 8723 or equivalent). This is available from Aidcall in 100m reels; Part No. YW1715.

Pair No.	Colour	Terminal
1	Red	12V
	Black	0V
2	Green	RS485+
	White	RS485-

ZNC550 CONNECTION DETAILS

Connect the RFE power and data to the Display Panel as shown below;



ZNC555 CONNECTION DETAILS

The Mains Powered RFE is pre-wired with 2.5 metres of mains flex for connection to a local fused spur. The fused spur must be installed in line with the latest Edition of IEE Regulations by a qualified Electrician. The spur should be fitted with a 240V 3A BS1362 fuse. The mains flex must be enclosed in conduit or trunking between the fused spur and the RFE. Connect the 3 core mains flex to the fused spur using the colour code below;

Mains Connection	
Colour	Terminal
Brown	Live
Blue	Neutral
Grn/Yel	Earth

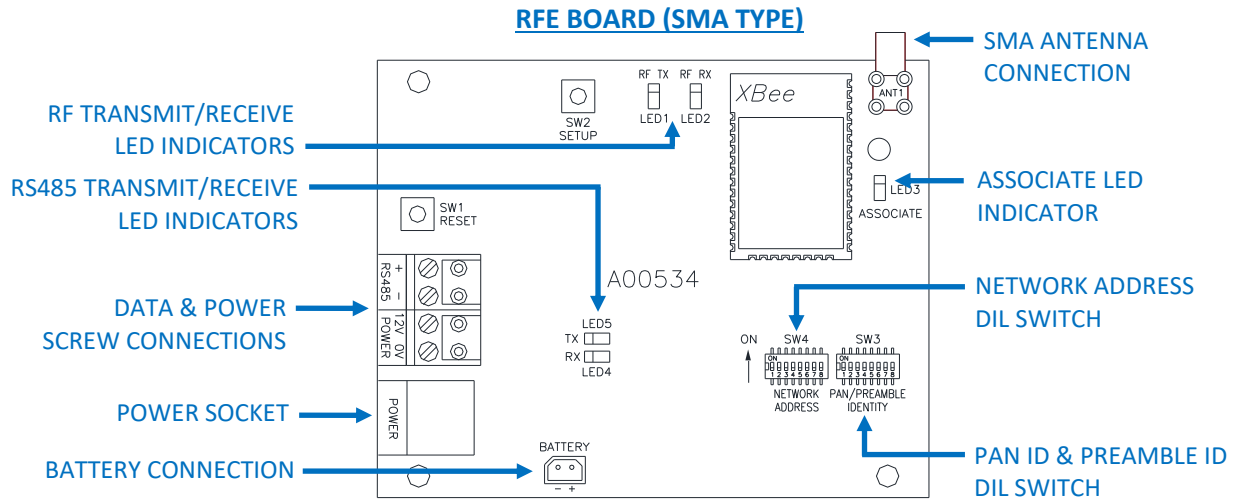
ZNC560 CONNECTION DETAILS

The Plug Top PSU Module has 2.9 metres of low voltage cable with an RJ11 plug. This should be plugged into an un-switched 13A socket with the low voltage cable enclosed in conduit or trunking between the socket and the RFE. Fit the "WARNING – DO NOT UNPLUG" plug wrap on the PSU. Plug the RJ11 connector into the Power Socket on the RFE PCB.

9. RFE SETUP

RFE PCB

All 3 models of RFE have the same PCB inside;



NETWORK ADDRESS DIL SWITCH (SW4)

DIL switches 1 to 6 are used to set the Network Address on each RFE board.

Network Nodes (i.e. ZNC550 RFE's with a data and power connection to Panel) addresses start at 0 for Panel 1 (Master) and continue sequentially to address 31 (Panel 32).

Wireless Nodes (i.e. ZNC555/560 RFE's with no data connection to a Panel) addresses start at 32 and continue sequentially to address 63 max. The Addresses are set in Binary as below;

DIL Switch No.	1	2	3	4	5	6	7	8
Binary Code	1	2	4	8	16	32	Batt	Spare
Panel 1	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF
Panel 2	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
Panel 3	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF
	↓	↓	↓	↓	↓	↓	↓	↓
Panel 32	ON	ON	ON	ON	ON	OFF	ON	OFF
Remote RFE 1	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF
Remote RFE 2	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
Remote RFE 3	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
	↓	↓	↓	↓	↓	↓	↓	↓
Remote RFE 32	ON	ON	ON	ON	ON	ON	OFF	OFF

DIL switch 7 enables/disables standby battery monitoring.

DIL switch 7 should be ON for RFE's powered from a Display Panel or a separate battery backed PSU.

DIL switch 7 should be OFF for RFE's powered from the mains supply with a standby battery connected.

IMPORTANT: all RFE's must be assigned in the Display Panel(s) as **House Code 000** with ID's 001 to 032 for Network Nodes and ID's 033 to 064 for Wireless Nodes. See "ADD ATX" in the System Configuration section of the Display Panel Installation Guide Doc No. FM5500.



Line Powered RFE's (Network Nodes) connected to Display Panels start at Address 0 and run sequentially to 31. Remote RFE's (Wireless Nodes) always start at Address 32 regardless of the number of Panels on the system, i.e. Remote RFE's cannot be Addressed as Panels.

9. RFE SETUP

PAN/PREAMBLE IDENTITY DIL SWITCH (SW3)

The PAN ID is a number (0 - 31) to identify separate Networks on the same site. Separate buildings or wards on the same system can be set on different Networks.

The Preamble ID is a number (0 - 7) to identify the site. Separate sites with independent systems that are within radio range of each other should be set with different Preambles.

DIL switch SW3 is used to set the PAN ID and the Preamble ID on each RFE board.

The PAN ID is set from 0 to 31 using DIL switches 1 to 5.

The Preamble ID is set from 0 to 7 using DIL switches 6 to 8.

The ID's are set in Binary as below;

DIL Switch No.	1	2	3	4	5	6	7	8
Function	PAN ID					Preamble ID		
Binary Code	1	2	4	8	16	1	2	4
PAN ID 0	OFF	OFF	OFF	OFF	OFF			
PAN ID 1	ON	OFF	OFF	OFF	OFF			
PAN ID 2	OFF	ON	OFF	OFF	OFF			
	↓	↓	↓	↓	↓			
PAN ID 31	ON	ON	ON	ON	ON			
Preamble ID 0						OFF	OFF	OFF
Preamble ID 1						ON	OFF	OFF
Preamble ID 2						OFF	ON	OFF
						↓	↓	↓
Preamble ID 7						ON	ON	ON



All wireless devices i.e. Call Points, Pullcords, Door Monitors and Pendants must be setup with the same PAN ID and Preamble as the RFE's within in their local network or site.

LED INDICATORS

Each RFE board has 5 LED indicators to show it is operating correctly;

LED No.	PCB Ref.	Function
1	RF TX	Flash Red when Radio Signal Transmitted to RF Devices
2	RF RX	Flash Yellow when Radio Signal Received from RF Devices
3	ASSOCIATE	Flash Green when RFE's are communicating OK
4	RX	Flash Yellow when RS485 Data Received from Panel
5	TX	Flash Red when RS485 Data Transmitted to Panel

BATTERY

Plug the rechargeable battery lead onto the RFE PCB Battery connector (BT1). The plug is polarised so it will only fit one way.

PUSHBUTTONS

The RESET button will restart microprocessor and XBee RF module. The SETUP button will look for new devices added to the Network; this also happens automatically on power-up or following a RESET.

10. REPLACING THE BATTERY

Mains powered RFE's (Model No's ZNC555 & ZNC560) include a 6V rechargeable battery to maintain normal operation for several hours in the event of a mains power failure.

The rechargeable battery should be un-plugged and tested by a Service Engineer on an annual basis and replaced every 5 years.

Only replace with Manufacturer Approved battery type:

BAT0315 - 6V 1800mAh NiMH Battery Pack

Replacement batteries are available from Aidcall; order Part No. F00144

IMPORTANT: always mark the battery with the date it was replaced for reference on future Service visits.



ADDITIONAL PSU

Line Powered RFE's (ZNC550's) may be powered from a 12V 3A power supply (Aidcall Part No. E40121) which includes a 12V 7Ah rechargeable battery.



**12V 7Ah Lead Acid
Rechargeable Battery**

PSU dimensions: 250x220x85mm (HxWxD)

The rechargeable battery should be removed and tested by a Service Engineer on an annual basis and replaced every 5 years.

With the battery disconnected; check the charge voltage across the battery leads is 13.75V DC and re-adjust if necessary.

If the battery shows any signs of damage, swelling or leakage during an annual inspection it should be replaced immediately.

Only replace with the Manufacturers Approved battery type:

Yuasa NP7-12: 12V 7Ah Sealed Lead Acid Rechargeable Battery

Replacement batteries are available from Aidcall; order Part No. F00622

IMPORTANT: always mark the battery with the date it was replaced for reference on future Service visits.



See section 3 of this manual for Regulations regarding the safe disposal of used batteries.

11. SPECIFICATION

General	
Safety	Compliance to Safety Requirements EN IEC 62368-1:2020+A11:2020
EMC	Compliance to Electromagnetic Compatibility Directive 2014/30/EU
Radio	Compliance to Radio Equipment Directive 2014/53/EU
Materials	Compliance to EU Directive RoHS 2011/65/EU
Radio Frequency	868MHz Mesh Network (30 x 200kHz Channels)
Radio Range	100 to 150 Metres Typical (indoor)
No. of Preamble ID's	8
No. of PAN ID's	32
No. of Network Addresses	64
Pushbutton SW1	Engineers Reset
Pushbutton SW2	Engineers Setup (i.e. scan for new devices)
8 Way DIL Switch SW3	1-5 = PAN ID & 6-8 = Preamble ID
8 Way DIL Switch SW4	1-6 = Network Address, 7 = Battery Monitoring On/Off, 8 = Not Used
LED's 1&2	Red = RF Transmit & Yellow = RF Receive
LED 3	Green = Associate (RFE's communicating OK)
LED's 4&5	Red = RS485 Data Transmit & Yellow = RS485 Data Receive
Antenna	GSM/3G Patch Antenna + 20cm RG316 & R/A SMA Male
Enclosure Material	ASA+PC (Cover: Light Grey RAL 7035, Base: Lava)
Flammability Rating	UL 94 5VB
Relative Humidity	Non-condensing
Operating Humidity Range	20% to 90% RH
Operating Temperature Range	0°C to 50°C
Storage Temperature Range	-20°C to 60°C

ZNC550 Model	
Dimensions	180mm x 180mm x 48.5mm (HxWxD)
Data Connection	RS485 (115200 Baud)
Power Supply	12V DC 100mA
Weight	435 grams

ZNC555 Model	
Dimensions	220mm x 220mm x 50.5mm (HxWxD)
Data Connection	N/A (Wireless Node)
Power Supply	220-240VAC 50/60Hz
Mains Cable	2183Y white 0.5mm 3 core x 2.5 metres long
PSU Module	12V DC 15W SMPSU
Battery Type	1 No. 6V 1800mAh NiMH Rechargeable (BAT0315/F00144)
Battery Standby Period	8 Hours Typical
Weight	1045 grams (inc mains lead)

ZNC560 Model	
Dimensions	180mm x 180mm x 48.5mm (HxWxD)
Data Connection	N/A (Wireless Node)
Power Supply	220-240VAC 50/60Hz
Plug Top PSU Module	9VDC 500mA SMPSU (Model No. FAS006P090005)
Battery Type	1 No. 6V 1800mAh NiMH Rechargeable (BAT0315/F00144)
Battery Standby Period	8 Hours Typical
Weight	570 grams