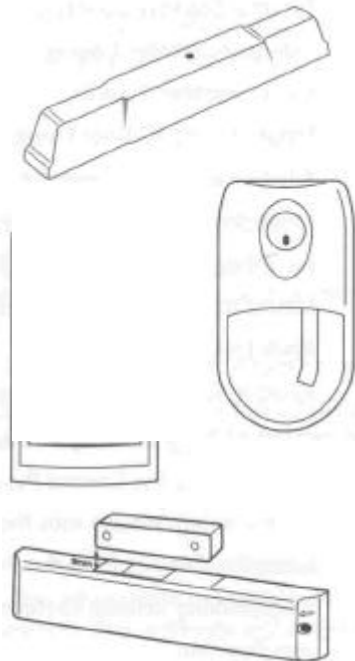
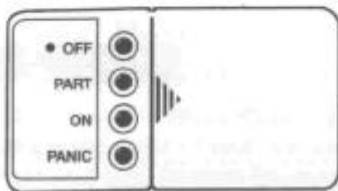
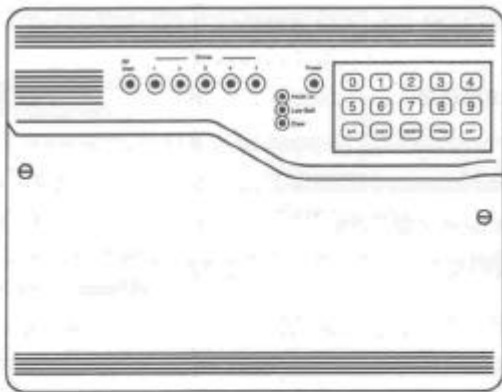


# Optima RF

## Engineering information



- .5-zone system with up to 3 individually identifiable detectors per zone
- .On-board back-lit keypad
- .Chime
- .Zone omit
- .Bell duration
- .Sophisticated anti-jamming protection
- .433.92 MHz operating frequency
- .BS6799 Class 4a system

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## Introduction

This RF alarm system has been designed to be compliant with BS6799 class IV Part a and to ETS 300-200 wireless exemption standard.

The control panel will identify up to a maximum of 15 wireless detectors which operate and function with the same protocol. These being a Door Contact, a PIR (Passive Infra-Red Detector), a Smoke Detector and a Viper Vibration Sensor. Additional to this, up to 6 remote key fobs can be supported. For added security the system has three levels of programmable anti-jamming protection. Further the system can be inter-wired to a communicator or dialler for added security and peace of mind. It is imperative that all detectors carry the 433.92MHz RF Label. Other Radio products cannot be programmed into the Control Panel and will not function as part of the system.

## Before you Begin

Please carefully read and understand the following:

**MAINS WIRING SHOULD BE COMPLETED BY A COMPETENT ELECTRICIAN. A 3 AMP UNSWITCHED FUSED SPUR SHOULD BE USED.**

Before any attempt is made to open the lid of the control panel please ensure that the mains has been isolated.

During the installation, it is advisable to wear safety goggles when drilling or hammering. Before drilling check all around the wall area targeted, for any buried pipes and cables using a quality cable and pipe locator.

## Local Authority Regulations

Depending on the area in which you live, you may be required by law to notify the local authority and/or the police of your new alarm system. This information can usually be obtained from your local Borough Environmental Department. This authority will advise you on siren timer duration.

## Installation Design

It is imperative to plan a Radio installation with extreme care.

The location of the control panel is critical for strong RF reception from the detectors. Being RF based, ambient conditions within any building can affect the system performance. It is therefore important that these be taken into consideration when planning the installation. Take into account foil-backed plasterboard, metal window frames and any large metal objects. Wiring to external or internal sounder should also be considered. All detectors should be located to give satisfactory coverage of the area under protection whilst maintaining good field strength reception at the Control Panel. Neither should be compromised and additional detectors used if either is in doubt.

We recommend that the control panel should be mounted **near the main entry/exit route** for ease of operation.

The control panel will supply a total output of 1 Amp to the bells, internal sounder and any communicators connected, when supported by a fully charged battery. It is therefore important that you calculate the total current drain of the whole system, including the panel, to ensure it does not exceed this 1 Amp.

### Mounting the Control Panel

Remove the bottom front cover from the control panel, unscrew the two speaker wires from the terminals and lift off the top cover.

Disconnect the transformer wires from the AC terminals and carefully lift the printed circuit board by gently pushing down the holding clips at the bottom edge of the board, and withdraw it from the base.

Cable entry holes are provided in the rear of the base and around the outside edge of the enclosure.

There are also thinned out plastic sections that may be cut away as required. We recommend using the round 20mm hole or the opening adjacent to the keypad bracket for entry of the mains cable.

Mount the base squarely on the wall whilst feeding any wiring through the holes provided. Ensure that all wiring is taken through at this time.

Refit the PCB by aligning the round support pillars to the bottom of the panel base. Carefully allow the board to engage down past the clips at the top of the enclosure.

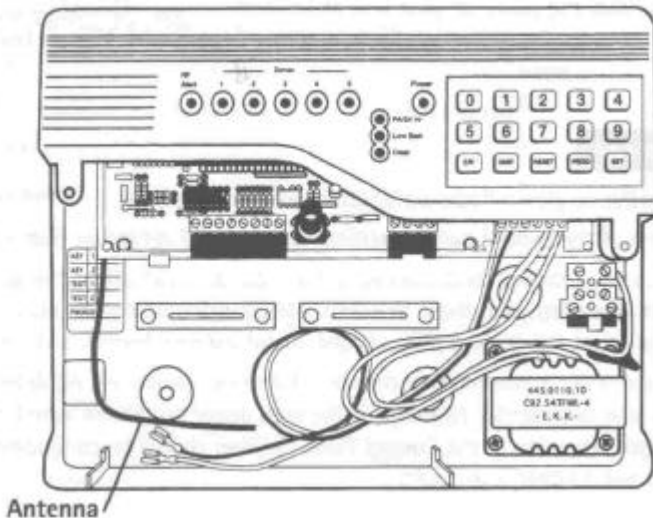
Reconnect the transformer wires into their terminals. (They are not polarity sensitive).

Refit the top cover reconnecting the speaker wires.

Replace the bottom cover.

NOTE: Please ensure that the antenna is routed correctly on the left hand side, as this can significantly affect the performance of the receiver (See figure A)

Fig A



## Mains Connection

### WARNING

The mains supply should only be connected by a technically competent person and according to current IEE wiring regulations.

To avoid the risk of electrical shock you must totally isolate the electrical supply before opening the control panel cover.

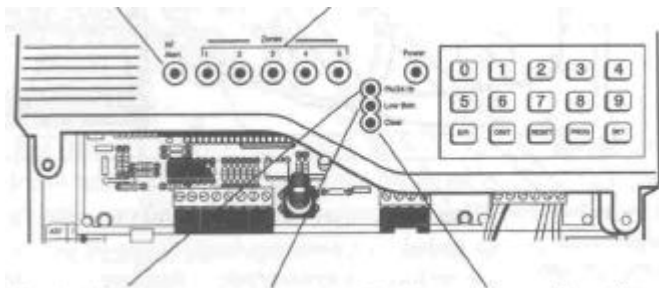
The mains power to the Control Panel should be connected from an unswitched fused spur (3 amps) using a 3 core cable of not less than 0.7mm<sup>2</sup>.

The mains input fuse inside the control panel is located within the mains inlet terminal block. This fuse is rated at 125mA, 250V type T (anti surge) and of a type approved to IEC 127. part 2 sheet III. This value and type must be adhered to when replacement is needed.

Fig B: Indications

RF Alert - Depending on the level of anti-jamming set

Zones 1 -5 -Red, Green or Orange to indicate which detector has been triggered.

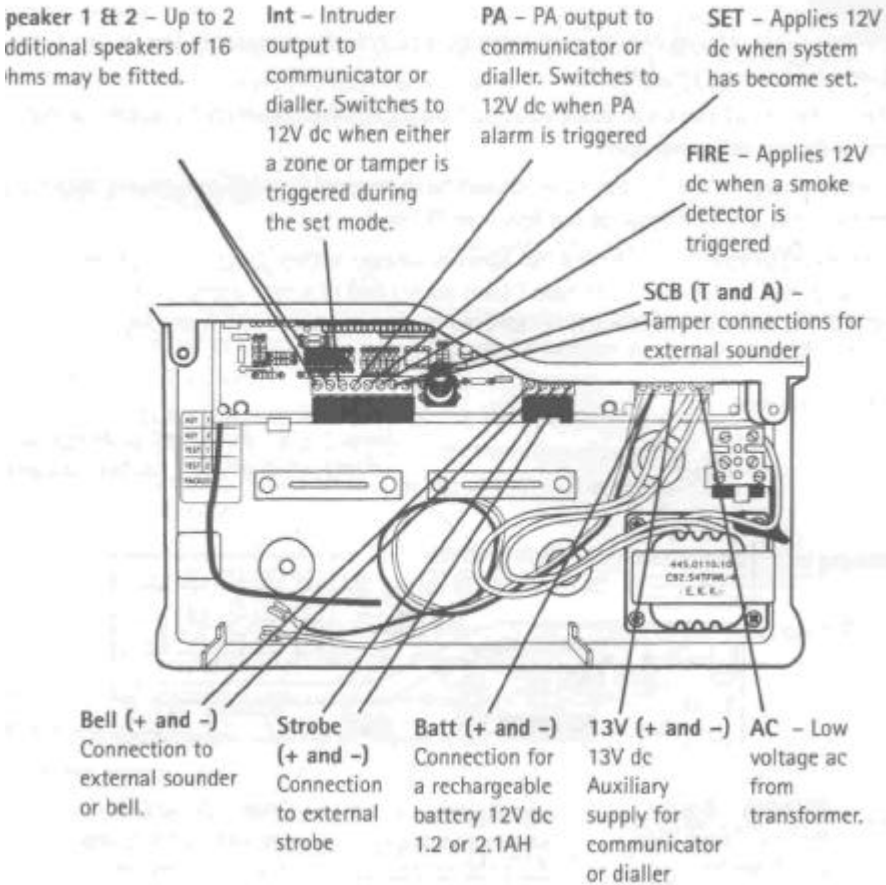


PA24HR -Red for Personal Attack (PA) and Green for tamper / 24HR

Low Battery -Red in conjunction with Zone LED to indicate detector battery replacement required.

Clear -On setting the alarm system, and if all the zones are clear of faults

Fig C: Connections



Ensure that the top cover is fitted and the speaker wires are connected.

Check that the link is fitted to the SCB terminals (7 and 8).

Carefully connect the battery observing the polarity.

The system should now power up into an alarm condition.

Enter the USER code (Factory set 1234). The alarm condition should cease and the panel will be indicating GREEN PA /24HR indication (TAMPER).

Depress and hold down the tamper spring whilst pressing RESET. No indication should be displayed. Panel should be silent

Press PROG (all LED's should light).

Enter the engineer code (Factory set 9999). The system will now be in the programming mode. Low Battery and PA /24HR indications should be flashing.

Release the tamper spring.

## External Sounder Connection

The external sounder is used to indicate that via the sounder and strobe that an alarm or tamper condition has occurred.

### Connections

7	T	-ve tamper return
8	A	-ve supply (OV)
9	D	+ve supply (12V)
10	B	-ve sounder Trigger
11	Strobe	+ 12V dc supply
12	Strobe	-0v strobe trigger

For ease of installation sounder and modules use the same T A D B terminals. Ensure connections are matched correctly when using another manufacturer's sounder.

If only a sounder is connected, use terminals D and B. Terminals T and A are used for tamper protection of the sounder housing.

## Extension Speaker Connections

If the audio output from the Panel is insufficient, up to 2 extension speakers can be connected. They will reproduce all internal sounds produced by the control panel speaker. They are wired to terminals 1 and 2 and should be wired in parallel with the internal speaker panel. Only use 16 ohm. The fitting of other speakers or electronic sounders may damage the panel functionality.

## Communicator Outputs

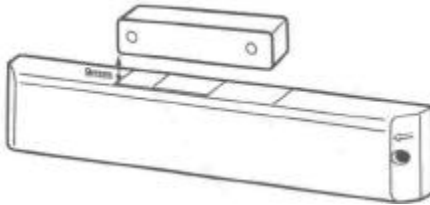
The control panel has 4 dedicated outputs that can be used for a digital communicator or a speech dialler.

### Connections

3	INTRUDER	+ 12V dc when an intruder alarm is activated.
4	PA	+ 12V dc when a Personal Attack is activated.
5	SET	+12Vdc when an alarm is set.
6	FIRE	+ 12V dc when Smoke detector is active.
15	13V+ve	+13V dc Auxiliary supply.
16	13V-ve	-13V dc Auxiliary supply.

## Mounting the RF Door Contact

Fig D



The front cover of the sensor has raised markings on one side to indicate where the magnet part should be positioned. Depending on which side the door is hinged, the large part of the unit may have to be turned the other way to position the magnet contact against the raised markings, as shown in figure D.

The gap between the magnet and main body should not exceed 9mm.

Using the screws provided with the door contact secure the back plate of the large part of the sensor using the hole at the top and the oval hole near the bottom.

Connect the battery to the battery clips.

Slide the front cover down -then up into position.

Refit the securing screw.

Using the screws provided mount the magnet part of the unit. Ensure that the magnet contact is lined up with the raised markings on the main body.

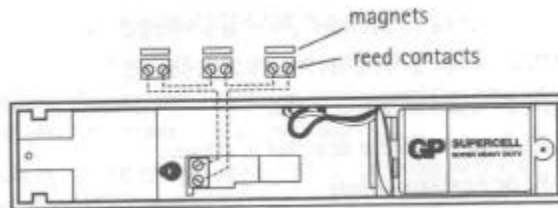
## Additional Magnetic Contacts

The RF Door Contact has the facility for hard wired contacts to be added if there is a requirement to fit more door contacts to an area, i.e. a large window with several openings.

When one of these additional contacts is triggered the RF contact will trigger. The wired contacts are slaves to the RF contact, hence the same zone on the control panel will respond.

Inside the RF contact are two linked terminals. When wiring additional contacts remove the link and wire in the additional contacts. If more than one additional door contact is used, they must be wired in series as shown in figure E.

Fig E: 3 additional contacts wired into RF magnet contact



## Mounting the RF Passive Infra-Red Detector

Choose a suitable location for the PIR. It may be mounted in a room corner or against a flat wall. It is unwise to place it in direct sunlight or above any heat sources, or in areas with large-leaved plants.

Remove the screw at the bottom of the housing and remove the front cover.

Carefully remove the PCB by unclipping from the left hand side.

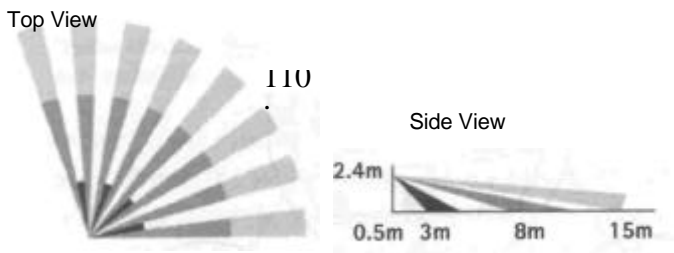
Position the rear plate where it is to be mounted and mark the mounting holes.

Affix the unit to the chosen location.

Place the PCB back into the base and press carefully into place.

Fit the battery supplied and replace the cover.

Fig F: PIR detection areas



## IMPORTANT

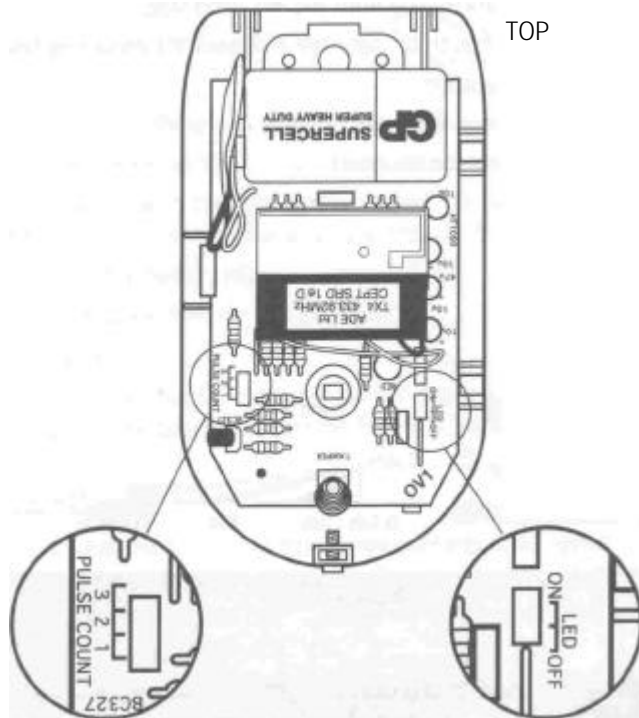
### LED Enable

Once the PIR has been tested. The walk test LED should be disabled to conserve battery life

## Pulse Count

The PIR has three levels of pulse count to overcome problematic situations. This can be adjusted as shown in Figure G.

Fig G: Pulse count jumpers and walk test jumpers



## Mounting the Viper Vibration Sensor

The primary use of the product is to protect windows and doors around the perimeter of a building. On vibration detection the Viper will operate and signal back to the control panel into which it is programmed.

The intent is to detect an attempted intrusion prior to entry actually being activated through the building fabric.

This gives an early warning to the occupier and reduces damage and opportunity for theft.

When the Viper detects an impact above the pre-set sensitivity threshold (see below) the LED will illuminate for approximately 2 seconds indicating that an alarm condition has been sent. Normally the LED is OFF.

The detection area of the device will vary dependent upon the window make-up, size and construction.

Assistance on positioning can be given on request.

It is important that the aerial is not disturbed and remains in the position supplied.

Fig H1

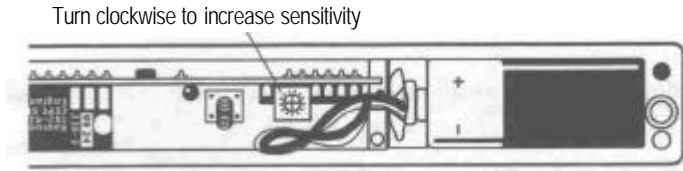
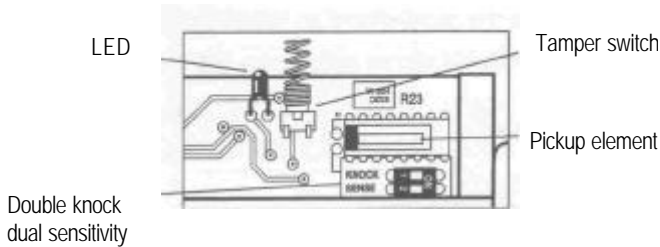


Fig H2



Remove the cover of the detector by undoing the one securing screw.

Slide the cover off from the base moulding. This will expose the PCB area.

Position the detector at the chosen location and affix to the substrate, using the 2 self tapping screws provided. A small pilot hole may be necessary dependent upon the material.

### Calibration

It is recommended that the Sensitivity is set to medium and slowly adjusted higher or lower to the level required, dependent on the prevailing conditions.

Fit the battery supplied, ensuring the correct polarity is observed.

Adjust the sensitivity of the unit by a combination of the potentiometer and DIL Switch Position 1, as shown in Figure H 1.

With DIL Switch Position 1 turned ON the potentiometer can adjust the sensitivity to a setting within the range of LOW to MEDIUM. Turning CLOCKWISE increases the sensitivity .

### Double Knock

If you wish to implement the patented Double Knock feature that ignores the 1st impact and triggers on the 2nd impact, set DIL Switch position 2 to OFF, as shown In Figure H2.

If however the Viper detects a gross attack -Double Knock will be overridden for 8 seconds. After this period the time window is reset. If you require activation on the first impact set DIL Switch position 2 to ON.

Once the set up is complete replace the cover.

## Walk Testing Detectors

Once the detectors have been fitted and programmed into the control panel it is recommended that they are

- ALL tested to ensure they give the required level of detection for that area.

Close all windows and doors under protection -the POWER LED only should be lit.

Press RESET.

Enter the user code -the clear LED should light.

Press SET -the exit time should start.

Wait 3 minutes for all the detectors to settle after the exit time has elapsed.

On entering the protected area the panel should go into alarm condition.

Enter the user code -the alarm will silence and display the zone which had caused the alarm.

Repeat this test for all detectors.

## Mounting the RF Smoke Detector (Optional)

The smoke detector should be installed away from smoke and/or fumes generated by kitchens or solid fuel heating. It should be installed at a recommended height of 2.2 metres. Loosen the securing screw at the bottom of the detector and remove the front cover. Unclip and remove the PCB and place in a safe place.

Position the rear plate where it is to be mounted and mark the mounting holes.

Affix the unit to the chosen location.

Place the PCB back into the base and press carefully into place.

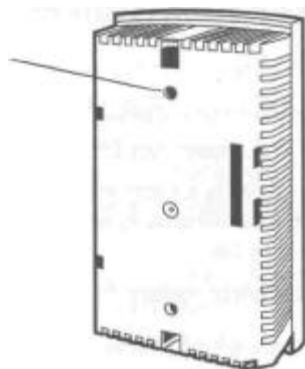
Fit the battery supplied and replace the cover.

## **Calibration**

The smoke detector has been electronically adjusted to a recommended setting. However, if adjustment is necessary turn the screw in the rear -see Figure J.

**Fig J:**

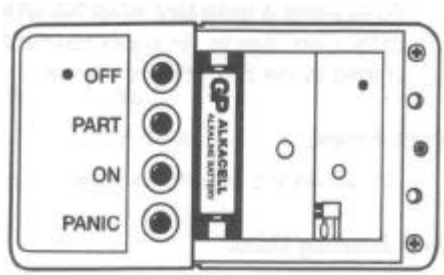
Clockwise decrease the sensitivity.  
Anticlockwise increases the sensitivity.



## Remote Key Fob

I

The device has been designed to work with this RF range of control panels. The keyfob will allow the alarm system to be set, part set, unset and signal panic attack remotely. Some of our kits provide this remote as standard, if so, it will be pre-programmed. If purchased separately, refer to (Programming Remote Keyfob) page 17.



## Reset to Factory Set Conditions

Power the control panel down by removing mains and battery.

Link the two pins on the PCB marked NVM. Reset using a small screwdriver and at the same time connect battery power. After 5 seconds remove the screwdriver.

Restore the mains supply.

The control panel programming will default to the factory set conditions.

The detectors that were programmed into the system will not be cleared by this method and will have to be manually removed using the engineer's programme.

### Description of Programming Attributes

#### Engineers Code Change

This code allows an engineer to programme the alarm system. The code may be reprogrammed to prevent anyone else from accessing this capability.

#### Exit Time

This allows a period of time to leave the protected area before the alarm system sets and is programmable between 1-99 seconds.

#### Entry Time

This allows a period of time to gain access to the property without the alarm sounding and is programmable between 1-99 seconds.

#### Entry/Exit Zones

This allows the engineer to programme which zones are the main entry/exit routes.

#### Bell Time

This adjusts how long the external sounder operates. This should be altered to suit your local environment authority.

#### Walk Through Zones

It is recommended that the zone(s) you pass through to gain access to the alarm panel is used as part of the entry/exit route.

A full alarm is generated when the system is set and any of these zones are activated by entry other than by the prescribed route. This is inhibited when the entry or exit time is started by the correct entry routine.

### **Omit Prevent**

This allows the engineer to prevent zones from being omitted.

### **Anti Jamming Levels**

The following levels are to prevent the system from being jammed and disabling the detectors.

It is possible to programme the jamming duration and the clear duration to make the system more secure.

Level 1 Jamming -This will monitor jamming caused by a constant radio signal. Level

2 Jamming -This will monitor jamming caused by a modulated radio signal. Level 3

Jamming -This will monitor jamming caused by any unrecognised devices.

### **Jamming duration**

This option allows the engineer to decide how long a jamming signal should be present before triggering the alarm, i.e. if a jamming signal is present for 30 seconds then the alarm will be triggered.

### **Clear Duration**

The jamming signal has to be clear for this period of time, otherwise the jamming duration will continue until its timer has expired.

### **Listen and Learn**

This function will listen for any other detectors that are nearby, but not part of this security system, and will learn their identification code. The control panel will then automatically ignore the unwanted signals, i.e. a neighbour might have the same security system but you do not want their security detectors affecting your alarm system.

### **Programming the Control Panel**

This allows the system parameters to be altered.

To enter the engineer programming mode:

Press Prog (all LEDs should light).

Now press 9999 (Default Engineers code). PA /24HR (RED) and Battery Low should light. You are now in the Programming mode.

(To EXIT the programming mode press RESET at any time.)

### Restore to Factory Set Conditions

Press key 0

The system will now return to day mode with factory defaults

This will not clear the detectors programmed into the control panel.

### Engineer Code Change

Press key 1.

Zones 1-4 LED's should light.

Enter a new code (4 digits).

### Exit Time

Press key 2.

Zones 1-2 LED's should light

Enter the new Exit Time, e.g 01=1 second, 99=99 seconds.

### Entry Time

Press key 30

Zones 1-2 LED's should light.

Enter new Entry Time, e.g. 01=1 second, 99=99 seconds.

### Bell Time

Press key 4.

Zones 1-2 LED's should light.

Enter new Bell Time, e.g. 01=1 minute, 99=99 minutes.

### Entry/Exit Zones

Press key 50

The Zone LED's will now display current zones programmed as Entry/Exit.

Press zone to be set as Entry/Exit LED ON zone as Entry/Exit.

Press the PROG button to save setting.

### Omit Prevent

Press key 6.

Zones 1-5 LED's will now display zones which are prevented from being omitted. Select Zone and the Zone LED will toggle either ON or OFF.

Zone LED ON zone(s) not able to be omitted.

Zone LED OFF zone(s) able to be omitted

Press PROG to store new settings.

## System Options

Press key 7.

The zone LEDs will now display current settings. Zone 1 =

Level 2 jamming.

Zone 2 = Tamp full alarm in day.

Zone 3 = Silent pa.

Zone 4 = Level 3 jamming.

Zone 5 = Key fob disable.

Press PROG to store new settings.

### Walk Through

Press key 8.

The Zone LEDs will now display current setting. Select

Zone(s) by keying zone number required. Press PROG to store new settings.

### System Options 2

Press key 9.

The Zone LEDs will show display current settings. Zone 1 =

Final door.

Zone 2 = Strobe on set.

Zone 3 = Signal jam full alarm in day.

Zone 4 = Fire full alarm in day.

Zone 5 = Level 1 jamming.

Press PROG to store new settings.

### Programming Sensors into the System

While in the engineering programming mode (Low Battery and PA /24HR LEDs flashing). Press the PROG key. The LOW BATTERY and CLEAR LEDs will flash alternately.

Select the zone to which the sensor is to be added (Press key 1-5).

The zone LED will light either RED, GREEN or ORANGE depending on which is spare. If the zone LED does not light then the zone already has three detectors programmed.

Now connect the battery to the sensor, but leave the cover open.

The panel will bleep and the detector is now programmed into the control panel.

Now place the appropriate coloured sticker on the detector to identify to which zone it belongs.

## Removing Sensors from the Programming

Performed in the engineering programming mode (low Battery and PA LEDs flashing). Press PROG.

The LOW BATTERY and CLEAR LEDs will flash alternately.

Press PROG low Battery indicator will flash.

Now select which zone should be cleared.

**Press 1-5.**

Press PROG.

The system will now beep twice and that zone will be cleared.

Please note that all 3 detectors on that zone will be cleared.

## Programming Remote Keyfobs

Performed in the engineering programming mode (PA and low Battery LEDs flashing). Press PROG (low Battery and Clear LEDs should be flashing).

Press 6 (low Battery and Clear flashing alternately with PA Flash).

Press the Panic button on the remote keyfob.

Two beeps will sound and the keyfob is programmed into the system.

## Jam Duration

While in engineering radio programming mode (low Battery and PA LEDs flashing). Press the PROG key (low Battery and Clear LEDs will flash alternately).

Press KEY 7.

Enter number of seconds: 01-99 required.

Press RESET to return to engineer mode.

## Clear Duration

While in engineering radio programming mode (low Battery and PA LEDs flashing). Press the PROG key (low Battery and Clear LEDs will flash alternately).

Press KEY 8.

Enter number of seconds: 01-99 required.

Press RESET to return to engineer mode.

## Listen and Learn

Performed in the engineering programming mode (PA and Low Battery LEDs flashing). Press PROG (Low Battery and Clear LEDs should be flashing).

Press OMIT (Low Battery and Clear flashing alternately with Tamper flashing).

Leave the system in this mode for at least 24 hours to record any devices that do not belong to this security system.

When you are happy that the system has learned about any other detectors that are not part of this security system press RESET twice to return to the day mode.

### Factory Set Conditions

User Code	1234
Engineer Code	9999
Exit Time	30 Seconds
Entry Time	30 Seconds
Bell Time	20 Minutes
Entry/Exit Zones	Zone 1
Walk Through Zones	
Omit Prevent All zones (excluding zone 1) can be omitted	

## System Options 1

Level 2 jamming	Off
Tamper in day	Off
Silent PA	Off
Level 3 jamming	Off
Keyfob disable	Off

## System Options 2

Final Door	Off
Strobe on Set	On
Signal Jam Full Alarm	Off
Fire Full Alarm	Off
Levell Jamming	Off
Jamming Duration	30 Seconds
Clear Duration	30 Seconds

## Specifications

Receiver Frequency	433.92 MHz
Indicators	RF Alert (Tricolour), 5 Zones (Tricolour), PA/Tamper (Tricolour) Power (Green), Low Battery (Red), Clear (Green)
Zones	5 x Zones, 3 detectors per zone
Bell Output	12V dc adjustable timer 1-99 minutes
Strobe Output	12V dc Latching
Extension Speaker	16 Ohms (2 max)
Battery Size	12V dc 1.2 or 2.1 Ah
Communicator Outputs	Intruder, PA, Set +ve, Fire (Normally OV, Active 12V dc).
Current Consumption	
Alarm	80mA
Standby	50mA
Total Current Output	1 Amp when supported by a fully charged battery
Low Voltage	13.8V dc stabilised +/-50/0
PCB Fuses	2 x 1 Amp 20mm Quick Blow
Mains Input Fuse	125mA, 250V type T (anti-surge) Type approved to IEC127, part 2 sheet III
Mains Supply Voltage	230V (+/-100/0) 50Hz max load 0.2A
Ambient Operating Temperature	0 to +4°C
Dimensions	H200mm x W253mm x D55mm

## **Faults**

### No Power LED

Check Main Voltage using a digital voltage meter. Check fuse in fuse spur and replace if required.

### Detector Not Triggering Alarm

- Check the battery if fitted in the detector.
- Check if the battery needs replacing.
- Check if the detector is programmed into the control panel.
- Ensure there are no large metal items between the detector and panel.

### Causing False Alarms

Check for any movement near the detector location.

Enable double knock or increase pulse count on the detector.

Heating sources and large-leaved plants can cause problems.

### Blowing Fuses

Check wiring to the external bell box, strobe, 13V dc and extension speaker for any short circuits or incorrect wiring.

If battery fuse blows, remove battery to see if problem persists. If it doesn't, battery is faulty.

## Zone Location Chart

Zone	Colour	Location	Detector Type
1	Red		
1	Green		
1	Orange		
2	Red		
2	Green		
2	Orange		
3	Red		
3	Green		
3	Orange		
4	Red		
4	Green		
4	Orange		
5	Red		
5	Green		
5	Orange		

## Notes