

SA-505

ROSSLARE
SECURITY PRODUCTS

Supervised Wireless Multi-Layer Repeater

Installation Manual

1. General Description

The SA-505 is a sophisticated wireless learning and layering repeater for indoor use.

It extends the range of all Rosslare's wireless units. It also enables working around obstacles between wireless devices and panels.

Up to eight SA-505 units can be daisy-chained to each other, enabling RF signals to be relayed from sensors and remote controls to the panel over large distances for extended-range applications.

Each SA-505 unit is transparent to the panel, eliminating the need for extra registration.

The SA-505 increases capacity by learning the device's ID. This prevents unknown sensors from retransmitting and thus reduces the number of needless transmissions.

The SA-505 includes local programming for learning or deleting sensors and for performing system tests.

It runs on either a 12 to 20 VDC or an 11 to 16 VAC supply. It also has an internal rechargeable backup lithium-ion battery to run up to 24 hours without main power.

The SA-505 is a fully-supervised end device. It sends its own ID and status to the hosting panel to monitor activity, tamper, and battery-level status.

The technically-advanced SA-505 Wireless Multi-Layer Repeater works in 433.92 MHz and 868.35 MHz. This makes it ideal for residential, commercial, and institutional security applications.

1.1 Features

- Single push-button enables easy local programming for registering, deleting, and testing
- RF transceiver with high-performance high-sensitivity receiver and high-power transmitter
- Dual-diversity antenna electronics strengthens the RF signal reception and transmission performance. This also prevents "dead spots" and data loss (due to diverse polarization of reflected signals)
- Daisy-chaining it to up to eight repeaters for extra-long-range installations
- Transparent to the panel, eliminating the need for extra registration
- Continuously checks activity, tamper, and battery-level status
- Rechargeable backup long-life Lithium-Ion battery – provides up to 24 hours of backup on a single charge
- Cover and back-tamper switches:
 - Detects wall removal or case opening by unauthorized people
 - Easily enabled or disabled

Figure 1: SA-505



2. Technical Specifications

2.1 Electrical Characteristics

Input Power	12 to 20 VDC or 11 to 16 VAC 200 mA max.
Backup Power Supply	3.7 V 1,400 mAh Integral Lithium-Ion rechargeable-type battery. Up to 24 hours of backup power.
Current Consumption	Standby – 30 mA Transmit – 40 mA
Learn Mode	Enrolls up to 15 wireless devices on non-volatile memory to the repeat list
Chain Capability	Up to eight repeaters
Supervision	Keep alive battery-level and tamper monitoring
Tamper Detection	On-board cover and wall tamper detection (both enabled/disabled by jumper)
Indication	Bi-color LED for status-registration (delete and test) Green LED for RF indication

2.2 RF Characteristics

Transmission Range	Up to 200 m in an open field
Transmission Power	+10 dBm
Receiving Sensitivity	-110 dBm at 2.4 kBaud 58 KHz BW
Operating Frequency	433.92 MHz (G) and 868.35 MHz (H)

2.3 Environmental Characteristics

Operating Temperature	-10°C to 50°C (14°F to 122°F)
Operating Humidity	Up to 95% non-condensing (max.)

2.4 Physical Characteristics

Weight	169 grams (including battery)
Dimensions (L x W x H)	101 x 99 x 35 mm (4 x 3.9 x 1.4 in.)

3. Installation

3.1 General

Find a location free from obstacles that can block transmission, such as concrete walls, metal frames, or metal pipes.

Mount the repeater on a flat surface and hang it as high as possible.

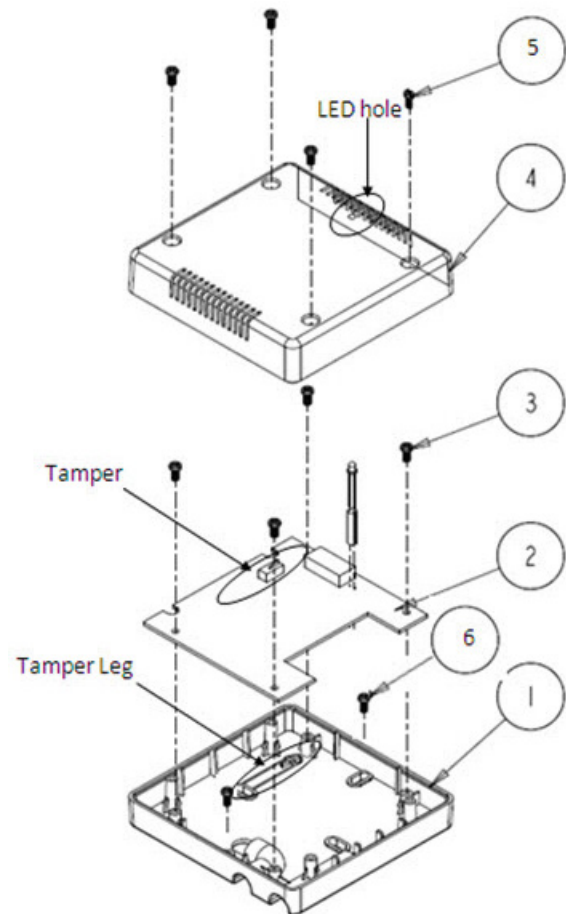
3.2 Installing the SA-505

For the following instructions, please refer to Figure 2.

To install the SA-505:

1. Unscrew the four screws (5) from the case's front cover (4).
2. Remove the case's front cover (4).
3. Unscrew the four screws (3) from the PCB (2).
4. Remove the PCB (2) from the back of the case and carefully place it on a clean surface.
5. Hold the case's back case (1) against where you want to mount the unit.
6. Mark at least two of the four oval drill holes in the case's back (1). Make sure you can insert the power-supply's wire into one of the tunnels without interference.
7. Drill the mounting holes in the locations you marked.
8. Insert the power supply wires through one of the back case's tunnels.
9. Line up the case's back with the holes you just drilled and screw it to the wall, tightening firmly.
10. Replace the PCB (2). Make sure the back-tamper switch is above the tamper-switch's leg (see Figure 2 – Tamper).
11. Screw the PCB back into place (3).
12. Connect the two power-supply wires to the terminal block (polarity is not important).
13. Make sure all jumpers and the DIP switch settings are as required (see Section 4).
14. Connect the power supply and make all the required registrations and settings (see Section 4).
15. After adjusting all settings, reattach the case's front cover on top of the back cover and screw it back in place (5). Make sure to place the LED hole on the front cover over the LED (next to Switch S3 in Figure 3).

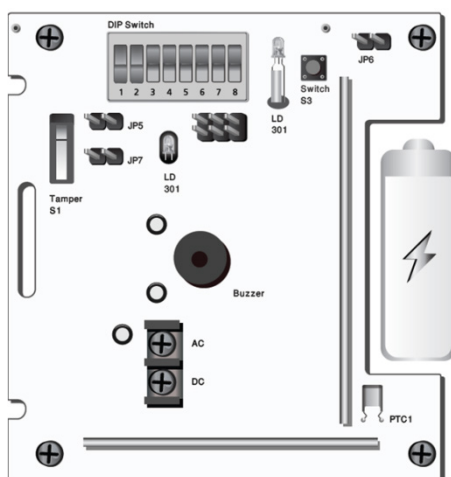
Figure 2: Installing the SA-505



4. Jumper Settings

The SA-505 has three jumpers: JP5, JP6, and JP7 (Figure 3). This section explains their roles.

Figure 3: Layout of SA-505 Supervised Wireless Multi-Layer Repeater



4.1 Rechargeable Battery Connector (JP6)

Use JP6 to connect or disconnect the rechargeable battery.



Battery Connect – JP6 IN



Battery Disconnect – JP6 OUT

By default, JP6 is set to IN (battery connect) to enable using the rechargeable backup battery. If you need to shut down the unit (when moving or storing), you can remove this jumper (OUT). At all other times, it is recommended to set JP6 to IN.



Note There is a thermal fuse connected to the rechargeable battery. If there's an over current from or to the battery, this fuse cuts the current until the problem is solved.

Because the fuse is thermal, it does not need to be replaced once it is activated. After solving the problem, the fuse returns to its normal state.

4.2 Tamper Setting (JP5, JP7)

The JP5 jumper activates the back tamper switch. The JP7 jumper activates the front tamper switch.



Tamper Enabled – IN



Tamper Disabled – OUT

For security reasons, it is recommended to enable both jumpers to ensure full tamper detection.

5. DIP Switch Settings

5.1 Diversity Mode (SW7 and SW8)

The SA-505 has a diversity feature. In Diversity mode, the transceiver alternates between the two antennas instead of using only one.

This enables peaking at the maximum signal when there are dead spots in the area due to signal interference. This usually happens in areas with many obstacles such as buildings.

You can choose between making Diversity mode active or inactive (see Figure 4).

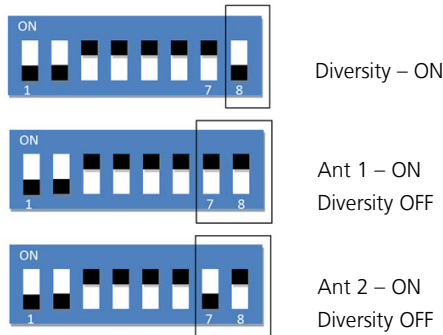
Diversity – Active; SW8 – ON

Diversity – Inactive; SW8 – OFF

Antenna 1 – ON; SW7 – ON

Antenna 2 – ON; SW7 – OFF

Figure 4: DIP Switch Settings for Diversity



5.2 Antenna's Performance Check



You can only perform this test after enrolling the repeater to a panel (see Section 6).

If you are not in Diversity mode, you can check which of the antennas is strongest. This is done by switching between antennas and performing the RF test in the panel (see panel manual). For each transmission, you can view the zone and the RF level it receives.



Even if the RF test shows that one of the antennas is stronger, this does not necessarily mean it is better for detection; therefore, it is recommended to use the diversity option.

6. Repeater Configurations

Each repeater can be registered to up to 15 wireless devices (excluding the KE-30 Wireless Keypad).

Before registering a wireless device to a repeater, you need to:

1. Open the repeater's case to access the **S3** and **S1** buttons (see Figure 4)
 2. Open the tamper switch of the unit you want to register or delete.
- Refer to Figure 4 to locate the parts of the repeater.

6.1 Registering Units to a Repeater

By default, the repeater registers all wireless devices. This procedure shows you how to limit registration to a specific group of wireless devices.

To register wireless devices to a repeater:

1. Press and hold the **S3** button until the first (green-colored) mode LED turns on, and then release it.
2. For each wireless device you want to register, perform a transmission (refer to each detector's manual). On success, the repeater emits two beeps and the Status LED flashes.
3. After registering all wireless devices, press **S3** once more and make sure the mode LED turns off. The repeater is ready for use.

6.2 Deleting a Single Wireless Device from the Repeater

To delete a single wireless device from the repeater:

1. Press and hold the **S3** button until the second (red-colored) mode LED turns on, and then release it.
2. For each wireless device you want to *delete*, perform a transmission (refer to each detector's manual). On success, you hear two beeps and the Status LED flashes.
3. After deleting all required wireless devices, press **S3** once more and make sure the mode LED turns off. The repeater is ready for use.

6.3 Deleting All Wireless Devices from the Repeater

To delete all wireless devices from the repeater:

1. Press and hold the **S3** button until the second (red-colored) mode LED turns on, and then release it.
2. Press and hold the **S1** button. After you hear beeps, release the button. This resets the repeater and thus deletes ALL the registered wireless devices. **In this state, the repeater is open for all wireless devices.**
3. Press **S3** once more and make sure the Mode LED turns off. The repeater is ready for use.

6.4 Checking Device Status in the Repeater

After registering or deleting wireless devices from the repeater, you can check each wireless device's status.

To check the wireless device's status in the repeater:

1. Press and hold the **S3** button until the third (green and red-colored) Mode LED turns on, and then release the button.
2. For each wireless device you want to check, perform a transmission. If the repeater beeps and flashes once, it is registered. If it beeps and flashes twice, it is not.

6.5 Registering the Repeater to the Panel



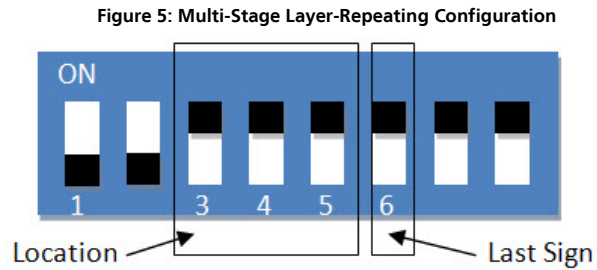
It is not necessary to register the repeater with the panel for regular use. This is only needed if you wish to fully monitor the tamper or battery, or to check if the repeater is still operating.

To register the repeater to the panel:

1. Set the panel to Repeater-Enrolment mode (see panel manual).
2. Press the repeater tamper **S1** button and/or **S2** button (depending on the jumper setting). Make sure the mode LED flashes (see panel manual).
3. Check that the repeater registers in the panel (see panel manual).

6.6 Multi-Stage Repeating Layer Configuration

The multi-stage repeater layer configuration can be used for long distance installations. You can daisy-chain up to eight repeaters, but you have to know the sequence between them (see Figure 5).



SW3-5 is the repeater position in the chain (8 positions maximum). You can set as many as you want, but follow the setting sequence shown in Table 1.

Table 1: Setting Sequence

Repeater	Location	SW3	SW4	SW5	SW6
Level 1	Closest to panel	OFF	OFF	OFF	ON
Level 2	⋮ ↓	OFF	OFF	ON	ON or OFF *
Level 3		OFF	ON	OFF	
Level 4		OFF	ON	ON	
Level 5		ON	OFF	OFF	
Level 6		ON	OFF	ON	
Level 7		ON	ON	OFF	
Level 8	Closest to detector	ON	ON	ON	OFF

* SW6 sign for the last repeater on the chain (closest to the detector). Only this one is set to OFF.

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