

EL-2648

Stand-Alone
Receiver

INSTALLATION GUIDE



Electronics Line 3000 Ltd.

1 Introduction

The EL-2648 is a stand-alone receiver that enables Electronics Line 3000's range of supervised wireless transmitters to be used with most popular hardwire control panels. The stand-alone receiver provides an interface between wireless devices and the control panel's wired zone inputs. The EL-2648 includes a simple, menu-driven programming interface and supports up to 8 individual detectors and 16 keyfobs.

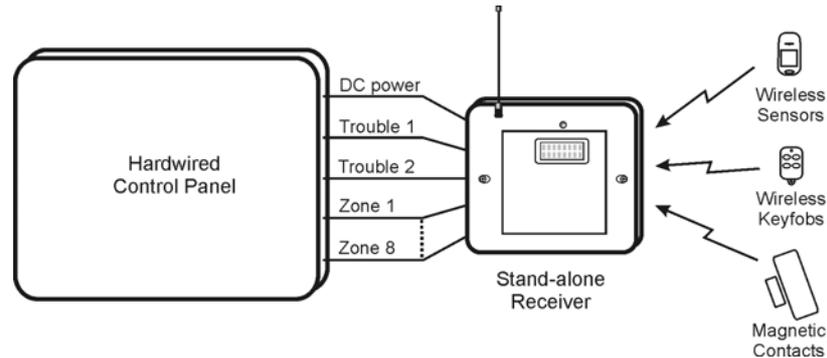


Figure 1: System Overview

2 Installation

This section explains receiver installation, transmitter registration and testing, wiring connections, and keyfob functionality.

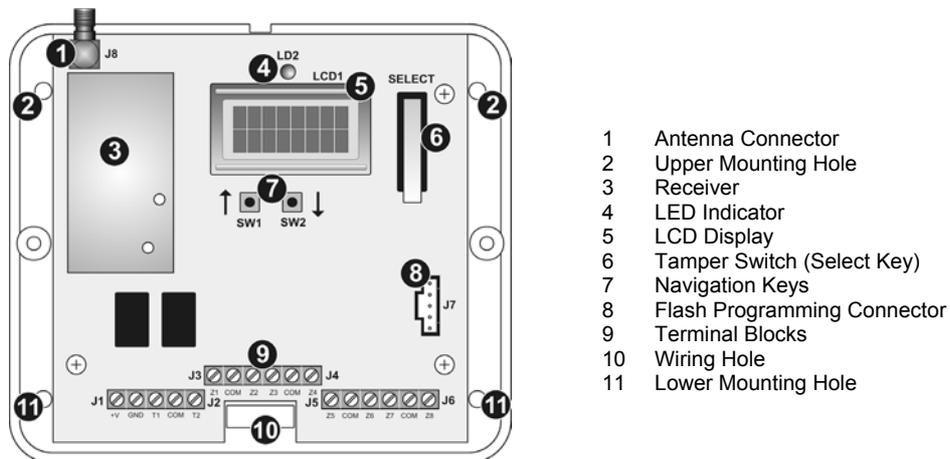


Figure 2: EL-2648 (cover off)

2.1 Receiver Installation

After unpacking the kit and making sure that you have all the necessary equipment, it is recommended that you install the stand-alone receiver as follows:

STEP 1: Plan the installation

STEP 2: Register the transmitters

STEP 3: Test the chosen mounting location

STEP 4: Permanently install the stand-alone receiver and the transmitters

STEP 1: Planning the installation

When planning the installation, consider the following guidelines:

- Whenever possible, mount the receiver centrally in relation to wireless transmitters.
- Avoid installation in close proximity to sources of high noise or radio frequency interference. For example, metal air conditioner/heater ducts and circuit breaker boxes.
- Minimize the distance between the receiver and transmitters.
- Minimize the number of obstacles between the receiver and transmitters.

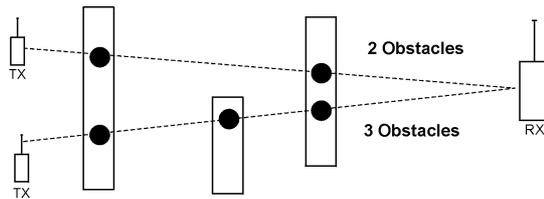


Figure 3: Minimizing Obstacles

- Metal based construction materials, such as steel reinforced concrete walls, reduce the range of radio transmissions.

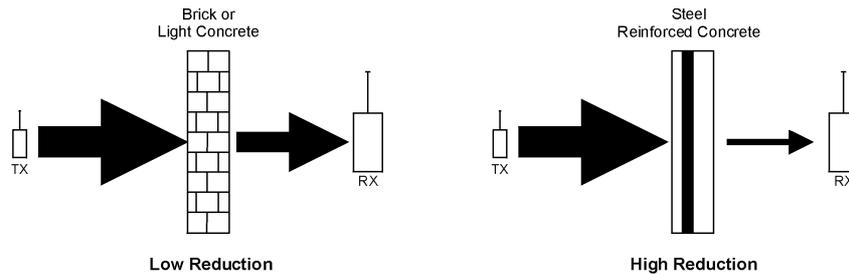


Figure 4: Considering Construction Materials

- The reduction of the RF signals' strength is directly proportional to the thickness of the obstacle, assuming that the obstacles are of identical material.

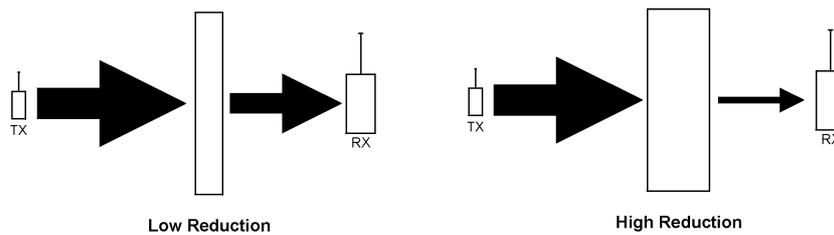


Figure 5: Considering Thickness of Obstacles

STEP 2: Registering transmitters

For the receiver to recognize a transmitter, it must be registered. In general terms, transmitter registration means sending two transmissions from a device when the receiver is in Registration mode.

To register transmitters to the receiver:

1. Open the plastic housing by removing the two cover screws.
2. Connect the provided antenna to the antenna connector.
3. Temporarily apply 9-13.8VDC to the power input terminals in order to register the transmitters to the receiver – see *Figure 6: Terminal Blocks* and *Table 1: Terminal Block Connections*.
4. With the receiver's tamper switch open, press the ↑ and ↓ navigation keys simultaneously to enter programming mode; **MAIN, TESTS** appears on the display.
5. Scroll using the ↑ or ↓ navigation keys until **MAIN, TX REG** appears on the display.
6. Press SELECT (tamper switch); **TX REG, ZONE REG** appears on the display.
7. Press SELECT if you want to register a detector, or ↓ to **KF REG** to register a keyfob.
8. Choose the Zone to which you want to register the transmitter.
9. Activate the transmitter twice; after the two transmissions have been received, **SAVE?** appears on the display.
10. Press SELECT; the transmitter is registered and the receiver is ready to register the next transmitter.
11. Register another transmitter or press ↑ and ↓ simultaneously to exit Registration mode. After 8 transmitters are registered, zone registration mode is automatically terminated.

STEP 3: Testing the chosen mounting location

Once all of the transmitters are registered, it is recommended that you test the chosen mounting locations before permanently mounting the receiver and wireless devices.

To test transmitters:

1. Choose a mounting location for each of the transmitter according to the guidelines given in STEP 1: Planning the installation.
2. With the receiver's tamper switch open, press ↑ and ↓ navigation keys simultaneously to enter programming mode; **MAIN, TESTS** appears on the display.
3. Press SELECT and then ↓ until **TESTS, TX TEST** appears on the display.
4. Press SELECT; **TEST** appears on the display.
5. Activate a transmitter; the transmitter's details are displayed: on the upper line **TEST**, and the transmitters' type; while on the lower line the transmitter's zone/keyfob, and the reception quality (0-9) appear. For example, **TEST PIR, Z3 S=7** indicates that transmitter registered to zone 3 is a PIR detector and has a signal quality of 7. Repeat this test until you determine the optimum mounting location.
6. Test the reception of all transmitters one by one.
7. To exit Test mode, Press ↓ and ↑ together.

STEP 4: Permanently install the stand-alone receiver and the transmitters

Having chosen and tested the mounting location of the receiver and each transmitter, you are now ready to permanently install the receiver and transmitters. To install the transmitters, refer to the individual installation instructions provided with each unit.

To permanently install the receiver

1. Power down the receiver and disconnect the antenna.
2. Place the receiver's rear cover in position against the wall and mark the four mounting holes.
3. Install wall anchors in the appropriate positions.

4. Thread all the required cables through the wiring hole from the rear of the cover and make all necessary wiring connections as described in the following section – *do not apply power yet!*
5. Mount the receiver to the wall using the four screws supplied with the kit.
6. Power down the control panel.
7. Connect the receiver's zone outputs to the control panel's zone inputs as required.
8. Connect the control panel's auxiliary 12V power output to the receiver's DC power input. Alternatively, you may power the receiver using a 12V (200mA) AC/DC adaptor.
9. Close the front cover with the two cover screws.
10. Connect the antenna to the antenna connector.

2.2 Terminal Block Connections

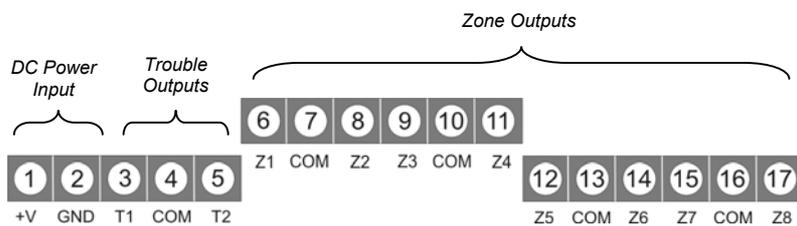


Figure 6: Terminal Blocks

TERMINAL	DESCRIPTION
Terminals 1 (+V) & 2 (GND)	9 - 13.8VDC power input.
Terminals 3 (T1) & 4 (COM)	<u>Trouble 1</u> output – activated by a tamper transmission from a detector, by the tamper switch opened on the receiver, by an out of sync transmitter, by antenna trouble or by RF jamming.
Terminals 4 (COM) & 5 (T2)	<u>Trouble 2</u> output – activated by a Trouble transmission, a Low Battery transmission, AC loss transmission or Supervision loss.
Terminals 6 (Z1) & 7 (COM)	Zone 1 detection device alarm output or ARM/DISARM output for keyfobs.
Terminals 7 (COM) & 8 (Z2)	Zone 2 detection device alarm output or PANIC output for keyfobs.
Terminals 9 (Z3) & 10 (COM)	Zone 3 detection device alarm output.
Terminals 10(COM) & 11 (Z4)	Zone 4 detection device alarm output.
Terminals 12 (Z5) & 13 (COM)	Zone 5 detection device alarm output.
Terminals 13 (COM) & 14 (Z6)	Zone 6 detection device alarm output.
Terminals 15 (Z7) & 16 (COM)	Zone 7 detection device alarm output.
Terminals 16 (COM) & 17 (Z8)	Zone 8 detection device alarm output.

Table 1: Terminal Block Connections

* Only relevant to versions with antenna supervision

2.3 Keyfob Functions

The EL-2648 supports two types of keyfob transmitter, EL-2611 and EL-2614. You can register up to 16 keyfobs to the stand-alone receiver. Figure 7 illustrates these transmitters and the functions assigned to their buttons.

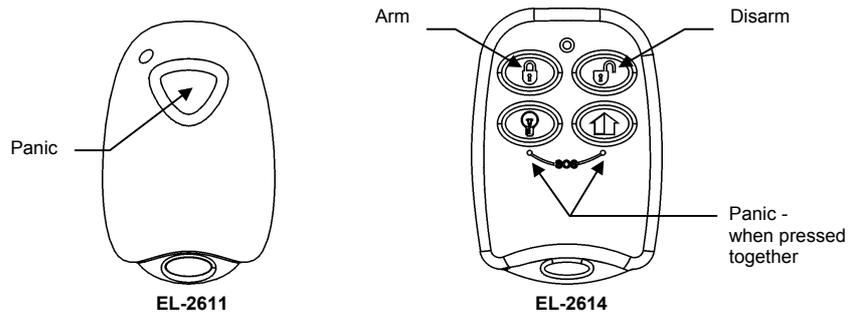


Figure 7: Keyfob Button Assignments

3 Programming

This section explains how to program the receiver, register and delete transmitters, and configure the settings for outputs and functions.

General Notes

- All programming and transmitter registration is performed using the ↓ and ↑ navigation keys and SELECT (tamper switch) located beside the LCD.
- Menu mode automatically terminates 15 minutes after the last keystroke.
- Pressing ↓ and ↑ together enables you to move up a level in the menu or to exit a programming option without saving any changes.
- Hold down the tamper switch for at least five seconds to exit Programming mode.

To program the receiver:

1. Disarm the control panel to which the receiver is connected.
2. Remove the front cover of the receiver.
3. Press ↓ and ↑ together to enter programming mode; **MAIN, TESTS** appears on the display.
4. Press ↓ to scroll through the menu until the required function appears on the display (↑ enables you to scroll backwards).
5. Press SELECT to select the function or press ↓ and ↑ together to cancel the procedure.
6. To exit Programming mode, select **MAIN, EXIT** from the menu or hold down the tamper switch for at least five seconds.

Note: When the receiver is in Programming mode all the outputs function as normal with regard to the control panel. For example, any device that detects will still activate the relevant output even though the receiver is in Programming mode.

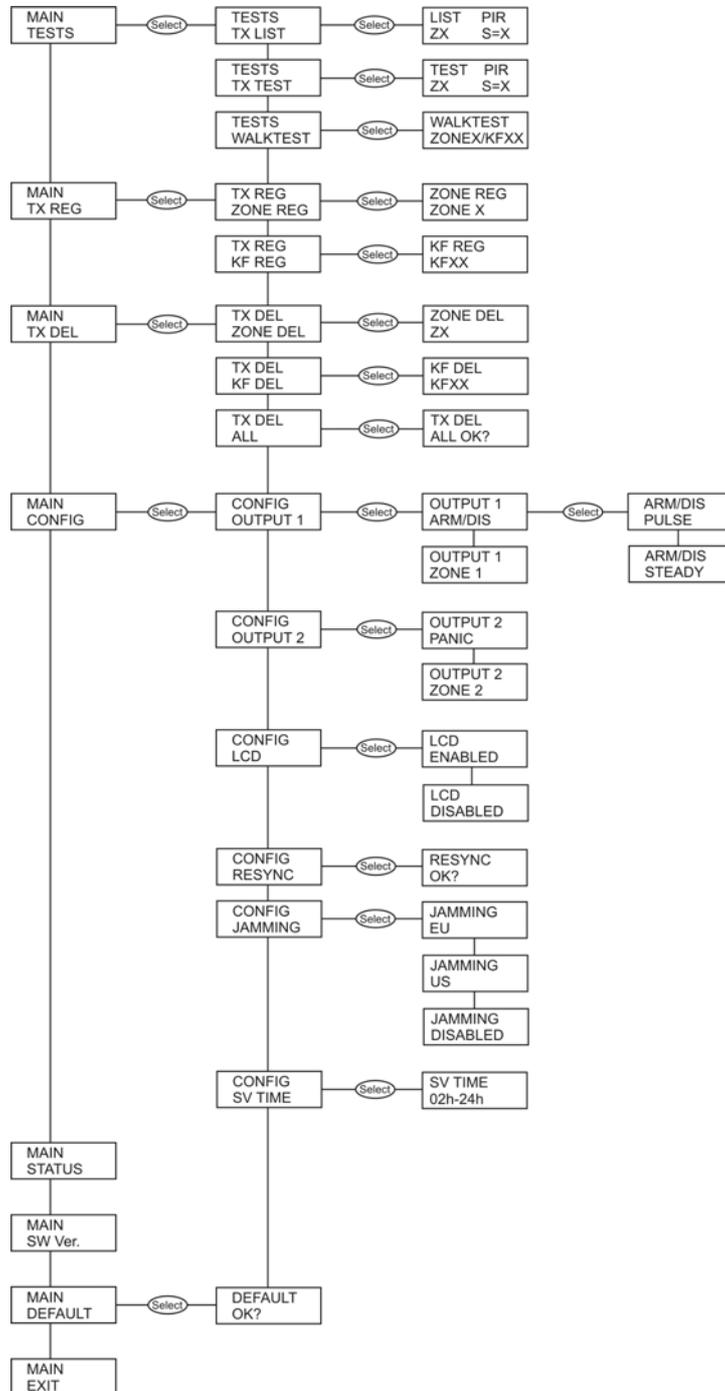


Figure 8: Menu Structure

3.1 General Configuration

To program function settings:

1. In Programming mode, scroll using ↓ or ↑ navigation keys until the **MAIN, CONFIG** appears on the display.
2. Press SELECT and then ↓ or ↑ to view the options.
3. Press SELECT to choose the displayed option or press ↓ and ↑ together to exit the option without saving changes.

The available options are explained in the following table.

OPTION	EXPLANATION
OUTPUT 1	Output 1 can be used as a regular detection device zone or it can be used as the output for Arm/Disarm commands from keyfobs.
OUTPUT 2	Output 2 can be used as a regular detection device zone or it can be used as the output for Panic alarms from keyfobs.
LCD	The LCD option determines whether the display is enabled during normal operation mode (i.e. when the tamper is closed) or during programming mode only (disabled).
RESYNC	Transmissions that are out of synchronization are rejected by the receiver. Re-synchronization of the transmitter with the receiver restores normal operation.
JAMMING	The system is able to detect RF Jamming that is usually caused by an intruder attempting to compromise the security system. Jamming detecting function can be set to European (EU), United States (US) standards, or it can be disabled.
SV TIME	The transmitters send a supervision signal approximately one hour after their last transmission. If the receiver does not receive supervision signals from a specific transmitter, that transmitter is regarded as inactive. Supervision time is the amount of time after which a transmitter is considered inactive. You can program a supervision time between 2 - 24 hours..

Table 2: Configuration Options

3.1.1 Output Configuration

You can program the output settings of zones 1 & 2 to react to detector alarms or commands from keyfobs:

To configure Output 1

1. In Programming mode, scroll using the ↓ and ↑ navigation keys until **MAIN, CONFIG** appears on the display.
2. Press SELECT; **CONFIG, OUTPUT 1** appears on the display.
3. Press SELECT and use the ↓ and ↑ navigation keys to choose the required output type for Output 1.

The following options are available:

- **ZONE 1** – The output is used as a regular zone output.
- **ARM/DIS** – The output reacts to arm and disarm transmissions from 4-button keyfobs (EL-2614). There are two relay operation modes available for Arm/Disarm. To choose the Arm/Disarm mode, press SELECT and use the ↓ and ↑ navigation keys to choose one of the following modes.
 - **STEADY** – intended for use with arm/disarm inputs designed for latching key-switches (i.e. the relay opens to arm and closes to disarm the control panel).
 - **PULSE** – intended for use with arm/disarm inputs designed for momentary key-switches (i.e. the relay opens then closes to arm or disarm the control panel).

4. Press SELECT.

To configure Output 2

1. In Programming mode, scroll using ↓ or ↑ navigation keys until **MAIN, CONFIG** appears on the display.
2. Press SELECT and then ↓ or ↑; **CONFIG, OUTPUT 2** appears on the display.
3. Press SELECT and use the ↓ and ↑ navigation keys to choose the required output type for Output 2.

The following options are available:

- **ZONE 2** – The output is used as a regular zone output.
- **PANIC** – The output reacts to panic transmissions from 1-button keyfobs or SOS transmissions from 4-button keyfobs - see *Figure 7: Keyfob Button Assignments*.

4. Press SELECT.

3.1.2 LCD Configuration

You can configure the LCD display to be enabled or disabled during normal operation. When disabled, the LCD shall still operate during Programming mode.

To configure the LCD display:

1. In Configuration mode, press SELECT and then ↓ or ↑; **CONFIG, LCD** appears on the display.
2. Press SELECT and then ↓ or ↑ to enable or disable the LCD.
3. Press SELECT.

3.1.3 Re-Synchronization

When a transmitter is out-of-synch, its transmissions are rejected by the system and you need to re-synchronize the transmitter.

To re-synchronize a transmitter:

1. In Configuration mode, press SELECT and then ↓ or ↑; **CONFIG, RESYNC** appears on the display.
2. Press SELECT; **RESYNC, OK?** appears on the display.
3. Press SELECT; a 10-minute time window opens.
4. During the 10-minute window, if a transmission is received that is out of synchronization, the transmitter is re-synchronized.

3.1.4 Jamming

When Jamming is enabled, the receiver is able to detect the presence of continued RF interference that may disrupt the reception of real transmissions from registered devices. You can set jamming detection to either US or European standards or disable jamming detection altogether.

To configure the Jamming setting:

1. In Configuration mode, press SELECT and then ↓ or ↑; **CONFIG, JAMMING** appears on the display.
2. Press SELECT and then ↓ or ↑ to configure the jamming EU, US or Disabled.
3. Press SELECT.

3.1.5 Supervision Time

The supervision time is the period after which the transmitter is considered as "inactive" if no transmissions are received.

To set the supervision time:

1. In Configuration mode, press SELECT and then ↓ or ↑; **CONFIG, SV TIME** appears on the display.
2. Press SELECT; **SV TIME, XXh** appears on the display.
3. Use ↓ and ↑ to choose a time between 2 and 24 hours in 1 hour increments.
4. Press SELECT.

3.2 Registering and Deleting Transmitters

Transmitter registration enables the receiver to recognize the source of received transmissions. Once the receiver is installed, up to 8 individual detection devices can be registered, one to each output. In addition you can register up to 16 keyfobs at the expense of detection devices registered to zones 1 and 2 (i.e. if you are using zone outputs 1 and 2 for keyfobs, you can register up to six detection devices to the remaining zones).

Note: If you intend to use keyfobs, make sure that you have correctly programmed the appropriate output in the Configuration section of the menu – see 3.1.1 Output Configuration. If detection devices are registered to zone 1 or 2 and you wish to register keyfobs to the receiver (or vice-versa), it is important to delete unused registered devices.

To register detection devices:

1. In Programming mode, press ↓ until the display shows **MAIN, TX REG**.
2. Press SELECT and then ↓ until **TX REG, ZONE REG** appears on the display.
3. Press SELECT; **ZONE REG, ZONEX** appears on the display (where X is the zone number). Only unregistered zones are included in the list.
4. Choose the Zone to which you want to register the detector.
5. Activate the detector twice; after two transmissions are received, **SAVE?** appears on the display.
6. Press SELECT; the detector is registered and the receiver is ready to register the next detector.
7. After 8 transmitters are registered, registration mode is automatically terminated.

Note: If a transmitter has been previously registered to a different zone, attempts to register will be ignored by the receiver.

To register keyfobs:

1. In Programming mode press ↓ until the display shows **MAIN, TX REG**.
2. Press SELECT and then ↓ until **TX REG, KF REG** appears on the display.
3. Press SELECT; **KF REG, KF XX** appears on the display (where XX is the keyfob number). Only unregistered keyfobs are displayed.
4. Choose a number to which you want to assign the keyfob.
5. Activate the keyfob twice; after two transmissions are received, **SAVE?** appears on the display.
6. Press SELECT; the receiver is ready to register the next keyfob.
7. After 16 keyfobs are registered, registration mode is automatically terminated.

Note: The keyfob transmitter number is only used to identify the keyfob. All keyfobs are associated with the same outputs (1 and 2) according to the key function.

To delete a registered transmitter:

1. In Programming mode, Press ↓ or ↑ navigation keys until **MAIN, TX DEL** appears on the display.
2. Press SELECT. Choose **ZONE DEL** to delete a detection device or ↓ to **KF DEL** to delete a keyfob.
3. Press SELECT,.
4. Press ↓ or ↑ until the required transmitter is displayed. Only registered transmitters are included in the list.
5. Press SELECT; **KF DEL, KFXX OK?** appears on the display (where XX is the keyfob number).
6. Press SELECT to delete the chosen transmitter or press ↓ and ↑ together to cancel.

To delete all registered transmitters:

1. From the **TX DEL** menu, press ↓ or ↑ until **TX DEL ALL** is shown on the display.
2. Press SELECT; **ALL OK?** is shown on the display.
3. Press SELECT to delete all registered transmitters, or press ↓ and ↑ together to cancel.

3.3 Listing Transmitters

Listing all registered transmitters enables you to view all the zones and keyfobs in use, and the quality of their last received transmission.

To view all registered transmitters:

1. In Programming mode press ↓ or ↑ navigation keys until **MAIN, TESTS** appears on the display.
2. Press SELECT; **TESTS, TX LIST** appears on the display.
3. Press SELECT; the first registered transmitter appears on the display.

4. Scroll using ↓ or ↑ navigation keys to view other transmitters.
5. Press ↓ and ↑ together to exit List mode. The List mode will be terminated automatically 60 seconds after the last keystroke.

3.4 Testing Transmitters

Electronics Line 3000 recommends that you check all transmitters after installation. It is also recommended for users to carry out a walk test once a week to ensure that all transmitters are functioning correctly.

To test the transmitters:

1. In Programming mode scroll using ↓ or ↑ navigation keys until **MAIN, TESTS** appears on the display.
2. Press SELECT; **TESTS, TX LIST** appears on the display.
3. Press ↓ until **TESTS, WALKTEST** appears on the display.
4. Press SELECT; the display starts listing all registered transmitters, each for two seconds. For example: **WALKTEST, ZONE03 - WALKTEST, KF01**, etc.
5. Activate each transmitter. Every time a transmission is received, the transmitter is removed from the list. When all transmitters have been successfully tested, **WALKTEST, END** will appear on the display.
6. Press ↓ and ↑ together to exit Walk Test mode.

3.5 Testing Reception

Testing the reception enables you to identify transmitters and test the quality of their signal when transmitting to the receiver. Each time a transmission is received the activated transmitter is displayed.

To test the quality of the signal received from each transmitter:

1. In Programming mode scroll using ↓ or ↑ navigation keys until **MAIN, TESTS** appears on the display.
2. Press SELECT and then ↓ until **TESTS, TX TEST** appears on the display.
3. Press SELECT; **TEST** appears on the display.
4. Activate a transmitter; the transmitter's details are displayed. Four pieces of information appear on the display. On the upper line **TEST**, and the transmitters' type; while on the lower line the transmitter's zone/keyfob number and the signal strength (0-9) appear. For example, **TEST PIR, Z3 S=7** indicates that transmitter registered to zone 3 is a PIR detector and has a signal strength of 7. Repeat this test until you determine the optimal mounting location.
5. Press ↓ and ↑ together to exit Test mode.

3.6 Status

If the LCD is enabled, in normal operation mode, the receiver displays Alarm and Trouble conditions (except for Panic alarms) as they occur. The Status menu enables you to view the status when the LCD is disabled – see 3.1.2 LCD Configuration.

To view the status:

1. In Programming mode, scroll using the ↓ and ↑ navigation keys until **MAIN, STATUS** appears on the display.
2. Press SELECT; the first condition is displayed. If there are no status events to display, **END OF LIST** appears on the display.
3. Move forward using ↓ navigation key to view the next event; at the end of the list **END OF LIST** appears on the display. Once an alarm or trouble condition is restored, the message is removed from the list.

3.7 Software Version

To display the EL-2648's software version:

1. In Programming mode, scroll using the ↓ and ↑ navigation keys until **MAIN, SW VER.** appears on the display
2. Press SELECT.

3.8 Restoring Default Settings

Restoring default settings enables you to erase all the programming modifications that you have made to the stand-alone receiver. This will also delete the transmitter register.

To reset default settings:

1. In Programming mode, scroll using the ↓ or ↑ navigation keys until **MAIN, DEFAULT** appears on the display.
2. Press SELECT; **DEFAULT, OK?** appears on the display.
3. Press SELECT to restore all settings to default, or press ↓ and ↑ together to cancel.

4 Operation

This chapter deals with the receiver's behavior in normal operation mode when the tamper switch is closed.

4.1 System Displays

During normal operation, the EL-2648 displays events as they happen. These events are displayed until the condition is restored. The following table explains each event display and the events that cause them to appear:

#	DISPLAY	CAUSED BY
1	ALARM XXXXXXXX	An Alarm from the indicated zone.
2	KFXX ARM/DISARM	An arm/disarm command from a keyfob.
3	AC LOSS XXXXXXXX	An AC loss transmission from the indicated zone.
4	ANTENNA TROUBLE	Damage to the antenna (antenna cut or removed). * Only relevant to versions with antenna supervision
5	BATT LOW ZONE X/KFXX	A low battery condition from the indicated transmitter.
6	JAMMING	A jamming condition detected by the receiver.
7	OUT SYNC ZONE X/KFXX	A transmission that is out of synchronization. If this message appears, the displayed transmitter is out of synchronization with the receiver. In some cases, this may indicate that an attempt to "grab" the transmission has occurred - i.e. a previous transmission has been recorded and sent by somebody trying to violate the system.
8	RECEIVER TAMPER	Opening the EL-2648's tamper switch.
9	SUPERVSN XXXXXXXX	Supervision loss from the indicated zone.
10	TAMPER XXXXXXXX	A Tamper transmission from the indicated zone.
11	TROUBLE XXXXXXXX	A Trouble transmission from the indicated zone.

Table 3: System Displays

Note: These messages are only displayed when the LCD is configured as "Enabled".

When multiple events occur simultaneously, each event message is displayed for three seconds.

Panic alarms are not displayed on the receiver's LCD.

4.2 System Status LED

The System Status LED provides essential information on the status of the system

LED INDICATION	EXPLANATION
OFF	The receiver's power is disconnected.
ON	The receiver's status is normal.
FLASHING	A trouble condition has occurred – see Table 3: System Displays (items 3-11).

Table 4: LED Indication

5 Technical Specifications

Model number	EL-2648	Zone Outputs	8
Operating Frequencies	868.35, 433.92, 418 or 315MHz FM	Trouble Outputs	2
Number of Transmitters	8 (max.) or 6 detection devices + 16 keyfobs (max.)	Output Rating	24V, 1A (relay) 24V, 50mA (open collector)
Sensitivity	-100dBm (nominal)	Operating Temperature	0 to 60°C
Operating Voltage	9-13.8 VDC	Dimensions	123 x 109 x 27mm
Current consumption	35mA (standby) 80mA (max.)		

ELECTRONICS LINE 3000 Ltd. - LIMITED WARRANTY

ELECTRONICS LINE 3000 Ltd. (hereafter "EL3K") warrants its products to be free from manufacturing defects in materials and workmanship for (Wireless – 12 months excluding batteries, Control Panels – 2 years, Dual Technology Detectors – 2 Years, PIR Detectors - 5 years) following the date of sale. EL3K will, within said period, at its option and in accordance with the terms of this Limited Warranty, repair or replace any product failing to operate correctly without charge to the original purchaser or user. In case of defect, contact the security professional who installed and maintains your security system. In order to exercise the warranty, the product must be returned by the user or purchaser, shipping costs prepaid and insured to EL3K. EL3K will not be responsible for any dismantling or reinstallation changes.

This warranty shall not apply to any equipment, or any part thereof, which has been repaired by others, improperly installed, improperly used, abused, altered, damaged, subjected to acts of God, or on which any serial numbers have been altered, defaced or removed, or on a product in which the fault does not prevent the use of the product at the installation site, or in the system to which the product is connected.

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EL3K RECOMMENDS THAT THE ENTIRE SYSTEM BE COMPLETELY TESTED WEEKLY.

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