![Inovonics logo]

EN4204R Four Zone Add-On Receiver with Relay Outputs
Installation Instructions

1 Overview

The EN4204R four zone add-on receiver with relay outputs allows you to add up to four transmitters to any application. With diversity reception and advanced signal processing, Inovonics' EchoStream technology is designed to minimize dead spots in transmission areas.

The following add-on receivers are available from Inovonics:

Receiver	Alarm Output Relays	Fault Relays	Transmitters Supported
EN4204R	4	1	4
EN4216MR	5	1*	16
EN4232MR	11	1*	32

At least one relay must be used for faults to ensure the system is supervised. More than one relay may be used, but that will deduct from the number of alarm output relays.

1.1 Installing an Inovonics Security System

An EchoStream survey kit should be used to establish an EchoStream system. The EchoStream survey kit measures the signal strength of high-power repeater and sensor messages to help optimize your EchoStream system.
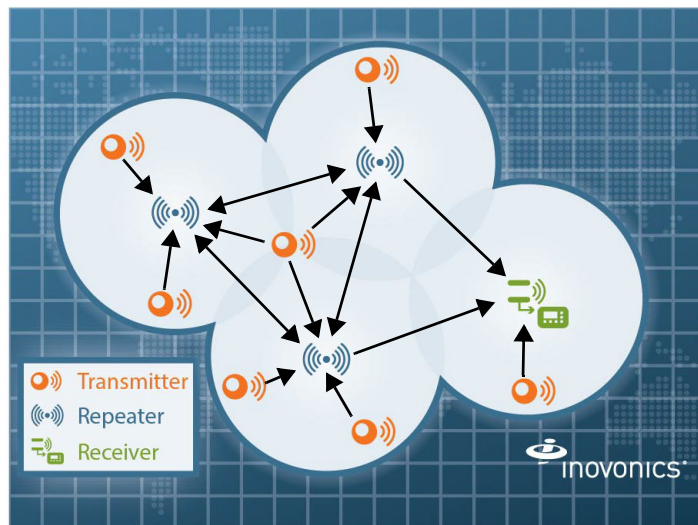

Figure 1 Sample EchoStream system

The EchoStream survey kit provides you with two signal strength measurements: signal level and signal margin.

Signal level

The signal level is the measurement of the overall decibel level of the message.

Signal margin

The signal margin is the measurement of the decibel level of the message, minus the decibel level of any interfering signals. Inovonics equipment should be placed within a facility such that all end-devices produce signal margin readings of at least 4 decibels.

Both the signal level and signal margin are measured in decibels. Because signal strength and signal margin are measured on a logarithmic scale, the difference between a decibel level of 3 (Weak) and a decibel level of 4 (Good) is a much larger difference than it would be on a linear scale.

Note: For more information about the EchoStream survey kit, see the *EN7017 Survey Kit and App Installation and Site Survey Instructions.*

Caution: The EchoStream system should be tested regularly to ensure operation. To test: place the system in test mode, activate an end device, and ensure an appropriate response.

1.2 RF Signal Propagation

While wood, drywall and glass usually let the RF signals pass, some materials may inhibit or attenuate radio frequency (RF) signal propagation by blocking, reflecting, deflecting or absorbing RF signals.

Consider anything between transmitters and repeaters and/or the receiver. Is there concrete and steel construction? Are there earthen berms or hills? Are there a lot of trees? Devices should be mounted such that they are least affected by these elements.

For best results, transmitters and repeaters should be mounted at the optimal height to achieve line of sight to repeaters and/or the receiver. Usually this means they will be mounted as high as possible.

Following are some typical obstacles to RF signal propagation:

Material	Affect	Recommendation
Metal construction, including ductwork; pipes; studs; stucco, plaster or concrete with wire mesh; satellite dishes, metal-lined rooms such as walk-in coolers or freezers; metal siding, safes, etc.	Can reflect, absorb and/or disrupt RF signals.	Perform a site survey using an Inovonics wireless survey kit to verify the RF signal is acceptable, and, when necessary, to determine where to locate repeaters.
Completely enclosed metal boxes/enclosures.	Can restrict RF signals.	
Solar panels, cinder block walls, windows with built-in solar tinting.	Can absorb and/or reflect RF signals.	
Vegetation.	Can attenuate RF signals. The RF environment can alter as trees shed or sprout leaves.	Add repeaters as issues arise.
Automobile and truck traffic.	Can disrupt RF signals.	Mount Inovonics devices at a height sufficient to achieve line of sight above traffic.

1.3 Inovonics Wireless Contact Information

If you have any problems with this procedure, contact Inovonics Wireless technical services:

- E-mail: support@inovonics.com.
- Phone: (800) 782-2709; (303) 939-9336.

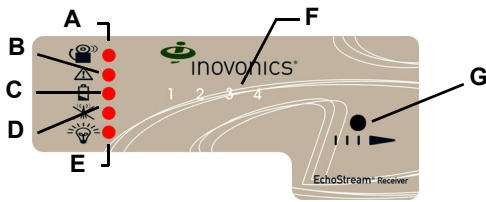## 1.4 EN4204R Four Zone Add-On Receiver with Relay Outputs Front Panel

Figure 2 EN4204R receiver LEDs and buttons

A Alarm LED **B** Tamper Fault LED **C** Low Battery Fault LED
D Inactive Fault LED **E** Power LED **F** Transmitter Number LEDs
G Advance Button

1.5 EN4204R Four Zone Add-On Receiver with Relay Outputs LEDs

Most of the LEDs and buttons perform different function depending on which mode the the receiver is in. By default the LEDs are in operation mode; to enter diagnostic mode, press the advance button.

Operation LEDs

Alarm LED: Lights when any transmitter is sending an alarm transmission.
Tamper Fault LED: Lights when any transmitter is sending a tamper transmission.
Low Battery Fault LED: Lit when any transmitter has a low battery.
Inactive Fault LED: Lit when any transmitter is inactive.
Power LED: Lit when receiving power.
Transmitter Number LEDs: Lit when the transmitter is in alarm.
Decode LED: Flashes when any recognizable transmission is received. This LED is only visible when the pry-out door or cover is removed.

Diagnostic LEDs

Alarm LED: Lights when the selected transmitter is sending an alarm transmission.
Tamper Fault LED: Lights when the selected transmitter is sending a tamper transmission.
Low Battery Fault LED: Lit when the selected transmitter has a low battery.
Inactive Fault LED: Lit when the selected transmitter is inactive.
Power LED: Lit when receiving power.
Transmitter Number LEDs: Shows status of the transmitter assigned to that number when lit. Use the advance button to scroll through transmitters.
Advance Button: Scrolls through transmitters to display status.
Decode LED: Flashes when any recognizable transmission is received. This LED is only visible when the pry-out door or cover is removed.
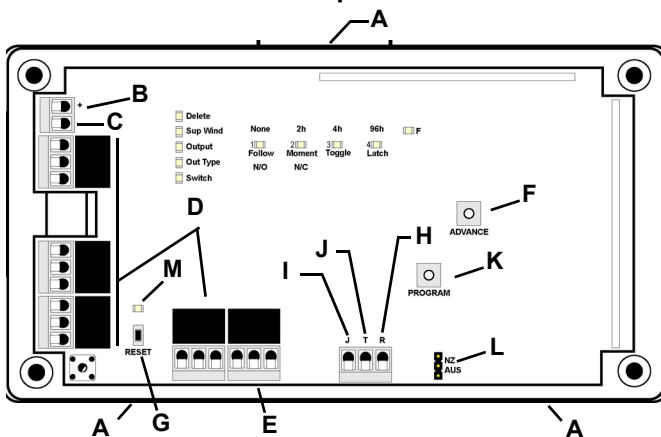
1.6 EN4204R Internal Components

Figure 3 EN4204R internal components

A Housing release tabs **B** Power (11-14 VDC) **C** GND connection
D Output terminals **E** Fault output **F** Advance button
G Reset button **H** Reset input **I** Jam output
J Tamper output **K** Program button **L** Frequency band selection pins
M Decode LED

1.7 What's in the Carton

- Two drywall anchors.
- Two mounting screws.
- Three housing screws.
- Two pieces double-sided mounting tape.
- One frequency band selection jumper.

2 Installation and Startup

2.1 Installation Notes

- These products are designed to be maintained by professional security technicians.
- Products are tested for indoor use.
- All products should be manually tested weekly.

2.2 Connect Power Cabling

Caution: Incorrect connections may cause damage to the unit.

Before beginning startup, you will have to connect power to the receiver. To connect power to the receiver:

1. Use a small screwdriver to press the housing release tab on the top or bottom of the receiver; separate the housing.
2. Connect power cabling to the Power and GND connections.
   - Power source should be 11-14 VDC. Power supply must be unswitched, uninterrupted, and regulated.
   - Use 18 - 22 gauge wire for all cabling, and ensure torque on the screw terminals does not exceed 7 inch-pounds.
   - For UL installations, wire lengths must not exceed 300 feet.

2.3 Select the Frequency Band

EchoStream devices are able to use a range of radio frequencies, and must be configured for your geographic area. This device ships with a default frequency range of 902-928 MHz for use in North America. If you are using the device in North America, skip to section 3, "Registering a Transmitter"; if you are using the device in Australia or New Zealand, you will need to configure it.

1. Place a selection jumper on the appropriate frequency band selection pins.
   - Place the jumper on the top two pins, marked NZ, to set the frequency range to 921-928 MHz for New Zealand.
   - Place the jumper on the bottom two pins, marked AUS, to set the frequency range to 915-928 MHz for Australia.

Note: Only devices set for North America are configured for UL installations.

2. Cycle power source to reset.

3 Registering a Transmitter

3.1 Quick Setup

In many cases, the default settings are sufficient and the points don't need programming changes. To register transmitters without changing the settings:

First Transmitter

1. Press the advance button one time to select the first point.
2. Press the program button four times to select the default programming options.
3. The first point number will be flashing, indicating it is awaiting the transmitter's reset message; press the transmitter's reset button.

Second Transmitter

1. Press the advance button two times to select the second point.
2. Press the program button four times to select the default programming options.
3. The second point number will be flashing, indicating it is awaiting the transmitter's reset message; press the transmitter's reset button.

Third Transmitter

1. Press the advance button three times to select the third point.
2. Press the program button four times to select the default programming options.
3. The third point number will be flashing, indicating it is awaiting the transmitter's reset message; press the transmitter's reset button.

Fourth Transmitter

1. Press the advance button four times to select the fourth point.
2. Press the program button four times to select the default programming options.
3. The fourth point number will be flashing, indicating it is awaiting the transmitter's reset message; press the transmitter's reset button.

Note: After registering a transmitter, there is no need to exit programming mode. The receiver is normal operation once the transmitter's reset button has been pressed.

The default settings are:

Point	Supervision Window	Output	Type
1	4 hours	1	Follow
2	4 hours	2	Follow
3	4 hours	3	Follow
4	4 hours	4	Follow
F	N/A	Fault	Inactive is set to follow; low battery and tamper are set to latching.

3.2 Customize Transmitters

If the default settings are not sufficient, you will need to program the points individually.

Note: If changing programming for a point that already has a transmitter registered to it, there is no need to re-register the transmitter. Changes to point programming are automatically assigned to the transmitter registered to that point.

The following programming options available:

Supervision window

- None, 2h, 4h, or 96h. When you are choosing the supervision window, the "Sup Wind" LED will light, along with the LED that indicates the selected window.
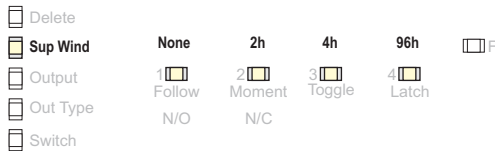
Figure 4 Select the supervision window

Output (relay)

- 1, 2, 3, 4. When you are choosing the output, the "Output" LED will light, along with the LED that indicates the selected output number.
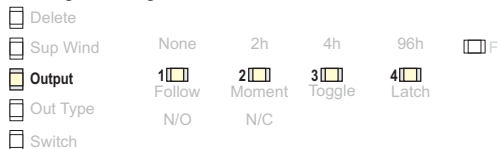
Figure 5 Select the output number

Output type

- Follow, Moment, Toggle, Latch. When you are choosing the output, the "Out Type" LED will light, along with the LED that indicates the selected output type.
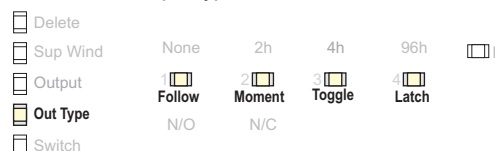
Figure 6 Select the output type

To program any of the four transmitter points:

1. Use the advance button to select any of the four transmitter points.
   - Press the advance button one time to select the first point; the first LED will light.
   - Press the advance button two times to select the second point; the second LED will light.
   - Press the advance button three times to select the third point; the third LED will light.

- Press the advance button four times to select the fourth point; the fourth LED will light.

2. Press the program button to begin programming the point.

Note: The program button should be pressed within a few seconds of selecting the point number. If not, the point number will not be lit, and you will need to select it again.

- If no transmitter has been registered to the chosen point, the receiver advances to the supervision window option.
- If a transmitter has already been registered to the chosen point, the delete LED lights. Press advance to delete the point and return to normal operation; press program to advance to the supervision window option.

3. Use the advance button to choose a supervision window of None, 2h, 4h and 96h (Fig. 4).
   - Press the advance button one time to select none.
   - Press the advance button two times to select two hours.
   - Press the advance button three times to select four hours.
   - Press the advance button four times to select 96 hours.

   When you have selected the supervision window, press program to complete and advance to the output option.

4. Use the advance button to select the output number (Fig. 5).
   - Press the advance button one time to select the first output.
   - Press the advance button two times to select the second output.
   - Press the advance button three times to select the third output.
   - Press the advance button four times to select the fourth output.

   When you have selected the output number, press program to complete and advance to output type option

5. Use the advance button to select the output type (Fig. 6),
   - Press the advance button one time to select follower. In follower the output reflects the transmitter's alarm status.
   - Press the advance button two times to select momentary. In momentary the output turns on for seven seconds, then turns off, regardless of the device status.
   - Press the advance button three times to select toggle. In toggle the output changes state each time the device sends a new activation. A minimum of four seconds must elapse before the output can send a new activation.
   - Press the advance button four times to select latching. In latching the output turns on when activated and remains on until the receiver is reset.

   When you have selected the output type, press program to complete and advance to the switch type option.

6. All the option LEDs will light and the point you've just programmed will flash. If you wish to register a transmitter to the point you've just programmed, press the transmitter's reset button; otherwise, press program to save programming changes without registering a transmitter.

Note: The registration is not complete until all LEDs turn off and the point number lights.

All of the alert LEDs will turn off when the receiver has received the transmitter's registration message, and the point number LED will light for two seconds. This indicates the receiver has received the transmitter's registration message. If this does not occur, press reset on the transmitter again.

3.3 Connect Input/Output Cabling

The tamper output, jam output and reset input are open collectors, not dry contacts.

1. Connect cabling to the tamper output. Must be configured for UL installations.
   - The tamper output is a normally open (N/O) open collector output that reports receiver case tamper to an external device.
2. Connect cabling to the jam output. Must be configured for UL installations.
   - The jam output is a normally closed (N/C) open collector output that opens when noise thresholds on all receive channels remain above a predetermined value for 10 seconds. The jam output is set to the follower output type.
3. Connect a momentary switch to the reset input and ground (Figure 7, "EN4204R terminals"). Must be configured for UL installations.
   - The reset input circuit permits installation of a remote momentary normally open (N/O) switch to clear faults, unlatch outputs, and reset the receiver to a normal state.

4. Connect cabling to the output terminals. Must be configured for UL installations.
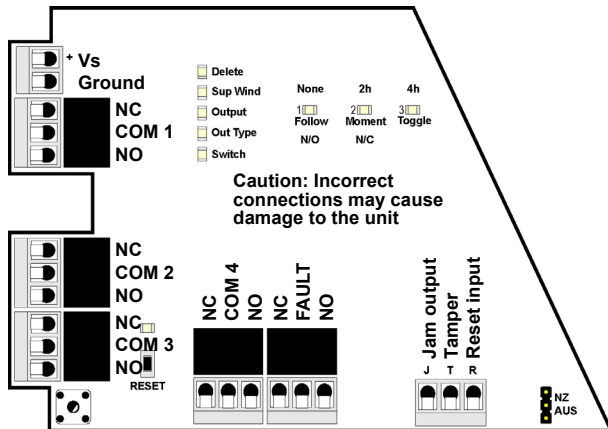   • The EN4204R provides five Form-C relays.

Figure 7 EN4204R terminals

3.4 Mount the Receiver

Caution: Mount the receiver in a location removed from metal. Metal objects (duct work, wire mesh screens, boxes) will reduce RF range.

Note: For UL listed systems containing a UL hold-up switch, the EN4204R must be located within three feet of a system keypad in a location out of sight from the protected premise.

Note: For UL installations, the EN4204R must be in the same room as the control panel.

1. Use the provided anchors and screws to mount the receiver in a location accessible for future maintenance, making sure the housing is flush with the wall and the back tamper switch is actuated.
2. After all transmitters have been registered, perform a walk test, activating each transmitter assigned to the receiver and ensuring a good signal.

4 Return to Factory Configuration

The EN4204R four zone add-on receiver with relay outputs can be returned to factory defaults using the following.

Caution: This procedure will erase all programmed point and output information.

To restore the factory configuration defaults to the receiver:

1. Hold down the reset and advance buttons.
2. With the buttons held down, cycle power.

5 US Patent Numbers

   • 7,154,866.
   • 7,554,932.
   • 7,746,804.
   • Other patents pending.

6 Specifications

Compatible repeater, transmitters: EN5040-T, EN1215EOL, EN1215WEOL, EN1223D, EN1235SF, EN1235DF, EN1244, EN1249, EN1261HT.

Housing: 6.38" x 3.60" x 1.10" (162 mm x 92 mm x 28 mm).

Operating environment: 32°- 140°F (0°- 60°C), 90% relative humidity, non-condensing.

Power requirement: 11 - 14 VDC; 400 mA.

Current consumption: Approx. ~400 mA max with all five relays energized.

Output specifications: Form C relay 1A @ 28 VDC, 0.5A @ 30 VAC resistive load; N/O receiver case tamper contact closure, N/C receiver jam output indication.

Input specifications: A low is less than .5 V; a high is greater than 2.5 V.

Reset input: Contact closure, momentary low.

Receiver type: Frequency hopping spread spectrum.

Operating frequency: 915-928 MHz (Australia), 921-928 MHz (New Zealand), 902-928 MHz (USA).

Number of points/transmitters: Four.

Number of alarm outputs: Four Form C relay outputs.

Number of fault outputs: One Form C relay output.

UL listings: UL 365, UL 636, UL 985, UL 1023, ULC/ORD-C1023-74, UL 1610, UL 1076.

7 UL Requirements

   • Due to the trouble output being shared by all transmitters, this receiver must be set up and programmed as either a commercial and residential burglary receiver or as a residential fire receiver. Burglary and fire devices cannot be intermixed in a single receiver. If both burglary and fire applications are required in a single system, two EN4204R receivers will be required, with one set up for burglary and the other set up for fire.
   • The control panel must be programmed to indicate an alarm if the system is in an armed condition and an RF jamming signal occurs at the receiver.
   • The receiver tamper and transmitter tamper cannot be combined in one loop.
   • The control unit providing input power to the receiver must not have a range outside of 11-14 VDC.

8 Television and Radio Interference

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

   • Reorient or relocate the receiving antenna.
   • Increase the separation between the equipment and receiver.
   • Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
   • Consult the dealer or an experienced radio/TV technician for help.