EH4104R Single Zone Fire RF Receiver with Relays
Installation Instructions

1 Overview
The EH4104R single zone fire RF receiver with relays is designed for use with the Inovonics EH1115EOL EchoStream single input fire RF transmitter to monitor water flow and pressure in piping and post indicator valves to send an alert when a fire protection system has been activated.

The EH4104R single zone fire RF receiver with relays allows you to add a transmitter to any application. With diversity reception and advanced signal processing, Inovonics EchoStream technology is designed to minimize dead spots in transmission areas.

1.1 Installing an Inovonics 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.

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 transmitter and the receiver. Is there concrete and steel construction? Are there earthen berms or hills? Are there a lot of trees? The device should be mounted such that it is least affected by these elements.

For best results, the transmitter should be mounted at the optimal height to achieve line of sight to the receiver. Usually this means it 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.
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.	

Material	Affect	Recommendation
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.
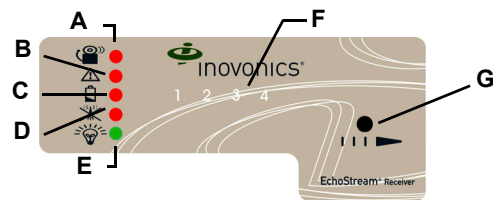- Phone: (800) 782-2709; (303) 939-9336.

1.4 EH4104R Front Panel

Figure 1 EH4104R receiver LEDs and buttons

A RF initiating device alarm LED
B RF initiating device tamper LED
C RF initiating device low battery LED
D RF initiating device inactive LED
E Power LED
F RF initiating device number LEDs
G Review button

1.5 EH4104R LEDs
Normal Operating Mode

LED	Event	Relay
Alarm and 1	Alarm activation.	Relay 1 is on until the condition clears.
Tamper	Initiating device case tamper or EOL resistor trouble.	Relay 5 is latched on until EH4104R is reset.
Battery	Initiating device low battery warning.	Relay 5 is latched on until EH4104R is reset.
Inactive	Initiating device not heard for more than three minutes.	Relay 5 is on until the condition clears.
Decode	Valid message was received. Decode LED is visible only with the cover removed.	

Review Mode
Press and release button on the EH4104R front cover. Review mode times out after ten seconds.

LED	Description
Alarm and 1	Last message from initiating device indicated alarm.
Tamper and 1	Last message from initiating device indicated tamper.

LED	Description
Battery and 1	Last message from initiating device indicated low battery.
Inactive and 1	Initiating device was not heard for more than three minutes. Communication has not been restored.

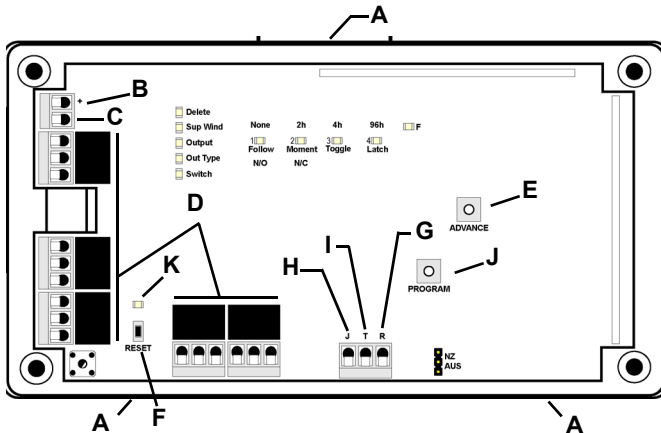## 1.6 EH4104R Internal Components

Figure 2 EH4104R internal components

A Housing release tabs
B Power (11-14 VDC)
C GND connection
D Output terminals
E Advance button
F Reset button
G Reset input
H Not used
I Not used
J Program button
K 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 Cabling

EH4104R Receiver Wiring

Connect Power Cabling

Caution: Incorrect connections may cause damage to the unit.

Note: All wiring shall be installed in accordance with the requirements of the National Fire Alarm and Signaling Code, NFPA 72.

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 shall be 11-14 VDC. Power supply must be listed UL 1481, regulated, power limited power supply.
   - Use 18 - 22 gauge wire for all cabling, and ensure torque on the screw terminals does not exceed 7 inch-pounds.
   - Wire lengths must not exceed three feet.

Connect Input/Output Cabling

1. Optionally, connect a momentary switch to the reset input and ground (Figure 3, "EH4104R terminals").
   - 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.
2. Connect cabling to the output terminals.
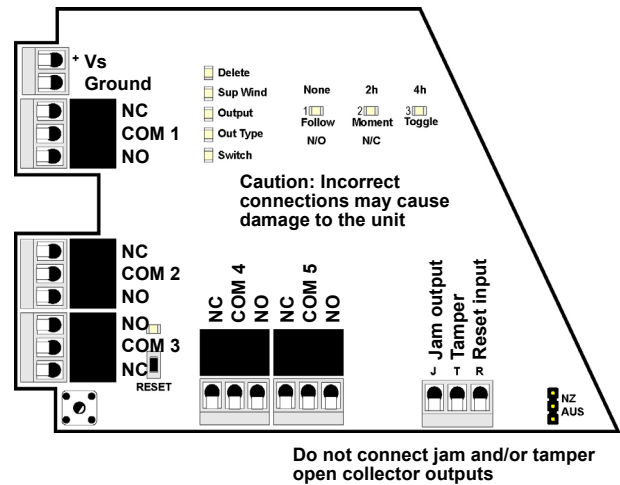   - The EH4104R provides five Form-C relays, described below.

Figure 3 EH4104R terminals

Relay 1: Wireless alarm.
Relay 2: RF jam.
Relay 3: Power loss.
Relay 4: Receiver case tamper.
Relay 5: Wireless trouble (tamper, low battery and inactive).

EH4104R Function	EH4104R Terminal	Panel Terminal	Description
12VDC power source	Vs (POS)	n/a	See note 1 below
Ground	GND (NEG)	n/a	
Relay 1	Com 1	Zone 1 -	RF initiating device alarm; see note 4 below
	NO	Zone 1 +	
Relay 2	Com 2	Zone 2 -	RF receiver jammed
	NO	Zone 2 +	
Relay 3	NO	Zone 3 +	Receiver power loss; see note 2 below
	Com 3	Zone 3 -	
Relay 4	Com 4	Zone 4 -	RF receiver tamper
	NO	Zone 4 +	
Relay 5	Com 5	Zone 5 -	RF initiating device trouble
	NO	Zone 5 +	
Not used, use relay 2	Jam	n/a	n/a
Not used, use relay 4	Tamper	n/a	n/a

EH4104R Function	EH4104R Terminal	Panel Terminal	Description
Optional remote reset:			
External reset circuit	Reset	Aux relay: NO	Reset RF receiver
Ground	GND (NEG)	Aux relay: Common	See note 3 below

1. Listed UL 1481, regulated, power limited power supply.
2. Relay 3 is kept activated to monitor power. Note that the NO and NC terminal positions are reversed.
3. Optional remote reset can be activated by a momentary short between ground and reset terminals.
4. The zone type (point function) shall be set at fire alarm or supervisory, depending on application.

3 Registering the Transmitter

3.1 Quick Setup

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

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

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

All of the alert LEDs will turn off when the receiver has received the transmitter's registration message, and the initiating device 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.

3.2 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: The EH4104R 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 the transmitter has been registered, perform a walk test, activating each transmitter assigned to the receiver and ensuring a good signal.

4 Return to Factory Configuration

The EH4104R can be returned to factory defaults using the following .

Caution: The factory config will erase all programmed initiating device, output, and language 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.
3. Wait for the switch LED to light, then release buttons.

5 Specifications

Compatible transmitter: EH1115EOL.

Compatible control panel: Compatible listed UL 864 control panel with a minimum of five conventional initiating device circuits (IDC).

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), 93% relative humidity, non-condensing.

Power requirement: 11 - 14 VDC; 400 mA; listed UL1481, regulated, power limited power supply.

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.

Reset input: Contact closure, momentary low.

Receiver type: Frequency hopping spread spectrum.

Operating frequency: 902-928 MHz.

Number of initiating devices/transmitters: One.

Number of alarm outputs: One Form C relay output.

Number of trouble outputs: Four form C relay outputs.

UL listings: UL 864 10th Edition.

6 UL Requirements

- The receiver tamper and transmitter tamper cannot be combined in one loop.

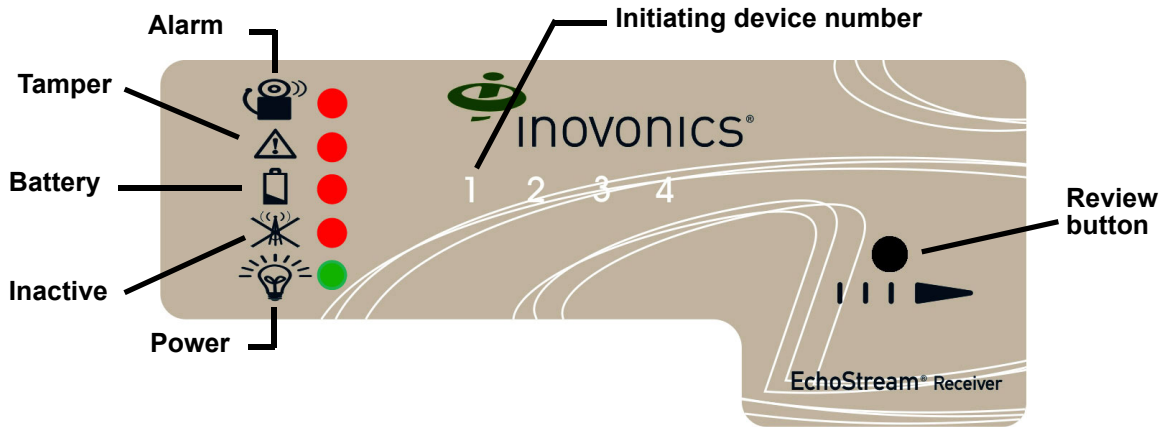## 7 Television and Radio Interference

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.

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EH4104R Single Zone Fire RF Receiver with Relays

Caution: This document must be framed and mounted in view adjacent to the EH4104R single zone fire RF receiver with relays

Normal Operating Mode

LED	Event	Relay
Alarm and 1	Alarm activation.	Relay 1 is on until the condition clears.
Tamper	Initiating device case tamper or EOL resistor trouble.	Relay 5 is latched on until EH4104R is reset.
Battery	Initiating device low battery warning.	Relay 5 is latched on until EH4104R is reset.
Inactive	Initiating device not heard for more than three minutes.	Relay 5 is on until the condition clears.

Review Mode

Press and release button on the EH4104R front cover. Review mode times out after ten seconds.

LED	Description
Alarm and 1	Last message from initiating device indicated alarm.
Tamper and 1	Last message from initiating device indicated tamper.
Battery and 1	Last message from initiating device indicated low battery.
Inactive and 1	Initiating device was not heard for more than three minutes. Communication has not been restored.