



E9X-R12-3HOTP (120V)
E9X-R24-3HOTP (240V)
E9X-R27-3HOTP (277V)



The 3-Wire Relay Receiver controls lights or other loads by responding to EnOcean signals from self-powered wireless light switches and/or other compatible transmitters. The Relay Receiver mounts to junction box knockout holes with a threaded nipple or inside wiring cavities; preferably in plastic enclosures for maximum wireless range.

Compatible Devices	EnOcean Equipment Profiles
Wireless Light Switches	EEPs: F6-02-01, F6-02-02, F6-03-01, F6-03-02
Key Card Switch	EEPs: F6-04-01, F6-02-01, F6-02-02
SLT Wireless Sensor	EEPs: F6-02-01, F6-02-02, Proprietary
Wireless Occupancy Sensors	EEPs: A5-07-01, A5-07-02, A5-07-03
Door/Window Sensor	EEP: D5-00-01, A5-30-01
Light Sensor	EEP: A5-06-01, A5-06-02
Central Command	EEP: A5-38-08 - untimed commands only

Transmitted EnOcean Equipment Profile

Central Command - Transmit teach packet w/ LNK button EEP: A5-38-08

Included Components

- (1) 3-Wire Relay Receiver
- (1) Instruction Sheet

Tools Needed for Installation

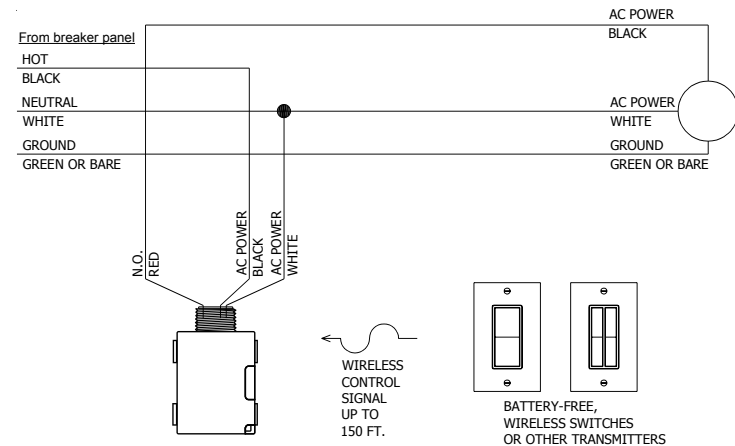
- Pen or object to press recessed buttons
- Electrical tape
- Wire nuts

Installation

Caution/Notes

WARNING: To avoid the risk of fire, shock or death TURN OFF POWER at the circuit breaker or fuse and verify that it is OFF before beginning installation. Make sure it remains off until the installation is complete.

- Depending on the circumstances it may be more convenient to pre-link the Relay Receiver prior to final installation.
- Always follow local electrical codes when installing this device. Only a qualified electrician should install the product.
- Relay Receivers are intended only for use in dry locations and with permanently installed fixtures.
- Relay Receivers should not be installed in close proximity to heat sources such as 75W+ ceiling fixtures. (See Operating Temperature)



Choosing the Optimal Mounting Location

The long term reliability and performance of the relay will be determined by the mounting location. Choose a mounting location carefully.

For best radio performance:

- Straighten antenna out & away from metal.
- Create separation distance away from interfering electronics such as fluorescent tube ends, ballasts, electronic transformers, and motors.
- Avoid mounting inside metal enclosures.
- Obstructions of metal, concrete and dense building materials will reduce the range. Mount higher and away from obstructions to maximize the range.
- Site survey tools are available to help fine-tune wireless communications.

Installation Overview:

- Link Transmitters and Receivers following *Linking Instructions* below.
- Identify best mounting locations for receiver and transmitter. Perform range test to confirm operation prior to installation.
- Connect Receiver to circuit following wiring diagram and local electrical codes. Press and release CLR button to toggle relay output and confirm relay operation.
- Mount transmitters and receivers in final location and verify operation.

Linking Instructions

Note: The Relay Receiver must be powered on while linking. After linking, the Relay Receiver retains the settings in the event of power loss. When in Link Mode, the Relay Receiver's communication range is shortened to prevent accidental interference from other transmitters. For best results, transmitters should be within 15 ft. (5 m) of the Relay Receiver when linking.

Basic Linking

Use basic linking to connect the following devices to the receiver for common applications:

- Wireless Switch** - Press top for ON, press bottom for OFF
- Occupancy Sensor** - Auto On/Auto off w/ no switch linked
- Man On/ Auto Off w/ switch also linked
- Switch Leg Transmitter** - Circuit Interlock
- Window/door Sensor** - Closed-ON, Open-OFF

Light Sensor - ON when below light setpoint, OFF if above setpoint

- Press and hold the LNK button for 3 seconds then release. The relay will toggle a steady pattern indicating Basic Link Mode is active:
- To link a switch, triple press the top switch button or single press the LNK button to create a link. Toggling will pause for 3 seconds when the link is created, then toggling will resume.
- Link additional transmitters (up to 25) as needed. Link mode will exit automatically after 30 seconds of inactivity and toggling will stop.

Advanced Linking

Use advanced linking to activate alternate functionality for specific applications:

- Choose an operating mode for the receiver with the transmitter by reviewing the Operating Mode Descriptions outlined in the following sections.
- Activate one of 4 specific Link Modes by pressing the LNK button in the correct sequence following Link Mode Activation Instructions below.
- Press the LNK button on the transmitter or triple press a switch transmitter, toggling will pause w/ relay ON to indicate when link is added.
- Exit Link Mode by waiting 30 seconds with no activity.

Operating Mode Descriptions

Switches

Switches can control relay in one of four modes: **Rocker, Momentary, Toggle, or Scene.** Triple press switch buttons during linking.

Link Mode 1: Rocker Mode – Behavior: Turn relay ON by pressing top button of rocker and OFF pressing bottom button. Create link by triple pressing top button and bottom button will be automatically linked.

Link Mode 2: Momentary Mode – Behavior: Pressing a button on a wireless switch causes the relay to go ON momentarily and stay on while the button is pressed. When the button is released, the relay goes OFF. Each button on the transmitter may control a different relay. Triple press switch to link.

Link Mode 3: Toggle Mode – Behavior: Pressing a button on a wireless switch causes the relay to go ON. Pressing it again causes the relay to go OFF. Each button on the transmitter may control a different relay. Triple press to link

Link Mode 4: Scene Mode — Behavior: Scene mode is used to link a receiver to recall a specific relay state when a button is pressed. Use scene mode to affect multiple receivers to a specific state with a single button press.

To link a receiver to recall a specific relay state, set the Relay Receiver to the desired state by pressing and quickly releasing the CLR button (which will cause the relay to toggle each time the CLR button is pressed). Once the Relay Receiver is in the desired state, activate Link Mode 4 and triple press a switch button to complete the link process.

Occupancy Sensor

Occupancy Sensors can operate in one of three modes: Manual On/Auto Off, Auto On/ Auto Off, and Walkthrough.

Link Mode 1: Manual On/Auto Off – User turns the relay ON manually with a wireless switch. The relay remains on while the sensor detects occupancy. If the sensor detects no occupancy for 15 minutes, the relay will turn off. This mode is California Title 24 compliant. When no manual controls (i.e. wireless switches) are linked to the relay, the relay will default to Auto On/Auto Off mode when linked in Mode 1.

Link Mode 2: Auto On/Auto Off – When the sensor detects occupancy, it turns on the relay. If the sensor detects no occupancy for 15 minutes, the relay will turn off.

Link Mode 3: Walkthrough – An aggressive energy saving mode using Auto On/Auto Off with a shorter delay timer. The Relay Receiver turns the relay on when the Occupancy Sensor detects occupancy. The Receiver Relay turns off automatically after 2-15 minutes of no occupancy, depending on sensed motion.

Notes:

- Confirm Occupancy Sensor is sufficiently charged or install battery to perform linking.
- After linking, use the LNK button on the sensor to toggle the relay output and confirm sensor is linked and to test reliability of wireless communications.
- Using a wireless switch to turn lights OFF manually will disable the Auto On function temporarily. Auto On functionality resumes after the occupancy sensor timeout expires (15 minutes of no activity).
- The occupancy timeouts operate only after an occupancy sensor packet is received by relay. If no linked sensors detect occupancy or if the sensors malfunction, the relay will not time out after 15 minutes.
- If no switches are linked to relay receiver, unit will always power up ON.

Key Card Switch

Link Mode 1: Not Supported

Link Mode 2: Key Card Switch – Relay turns ON when a key card is inserted. Relay turns OFF when the key card is removed. Insert and remove key card 3 times in link mode to create link.

Switch Leg Transmitter (SLT)

Link Mode 1: SLT - When the Switch Leg Transmitter is energized, the relay turns on. When power is removed from the SLT, relay turns OFF.

Door/Window Sensor

Link Mode 1: Instantaneous Mode – Door/Window Sensor Open, relay turns OFF. Door/Window Sensor closed, Relay turns ON. Instant response.

Link Mode 2: Delay Mode – Door/Window Sensor Open, relay turns OFF after relay has been ON for at least 5 minutes. Door/Window Sensor closed,

relay turns ON after relay has been OFF for at least 5 minutes. Delays prevent short cycling of equipment. This mode is commonly used in HVAC applications.

Note: When delay mode is active all linked transmitters are subject to minimum on and off delays.

Light Sensor

Link Mode 1: Light Sensor – When sensed light level is below a threshold, relay turns ON. When sensed light level is above a threshold, relay turns OFF.

Link Mode Activation Instructions

The Link Modes build on each other: transition to Link Mode 2 while Link Mode 1 is active, etc as outlined below.

Link Mode Instructions:

- Enter Link Mode** (follow steps a - d until desired Link Mode is active, then skip to step 2)
 - Link Mode 1:** Press and hold the LNK button for 3 seconds then release. The relay will toggle a steady pattern indicating Link Mode 1 is active:
— — — —
 - Link Mode 2:** Press and hold the LNK button a second time for 3 seconds, then release. The relay will toggle a 2 blink stutter pattern indicating Link Mode 2 is active:
— — — —
 - Link Mode 3:** Press and hold the LNK button a third time for 3 seconds, then release. The relay will toggle a 3 blink stutter pattern indicating Link Mode 3 is active:
— — — —
 - Link Mode 4:** Press and hold the LNK button a fourth time for 3 seconds, then release. The relay will toggle a 4 blink stutter pattern indicating Link Mode 4 is active:
— — — —
- Triple press wireless switch button or single press LNK button on sensor transmitter. Toggling will pause in the ON state for 3 seconds when link is created, then resume toggling.
- Link additional transmitters (up to 25) as needed, wait 30 seconds to exit Link Mode. Toggling stops when Link Mode stops.

Additional functions

CLR button functions:

Toggle relay - Press and release the CLR button in less than one second to toggle the relay state.

Purge All Links - First activate Link mode by holding the LNK button until the relay starts toggling, then press and hold the CLR button for 10 seconds to purge all Links from the relay. The relay will stop toggling when CLR button is pressed and resume toggling when the CLR process is complete.

Selective Link Deletion

To remove one Link from relay and leave others unaffected:

- Activate the Link Mode used to Link the transmitter. Relay will toggle a pattern indicating the active Link Mode.
- Press the LNK button or triple press a wireless switch or keycard for the transmitter to be deleted. Toggling will pause in the OFF state for 3 seconds indicating that link is removed, then resume toggling. (Toggling pauses in the ON state when Links are added.)
- Wait 30 seconds for Link Mode to exit. Toggling stops when Link Mode stops.

Repeater

Repeater mode is enabled by default. This capability extends the range for other compatible transmitters and receivers in the area by retransmitting any packets received. This receiver supports 2 Level Repeating meaning that it will repeat both original packets and packets that have been repeated one time. Packets already repeated twice will not be repeated again.

To change repeater status hold the LNK button for 20 seconds while powering ON the relay and observe the relay toggling 1 or 2 times to indicate the new repeater status: 1 - Disabled, 2 - Enabled. When more than 10 receivers are deployed in the same area it is recommended that some repeaters be disabled to reduce the possibility of interference from too many repeaters.

Power Up Mode

The relay will power up to the ON state unless a wireless switch is linked. When a wireless switch is linked, the relay will use state memory and power up in the state active before the power was shut off.

Specifications

	E9X-R12-3HOTP	E9X-R24-3HOTP	E9X-R27-3HOTP	
Range	50-150 feet (typical)			
Frequency	902 MHz			
Relay Output	1 FORM A Relay Normally Open			
Max Loads/Contact Ratings	Tungsten (Incand.)	1500 W	3000 W	
	Fluorescent Ballast	8 A		
	General Duty	16 A		
	A300 Pilot Duty	360 VA	720 VA	830 VA
	Motor Load	1/2 HP	1 HP	1 HP
Power Supply - 50/60 Hz	120 VAC	240 VAC	277 VAC	
Wire color - Hot	Black	Black	Black	
Wire color - Neutral	White	Brown	Gray	
Memory	Stores up to 25 switch IDs			
Dimensions	2.11 x 1.73 x 1.09 inches (54 x 44 x 28 mm)			
Operating Temperature	14° to +122°F (-10° to +50°C)			
Storage Temperature	-4° to +176°F (-20° to +80°C)			
Radio Certification	FCC (United States): SZV-TCM320U I.C. (Canada): 5713A-TCM320U			
Safety Approval	ETL (U.S.): UL244A ETL (Canada): CSAC22.2#14-05			
Plenum Rating	UL2043			

Invert Output Mode

Invert Output mode is disabled by default. Select different modes by holding the CLR button while powering up the relay and observe the Relay toggling 1 or 2 times to indicate the newly selected Output Mode.

- 1 = Disabled: ON- Relay contact closed, OFF - Open
- 2 = Enabled: ON- Relay contact open, OFF - Closed

State memory

State Memory - Power up to the state active prior to the power cycle. State Memory is active when a wireless switch is linked to the relay. If a relay is linked to only occupancy or light sensors or nothing at all, the relay will power up to the ON state. If no switch is linked, power cycling the relay will turn the unit ON in the event of a light or occupancy sensor malfunction. Also, upon initial installation the relays will power up ON when they are not linked to any devices.

Troubleshooting Tips:

- Briefly press and release CLR button to toggle relay output and confirm correct wiring and operation.
- Press LNK button on Linked sensors to toggle relay output and to confirm link and test RF range.

Remote Commissioning

This device supports the EnOcean Remote Commissioning protocol which can be used to manage stored links, occupancy timeouts, minimum on/off times for HVAC applications and other parameters without physically accessing the device to press any buttons. Use remote management commands to discover and configure the relay from gateways or PC software. Contact support for Remote Management documentation or more information.

Contains FCC ID: SZV-TCM320U

Contains IC: 5713A-TCM320U The enclosed device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (i) this device may not cause harmful interference and (ii.) this device must accept any interference received, including interference that may cause undesired operation.

ETL (US) – Conforms to UL STD 244A. This device was tested according to and was found to comply with UL 244A Solid State Controls for Appliances and UL 2043 UL Standard for Safety Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces.

ETL (Canada) – Certified to CAN/CSA STD C22.2 No. 14-05. This device was tested according to and was found to comply with CAN/CSA STD C22.2 No. 14-05.



This device or certain aspects thereof is protected by at least one U.S. or international patent or has at least one such patent application pending.

ILLUMRA is a trademark of Ad Hoc Electronics, LLC. Other trademarks herein are the property of their respective owners.