

Ad Hoc Electronics

LVRX-4/8

Low Voltage Relay Receivers (4 or 8 Channels)

Installation and Operating Instructions



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1. SPECIFICATIONS

The LVRX-4 and LVRX-8 relay receivers are used to connect wireless switches and sensors to existing security, lighting, media, HVAC and other control systems. The low voltage relay receivers provide 4 (SPDT, LVRX-4) or 8 (SPST, LVRX-8) channels of relay output which mirror the status of EnOcean battery-free wireless transmitters. The relays can be wirelessly linked either to magnetic proximity door/window sensors or to wall-mounted or handheld push switches.

The LVRX connects to EnOcean transmitters with a simple "ID-learn-sequence" that stores transmitter IDs in EEPROM. This allows the LVRX relay receiver to store an association between each switch and each relay output. When used with EnOcean PTM Switches, the relays can be configured to toggle with each button press or provide momentary relay closure while the button is held and released. When used with EnOcean STM devices, the relays operate in only one mode in which the relay reflects the status of the magnetic sensor.

Table 1. Specifications for the LVRX-4 and LVRX-8 Relay Receivers

SPECIFICATIONS	
Power supply input	14 – 28VAC or 8-28VDC 250mA
Relay rating	0-30VAC 1A or 0-30VDC 1A
Number output channels	4 (LVRX-4) or 8 (LVRX-8)
Frequency	868 MHz
Indoor range	50 – 150 feet
Dimensions (enclosure)	10.7cm (4.200") W x 7.2cm (2.800") H x 2.9cm (1.125") D (With connectors, 13 cm(5.1") W, 8 cm(3.2") H)
Weight	175g (6.5 oz.)
Agency certifications	FCC, IC

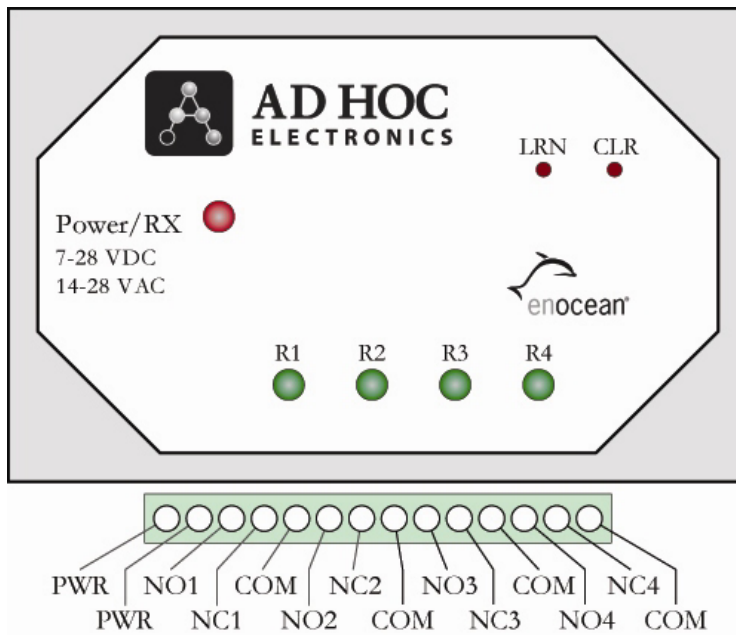
2. INSTALLATION

Adhere to the following guidelines to insure safety and maximize performance.

1. Warning: To avoid fire or shock, turn off power before wiring.
2. For optimal radio performance:
 - Do not mount or place receivers close to the floor.
 - Do not mount or place a receiver inside a metal housing.
3. Connect the power supply to the power terminals of the LVRX relay receiver. Polarity does not matter, '+' can be connected to either terminal.
4. Connect the appropriate wire(s) to the desired Common terminal(s). C1 relates to relay 1, C2 relates to relay 2, etc.
5. Choose between Normally Open and Normally Closed for the other wire(s) dependent on the application.

2.1. Connection Diagram (LVRX-4)

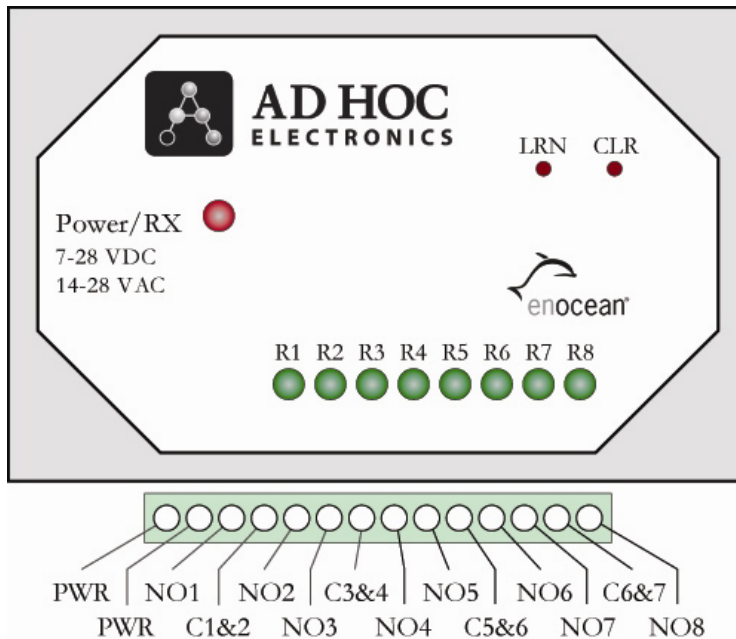
Figure 1. Low Voltage Relay Receiver (4-channel)



R1 = Relay 1
 R2 = Relay 2
 R3 = Relay 3
 R4 = Relay 4
 PWR = Power
 NO = Normally Open
 NC = Normally Closed
 COM = Common
 LRN = Learn
 CLR = Clear

2.2. Connection Diagram (LVRX-8)

Figure 2. Low Voltage Relay Receiver (8-channel)



R1 = Relay 1
 R2 = Relay 2
 R3 = Relay 3
 R4 = Relay 4
 PWR = Power
 NO = Normally Open
 NC = Normally Closed
 COM = Common
 LRN = Learn
 CLR = Clear

3. OPERATING MODE

The LVRX can operate as either a Push Button Switch Receiver (by learning EnOcean PTM Switches) or a Magnet Contact Receiver (by learning EnOcean STM250 Magnet Contacts). Each of the LVRX relays can learn either of these transmitters but not both at the same time. By assigning the first transmitter, the operating mode (push button switch or magnet contact) is defined for that relay. A single LVRX-4 unit can learn a maximum of 80 EnOcean switches (any number of switches per relay, up to the total maximum for the unit). The PTM Switches can be learned in either toggle or momentary mode. The memory of the receiver is empty when delivered. The operating mode for a single relay can be changed by pressing the CLR button while that desired relay is in learn mode. To clear all 4 of the relays operating modes, hold down the clear button while none of the relays are in learn mode.

Rocker Switch Mode

Each assigned transmitter can be used to change the switching state of the receiver. In toggle mode, each relay can be assigned to respond to a rocker. There is either 1 or 2 rockers on a PTM switch. When learned in toggle mode, one side of the rocker will close the relay; the opposite side of the same rocker will open the relay. In momentary mode a relay will respond to each button separately, there are either 2 or 4 independent buttons on a PTM switch. When learned in momentary mode the relay will close when a switch is pressed and the relay will open switch is released.

Window Contact Mode

[This mode is not yet fully implemented, but will be added in a future release. Currently when used with STM modules, any one STM can open or close the relay, rather than acting as a secure loop.]

If at least one of the assigned magnet contacts is open, the switching state of the receiver is ON. If all learned magnet contacts are closed then the switching state is OFF. The magnet contacts transmit a 'supervisory signal' approximately every 15 minutes. For magnet contacts that are in security mode (indicated by a 1 second interval blinking of a relays green light during learn mode) if there has been no supervisory signal for more than 35 minutes the relay considers the contact open. For magnet contacts in unsecured mode (indicated by a 0.5 second interval blinking of a relays green light during learn mode) there will never be an indication of whether the contact has failed to send a supervisory signal.

Potential reasons why the supervisory signal is not being received include:

- The energy store of the window contact is empty (make sure the solar cell receives sufficient sunlight), the radio channel is disturbed by interference or obstructions, the window contact has been removed, or the contact is broken.

4. PROGRAMMING THE RELAY RECEIVER

When programming the receiver, the LVRX must be connected to power. Parameter values are retained after power is disconnected.

Choosing a relay

The LVRX-4 has four and the LVRX-8 has eight different relays that can communicate with transmitters. To choose a relay hold down the LRN (learn) button for approximately 0.5 seconds. The green R1 button will start blinking every 1 second confirming that relay 1 is in learn mode. To change the learn mode to relay 2 press the LRN button again and the green R2 light will blink every 1 second confirming that relay 2 is in learn mode. To change the learn mode to relay 3 and relay 4 simply follow the same steps by repeatedly pressing the LRN button until the desired relays green light is blinking. (Note: The LVRX-4/8 starts in toggle/secure mode and after going through the 4/8 relays once it circles back to R1 and changes to momentary/unsecured mode.) See step 8 to learn about the different modes.

Each LVRX unit can learn up to 80 transmitters, but any one channel can learn more than 20 transmitters, if desired, as long as the total number of switches does not exceed 80. One single relay can learn either PTM Switches or STM250 Magnet Contacts but not both at the same time.

How to learn a PTM Switch

First find the desired relay by repeatedly pressing the LRN button until the desired relay green light is blinking. Once the desired green light is blinking press one of the rockers on the PTM Switch and the relay will learn that switch's signal. The green light will turn on and stop blinking for approximately 4 seconds indicating that the relay has learned the transmitter's signal. Once the light starts blinking again more transmitters can be added or deleted. To delete that same switch from the relays memory, simply press one of the rockers on the PTM switch again. The green light will turn off for approximately 4 seconds indicating that the transmitter has been deleted from the relay's memory. Every time a rocker from the switch is pressed the rocker will either be added to or deleted from that specific relay's memory. To exit learn mode hold down the LRN button for 2 seconds.

How to learn the STM250 magnet contact

First select the desired relay by repeatedly pressing the LRN button until the desired relay's green light is blinking. Once the desired relays green light is blinking press the red button inside the back cover of the STM250 Magnet Contact and the relay will learn the signal. The green light will turn on and stop blinking for approximately 4 seconds indicating that the relay has learned the transmitters signal. Once the light starts blinking again more transmitters can be added or deleted. To delete a specific STM250 Magnet Contact from a relays memory press the red button again. The green light will turn off for approximately 4 seconds indicating that the transmitter has been deleted from the relay's memory. Every time the red button inside the back cover of the STM250 is pressed that STM250 will either be added to or deleted from that specific relay's memory. To exit learn mode hold down the LRN button for 2 seconds.

Exiting Learn Mode

After all of the PTM Switches and/or STM250 Magnet Contacts have been configured to the desired relays hold down the learn button for 2 seconds and the LVRX will exit learn mode. The green lights will no longer blink indicating that none of the Relay's are in learn mode. To test if the PTM switches are working, press the switch's rocker and the green light(s) that correspond with that transmitter will light up. Do the same thing for the STM250 by moving the magnet towards or away from the contact.

Clear All

To clear the entire memory of the LVRX, hold down the CLR button for 2 seconds. This will clear the entire memory of the LVRX and it automatically starts the learn mode.

Clear Relay

To clear one relay hold down the clear button for 2 seconds while the relay you want to clear is in learn mode. This will clear the entire memory for that relay and return you to learn mode.

Toggle/Secure mode and Momentary/Unsecured mode

[This mode is not yet fully implemented, but will be added in a future release. Currently when used with STM modules, any one STM can open or close the relay, rather than acting as a secure loop.]

After entering learn mode by holding the LRN button down for 0.5 seconds the green R1 light will start blinking every 1 second indicating that relay 1 is in learn mode. The 1 second blinking of the green light also indicates that the LVRX is in Toggle/Secure mode. To change the LVRX into Momentary/Unsecured mode press the LRN button three more times until the green R4 light is blinking every 1 second. The LVRX is still in Toggle/Secure mode at this point but when the LRN button is pressed again the green R4 light will stop blinking and the learn mode will cycle back to Relay 1. The LVRX will now be in Momentary/Unsecured mode which is indicated by the green R1 light blinking every 0.5 seconds. To change the learn mode to relay 2, relay 3, or relay 4 (up to 8 for the LVRX-8) while the LVRX is in Momentary/Unsecured mode follow the same procedure pressing the LRN button until the green light of the desired relay is blinking.

- a. Toggle and Momentary mode refer to EnOcean PTM Switches. Secure and Unsecured mode refer to EnOcean STM250 Magnetic Contacts
- b. One relay can have transmitters in both toggle/secure mode and momentary/unsecured mode in its memory

5. TROUBLESHOOTING

For a new or pre-existing system:

- Verify the receiver is connected as specified.
- Verify the fixture operates without the switch in-line.
- Delete all assigned transmitters in the receiver (press and hold the CLR button for 2 seconds); then reprogram the receiver

If the receiver independently turns ON and/or OFF:

- This can occur when an unintended transmitter is activated within the receiver when a receiver was in Programming Mode.
- Clear all transmitters in the receiver and reprogram the receiver

The receiver does not receive a transmitter command:

- Move the switch or magnet contact closer to the receiver. If the system works at closer distance, the transmitter was installed outside the reception range or there was radio signal interference. In such instances, repeaters are a plausible solution and are available through your dealer.
- Mount the switch or magnet contact or the receiver at a better location

Please note that 868 MHz band is used in the United States of America by trunk radios. In some locations close to trunking radio towers, decreased range may be noticed.

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