User's Manual
RF Wireless Receiver
Model TL-Rx-315
315 MHz Remote Control Receiver

TL-RX-315 User Manual Contents

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DESCRIPTION

Model TL-Rx-315 radio frequency (RF) receiver operates at 315 MH, together with a compatible handheld RF transmitter, e.g., CMD-HHLR-315, they allow wireless remote control for a variety of TLE RF Switch devices. The TL-Rx-315 receives RF signals sent by the RF transmitter, then translates it into a Rs232 compliant output to be carried by control cable to the RF Switch. Figures 1and 2 shows example of Remote controlled RF Switch.

Application

Figure 3 shows an example of wireless remote control of RF Switch used in small building for TV/RF signal distribution.

Save this User's Manual - It contains important installation and operating instructions.

Please read all instructions before installing and operating.

Please note The receiver will not operate properly if it is located in RF shielded area, e.g, behind or within metal walls.

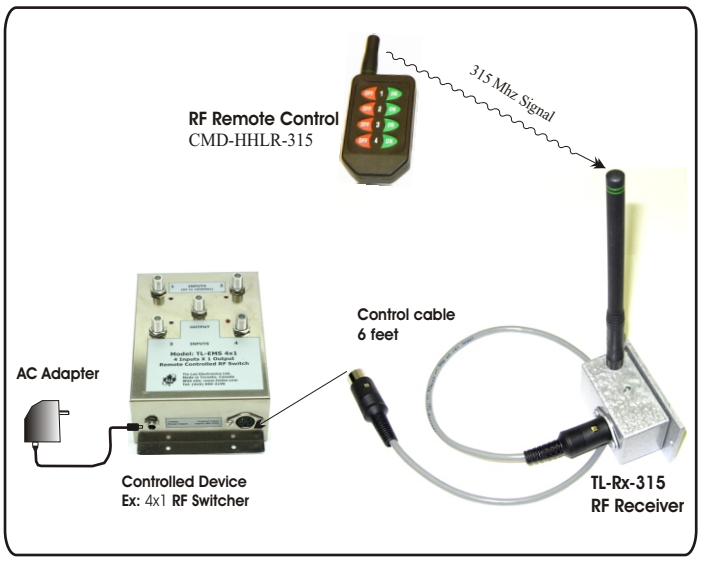


Figure 1 RF Remote Control for RF Signal Switcher

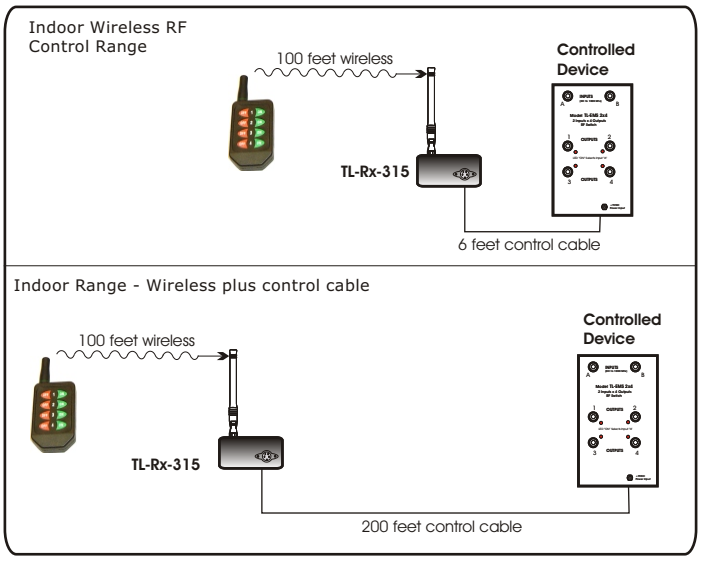


Figure 2 Remote Control Range

HOW IT WORKS

TL-Rx 315 can receive signals from four transmitter *, then, output the signal via control cable to a controlled device (e.g., TL-EMS-2x4 - two input by four output RF Switch.
Remote Control Range = 100' and control cable (see fig.2)
Remote controls (Tx) are used to select input A or B for outputs 1 thru 4.

* Multiple remote controls can be used provided there is a two second gap between transmissions.

Firmware in TL-EMS 2x4 switcher determines Tx control functions.

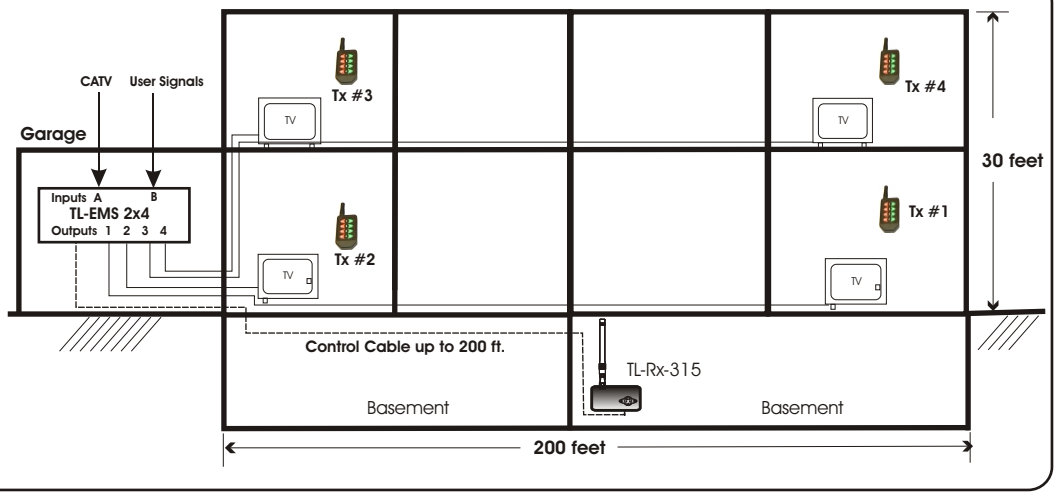


Figure 3 Example Application RF Remote Control for RF Signal Switcher in small building

PARTS DESCRIPTION

Receiver Package Description: Figure 4 package contents for RF receiver includes: TL-Rx-315, Antenna, Shielded Control Cable (6'), and two screws (see Figure 4).

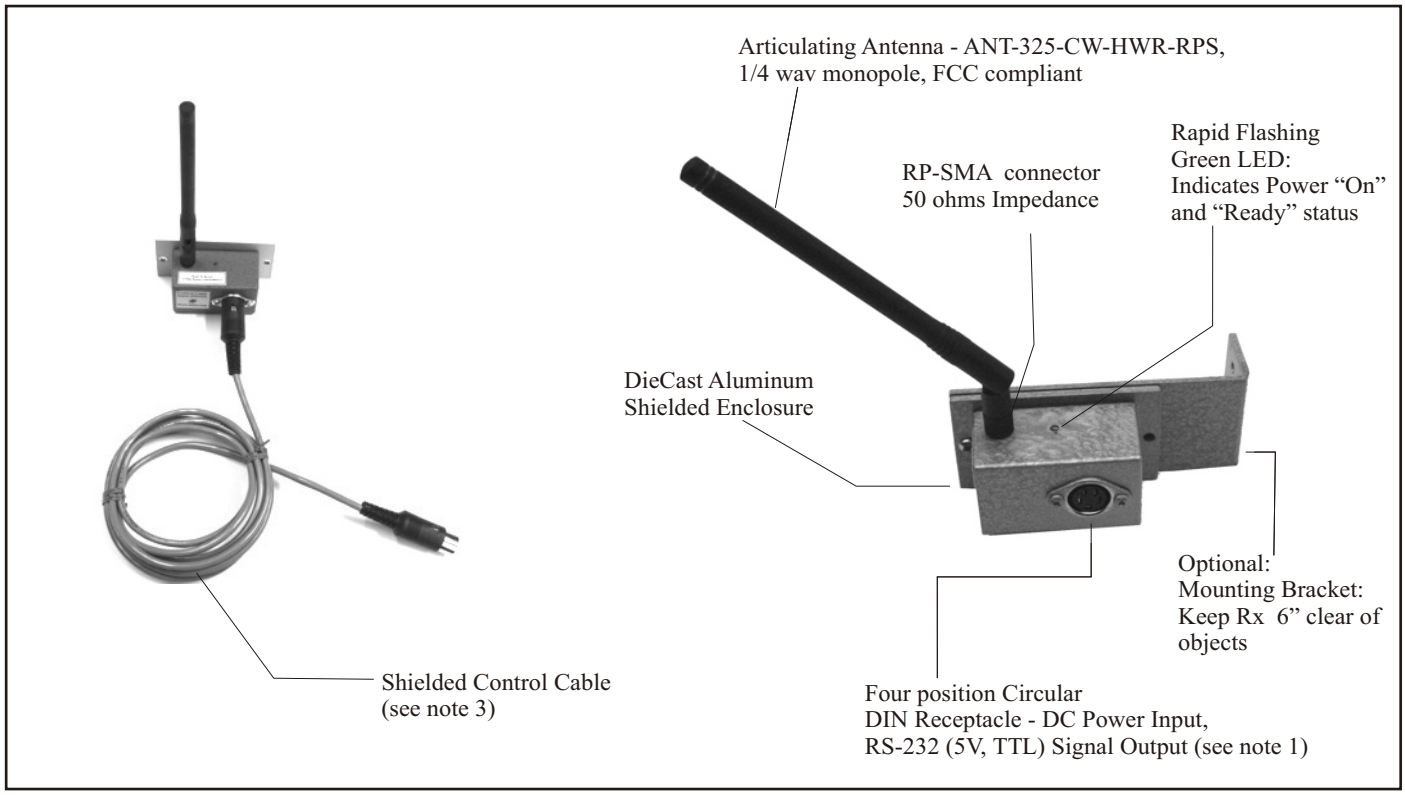


Figure 4

Notes:

1. TL-Rx-315 Output port pin assignments and Rs232 signal output sequence, see Appendix A
2. Compatible transmitters: CMD-KEYx-315xxx, CMD-HHCP-315, CMD-HHLR-315, CMD- HHTX-315 (Linx pre-certified products).
3. Standard control cable is 6 feet. Optional Longer control cable is available - up to 200 feet.

SPECIFICATIONS

Operating Power: Voltage: +5VDC; Current: 7mA
Operating Temperature: -40 to +70º C

Receive frequency: 315Mhz±50Khz
Receive Sensitivity: -112 dBm (for BER 10^{-5} at 1,200 bps)
Receive range: Indoor operation up to 100 feet from transmitter, with typical indoor construction materials. Range without obstructions, in the line of sight, is up to 1000 ft.
Note: RF signals will not propagate through solid metal obstructions. The TL-Rx-3l5 will not function if located in shielded area.

Output RS232 signal: 5V TTL, 19.2K Baud - RS232 signal transfer range: up to 200 ft
Dimension: Die-Cast Aluminum Shielded Enclosure: 57 x 35 x 30 mm or 2.23 x 1.36 x 1.13 in
Weight: 0.25 lbs (5 oz) (w/ antenna & mounting bracket)

Configuration:
The TL-Rx -315 Receiver doesn't need configuration. When controlled device is connected, and +5VDC is supplied to the Rx, the green LED on Rx will rapidly flash to indicate power presence and ready to receive status.

4.0 INSTALLATION and CONNECTIONS

TL-Rx-315 (Receiver) Location
The Receiver can be located close to the controlled device or far from it. For best performance, the receiver should be located in an interference free location, and where there is least amount of obstructions. Remote control works best when physical distance between Receiver and the Transmitter is less than 100 ft through ususal indoor building materials.

Control Cable Connection
Connected one end of control cable to TL-Rx-315 and other end to the Controlled Device. The TL-Rx-315 has a circular 4 pin DIN output jack. The control cable is a shielded four conductor control cable with 4 pin circular DIN plug ends. Cable length is 6 feet standard, and available up to 200 feet.

Install TL-Rx-315 indoors, do not immerse in water, and avoid locating the TL-Rx-315 in direct sunlight or in temperatures below +14°F (-10°C) or above +122°F (+50°C).

Antenna Orientation: The TL-Rx-315 includes an articulating antenna which can be adjusted for best performance.(see figure 4). In general orientate the Receiver and transmitter antennas vertically relative to the floor.

DO NOT modify the receiver.
The user is cautioned that changes and modifications made to the equipment without the approval of the manufacturer could void the user's authority to operate this equipment.

5.0 OPERATION

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

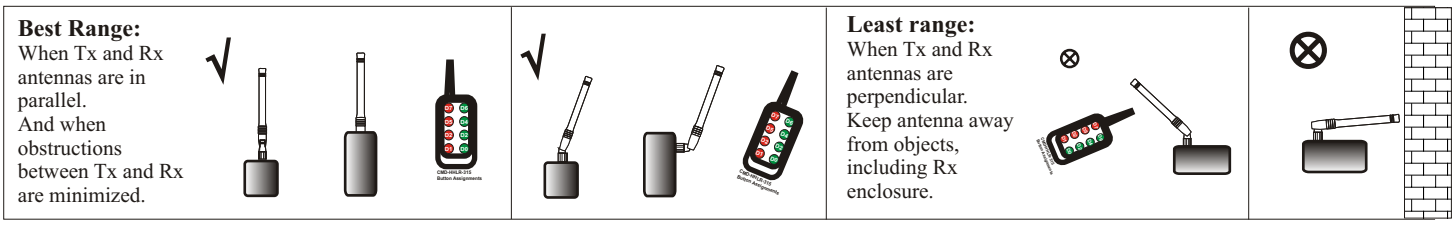
The TL-Rx-315 is powered from the Controlled Device. When the control cable is connected and power (+5Vdc) is applied, the LED on the receiver will flash rapidly to indicate it will receive the remote control transmissions.

Operating the Remote Control - To send a control signal press down a button and hold for 1 second, then release.

Operating range (see fig.2,3)
Wireless remote control range is up 100 ft with typical indoor obstructions. The control range between TL-Tx-315 and controlled device is up to 200 feet. This can be further increased with a signal conversion option.

Limitations:
The TL-Rx-315 and Remote Control range will vary depending on operational and environmental conditions. The Receiver and Remote Controls will not function if located between RF shielded area, RF signals will not travel through metal obstructions, e.g., aluminized wall panels.
Multiple Transmitters (Tx) can operate in same reception area. All Tx use the same frequency, therefore, allow two seconds separation between transmissions. Note: Each Tx have distinct address and will be recognized individually by the controlled device.

Figure 4 Range and Antenna Orientation



FCC Information

Declaration of Conformity

Trade Name:	Radio Frequency Receiver
Model Number:	TL-Rx-315
Compliance Test Report Number:	B70710A1
Compliance Test Report Date:	July 10, 2007
Responsible Party:	Tin Lee Electronics Ltd.(TLE)
Address:	41 Coxwell Ave., Toronto, Ontario, Canada
Telephone:	416-690-3196

INSTRUCTION TO THE USER (FCC NOTICE)

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.

In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

I the undersigned, hereby declare that the receiver specified above conforms to the above requirements.

Place: Signature:

Date: Full Name:

Position

Industry Canada Requirements

INDUSTRY CANADA (DIGITAL APPARATUS)

Interference -Causing Equipment Standard ICES-003 Issue 2

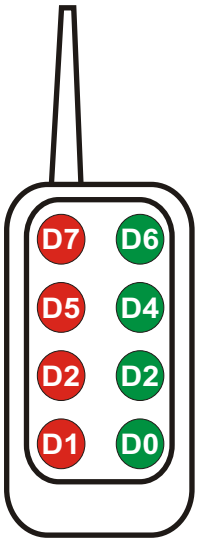
This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment regulations.

NOTE:
Operation is subject to the following two conditions:
(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Product Warranty

TLE warrants theis product to be free from defects in material and workmanship for 2 years. This time period will be based on date of purchase on invoice.

Transmitter Eight Button Keypad Output



CMD-HHLR-315
Button Assignments

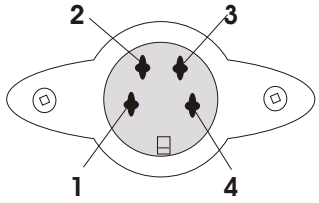
Table1. Button pressed Information:

BIT digit (The sixth byte)	Button pressed
00000001	D0
00000010	D1
00000100	D2
00001000	D3
00010000	D4
00100000	D5
01000000	D6
10000000	D7

TL-Rx-315 Serial Output Connector and RS-232 Output Sequence

The TL-Rx-315 Circular DIN connector Pin assignments is as follows:

Pin1 (Green wire) is TX of RS-232. (5.0v, TTL)
Pin2 (White wire) is RX of RS-232. (5.0v, TTL)
Pin3 (black wire) is Ground.
Pin4 (red wire) is for 5.0v power supply.



Circular DIN Connector

The RS 232 Signal Output Sequence:

When the TL-Rx-315 (Rx) receives valid signal from a transmitter it will send 6 bytes data to RS-232 port. The first three bytes are 3 ASCII characters “STR”, the fourth byte is low byte of the address of the transmitter, the fifth byte is high byte of the address of the transmitter, and the sixth byte is Button Pressed information (see Table 1).
After sending 6 bytes data to RS-232 port, the Rx will wait for answer. If the answer is ASCII character 'K', the Rx will cease sending data to RS-232 port. If the answer is ASCII character 'e', the module will send the same data to RS-232 port again. If no answer occurs during 10 ms, the module will repeat sending same data to RS-232 port.