impro technologies®

MODEL NUMBERS: HRR900-0-1-GB-XX
HRR901-0-1-GB-XX

Quad Receiver

433.92 MHz 4-Channel RF Receiver
INSTALLATION MANUAL

SPECIFICATIONS

Working Environment

Water resistance	Designed to work in an indoor or outdoor environment similar to IP44, the Impro Quad Receiver is water resistant

Power Source

Input Voltage	11V to 15 V DC (Polarity sensitive)	
Power Requirements	**Current (mA)**	**Power (W)**
12 V DC	60	0.7

NOTE: When upgrading or replacing a legacy "ImproX UHF Receiver", make sure to reconnect using a 12V DC supply.

INSTALLATION INFORMATION

CAUTION: These two models of the Impro Quad Receiver only support connection to the Impro IXP220 Controller, IXP20 Controller, iTRT (Intelligent Twin Reader Terminal), MfT (Multi-function Terminal), TA (Time Attendance Terminal), and the Impro UniScan and FlexiScan Controllers. DO NOT attempt to connect this Receiver to an Impro (DT) Door Terminal.

Accessories

Find the following when unpacking the Quad Receiver:

- The Quad Receiver consists of a glass-filled nylon Base with the PCB attached by four screws, a glass-filled nylon Top Cover (press-down firmly to clip into the base).
- A black gland plate for power, data and RF (in the case of the HRR901) lines into the unit (this needs to be drilled to accommodate the wiring during installation).
- An extra Serial Number Label.

General

Impro TA Terminal Considerations

When installed with the Impro TA, the Terminal can be placed in one of two modes: Channel 1 and 2 Mode or Channel 3 and 4 Mode. If you place the Terminal in Channel 1 and 2 Mode then Channels 1 and 2 of the Impro Quad Transmitter (TRK900-1-1-GB-XX) are processed. Channel 1 is processed as the Terminal's Primary Fixed Address and Channel 2 is processed as the Terminal's Secondary Fixed Address. This scenario also applies to Channel 3 and 4 Mode. Using the Impro TA as an example, refer to Figure 1 for clarification.

Upgrading or replacing legacy UHF Receiver

When upgrading from or replacing a legacy UHF receiver, it is important to do the following:

- Change the DC supply voltage from 5V to 12V (12V is available on IXP220, IXP20 or iTRT)
- When connecting to an IXP220, IXP20, iTRT, Mft or TA, ensure that the "Legacy" link is in place. (There is no need to change any DIP Switch settings.)

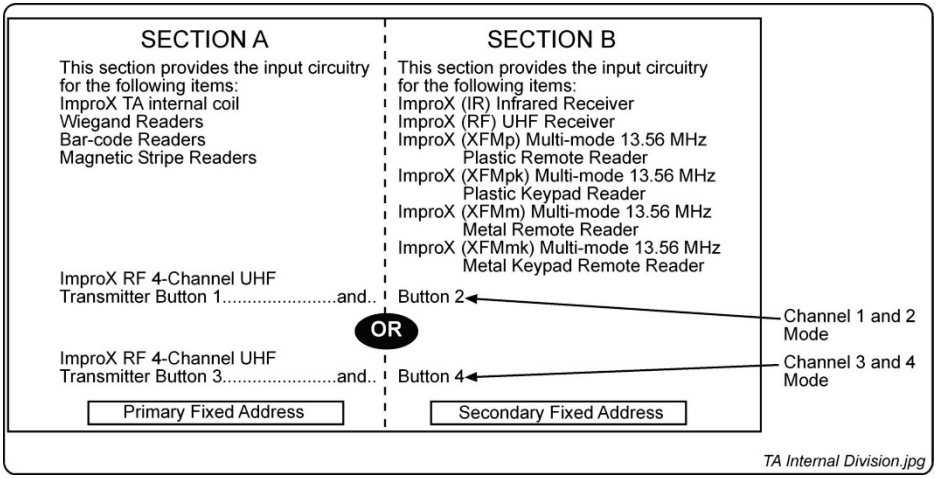

Figure 1: TA Internal Division Showing Channel 1 and 2 Mode and Channel 3 and 4 Mode

Maximum Data Communications Distance

The maximum cable length between the Impro Quad Receiver and the Terminal or Controller is 150 m (164 yd.), using a good quality multi core cable. The cross-sectional area of the cable conductors must be at least 0.21mm^2 (24 AWG) for each of the "-", "+" and "D" conductors. To mitigate interference, cables should be a screened multi core cable.

Solder a 2.5 mm^2 (13 AWG) grounding wire to the Host end of the screen drain wire (insulate the soldered joint so that it is not left exposed) and route this wire to the nearest Electrical Mains EARTH terminal – most often this may be same power socket used by the DC Power supply for the Controller.

NOTE: The Quad Receiver (Device) end of the screen drain wire must not be connected to anything.

Serial Number Label

The loose Serial Number Label (packaged with the Receiver) identifies the model of Receiver and its Serial Number.

Installation Considerations for Best Performance

When installing the HRR900-0-1-GB-XX, it is important to consider the location and environment for achieving optimum performance.

Location

Mounting the Impro Quad Receiver or Antenna mid-distance between the expected point of entry and exit may balance the available operational range between both locations.

Line-of-Sight

Locating the Impro Quad Receiver or Antenna within line-of-sight of the expected point of entry and exit may result in greater received signal strength, increasing the operational range.

Integrated Antenna (HRR900-0-1-GB-XX)

Mounting this Impro Quad Receiver on (or close to) conductive, ferrous materials, damp surfaces (i.e.: walls) or electrical equipment can affect the overall performance of the Impro Quad Receiver by either blocking, absorbing or interfering with the transmitted signal from the Quad Transmitter.

Due to the radiation pattern of the integral antenna, it is preferable to install the Impro Quad Receiver in a high position, with its integrated antenna pointing down. If this is not possible, then consider using the HRR901-0-1-GB-XX with an external antenna that meets the requirements of the installation.

External Antenna (HRR901-0-1-GB-XX)

This model is recommended when an installation calls for special antenna considerations. This Impro Quad Receiver has its internal antenna bypassed and is configured for direct connection to any of the various suitable antenna types available (i.e.: high gain, Omni-directional, yogi etc.). An appropriate antenna must be selected by the installer to complete the installation.

External Antenna Basic Requirements

Frequency	433.92 MHz
Impedance	50 Ω
Connector	SMA Male (Straight preferred)

Transmit-Receive (Reciprocity) Trouble Shooting:

The Impro Quad Receiver has a built-in LED RSSI (Received Signal Strength Indicator) bar graph. Before permanently mounting the Quad Receiver (or the external antenna for HRR901) to a surface, it is recommended that the RSSI is checked with the receiving antenna temporarily held in its proposed mounting position, and the Impro Quad Transmitter at the expected point of entry or exit.

RSSI (Received Signal Strength Indication)

Strong	Installation is perfect, no need to change anything
Average.....	Installation is good enough for nominal operation
Weak.....	Consider installing the Quad Receiver in another location to improve operation
No Signal ..	There is no reception at the current location. Refer to all of the above installation considerations or check the installation for faults

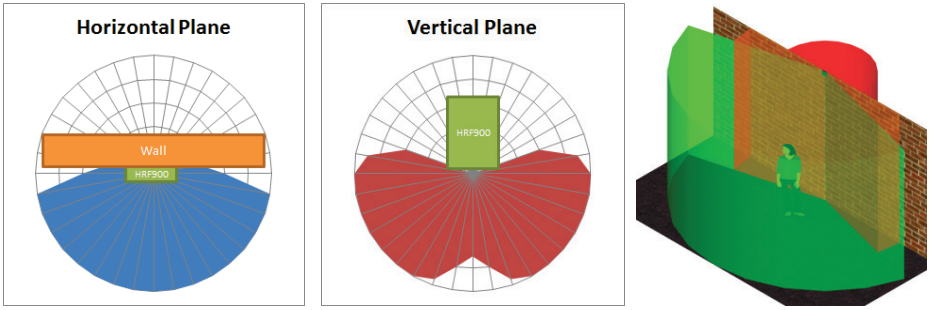

Figure 2: Radiation Pattern for the HRR900's integrated antenna

In Figure 2, the 3-D isometric radiation pattern (extreme right) is achieved with the HRR900 Impro Quad Receiver mounted flat against the wall, right near the top, with the internal antenna facing downwards. The green volume represents the direction of maximum sensitivity.

Four Channel Operation

When using the Impro Quad Receiver and a single Impro (iTRT) Intelligent Twin Reader Terminal (XRT910-0-0-GB-XX, XRT920-0-0-GB-XX, IPS920-0-0-GB-XX or IPS921-0-0-GB-XX), only two Push-buttons on the Impro Quad Transmitter (TRK900-1-1-GB) are available for use.

To use all four of the Quad Transmitter's Push-buttons, connect two Impro (iTRT) Intelligent Twin Reader Terminals (XRT910-0-0-GB-XX, XRT920-0-0-GB-XX, IPS920-0-0-GB-XX or IPS921-0-0-GB-XX), to the Quad Receiver, see Figure 3.

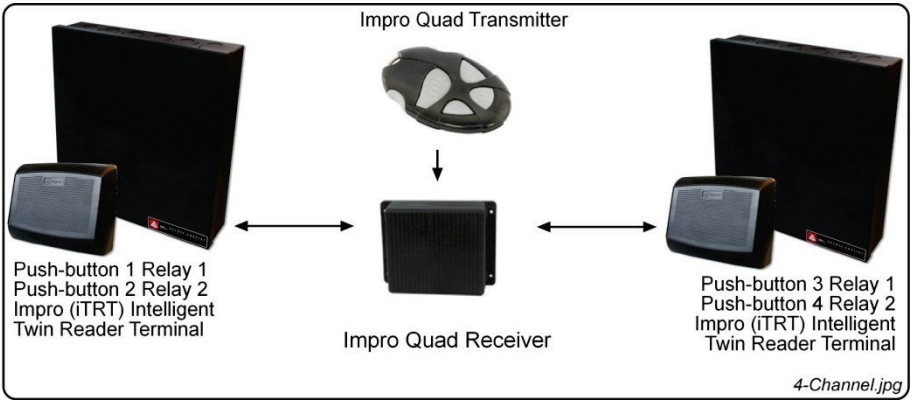

Figure 3: Using Four Channels

Impro FlexiScan Controller

When using the Quad Receiver with the FlexiScan Controller (HCM991-0-0-GB-XX), EACH of the four Quad Transmitter buttons (when "added" to the Tag Database) are mapped to each the FlexiScan's four relays respectively. The "Legacy link" must be REMOVED from the Quad Receiver PCB. See Figure 9 for wiring details

Impro UniScan Controller

When using the Quad Receiver with the UniScan Controller (HCM990-0-0-GB-XX), all four Quad Transmitter buttons will trigger the UniScan's single relay ONLY with the Quad Transmitter buttons that have been "added" or "enrolled". The "Legacy link" must be REMOVED from the Quad Receiver PCB when connected to a UniScan Controller. See Figure 10 for wiring details.

Cable Gland Plate Drilling Procedure:

- Remove the Housing Cover ensuring that the Gland Plate remains in its position in the slot in the base of the housing.
- Make a mark on the Gland Plate corresponding exit points that will have the wires run NEXT to, and NOT OVER the Impro Quad Receiver PCB (if using the built-in antenna, this area must be kept cleared of any objects).
- Remove the Gland Plate and drill a 2mm pilot hole through the mark/s.
- Select a drill size for a snug fit around the cable/s to be used and drill the hole/s to the final size/s required.

Mounting the Impro Quad Receiver

CAUTION: Make certain that you mount the Impro Quad Receiver on a vibration-free surface.

Select the mounting position of the Impro Quad Receiver, considering accessibility and routing of wires – and test to ensure the RSSI reading is adequate. (See Transmit-Receive (Reciprocity) Trouble Shooting on page 4.)

Secure the housing to a vertical mounting surface, using suitable screws and wall plugs, nuts and bolts, rivets or double-sided adhesive tape.

Connecting the Impro Quad Receiver

Figure 4 to 10 show typical electrical connection diagrams for the Receiver.

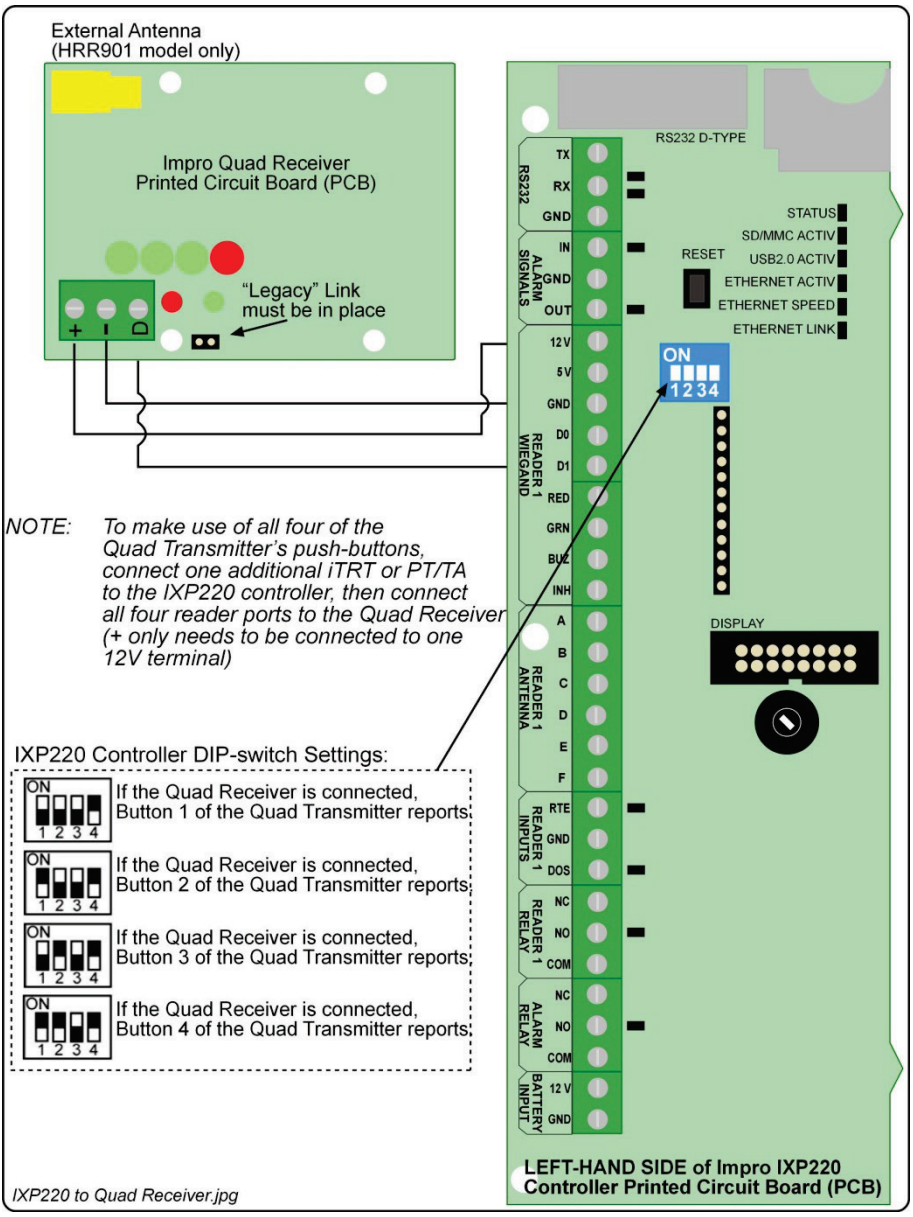

Figure 4: Impro Quad Receiver Connected to the IXP220 Controller

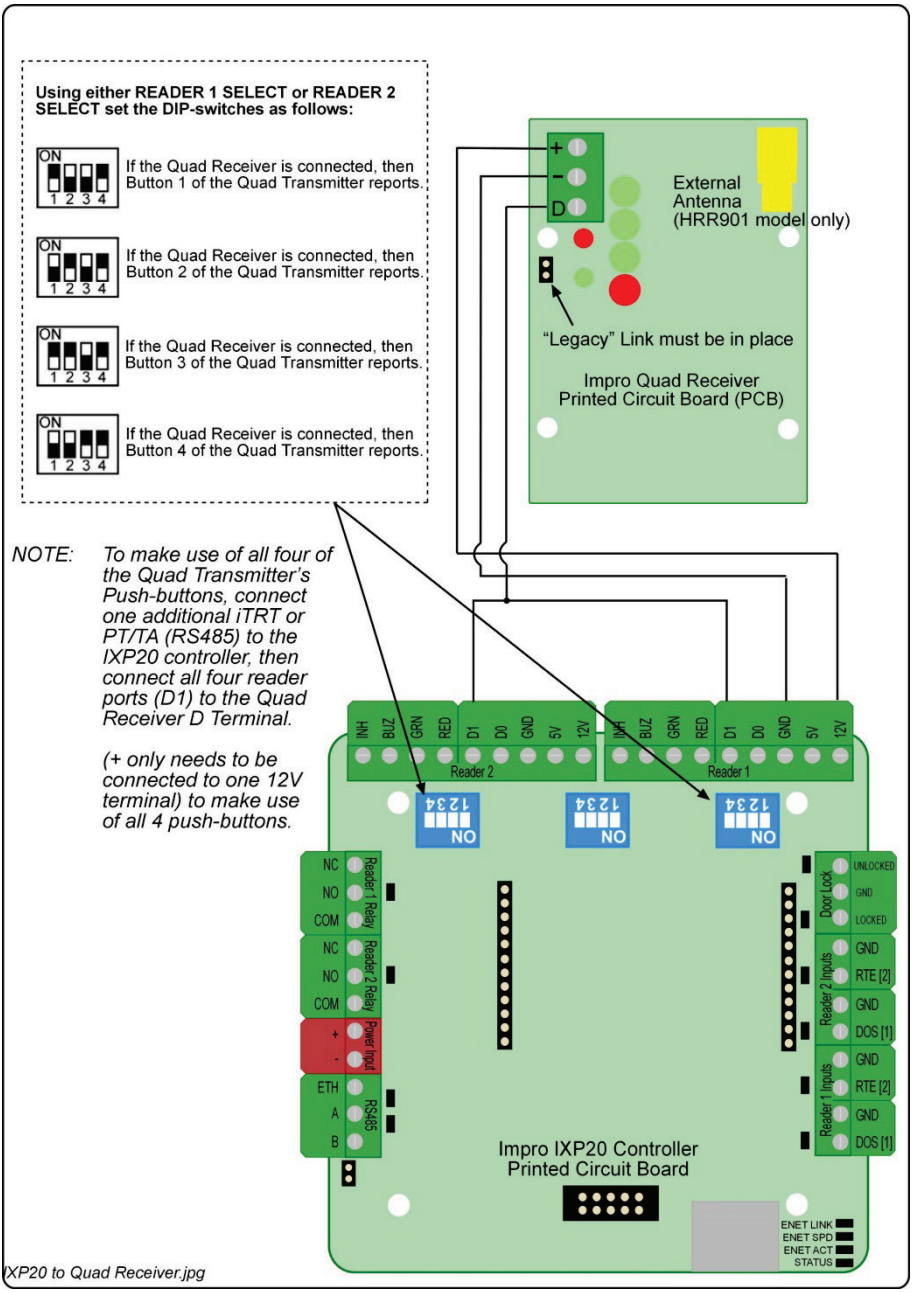

Figure 5: Impro Quad Receiver Connected to the IXP20 Controller

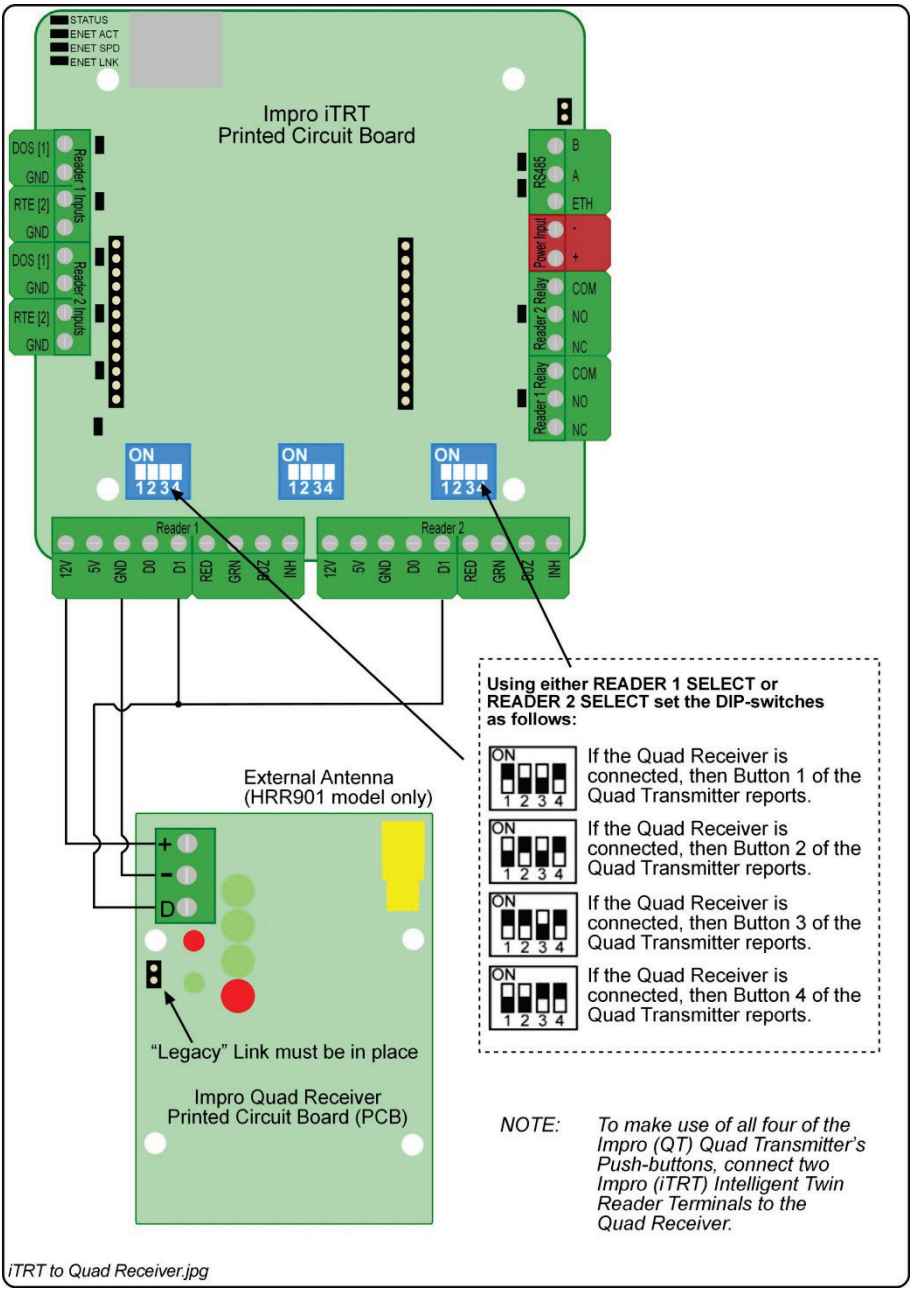

Figure 6: Impro Quad Receiver Connected to the Impro iTRT

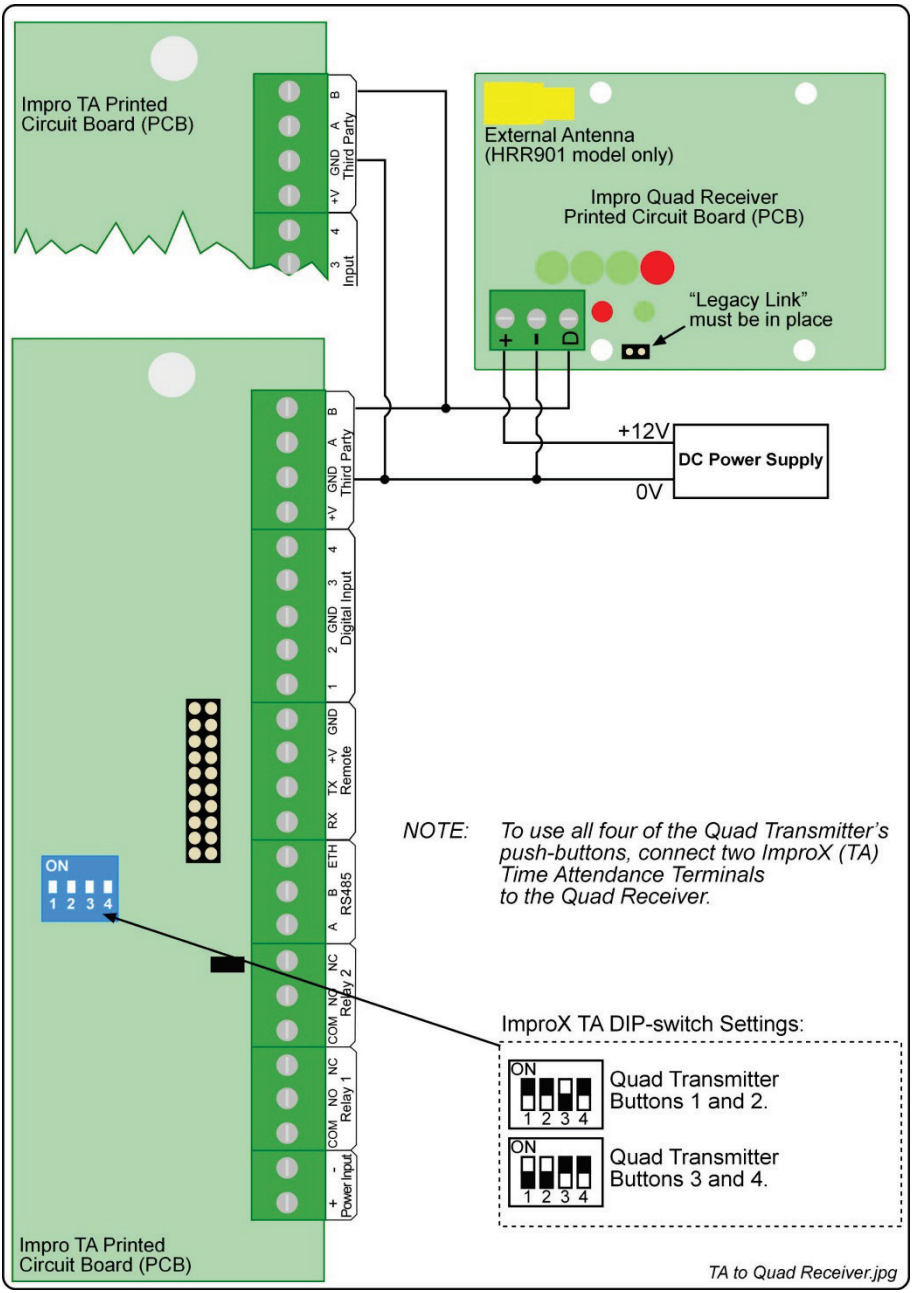

Figure 7: Impro Quad Receiver Connected to two Impro PT/TA Terminals

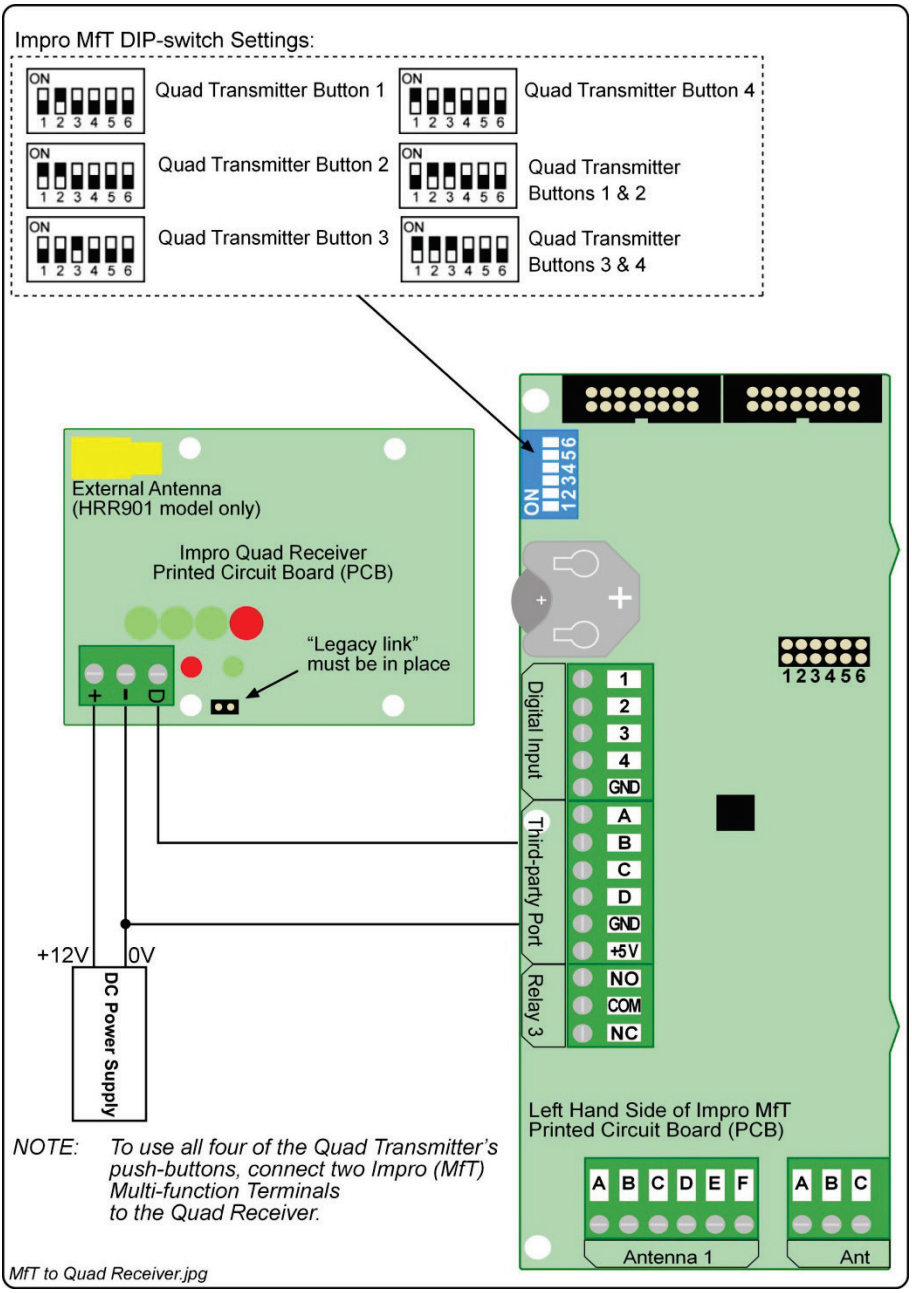

Figure 8: Impro Quad Receiver Connected to the Impro MfT

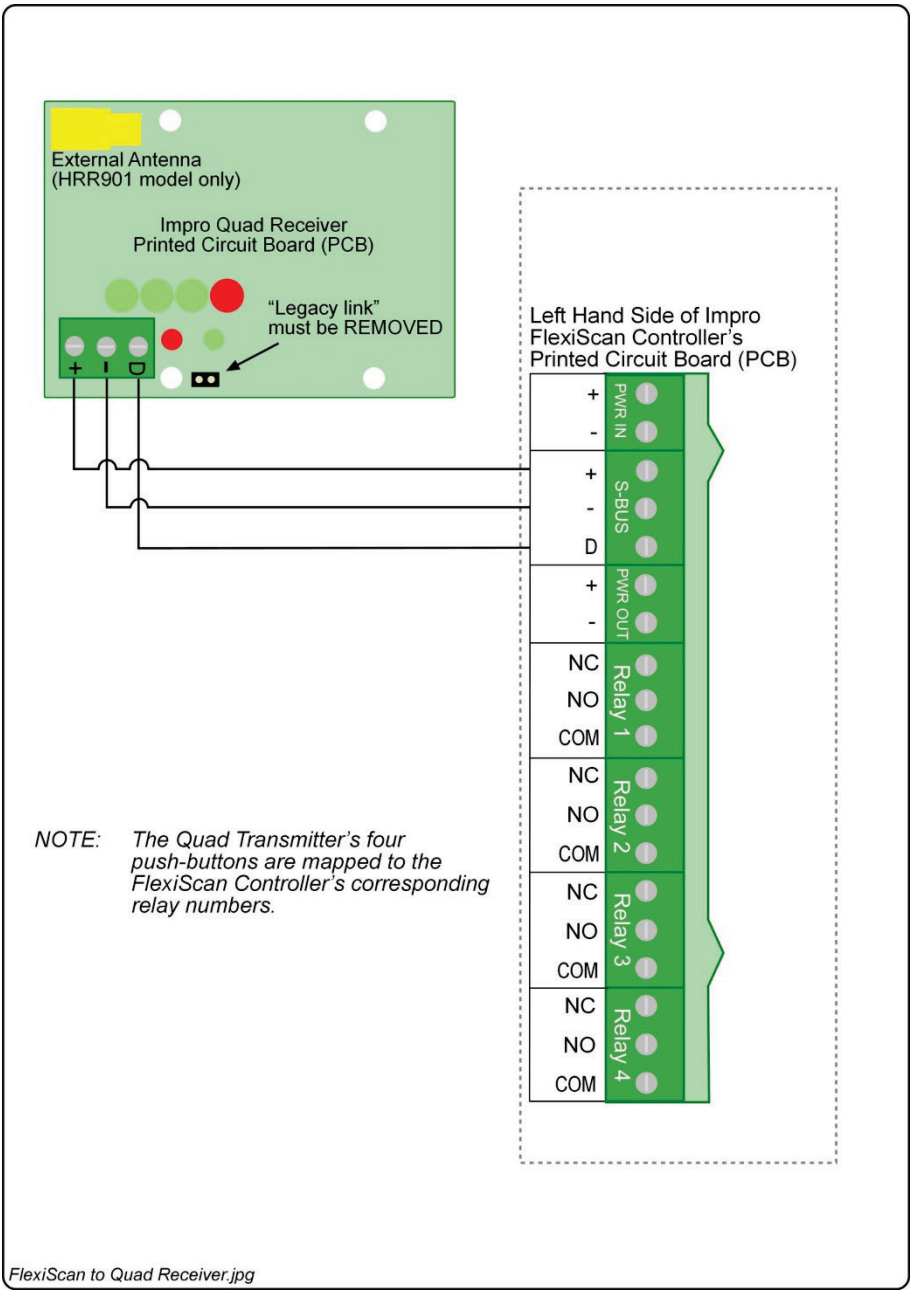

Figure 9: Impro Quad Receiver Connected to the Impro FlexiScan Controller

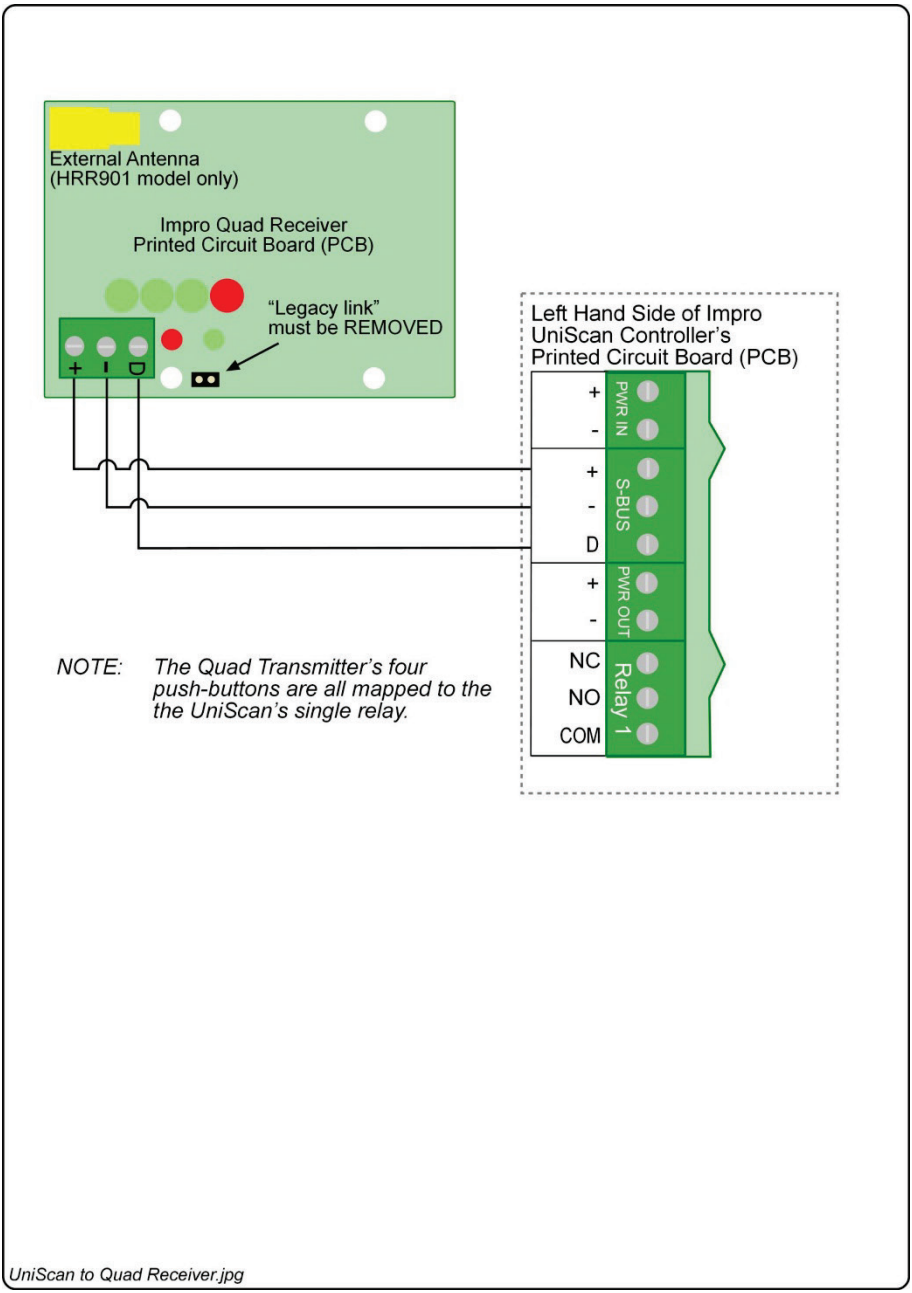

Figure 10: Impro Quad Receiver Connected to the Impro UniScan Controller

GUARANTEE OR WARRANTY

This product conforms to our Guarantee or Warranty details placed on our Web Site, to read further please go to www.impro.net.

User Notes

This manual is applicable to both variants of the Impro Quad Receiver, HRR900-0-1-GB-XX and HRR901-0-1-GB-XX. (The last two digits of the Impro stock code indicate the issue status of the product).			
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