

PTZ-900 Series

**900 MHz Spread Spectrum
Digital Wireless Pan/Tilt/Zoom Camera Control Transmission System**

Installation and Operating Instructions



Your Trango Systems Wireless PTZ System:

Congratulations on choosing **Trango Systems, Inc.** to fulfill your wireless needs. Unpack your system carefully. If any items are missing, notify your sales representative. If an item appears to be damaged from shipment, replace it in its packing material and notify the shipper.

Save the packaging for further storage of the equipment.

Service:

If the unit ever needs repair service, contact Trango Systems customer service for return authorization and shipping instructions.

Note: This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with these 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 correct the interference by one of more of the following measures:

- 1) Reorient the receiving antenna;
- 2) Increase the separation between the affected equipment and the receiver;
- 3) Connect the affected equipment to an outlet on a different circuit from that which the receiver is connected to;
- 4) Consult the dealer and/or experienced radio/TV technician for help.

FCC ID Numbers:

Transmitter PTZ-900TX: FCC ID# NCYPTZ900TX

WARNING: Intentional or unintentional changes or modifications not expressly approved by the party responsible for compliance must not be made. Any such modifications could void the user's authority to operate the equipment.

QUICK START GUIDE

1. VERIFY PROPER OPERATION OF CAMERA CONTROL USING A DIRECT WIRED CONNECTION PRIOR TO INSTALLING WIRELESS LINK.
2. SET THE PTZ-900TX AND PTZ-900RX SERIAL PORT DATA RATE AND MODE (RS422 or RS232) USING THE TRANGOLINK PROGRAM AND SUPPLIED CABLE. (THIS STEP NOT REQUIRED IF THE PTZ CONTROL EQUIPMENT IS SET TO USE 9600 BPS and RS422 or RS485 MODE)
3. INSTALL TRANSMITTER AND RECEIVER UNITS IN DESIRED LOCATION TO 2 3/8" MAX DIAMETER STEEL POLE PER INSTALLATION DRAWING.
4. INSTALL ANTENNAS ABOVE THE ENCLOSURES AND ALIGN PROPERLY.

IMPORTANT NOTE: THE PTZ-900TX (TRANSMITTER) USES A SPECIAL ANTENNA CONNECTOR. ONLY USE ANTENNAS SUPPLIED BY TRANGO SYSTEMS WITH THIS TYPE OF CONNECTOR OR DAMAGE TO THE UNIT MAY OCCUR.

5. TIGHTEN ANTENNA CABLE TO RECEIVER AND TRANSMITTER. APPLY A SMALL AMOUNT OF SILICONE TO FLANGE TO MAKE A LEAKPROOF CONNECTION.
6. CONNECT INTERFACE AND POWER CABLES TO UNITS THROUGH FLANGES. TIGHTEN FLANGES TO ALLOW SMALL AIR GAP AT BOTTOM OF ENCLOSURE. MAKE SURE THAT GROUNDING STRAP IS SECURE TO AN EARTH GROUND.
7. VERIFY THAT LEDs ARE SOLID RED ON TRANSMITTER AND RECEIVER BEFORE SENDING PTZ COMMANDS.
8. TIGHTEN LID OF ENCLOSURE DOWN.

IMPORTANT NOTE: DO NOT APPLY POWER TO THE TRANSMITTER UNLESS THE ANTENNA IS CONNECTED. PERMANENT DAMAGE MAY RESULT.

SAFETY NOTE: THE PTZ-900TX TRANSMITTER OUTPUT POWER VARYS BETWEEN ½ and 4 WATTS EIRP. ALTHOUGH TRANSMISSIONS ARE OF A SHORT DURATION, IT IS RECOMMENDED THAT THE TRANSMIT ANTENNA BE KEPT AT LEAST 3 FEET AWAY FROM NEARBY PERSONS.

System Description:

The PTZ-900 is a professional quality wireless transmission system designed for sending simplex digital pan, tilt, zoom and camera control signals up to 12 miles line-of-sight. The system employs 900 MHz frequency hopping spread spectrum technology with the maximum effective output power allowed by the FCC for unlicensed operation. The system will operate interference free with the Trango Falcon or Eagle series wireless video transmission systems to form a complete wireless control link.

Figure 1 shows the most common connection diagram for setting up a PTZ link using the PTZ-900 system.

Figure 2 shows the orientation of the antennas and mounting of the enclosures. Since the antennas are directional, they must be aligned towards each other as shown. Optional antennas are available for omnidirectional coverage and increased transmission range.

NOTE: Make sure that you have tested the controller and receiver/driver using a direct connection (with wires) before installing the wireless link.

Installation:

The system is factory-configured for operation at 9600 BPS, RS-422 mode, hopping sequence 1. If your controller and receiver/driver operate at a different speed or use RS-232 protocol, you must reprogram the PTZ-900TX and PTZ-900RX using the supplied cable and the Trangelink software which runs on any Windows 95 or higher computer. See "Changing System parameters" section for detailed information.

To obtain the best performance and transmission distance, the following rules of thumb should be followed:

- 1) Mount the transmitter and receiver antennas above human and mechanical traffic. The higher the better.
- 2) Keep the transmission path as open as possible. Objects such as walls and metallic objects near the transmission path will reduce the transmission distance.
- 3) Do not add additional lengths of cable to connect the receiver to the antenna as significant losses in signal, and reduced transmission range will occur.

The transmitter and receiver units come pre-mounted in a NEMA 4X rated polycarbonate enclosure which allows mounting of the unit outdoors.

IMPORTANT NOTE: The supplied enclosure mounting brackets are designed for a 2 3/8" max diameter, 1/4" wall thickness steel pole. The pole must be securely mounted into the ground or to a structure to prevent movement of the antenna and camera in windy conditions. This pole also acts as an earth ground. The equipment is grounded through a grounding strap.

IMPORTANT NOTE: The Transmitter and Receiver units may get warm to the touch. This is normal and does not affect operation in any way.

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TRANSMITTER OPERATION

Figure 3 shows the front panel of the PTZ-900TX transmitter and the functions of each input/output. Each is described in greater detail below.

IMPORTANT NOTE: The transmitter uses a non-standard jack to connect to the transmitter antenna. Any modification to this jack may void the user's authority to operate the equipment and will void the manufacturer's warranty.



WARNING:

DO NOT APPLY POWER TO THE TRANSMITTER WITHOUT THE ANTENNA SECURELY ATTACHED. DAMAGE TO THE UNIT MAY RESULT.

DATA INTERFACE -- This input accepts serial commands from any PTZ controller, and acts as an interface with the Tringolink software to control its internal settings. See the Tringolink software program help for more information. This interface acts as the input for simplex data up to 19200 bps.

POWER INPUT -- -- Accepts a 6-13 Volt DC power source. It is highly recommended that the supplied power adapters (7 VDC) be used to reduce heat from the unit. If another power adapter is to be used, ensure that it is well regulated (+/- 5%). Batteries may be used as external power sources as well. The nominal current draw is 200 milliamperes when not sending commands and 520 mA while sending commands.

LED -- The LED has three functional modes as follows:

- 1) Alternating Green/Red: The unit is waiting for a command from Tringolink (30 seconds after startup only.)
- 2) Red- Unit is ready to receive data from the PTZ control equipment.
- 3) Green -- The unit is sending data on the air. Since the data is typically sent out in bursts, the LED will be green for a very short time only.

RECEIVER OPERATION

Figure 4 shows the front panel of the PTZ-900RX receiver and the functions of each input/output. Each is described in greater detail below.

DATA INTERFACE -- This output sends serial commands received from the transmitter out to the PTZ receiver/driver, as well as interfacing with the Tringolink software to control its internal settings. See the Tringolink software program help for more information. This interface acts as the output for simplex data up to 19200 bps.

POWER INPUT -- -- Accepts a 6-13 Volt DC power source. It is highly recommended that the supplied power adapters (7 VDC) be used to reduce heat from the unit. If another power adapter is to be used, ensure that it is well regulated (+/- 5%). Batteries may be used as external power sources as well. The nominal current draw is 200 milliamperes.

LED -- The LED has three functional modes as follows:

- 1) Alternating Green/Red: The unit is waiting for a command from Tringolink (30 seconds after startup only.)
- 2) Red- Unit is ready to receive data from the PTZ-900TX transmitter.
- 3) Green -- Not used.

CONNECTOR WIRING

Supplied with the units are DB9- female to R-45 adapters that can be used to wire the units properly. Below are common wiring diagrams for various manufacturer's PTZ equipment and a description of the individual pins on the Transmitter and receiver.

Diagrams

POINT TO MULTIPOINT OPERATION

In some cases it may be necessary to control more than one camera from the same control panel. In this case, one PTZ-900TX transmitter would send control signals to all receivers, and the receiver drivers will filter the data as in a hardwired system. The user must ensure that all receivers have the same address and PN sequence selected.

MULTI-LINK OPERATION

Different from Point to Mutipoint operation, this is where more than one transmitter is operating in the same area. In this case, all the transmitters and receivers operating on System "A" would have the same PN code and address. Those on system "B" should have a different address

TRANGOLINK SOFTWARE OPERATION

The Trangolink software allows the user to change the user settings on the PTZ-900TX and PTZ-900RX. The software runs under the Windows 95 PC platform and connects from either COM1 or COM2 to the Data interface on the transmitter or receiver via the Cabldat-2 interface cable. After entering the program, a screen is displayed showing the current settings. The user may change the settings and upon exiting the program and cycling power to the unit the settings will be come effective.

PN Sequence: The hopping channel sequence, which must be the same on the transmitter and receiver in order for data to be transferred properly.

RSSI: Used for receiver only to monitor the radio spectrum on all hopping channels. Useful in troubleshooting to determine if any signals are present in the 900 MHz band.

Data Rate: Serial port data rate for user data. Must be the same on the transmitter and receiver. Trangolink interface is unaffected by changes made here.

Mode: RS-232 (unbalanced) or RS-422/RS-485 (differential). Select the mode which matches your PTZ control equipment.

Address: Used if more than one system is to be used on the same hopping sequence in the same area.

TROUBLESHOOTING

INTERFERENCE – INTERMITTENT OPERATION

Heavy equipment such as industrial roof –mounted air conditioners or fan motors in close proximity to the transmitter or receiver or cables may cause interference, especially when operating using RS232 mode. Move the unit/cable away from the source of the interference.

Antenna polarization may be wrong. The AD900-9 antenna is normally horizontally polarized which has been determined to give the best results. When using Yagi antenna on the receiver make sure that the alignment is as follows:

pic

Raise transmitter and receiver antennae above ground and away from obstacles and traffic, including foot traffic.

Verify all connectors are tight.

Shorten the receiver antenna feed cable.

Cable from transmitter to PTZ controller is too long, corrupting digital data. Use Cat 5 twisted pair shielded cable if possible with a maximum length of 500 feet for RS422 and 200 feet for RS232.

If the system becomes unusable for a period of time on the order of minutes or hours and then becomes usable again, changing the PN sequence may cure the problem. The different PN sequences have different waiting channels that are used to synchronize the hopping sequences. Depending on your environment, there may be a 900 MHz transmitter interfering on one of the waiting channels. By changing the PN sequence on the transmitter and receiver, the waiting channel will change. Some of the types of equipment that may interfere are: 900 MHz cordless phones, wireless LANs if very close to the PTZ-900RX receiver.

High power equipment operating near the 902-928 MHz band such as paging system base stations or cellular phone base stations may also interfere if they are within several hundred feet of the receiver. Changing the PN sequence and reorienting the receive antenna will most like cure this type of interference.

Cable from receiver to PTZ receiver/driver is too long, corrupting digital data. Use Cat 5 twisted pair shielded cable if possible with a maximum length of 500 feet for RS422 and 200 feet for RS232.

NO DATA IS RECEIVED

Check that the transmit and receive PN sequences, data rate, mode and address are set the same.

Verify all connectors are tight.

Verify that transmitter and receiver antennas are aligned properly as discussed above.

CAN'T COMMUNICATE WITH TRANSMITTER OR RECEIVER USING TRANGOLINK

Plug in the supplied cable to the unit. Power the computer on. Power the transmitter or receiver on, and within 30 seconds run the Trangolink program from Windows. The LED will alternate between green and red to indicate that it is ready to Talk to the Trangolink software. Use the supplied cable or any standard null modem RS232 cable.