

## XR 1 Watt Transmitter - Internal Antenna Quick Install Guide

The purpose of this guide is to provide an overview of the installation instructions. Prior to installation, it is strongly recommended to review the complete guide for detailed installation procedures.

### Important Safety Instructions

READ ALL INSTRUCTIONS BEFORE INSTALLATION, OPERATION, OR MAINTENANCE OF PRODUCT.

Some of the following information may not apply to your particular product model; however, as with any electronic product, precautions should be observed during installation, operation, and maintenance.

- Never operate the Transmitter without the antenna being properly connected to the Transmitter. Operating the Transmitter without an antenna can lead to permanent damage of the Transmitter and poses a safety risk.
- Do not touch any of the antennas while broadcasting, as it could result in a skin burn or other injuries.
- Standard acceptance procedures must be followed prior to operating this equipment in the proximity of life support systems.
- Do not operate the Transmitter outdoors, in wet areas where there is standing water, or in areas where there is condensation or the risk of condensation. Use in any of these environments will damage the Transmitter and void the warranty.
- Do not open the Transmitter to alter the internal elements in any way. This will void the warranty and could lead to unsafe conditions, malfunction, and violations of FCC/IC regulations.

Primex disclaims any liability or responsibility for the results of improper or unsafe installation practices.

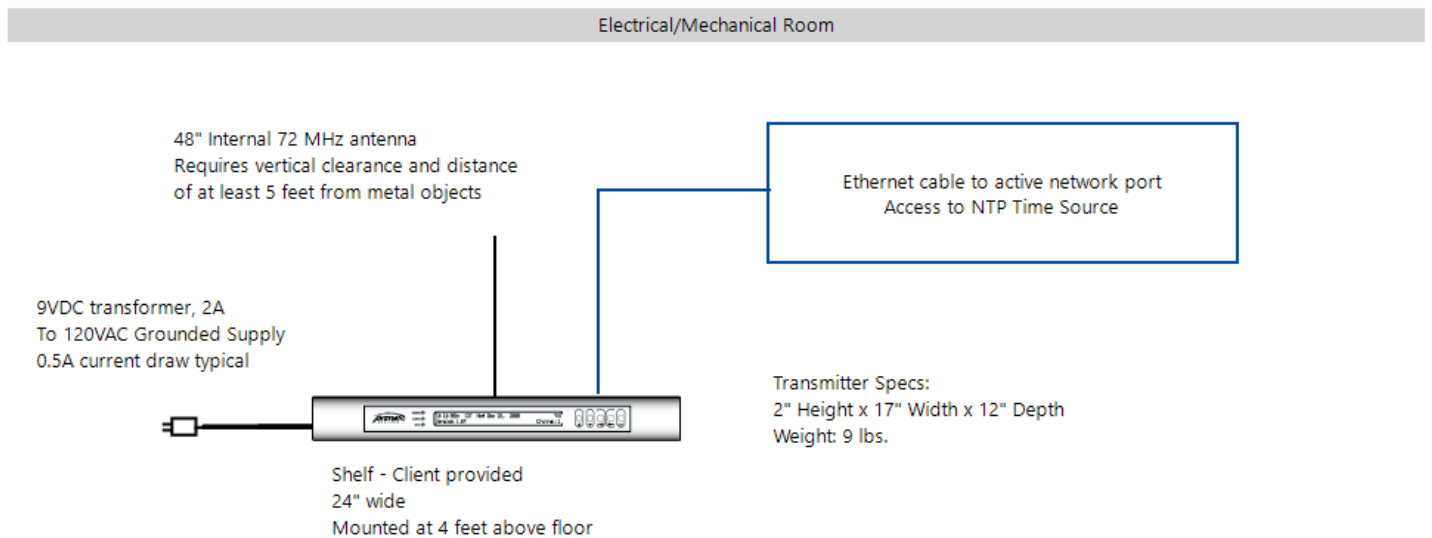
# Install XR 1 Watt Transmitter - Internal Antenna

Leveraging the precision of GPS satellite or Network Time Protocol (NTP) time, XR Series Transmitters wirelessly synchronize time for analog and digital clocks, timers and other satellite Transmitters throughout a facility. The Transmitter includes an external roof mounted antenna, which requires installation by a Primex Certified Installer.

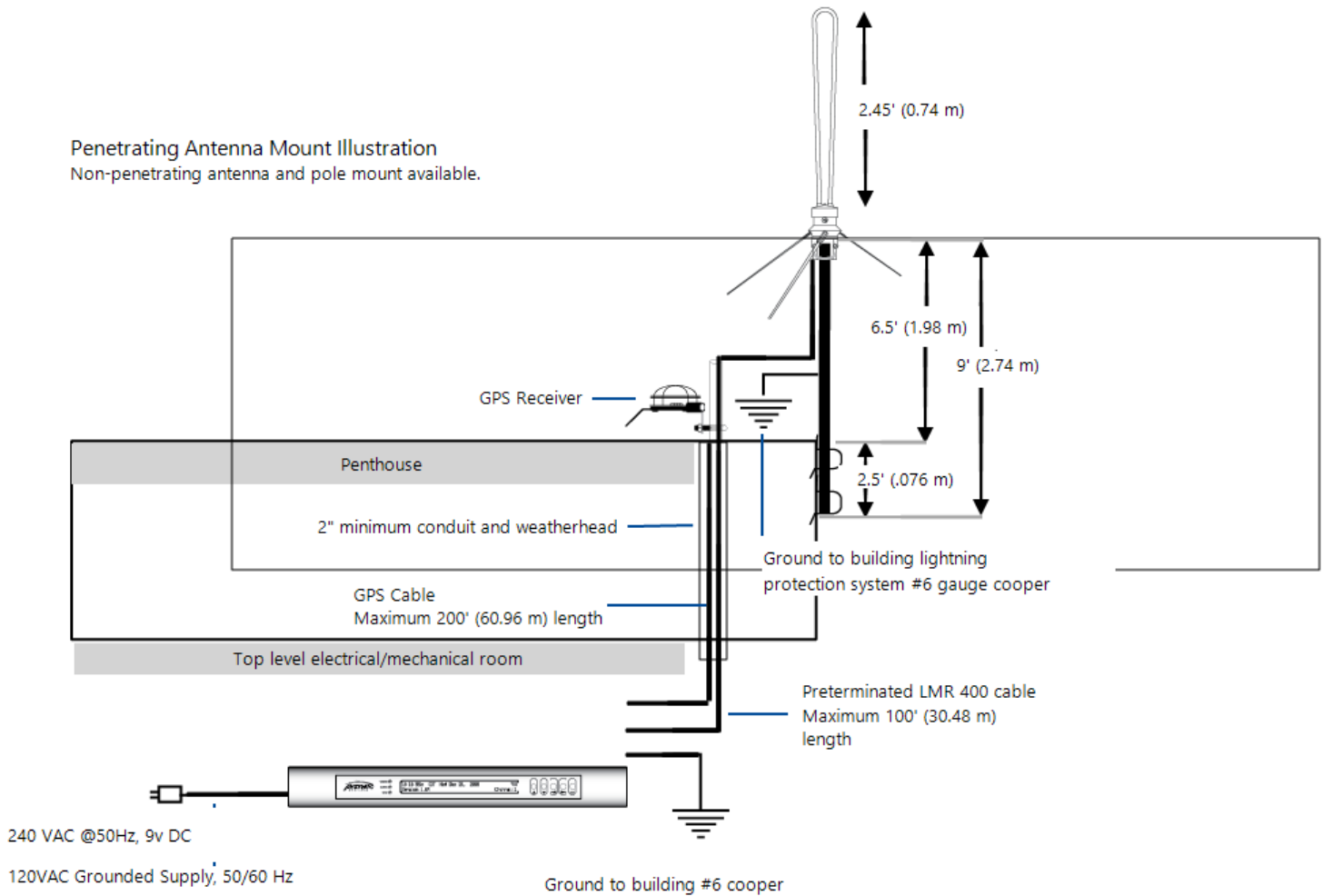
Learn how to install and configure a XR 1 Watt Transmitter with an Internal Antenna.

## Typical System Setup - 1 Watt Transmitter

### Example: 1 Watt Transmitter with Internal Antenna and NTP Time Source



## Example: 1 Watt Transmitter with External Antenna and GPS Time Source



## Installation Overview

Listed below is the order the Transmitter and its components are to be installed and configured.

1. GPS time source: Install the GPS Receiver and route GPS cable.
2. Connect Transmitter antenna.
3. Connect Transmitter time source.
4. NTP time source: configure NTP time.
5. Establish Transmitter settings and verify connections.
6. Verify system is operational.

## Tools and Equipment Required

The following tools and equipment are required to complete installation.

## Transmitter equipment

- 1 Watt Transmitter Rack 18 GA metal, epoxy coated (optional)
- UPS surge protector and battery backup system (recommended)

## GPS Receiver installation tools and equipment

- Standard or hammer drill
- 5/8 inch concrete drill bit, 18 inches (45.7 cm) long
- Silicone caulk for GPS cable penetration
- Phillips screwdriver
- Flat head screwdriver

## Install Location Guidelines

When planning the system installation of a Transmitter with an Internal Antenna, Primex recommends taking into consideration the below guidelines. Location is extremely important to ensure the best operation of your system.

- In a multi-story building, locate Transmitter on the top floor; significantly improves coverage to the lower floors due to the “umbrella” pattern of transmission.
- Transmitter must be located a minimum of 4 feet (1.2 m) above the floor.
- Transmitter must be located within 5 feet (1.5 m) from a 120 VAC electrical outlet. 10 AMP dedicated service recommended.
- Transmitter 48" internal antenna requires vertical clearance and distance of a minimum 5 feet (1.5 m) from large, solid objects, such as lockers or filing cabinets, and cannot be touching any surfaces.
- Transmitter must be located in an area that allows for enclosure and antenna clearance. Enclosure dimension is 2" height x 17" width x 12" depth (5.08 cm x 43.18 cm x 30.48 cm) and antenna height is 48" (1.2 m).
- Transmitter must be located in a controlled environment that is 32° to 122° F (0° to 50° C) and non-condensing humidity environment.

## Install GPS Receiver

A GPS Receiver is required when a Transmitter is set to use GPS as its time source.

## Specifications

A GPS Receiver draws time information from the U.S. Government Satellites, providing the system with Coordinated Universal Time (UTC).

- Mounted to rooftop, pole, or window (not a Low-E glass window).
- GPS Receiver sends UTC time to the Transmitter via the NMEA 0183 standard protocol.
- Optional GPS extension cable. A specially designed low-resistance cable to extend the distance between GPS Receiver and Transmitter. The maximum total length of the cable cannot exceed 200 ft. (60.96 m).

Parameter	Specification
Cable	10 ft. (3.05 m) cable  50, 100 and 200 ft. (15.24 m, 30.48 m and 60.69 m) extensions available. The maximum total length of the cable cannot exceed 200 ft. (60.96 m).

Parameter	Specification
Dimensions	2.5 inches W x .75 inches H (6.35 cm x 1.91 cm)
Mounting Bracket	3.5 inches W x 1.4 inches H x 4.5 inches D (8.89 cm x 3.56 cm x 11.43 cm) Included for rooftop or window installation.
Weight	0.75 lb (.34 kg)
Operating Range	-32° to 158° F (-30° to 70° C)

## Installation location guidelines

Determine a suitable location for the GPS Receiver unit. Location is extremely important to ensure the best operation of the system.

- GPS Receiver must be mounted where it has a "clear view of the sky" to receive a GPS signal 24 hours a day.
- Typical mounting locations of the GPS Receiver unit include the inside of a window (not a Low-E glass window), to an exterior pole, or on a rooftop.
- GPS Receiver unit should be kept away from large metal objects.
- GPS Receiver unit and cable must be mounted above any potential standing water, snow depth, leaves or other obstructions and is protected from the weather.
- Maximum total distance of the GPS cable to the Transmitter cannot exceed 200 feet (60.96 m).
- If the GPS cable is located outdoors, the use of a GelWrap splice enclosure is strongly recommended.

## How to mount a GPS Receiver

1. Verify the kit contents and the installation location meets the installation guidelines.
2. From the outside of the building, route the GPS cable.

Internal antenna Transmitter: route through a 5/8 inch drilled hole into the building.

3. Assemble and mount the GPS Receiver unit to either the inside of a window (not Low-E glass) or to an outside pole or rooftop. The mounting location is required to have a clear view of the sky.

### NOTE

Be sure to follow local building code requirements when attaching the GPS unit to the inside of a window. Clean the windowpane before using the suction cups for attachment.

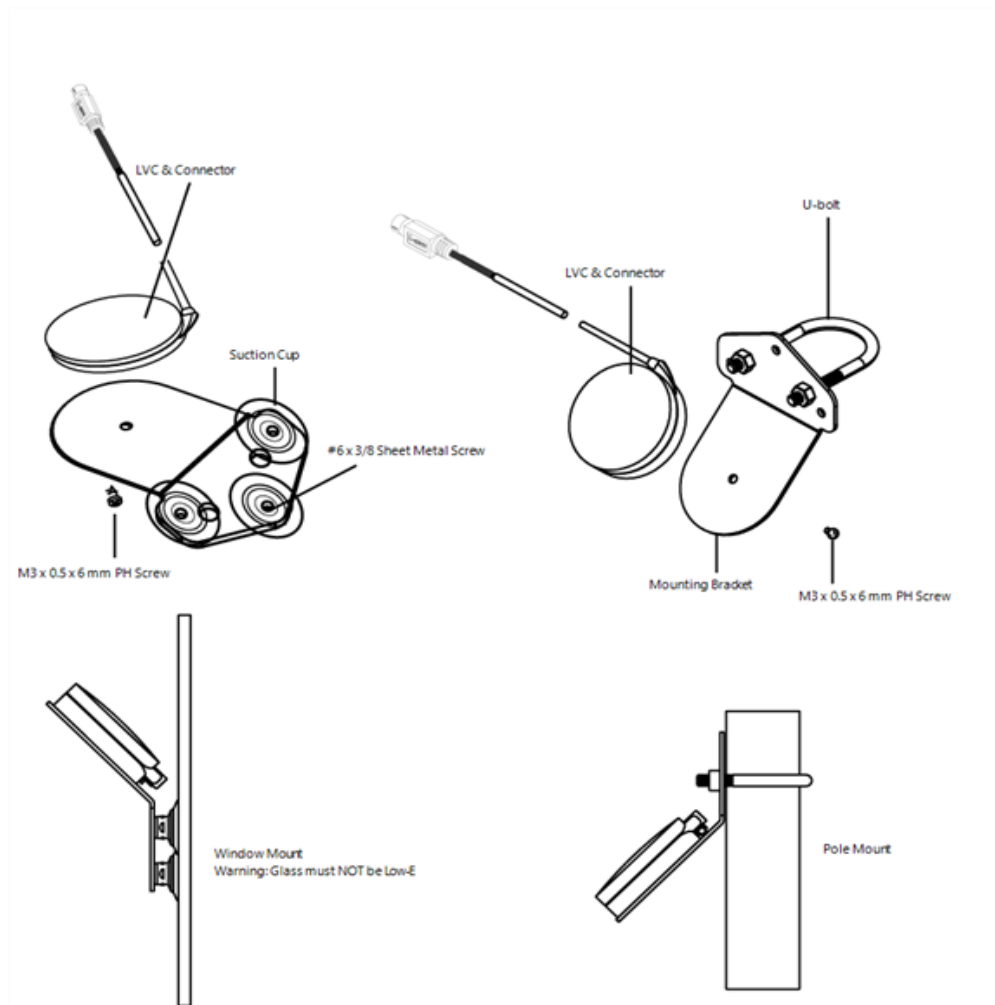
4. Route GPS cable and connect to Transmitter GPS connection.

1 Watt Transmitter: connect cable to the GPS IN connection.

5 or 30 Watt Transmitter: connect cable to the Transmitter exciter GPS IN connection.

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## GPS Receiver installation components and illustration



## Establish Transmitter Connections

### Internal antenna

The supplied antenna is attached onto the top case of the Transmitter.

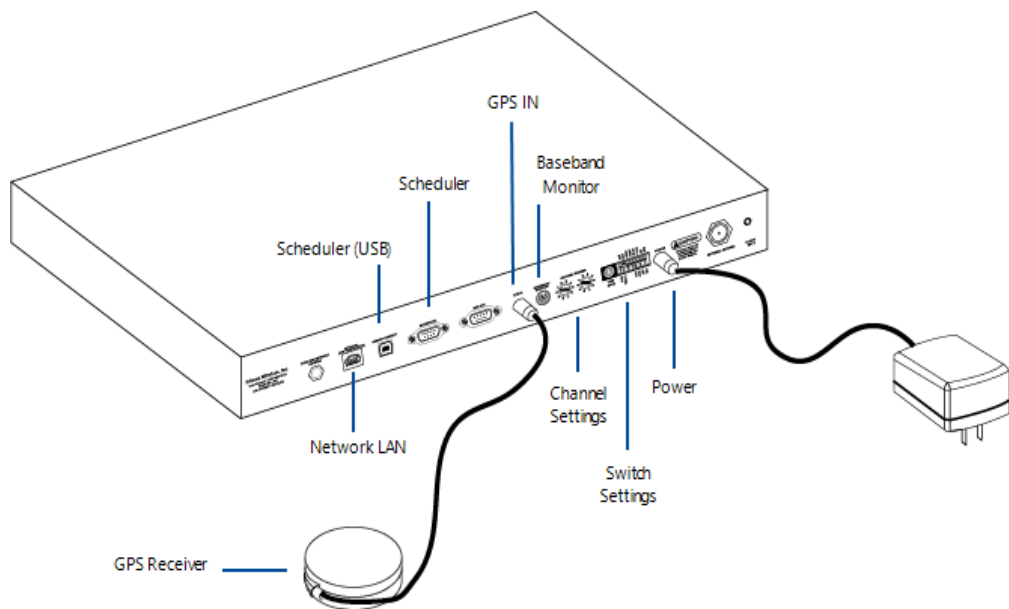
Carefully screw the Transmitter antenna onto the Transmitter. Turn the antenna clockwise, being careful to avoid cross-threading the antenna. The antenna must be snug and flat against the case.

### Time source connection

The system can be configured to use GPS or NTP time.

- GPS: plug the supplied GPS cable into the Transmitter "GPS IN" connection.
- NTP time: connect a network cable to the Ethernet port/Network LAN connection and configure the Transmitter to use NTP time. To learn more, view "Configure NTP Time (Optional)" on page 1.

### 1 Watt Transmitter connection illustration



Connection	Type	Description
Network LAN	RJ-45 Ethernet	NTP time source
Scheduler USB (Server Connect)	USB Type B	Scheduler connection
Scheduler	Serial RS232 DB9, male	Scheduler connection
GPS IN	MiniDIN 7-Pin	GPS Receiver connection
Baseband Monitor	MiniDIN 9-Pin	Amplifier diagnostic connection
Power	9V DC power UK: requires 240 VAC AC @50 Hz)	AC-power connection

## Configure NTP Time

An XR Transmitter can be configured to use NTP as its time source. If the system will use NTP, complete the configuration procedures below.

### Overview

To use a NTP time source:

- Transmitter is required to be connected to a wired Ethernet network.



- Transmitter switch settings must be set for NTP time, which is specific to the transmitter's firmware version. The firmware version is displayed on the transmitter front LCD display in the lower-left corner. For version 1.79, set switch 1 to the UP position and switch 2 to the DOWN position. For versions below 1.79, set switch 1 and 2 to the UP position.
- Optionally can be configured to use an alternate NTP time source if the factory-default NIST time source will not be used.
- Transmitter NTP settings are accessed and configured from a web browser, use of Firefox is strongly recommended, on a computer that is on the same Local Area Network (LAN) as the Transmitter. If you need assistance, contact the on-site IT department.

#### NOTE

Prior to configuring the NTP time source, the IP address of the NTP server and Transmitter is required to complete this configuration. Before beginning this procedure set your computer to use a static IP address.

## Transmitter Factory Default Network Settings

- Factory-default IP address: 192.168.1.1
- Subnet mask: 255.255.255.0
- User name and password: blank (not required)
- Pre-Configured NTP Time Source: By default when configured for NTP time, the Transmitter is programmed from the factory to obtain the NTP time from the National Institute of Standards and Technology. According to the NIST they provide a public service by outputting one of two official time sources by the United States. Readings from the clocks of the NIST contribute to world time, called Coordinated Universal Time (UTC). The time maintained by NIST should never differ by more than 0.000 0001 seconds from UTC. For more information, please visit: <http://www.nist.gov>

#### NOTE

Be sure to write down and file all changes made to the network configuration settings. Once the default Transmitter static IP address is changed, the factory default IP address will no longer work and you must use the new IP address to access the Transmitter configuration.

## How to configure a Transmitter to use a NTP time source

1. Transmitter switch settings must be set for NTP time, which is specific to the transmitter's firmware version. The firmware version is displayed on the transmitter front LCD display in the lower-left corner. For version 1.79, set switch 1 to the UP position and switch 2 to the DOWN position. For versions below 1.79, set switch 1 and 2 to the UP position. Located on the back of the transmitter, set the dip switch settings to the firmware version.
2. Insert one end of an Ethernet cable into the Ethernet port located on the back of the Transmitter and the other end into a port on the facility's Ethernet network.
3. Apply power to the Transmitter.
4. From your computer open a web browser, recommend use of Firefox is strongly recommended, and from the address bar enter the Transmitter factory default IP address: <http://192.168.1.1>

If the Transmitter IP address has been changed from the factory default address, complete the steps in topic Set a Temporary IP Address for the Transmitter LAN Interface.

NOTE

Your computer is required to be on the same subnet as the Transmitter (for example: 192.168.1.10).

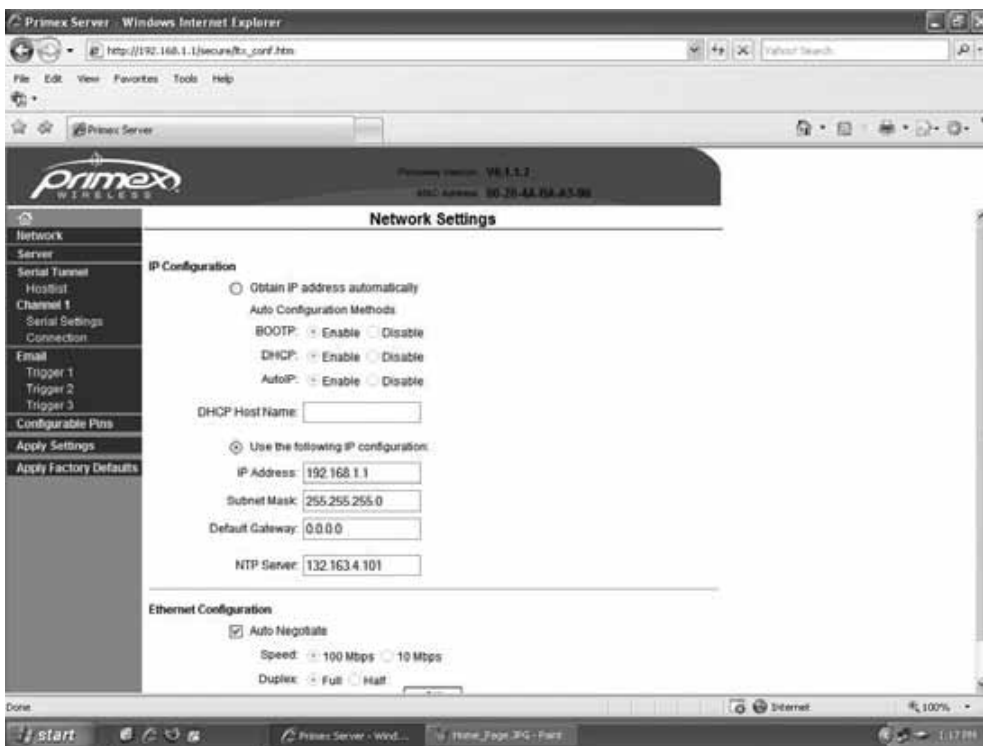
5. The Connect To dialog window is displayed.



6. Leave both user name and password blank, click OK to log into the Transmitter. The XPort Device Configuration Manager screen is displayed.



7. Click **Network**. The Network Settings screen is displayed.



8. To change the factory default static IP address, set the options in the Network Settings screen.

- To use DHCP, select "Obtain IP address automatically". You must also enter the DHCP Host Name.
- To use a static IP address, select "Use the following IP configuration" and enter the IP Address, Subnet Mask and Default Gateway.

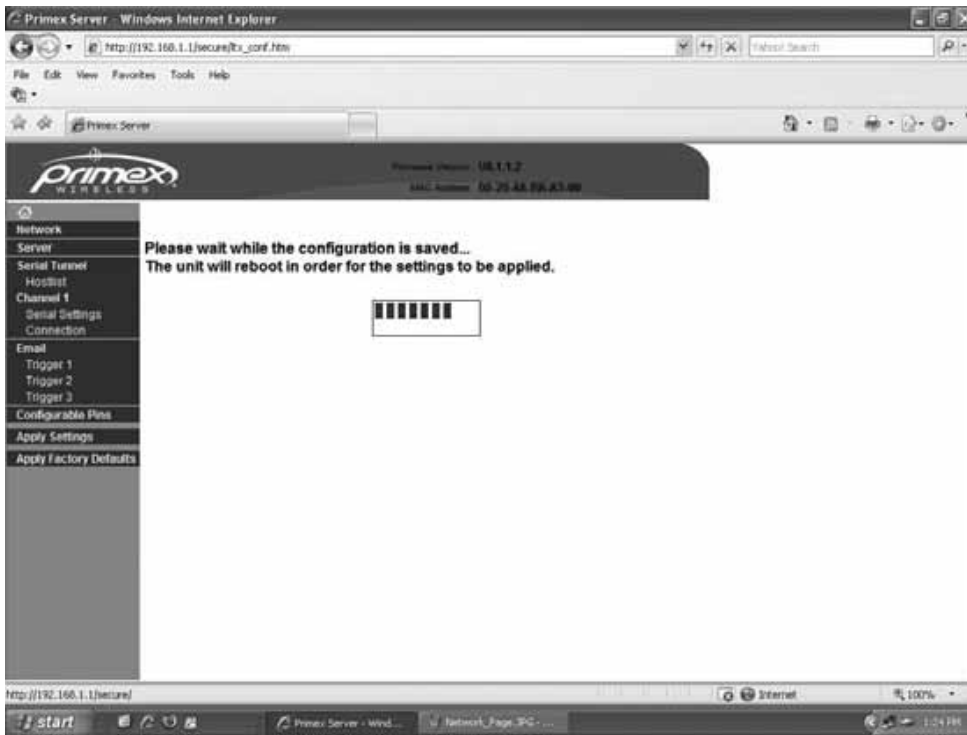
#### NOTE

Be sure to write down and file the changes you make to the network configuration settings. Once the default static IP address

is changed, the factory-default IP address will no longer work and you must use the new settings to access the Transmitter configuration.

9. (Optional) Enter the IP address of the NTP server to set the Transmitter's time source.
10. Click OK.
11. Click Apply Settings on the configuration frame.

The Transmitter automatically reboots (restarts). The window below is displayed.



## Establish Transmitter Settings

The setting panel is located on the back of an XR Series Transmitter. The setting panel consists of dial and dip switch settings that set its channel number, time zone, and time source.

### Channel Number

Preset by factory. The Channel Number is set according to the FCC Site License; do not attempt to change without contacting Primex.

### Time Zone

- Transmitter with Internal Antenna: set the Time Zone dial to your system Time Zone using the dial Time Zone switch.

### Time zone dial switch specifications

4 for Atlantic Time Zone

5 for Eastern Time Zone

6 for Central Time Zone

7 for Mountain Time Zone

8 for Pacific Time Zone

9 for Alaska Time Zone

A for Hawaii Time Zone

0 for Greenwich Mean Time (GMT)

## Time source and time settings

Set the Transmitter dip switch settings below to meet the system requirements.

Switch	Function	Up Position	Down Position
1	NTP/GPS	Receive time from NTP server.	Receive time from a GPS Receiver.
Transmitter switch settings must be set for NTP time, which is specific to the transmitter's firmware version. The firmware version is displayed on the transmitter front LCD display in the lower-left corner. For version 1.79, set switch 1 to the UP position and switch 2 to the DOWN position. For versions below 1.79, set switch 1 and 2 to the UP position.			
2	LAN/Local	LAN network connection is enabled. Required for use of NTP time source.	Local USB and/or serial port attached to unit is enabled.
3	Aux 3 (setting unassigned)	Not applicable	Not applicable
4	Aux 4 (setting unassigned)	Not applicable	Not applicable
5	-30M	-30 minute offset enabled Transmitter is installed in Newfoundland or other countries with a -30 minute off set.	-30 minute off set disabled (default position)
6	UTC Offset	Transmitter is installed in Europe.	Transmitter is installed in North America
7	Daylight Saving Time	Daylight Saving Time is disabled.	Daylight Saving Time is enabled.
8	12-Hour or 24-Hour Time	Time is displayed in 24 hour time.	Time is displayed in a 12 hour time.

## Verify Transmitter is Operational

The final step is to verify the system Transmitter is operating and functional.

1. Verify a GPS signal or NTP time has been received.
  2. Verify the time and date displayed on the Transmitter front display are correct.
  3. Verify the Channel Number is set correctly.
  4. Verify the Transmitter does not have any error codes. For additional information, see [Diagnostics Menu](#)
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# Support

To obtain additional technical documentation for Primex products, visit the Support area on our website at [www.primexinc.com](http://www.primexinc.com)

You may require Technical Support when you have questions about product features, system configuration, or troubleshooting. Support services are delivered in accordance with your organization's support agreement, end user licenses agreements, and warranties, either with a Primex Certified Sales and Service Partner or directly with Primex.

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