

Primex XR 72MHz Synchronized Time Solution

14000 Series Repeater Transmitter Install & User Guide



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Primex, Inc.

Primex is a leading provider of synchronized time and environmental monitoring solutions. Our solutions automate and maintain facility compliance, increase efficiencies, enhance safety and reduce risk for organizations in the healthcare, education, manufacturing and government vertical markets.

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Regulatory Compliance

Federal Communications Commission (FCC) / Industry Canada (IC)

License Requirements

- Operation of the Transmitter requires a FCC/IC operating license, which must be obtained prior to operation.
- FCC licenses must be renewed every 10 years and the IC licenses must be renewed annually.
- As a service, Primex will file the license application if the end-user desires it. An end-user that does not want Primex to file for the original site license will be required to complete a waiver form, file the required application, and receive a valid license from the FCC/IC prior to use. If you have any questions or need any assistance, please contact Primex Technical Support.
- Primex requires a copy of the licenses in order to complete the factory presets.

Product Compliance

- This device complies with Part 90 and Part 15 of the FCC rules and RSS-210 of Industry Canada.
- Operation of this device is subject to the following two conditions:
 1. This device may not cause harmful interference.
 2. This device must accept any interference, including interference that may cause undesired operation.

Changes or modifications to any part of the Primex System components not expressly approved by Primex could void the user's FCC/IC authority to operate the equipment.

Radio Frequency (RF) Exposure

To comply with FCC/IC RF exposure requirements for mobile transmitting devices, the Transmitter is only to be used or installed in locations where there are at least 20 cm (approximately eight in.) separation distance between the antenna of the Transmitter and all persons.

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.
- 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.

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14000 Series Specifications - System Components

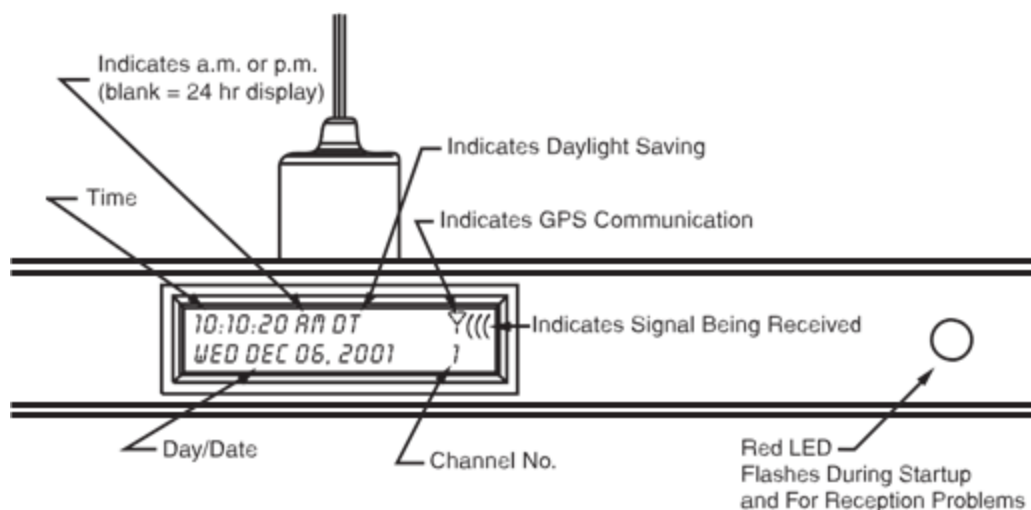
This section provides the specifications of the 14000 Series Transmitter and its components.

14000 Series Transmitter Specifications

Parameter	Specification
Operating Frequency Range	72MHz
Channels	16 channels available (pre-programmed prior to shipping)
Dimensions	16.0"L x 12.0"W x 1.9"D (40.6 cm x 30.5 cm x 4.8 cm)
Maximum Transmission	1 Watt (at Transmitter)
Radio Technology	Narrowband FM
Weight	9 lbs
Settings	Time Zone(External Antenna model factory preset), LAN/Local, 30 min offset, serial/USB/Ethernet connectivity
Daylight Saving Time	Bypass switch
LCD Display	Time, date, and signal verification
Power Supply	Input: 120 VAC, 50/60 Hz, 0.4 Amp Output: 9 VDC, 2.0 Amp 6 ft (1.82 m) cord
Operating Range	32° to 158° F (0°to 70° C), non-condensing environment

Front Display Details

The 14000 Series Transmitter front display provides important information and indicates its current operating status.



GPS communication status

The status of the GPS Receiver is indicated by the GPS communication indicator.

- When the Y like symbol is displayed, the GPS Receiver is connected to the Transmitter and there is communication between the GPS Receiver and the Transmitter.
- When the Transmitter is receiving valid time data from the GPS Receiver, the three parentheses (((sequence in a motion pattern. If these symbols are not displayed, see Troubleshooting.

Time displayed

The front display of the Transmitter displays the precise time received by the GPS Receiver.

The time displayed may be in 12 or 24-hour format, which is set by the 12/24-hour switch setting on the back Transmitter. The switch setting only sets the time displayed on the Transmitter front display, and does not affect the system devices. If AM or PM is displayed, the switch setting is set to 12-hour. If neither AM nor PM is displayed, the switch settings is set to the 24-hour.

- Analog Clocks are all 12-hour clocks.
- Digital Clocks have a selectable jumper option to display either 12-hour or 24-hour time regardless of the Transmitter 12/24 option setting.

Daylight Saving Time indicator

The Transmitter is pre-programmed to automatically make adjustments for Daylight Saving Time shifts.

- The letters "DT" (Daylight Saving Time) or "ST" (Standard Time) is displayed when adjustment for Daylight Saving Time is active (switch #3 in the up position).
- If neither "DT" nor "ST" is displayed, then switch #3 is in the down position and the Transmitter does not adjust for Daylight Saving Time.
- The adjustment to Daylight Saving Time and back to Standard Time take place 2:01 AM on the day of the DST shift.

NOTE

The GPS signal does not encode information about Daylight Saving Time. In the spring when the Transmitter changes to Daylight Saving Time, the system clocks adjust by advancing faster than their normal speed to make the adjustment and then return to normal operation. In the fall when the Transmitter returns to Standard Time, the system clocks make the time adjustment and then return to normal operation.

Time Zone

The Time Zone is not shown on the front display. However, when the Transmitter has received a valid time from the GPS Receiver, the correct Time Zone can be checked by verifying the correct hour is displayed. The Transmitter can be set for all 24 time zones around the world and 1/2-hour time zones.

Front Display specifications

Component	Description
Time	Displays the precise time received from GPS Receiver. If AM or PM is on the display, then 12-hour option is selected. If neither AM nor PM is on the display, then 24-hour option is selected.
Daylight Saving Time	The letters "DT" (Daylight Saving Time) or "ST" (Standard Time) displayed when adjustment for Daylight Saving Time is active. If neither "DT" nor "ST" is displayed, then switch #3 is in the down position and the Transmitter will not adjust for Daylight Saving Time.
GPS Communication	GPS Communication indicator appears when the Transmitter is communicating with the GPS Receiver. The parentheses))) indicate a time signal is being received.
Day/Date	Displays the day and date received from the GPS satellite.
Channel Number	Displays the channel number (1-16) the Transmitter is set to.
Red LED	The red LED (light emitting diode) is located on the right side of the front panel of the Transmitter. The LED flashes on initial setup until a GPS time signal is received. The LED flashes when no time data has been received from the GPS Receiver in 48 hours. See the Troubleshooting section for additional information.

Repeater (Satellite) Receiver Switch Specifications

Component	Specification
Cable	5 ft (1.52 m) RS232 cable connects Receiver Switch to the Repeater (Satellite) Transmitter
Dimensions	5.75 inches (14.6 cm) L x 4.25 inches (10.8 cm) H x 1.25" (3.16 cm) D
Antenna	12.5 inches (31.7 cm) L
Weight	0.75 lb (.34 kg)
Power Supply	Input: 120 VAC, 50/60 Hz, 0.4 Amp Output: 9 VDC, 0.25 Amp, 6 ft (1.83 m) cord
Operating Range	-32° to 58° F (-36° to 70° C)

Install 14000 Repeater (Satellite) Transmitter

Receiver Switch Operation

While using the timed broadcast schedule of a Transmitter with an External Antenna, the Receiver Switch updates between 40 and 56 minutes past the hour. The actual update time varies depending on the channel number it is receiving a signal on.

Transmitter broadcast schedule

Broadcast (Transmit) Schedule Transmitter with Internal Antenna: broadcasts its synchronized time continuously to the system clocks and devices.

Broadcast (Transmit) Schedule Transmitter with External Antenna: broadcasts its synchronized time to the system clocks and devices from the 39th to the 6th minute of the next hour and changes to a standby mode during the 7th to the 38th minute of the hour (standard broadcast schedule). During initial power-up, the Transmitter broadcasts for 8 consecutive hours. After the 8 hour power-up period, the Transmitter reverts to its timed broadcast schedule.

Installation considerations - Transmitter with External Antenna

If installing a Receiver Switch after the initial Transmitter 8 hour power up transmission, there are three options.

1. Install the Receiver Switch between 39 minutes past the hour and 6 minutes after the next hour. It will set right away.
2. Install the Receiver Switch at any time of the day, it will disable the output of the Repeater (Satellite) Transmitter and the green LED will remain solid until 39 minutes after the hour. At that time, the LED will begin flashing and the Transmitter connected to it will begin broadcasting.
3. Cycle power to the Transmitter. It will then transmit for 8 hours and the Receiver Switch will update immediately on power up.

Power loss

If a Receiver Switch loses power when the Transmitter is not broadcasting, it will disable the output of the Repeater (Satellite) Transmitter and the green LED will remain solid until 39 minutes after the hour. At that time, the LED will begin flashing and the Transmitter connected to it will begin broadcasting.

Signal loss indicator

If a Receiver Switch has been synchronized and did not receive a signal from the Transmitter in the past hour, the green LED is solid. If the Transmitter has not received a time signal for 48 hours, its red LED flashes.

Location Guidelines

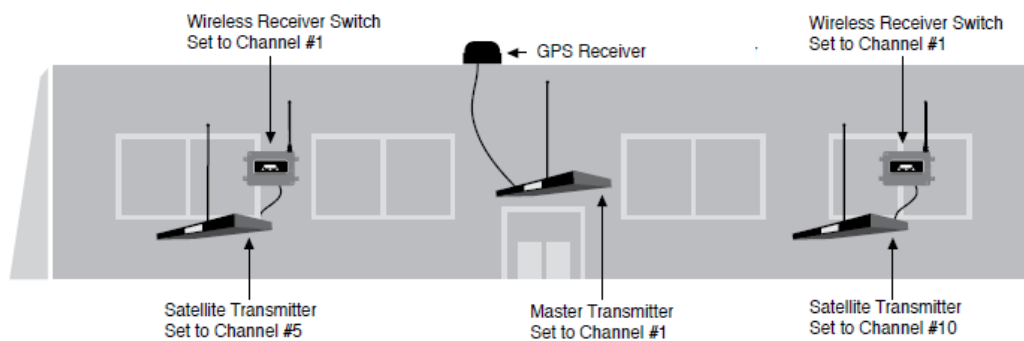
The Repeater (Satellite) Transmitter must be in a location where it can receive a signal from the Main Transmitter.

Typical Application Drawings

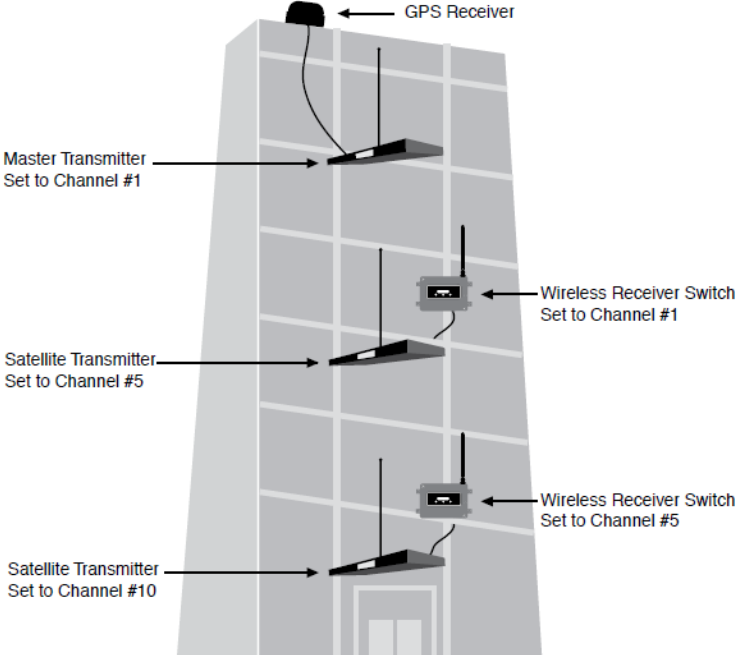
WARNING

Do not adjust the channel numbers on the Transmitter. The examples below only demonstrates how a repeater switch chain works.

Example of system with horizontal installation



Example of a system with vertical installation



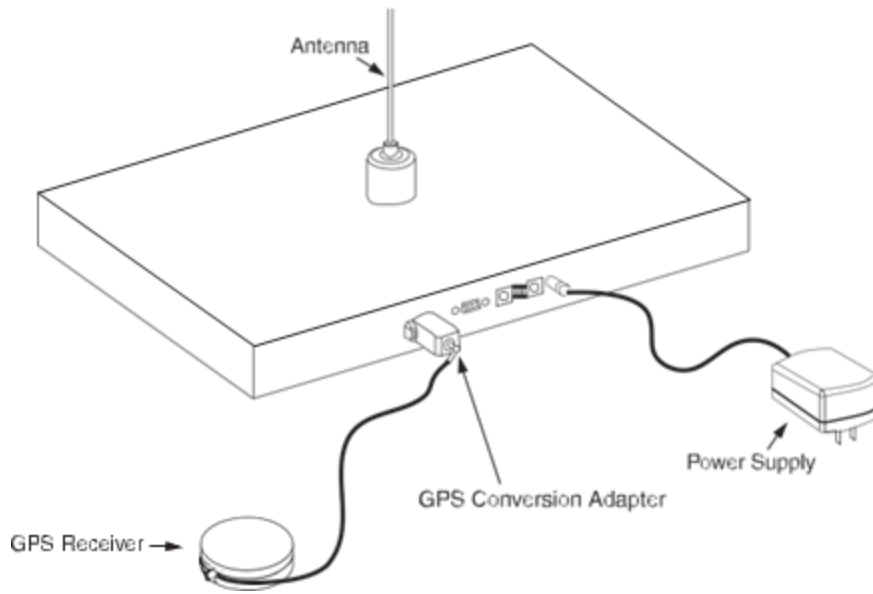
Verify Setup of Main Transmitter

Installation of the Repeater (Satellite) Transmitter begins with the setup of the main Transmitter with a time source. The main Transmitter transmits the signal to the Repeater (Satellite) Transmitter by way of the Receiver Switch.

The main Transmitter must be set up and working prior to installation of the Repeater (Satellite) Transmitter. For the setup and installation of the main Transmitter, refer to the installation guide of the Transmitter model.

Establish Connections

1. Plug the included DB9/RJ45 GPS conversion adapter into the GPS socket located in the back of the Transmitter.



2. Plug the GPS cable into the GPS conversion adapter.
 3. Plug the supplied 9 Volt 2.0 Amp DC power supply (transformer) into the Transmitter.
 4. Plug the power supply (transformer) into a 120 VAC outlet.
-

Set Up Receiver Switch

To access the Receiver Switch menu preferences, press the Menu button located on the front of the unit. By pressing and holding the Menu button, the Receiver Switch cycles through the menu options.

- While in the Channel menu option if there are no changes made in a minute of entering a menu section, it will time out and save the displayed value and exit the menu mode.
- If a value is changed while cycling through the menu it will be saved and continue to cycle.
- While in test mode it will remain in the selected mode until the menu button is pressed again to exit.

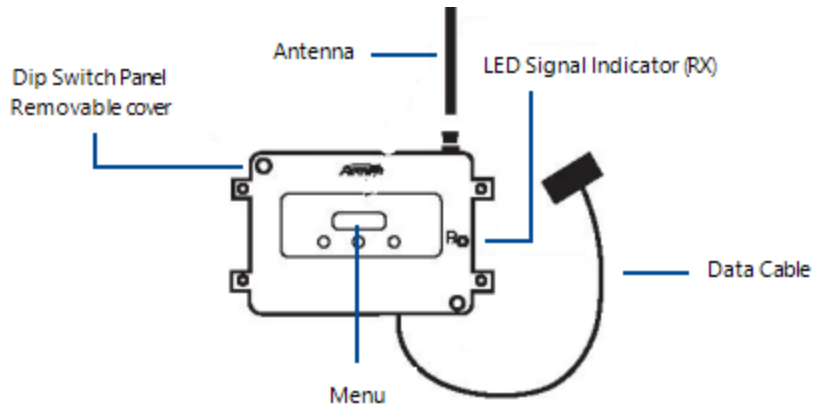
After entering changes it's recommended to step through the menu options until the option donE is displayed to exit the menu mode; the menu will display donE. Changes made in the Menu are saved when the menu is exited.

Receiver Switch menu mode option specifications

Display	Menu	Description
Ch	Channel	The Channel Number menu allows the user to change the channel by using the UP or DOWN button. The channel number must be set to the same channel number as the Main Transmitter or other Repeater (Satellite) Transmitter broadcast channel.
tEst	Test	The Test menu allows the user to hear audible beeps with a valid time/date reception. This occurs 5 seconds after the test menu is selected. If continued to be in this mode until the menu button is pressed again, leaving the menu mode and returning to normal mode.
LtU	Last Time Update	The Last Time Update menu allows the user to see the last time update, time and date (cycles every second). This occurs five seconds after last time update menu is selected. The unit remains in this mode for a minute, it will then time out and return to the menu mode.
Soft	Software Revision	The Software Revision menu allows the user to see the software revision on the unit. This occurs five seconds after last time update menu is selected. The unit remains in this mode for a minute, it will time out and return to the menu mode.
dst	Daylight Saving Time Calendar	The Daylight Saving Time Calendar menu allows the user to see the current Daylight Saving Time calendar in use. This occurs five seconds after last time update menu is selected. The unit remains in this mode for a minute, it will time out and return to the menu mode.
donE	Done	The Done menu allows the user to exit the menu mode. This occurs five seconds after the done menu is selected returning to the normal mode and save all settings.

Install Receiver Switch

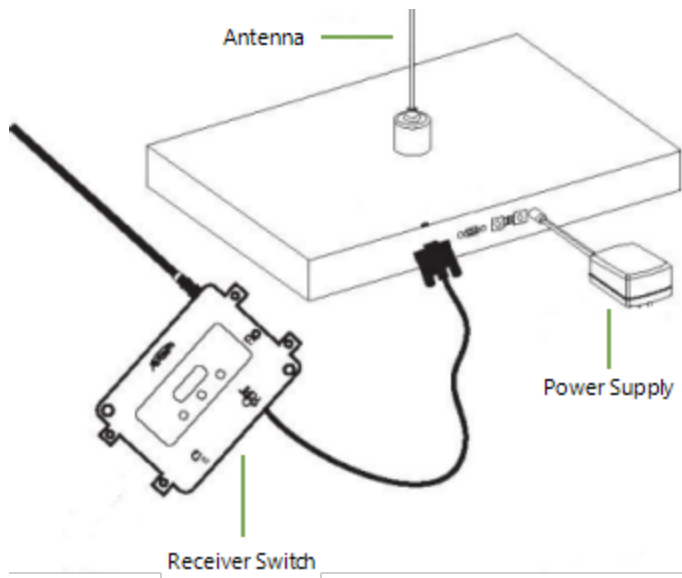
1. Attach the rubber antenna to the Receiver Switch.



NOTE

A first generation Receiver Switch has a red channel selector knob with an arrow on its front flat side with an LED Signal Indicator (RX). Receiver Switch requires its own power supply at 9V. 250 mA output for power and is restricted to channels 1-16.

2. Power down the Repeater (Satellite) Transmitter.
3. Connect the serial cable of the Receiver Switch into the GPS IN Socket on the back of the Repeater (Satellite) Transmitter.



4. Power up the Repeater (Satellite) Transmitter.

5. Press the Menu (middle button) on the front of the unit to scroll through the Menu options to the Channel Mode (Ch displayed)
6. Press the up or down button to set the channel number to match the Main Transmitter transmit channel.
7. Scroll through the menu to the donE mode. After 5 seconds the Receiver Switch will time-out and return to the Day/Date mode saving the channel selection.
8. Determine the best mounting location for the Receiver Switch.
 - a. Locate the room/area the Transmitter is to be installed in. Close all doors and windows before testing.
 - b. DO NOT hold the rubber antenna during testing, as this can affect the sensitivity of the receiver. Instead, hold the switch by the sides of the housing while locating the best mounting position.
 - c. Place the Receiver Switch in the EXACT location where it will be mounted. This is crucial as closeness to walls can degrade receiver sensitivity. If the exact location is not known, be sure to test the Receiver Switch in several locations. If any locations tested are unsuccessful, note this for future reference.
9. Power Cycle the Receiver Switch power at least 1-2 times after installation is complete and verify the green LED begins to flash. Doing this will ensure a solid signal is being received.
 - To cycle power the Receiver Switch, remove the switch cover by removing the two phillip head screws, located in the upper right and lower right of the unit. Use caution when removing the cover to avoid causing the up or down menu buttons to fall off the circuit board.
 - Press and release the Reset button, located in the upper right corner to the left of the antenna mounting, 1 to 2 times and verify the green LED begins to flash. The flashing of the green LED indicates a solid signal is being received.
10. Mount the Receiver Switch in its final location and verify the switch settings. To learn more, view "Set Up Receiver Switch" on page 15.

NOTE

When the Receiver Switch is mounted, its antenna must be vertical. Do not use an analog clock to determine if a mounting location will be adequate for signal reception. The receiver in a clock is more sensitive than the Receiver Switch and therefore the switch may not work in areas where a clock works.

Confirm Reception with Transmitter

When the Receiver Switch is connected to the powered Repeater (Satellite) Transmitter, an R is displayed in the upper right corner of the Transmitter's front panel display. This may take up to a minute.

The green RX LED on the Wireless Receiver Switch will flash when a valid signal is initially received. This LED will then flash once per second, signifying a successful time update. If the green LED is solid, the Receiver Switch missed the last update. Time updates occur once per hour.

NOTE

If the Repeater (Satellite) Transmitter does not receive a time update from the Receiver Switch after 48 hours, its yellow "Caution" LED begins flashing and an error is logged.

Verify Receiver Switch Last Time Update

To verify the last time the Receiver Switch received and applied a valid time/date update, toggle through the Receiver Switch Menu to the Last Time Update (LTU) section.

Receiver Switch Setting - Daylight Saving Time Not Observed

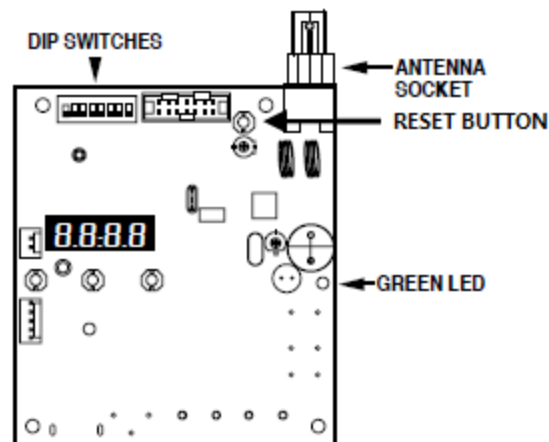
For geographic areas that do not observe Daylight Saving Time (DST), the Transmitter's Daylight Saving Bypass Receiver Switch must be configured to bypass DST as defined below.

NOTE

In the event the Receiver Switch does not receive a Transmitter signal when the DST change is scheduled to occur, the switch automatically adjusts its time received from a Transmitter. In areas that do not observe DST this feature must be disabled on the circuit board of the Receiver Switch as defined below.

How to set Receiver Switch not to observe DST

1. Disconnect the Receiver Switch from the Repeater (Satellite) Transmitter.
2. On the Receiver Switch remove the access cover and change dip switch #5 to the "ON" position.



3. Reconnect Receiver Switch to Transmitter.

Set up Multiple XR Repeater (Satellite) Transmitters at the Same Facility

Set up and install each Repeater (Satellite) Transmitter and Receiver Switch. The channel number of the Repeater (Satellite) Transmitter is preset to the channel number specified on the red label located on the top its packaging box.

How to change a Receiver Switch channel number

1. Use the buttons on the Receiver Switch to toggle through to LED menu, and set the channel number to match the XR system channel with the strongest available signal. This signal may be from either the Main Transmitter or the nearest Repeater (Satellite) Transmitter.
 2. After changing the channel, power cycle the Receiver Switch. Remove the switch cover by removing the two Phillip head screws, located in the upper right and lower right of the unit. Use caution when removing the cover to avoid causing the up or down menu buttons to fall off the circuit board.
 3. Press and release the Reset button, located in the upper right corner to the left of the antenna mounting, one to two times and verify the green LED begins to flash. The flashing of the green LED indicates a solid signal is being received.
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Support

To obtain additional technical documentation for Primex products, visit the Support area on our website at 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.

Support through Primex Certified Sales and Service Partners

Ensuring our customers experience excellent service is of utmost importance to Primex. Our network of Certified Sales and Service Partners offer technical support services for Primex products.

If you have purchased Primex products or have a service agreement with a Primex Partner, they are your primary contact for all Technical Support inquiries.

When contacting Primex Technical Support

Make sure you have satisfied the system requirements listed in your product documentation. Also, you should be at the computer or device on which the problem occurred, in case it's necessary to replicate the problem.

When you contact Primex Technical Support, please have the following information available:

- Customer ID/Account Name
- Problem description/error messages
- Device hardware information
- Troubleshooting performed before contacting Primex

Primex Technical Support

Hours: 8:00 a.m. to 5:00 p.m CST | Monday through Friday

Phone: 1-262-729-4860

Email: techservices@primexinc.com | Web: www.primexinc.com/support

Five Year Limited Warranty

Primex, Inc. warrants this product to be free from defects in materials and workmanship for a standard of five (5) years from the date of purchase* from an authorized reseller or directly from Primex. Primex, Inc. will at its sole option, repair or replace any components that fail in normal use. Such repairs or replacements will be made at no charge to the customer for replacement parts. The customer will be responsible for any transportation costs. This warranty does not cover failures due to misuse, abuse, accidental or unauthorized alterations or repairs.

The warranties and remedies contained herein are exclusive and in lieu of all other warranties express or implied or statutory, including any liability arising under any warranty or merchantability or fitness for a particular purpose, implied, statutory or otherwise. In no event shall Primex, Inc. be liable for any incidental, special, indirect or consequential damages, whether resulting from the use, misuse or inability to use this product or from defects in the product. Some states do not allow this exclusion or limitation of incidental or consequential damages so the above limitations or exclusion may not apply to you.

To obtain warranty service: If after following the instructions in the product guide, you are certain the product is defective, contact Primex Technical Support to assist with troubleshooting the issue. If the issue cannot successfully be resolved and the product is under warranty, a RMA (Return Material Authorization) will be generated. The RMA form will be provided via email with detailed instructions for the return. All merchandise returned must be shipped to Primex, Inc. Attn: Returns Dept., N3211 County Road H, Lake Geneva, WI 53147.

Primex, Inc. retains the exclusive right to repair or replace the unit at its sole discretion. Such shall be your sole exclusive remedy for any breach of warranty.

* applies to products sold on or after June 1, 2018.