

Primex XR 72MHz Synchronized Time Solution

14000 Series Repeater Transmitter Troubleshooting 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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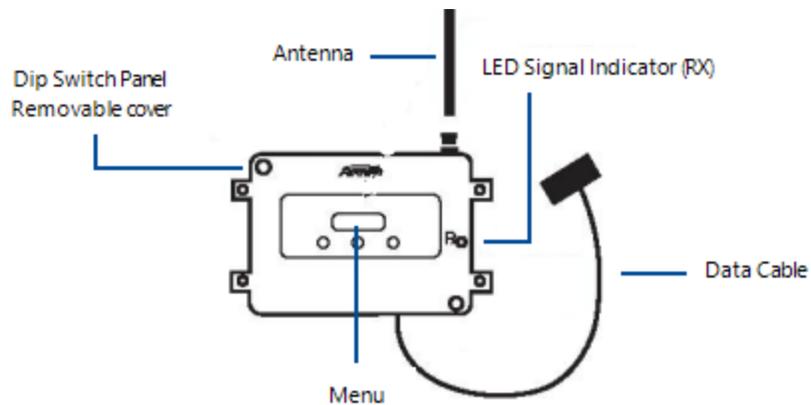
Troubleshooting - 14000 Series Repeater (Satellite) Transmitter

The topics in this guide provided the common troubleshooting procedures for a 14000 Series Repeater (Satellite) Transmitter.

The 14000 Series Satellite Transmitter is an optional unit used with the Primex GPS Time Synchronization system. A Satellite Transmitter(s) is used to supplement and extend signal coverage at a facility.

NOTE

Satellite Transmitter uses a Receiver Switch for its time source.



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.

Red LED is Flashing

Problem

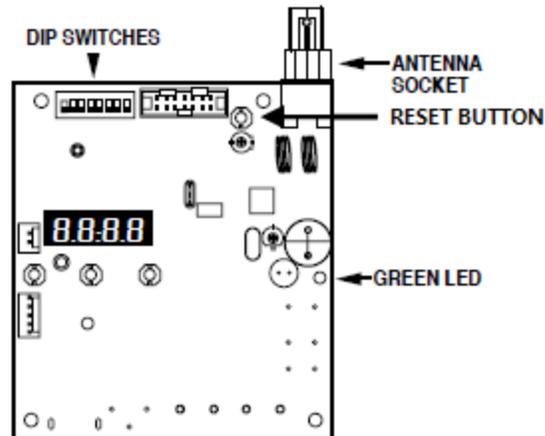
Transmitter Red LED is flashing.

Cause

The Transmitter has not received an updated time signal for 48 hours. It will also flash during initial setup.

Solution

1. Check the Receiver Switch for a flashing green LED Signal Indicator. If the indicator is solid Green LED this indicates it has lost communication with the channel providing time updates.
2. Verify the channel number selected on the Receiver Switch is the same as the channel set on the Transmitter that's providing updates. From the Receiver Switch, press the Menu button until Ch is displayed - the two digit channel number is visible to the immediate right. For a first generation Receiver Switch, verify the channel the arrow is pointing to.
3. Locate and check the status of the Transmitter broadcasting the channel and verify the Receiver Switch is set to the Transmitter's channel.
4. Return to the Repeater (Satellite) Transmitter. Verify the Receiver Switch has a flashing green LED Signal Indicator.
5. If the Receiver Switch still has a solid green LED Signal Indicator, it will need to be reset. To reset: remove its cover by removing the two Phillips head screws located on the cover's upper left and lower right side - be careful not to lose the Menu Up and Down buttons. From the upper right corner of the circuit board, push and release the reset button.



Transmitter Red LED is Flashing & Receiver Switch has a Dark LED Signal Indicator

Problem

Transmitter Red LED is flashing and Receiver Switch has a dark LED signal indicator.

Cause

The Transmitter has not received an updated time signal for 48 hours. It will also flash during initial setup.

Solution

XR Receiver Switch

1. Verify the Receiver Switch cable is securely connected to the Transmitter's GPS input.
2. If the Receiver Switch is securely connected to the Transmitter, open the Receiver Switch and verify the cable is securely connected to the circuit board connection.
 - Remove its cover by removing the two Phillips head screws located on the cover's upper left and lower right side - be careful not to lose the Menu's Up and Down buttons.

First Generation Receiver Switch

1. Verify the power supply to Receiver Switch is securely connected - located at the lower-left.
2. Verify the Receiver Switch cable is securely connected to the GPS input on the back of the Repeater (Satellite) Transmitter.
3. If the Receiver Switch is securely connected at the Transmitter, open the Receiver Switch and verify the cable is securely connected to the circuit board connection.

For further assistance, contact Primex Technical Support at 1-262-729-4860.

Extremely Weak Transmitter Power

Models

14000 Internal Antenna, 14000 Repeater (Satellite) Transmitter, XR 1 Watt Internal Antenna, XR Repeater (Satellite) Transmitter

Problem

If the Transmitter power is estimated to be 100 feet or less, this may indicate the Transmitter power is extremely weak.

Cause

This may be due to its antenna connection or weak amperage from the power supply to the Transmitter.

The issue may be due to weak amperage from the power supply to the Transmitter. The amperage needs to be at least 2.0 amps to broadcast to its specifications. The power supply to Transmitter may be putting out 9 Volts and its display has the correct day, date, time, channel number in the lower right corner and the GPS Communication symbol-with parenthesis ())) flowing from right to left towards the tower in the upper right corner of the display.

Solution

1. Remove power from the Transmitter and ground yourself to eliminate static electricity.
2. Verify the antenna connection is not cross-threaded and the base of the antenna is flat and secured to the Transmitter enclosure.
3. Verify the antenna rod is secure in the antenna base; hand tighten only.
4. Verify the antenna is straight up vertical and not touching anything.
5. Power back on the Transmitter.

Recommended corrective action if its power output is still extremely weak

1. First, replace the power supply to the Transmitter.
2. If that doesn't resolve the weak signal, the output stage of the Transmitter may have failed and may be required to replace the Transmitter. For further assistance, contact Primex Technical Support at 1-262-729-4860.

Weak Signal & Limited Coverage Area

Model

All Transmitters

Problem

How does the end user know that it has a weak signal with limited coverage area?

Cause

The coverage area is determined by many factors. One of the primary factors is the transmitted signal compared to the background interference.

For the clocks to receive a clear signal from the Transmitter, the signal must be several times stronger than the background interference. Therefore, Transmitters located in areas with generally higher background interference will have reduced coverage.

NOTE

When certain types of electronic light ballasts become defective they may radiate broadband noise, which can interfere with wireless devices. While interference issues are unlikely with the Primex system, high levels of noise present in the 72-76MHz range could potentially cause clocks which are located far from the Transmitter and also within the close proximity of these ballasts to not receive a signal. Very limited instances have occurred in the past, which has only been found to happen when ballasts become defective.

Solution

How to determine if there is background interference?

For further assistance, contact Primex Technical Support at 1-262-729-4860.

No or Low Output Transmitter Power

Model

14000 Transmitter Internal Antenna, 14000 Repeater (Satellite) Transmitter, XR Repeater (Satellite) Transmitter

Problem

How does the end user know?

Cause

The Transmitter has no or low power that may be due to hardware failure event.

Solution

Step 1 - verify low power condition.

1. From the Transmitter front display, check for the presence of LP to the immediate left of the GPS Communication symbol indicator. If LP is present, this indicates the Transmitter has a low power condition. The Transmitter may need to be replaced. For further assistance, contact Primex Technical Support at 1-262-729-4860.
2. From the Transmitter front display, check for the presence of an L (Loop Lock Failure) located to the immediate right of ST+ or DT+. If displayed, power down the Transmitter, wait 5 seconds, and power on the Transmitter. If the L is still present, the Transmitter may need to be replaced. For further assistance, contact Primex Technical Support at 1-262-729-4860.

Front Display Does Not Light Up

Model

14000 Transmitter Internal Antenna, 14000 Repeater (Satellite) Transmitter, XR 1 Watt Internal Antenna, XR Repeater (Satellite) Transmitter

Problem

The front display of the Transmitter does not light up.

Cause

This may be due to Transmitter's power supply or internal its EPROM chip or wiring ribbon/harness connection.

Solution

Step 1 - verify Transmitter power source and output.

1. Verify power is present at the 120 VAC outlet.
2. Verify the power supply connection to the Transmitter and to the 120 VAC outlet is secure.
3. Using a multimeter, check for 9V at least 2.0A output from the power supply to the Transmitter.
4. If there is a UPS (surge protector/battery backup) in use, check the voltage carefully or bypass the UPS it to determine if it has become defective.

Step 2 - power down Transmitter and disconnect connections.

1. Power down the Transmitter and remove its antenna.
2. From the Transmitter, disconnect its power supply and GPS cable.

Step 3 - verify EPROM chip and wiring ribbon/harness connection.

1. Turn the Transmitter over.
2. From Transmitter's bottom panel, remove the four Phillips half-inch screws and remove the bottom panel.
3. Locate the EPROM chip (charcoal colored) - 1 1/8" square, connections on all 4 sides, in a 4 sided nest, in the center area of the green main circuit board.
4. Rub your index finger along all four sides of the EPROM chip to ensure it's flush with the board. Gently push (not too hard, which may crack the circuit board) the center of the chip to ensure it's secure. The light pushing is an attempt to re-establish any loose connections.

5. Slide ribbon cable up and down on its pins, on both the main board and display board, seat down completely. This again is an attempt to reestablish any loose connections; the wiring ribbon/harness from the circuit to the back of the display is secure. Be gentle at the back of the display - the wiring ribbon/harness is connected to pins that are floating on the back of the display.
6. Power on the Transmitter. From the Transmitter display, verify the correct time, day, date and channel number is displayed.

Step 4 - Reconnect back panel and connections.

1. Reconnect the back panel with the four Philips half-inch screws.
2. Reattach the antenna and GPS cable.
3. From the Transmitter display, verify the correct time, day, date and channel number is displayed.

If these steps do not resolve the problem, the Transmitter may be required to be replaced. For further assistance, contact Primex Technical Support at 1-262-729-4860.

NOTE

If the display lights up, but is blank or very faint, the Transmitter may need to be replaced.

Black Boxes Across Transmitter Front Display

Model

14000 Internal Antenna, 14000 Repeater (Satellite) Transmitter, XR 1 Watt Internal Antenna, XR Repeater (Satellite) Transmitter

Problem

The front display of the Transmitter lights up with black boxes across the display.

Cause

This may be due to Transmitter's power supply or internal its EPROM chip or wiring ribbon/harness connection.

Solution

Step 1 - power down Transmitter and disconnect connections.

1. Power down the Transmitter and remove its antenna.
2. From the Transmitter, disconnect its power supply and GPS cable.

Step 2 - verify EPROM chip and wiring ribbon/harness connections.

1. Turn the Transmitter over.
2. From Transmitter's bottom panel, remove the four Phillips half-inch screws and remove the bottom panel.
3. Locate the EPROM chip (charcoal colored) - 1 1/8" square, connections on all 4 sides, in a 4 sided nest, in the center area of the green main circuit board.
4. Rub your index finger along all four sides of the EPROM chip to ensure it's flush with the board. Gently push (not too hard, which may crack the circuit board) the center of the chip to ensure it's secure. The light pushing is an attempt to re-establish any loose connections.
5. Slide ribbon cable up and down on its pins, on both the main board and display board, seat down completely. This again is an attempt to reestablish any loose connections; the wiring ribbon/harness from the circuit to the back of the display is secure. Be gentle at the back of the display - the wiring ribbon/harness is connected to pins that are floating on the back of the display.
6. Power on the Transmitter. From the Transmitter display, verify the correct time, day, date and channel number is displayed.

Step 3- Reconnect back panel and connections.

1. Reconnect the back panel with the four Philips half-inch screws.
2. Reattach the antenna and GPS cable.

3. From the Transmitter display, verify the correct time, day, date and channel number is displayed.

If these steps do not resolve the problem, the Transmitter may be required to be replaced. For further assistance, contact Primex Technical Support at 1-262-729-4860.

Transmitter continues to power cycle and does not stay synced

Symptoms

All or some of the below symptoms may be present.

- Transmitter front display screen is dim.
 - Transmitter syncs its time, cycles back to counting up, syncs its time, and then cycles again.
-

Cause

This may be due to a power issue.

Analyze

1. Verify power is present at the 120 VAC outlet.
 2. Verify the power supply connection to the Transmitter and to the 120 VAC outlet is secure.
 3. Using a multimeter, check for 9V at least 2.0A output from the power supply to the Transmitter.
 4. If there is a UPS (surge protector/battery backup) in use, check the voltage carefully or bypass the UPS it to determine if it has become defective.
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Solution

1. If power to the Transmitter power supply is bad, get the issue corrected.
2. If it's determine the UPS (surge protector/battery backup) is defective, bypass it until is can be replaced.
3. If power to the Transmitter power supply is good, replace the power supply as your first step.

If these steps do not resolve the problem, the Transmitter may be required to be replaced. For further assistance, contact Primex Technical Support at 1-262-729-4860.

Transmitter time and date are not correct on the front display

Symptoms

All or some of the below symptoms may be present.

- Time and date is not correct on the Transmitter front display.
- Red LED is flashing on the Transmitter front display.
- Channel Number may be or may not be displayed on the Transmitter front display, located in the lower right hand corner of the screen.

Channel Number displayed: indicates the Transmitter is currently broadcasting.

Channel Number is NOT displayed: indicates the Transmitter is not currently broadcasting.

- GPS communication symbol may not be displayed on the Transmitter front display.
- GPS communication parentheses symbol  may not be displayed on the Transmitter front display.

Problem

This may be due to the Transmitter switch position(s), bad or lacking information from the GPS Receiver.

Analyze

1. Verify the GPS communication symbol and parentheses are present.
2. Check dip switch #1, #2, #3, or #4 to verify they are in the correct position.

Switch #1 sets the Daylight Saving Time Calendar. UP position: set to the new Daylight Saving Time calendar of 2007. DOWN position: set the old schedule before 2007.

Switch #2 sets the direction of UTC offset. UP position for U.S. and Canada, DOWN position for Europe.

Switch #3 sets the automatic Daylight Saving Time adjustment. UP position for automatic Daylight Saving Time changes. DOWN position to bypass Daylight Saving Time adjustments.

Switch #4 sets the clock display on the Transmitter. UP position for 12-hour display. DOWN position for 24-hour display.

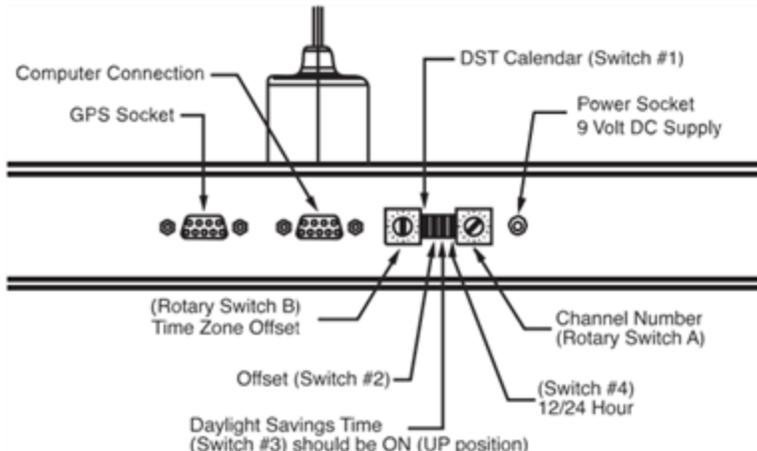
3. Verify the time zone selector is set to the correct position. Use a small slotted screwdriver to adjust the rotary switch.

"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

WARNING

Do NOT adjust Rotary Switch A which is the Channel Switch. It's set to the frequency specified on the FCC/IC application

and is factory preset to the FM frequency on which the Transmitter will broadcast. A 14000 series Transmitter has 16 available channels.



4. If dip switch #1 is in the correct position and ST or DT is displayed behind the time and not ST+ or DT+, the Transmitter may have the wrong EPROM chip in it.
5. If everything looks normal on the front display, but the Channel Number is not displayed, power cycle the Transmitter. As the screen comes back up, watch the upper left hand corner of the screen for either "No call sign", or "4 letters and 3 numbers" which is the Transmitter's call sign. If "No call sign" is displayed, the Transmitter cannot broadcast and requires configuration.
6. If all switch settings are correct, the GPS symbol and parentheses are both displayed, and the time and/or date are still not correct, it may be due to a bad GPS cable connection or a bad GPS Receiver.

NOTE

Other than the switch settings or the loss of GPS signal, the Transmitter should never display the wrong time or date. The Transmitter's time is set by the time signal received from the GPS Receiver.

Solution

1. If the GPS communication symbol and/or parentheses is not displayed, see Transmitter Does Not Have GPS Communication Symbol (Section 1)
2. If the switch settings are wrong, correct them, and then power cycle the Transmitter.
3. If the GPS communication symbol and parentheses are showing and all switch settings are correct, and the time and/or date are still wrong, replace the GPS Receiver and cable.

4. If ST or DT is displayed instead of the ST+ or DT+, the Transmitter needs a new EPROM chip with the new Daylight saving Calendar. You can temporarily fix the time by changing the time zone. For further assistance, contact Primex Technical Support at 1-262-729-4860.
 5. If you have determined the Transmitter has lost the Call Sign, contact Primex Technical Support.
 6. If the switch settings are correct, the GPS Receiver and cabling have been replaced, and the time and/or date is still not correct, the Transmitter is required to be replaced. For further assistance, contact Primex Technical Support at 1-262-729-4860.
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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

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