# Technical Bulletin: AirLink XR Series GNSS Issue

## OVERVIEW

| DATE ISSUED: | 26-July-2023 |
|---|---|
| ISSUED BY: | Sierra Wireless Enterprise Solutions Product Management |
| PRODUCTS AFFECTED: | XR80, XR90 |
| VARIANTS AFFECTED: | <table><tr><th>SKU</th><th>DESCRIPTION</th><th>STATUS</th></tr><tr><td>1104722</td><td>XR90 Single 5G Global</td><td>UNAFFECTED</td></tr><tr><td>1104723</td><td>XR90 Dual 5G Global</td><td>AFFECTED</td></tr><tr><td>1104785</td><td>XR90 Single 5G North America</td><td>AFFECTED</td></tr><tr><td>1104786</td><td>XR90 Dual 5G North America</td><td>AFFECTED</td></tr><tr><td>1104787</td><td>XR80 5G Global Wi-Fi</td><td>AFFECTED</td></tr><tr><td>1104789</td><td>XR90 5G North America Wi-Fi</td><td>AFFECTED</td></tr><tr><td>1104791</td><td>XR80 5G Global non-Wi-Fi</td><td>AFFECTED</td></tr><tr><td>1104793</td><td>XR90 5G North America non-Wi-Fi</td><td>AFFECTED</td></tr><tr><td>1104878</td><td>XR80 LTE Global Wi-Fi</td><td>AFFECTED</td></tr><tr><td>1104879</td><td>XR80 LTE North America Wi-Fi</td><td>AFFECTED</td></tr><tr><td>1104880</td><td>XR80 LTE Global Wi-Fi</td><td>UNAFFECTED</td></tr><tr><td>1104881</td><td>XR80 LTE North America non-Wi-Fi</td><td>UNAFFECTED</td></tr><tr><td>1104757</td><td>XP-5G Cartridge</td><td>UNAFFECTED</td></tr></table> |
| FOR DISTRIBUTION TO: | **Customers & Authorized Resellers** |
| SUMMARY: | Sierra Wireless has determined that a small number of XR routers may contain a Global Navigation Satellite System (GNSS) hardware issue.<br><br>The symptom is a flashing red GNSS LED on a powered router that is connected to a known-good active GNSS antenna. Note: A flashing red GNSS LED normally indicates a GNSS antenna installation issue, but if observed with a known-good antenna, the router is affected.<br><br>We have isolated potentially affected routers to a serial number range. Affected routers can be returned for replacement.<br><br>• If you require GNSS and your router is exhibiting this symptom, we recommend you return your router for replacement.<br><br>• If you do not require GNSS, you should disable the GNSS function as a best practice and you can continue to operate your router. (Refer to Appendix C: How to Disable Your GNSS)<br><br>It is your choice to either:<br><br>• Return your router that is in the serial number range, or<br>• Verify that your router is unaffected.<br><br>Use the **VERIFICATION PROCESS** to confirm whether your router is unaffected.<br><br>Use the **REPLACEMENT PROCESS** to return your affected router. |

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| **VERIFICATION PROCESS:** | Verify potentially affected routers using:<br>• Appendix A: How to Verify Routers by Serial Number |
| **REPLACEMENT PROCESS:** | Affected XR routers may be returned for replacement as follows:<br>1. Initiate the replacement by sending an email to ***repairs@sierrawireless.com*** and include the following information:<br>    • State the problem description as "RMA DOA - Airlink XR Series GNSS Issue".<br>    • State the quantity of replacement routers that you require urgently. We will prioritize urgent requests.<br>    • Provide the router Serial Numbers.<br>    • Provide the return address to ship the replacement routers.<br>2. Sierra Wireless will provide prepaid shipping labels.<br>3. Ship all affected routers to Sierra Wireless using the prepaid shipping labels.<br><br>IMPORTANT –<br>• Sierra is providing replacement routers via our normal warranty return material authorization (RMA) process.<br>• Place your return requests by August 30, 2023 and ship all affected routers by October 31, 2023.<br>• We expect that all in-warranty confirmed-affected routers will be replaced by the end of November with the timing being dependent on the returned SKU mix and quantity. Customers may email ***repairs@sierrawireless.com*** for updates. |
| **ADDITIONAL INFORMATION:** | This Bulletin contains the following additional information:<br>Appendix A: How to Verify Routers by Serial Number<br>Appendix B: How to Verify Your GNSS is Working<br>Appendix C: How to Disable Your GNSS |

## CONTACT

| | |
|---|---|
| **SALES:** | Ask for sales support here:<br>• https://www.sierrawireless.com/how-to-buy/contact-sales<br>• 1-877-687-7795 |
| **CUSTOMER SUPPORT:** | Ask for technical support here:<br>• https://www.sierrawireless.com/support<br>• 1-877-687-7795<br>Sign up to the Source for product resources and subscribe to product bulletins here:<br>• https://sierrawireless.com/sso/signup<br>Sign up for Sierra Wireless Security Bulletins here:<br>• https://www.sierrawireless.com/company/iot-device-security/security-bulletins |
| **RMA:** | Ask for return support here:<br>• repairs@sierrawireless.com |

# AirLink XR Series GNSS Issue

## REVISION HISTORY

| 5-July-2023 | Rev1: Initial announcement |
|---|---|
| 26-July-2023 | Rev2: Added replacement timing guidance. Clarified that XR routers with a functional GNSS will remain functional in the future. |

## Appendix A: How to Verify Routers by Serial Number

Routers shipped after July 1, 2023 are unaffected and do not require verifying.

Only certain XR SKUs with certain serial numbers are affected. See **VARIANTS AFFECTED** above.

If you are unsure how to check if your routers are affected, please contact your authorized reseller.

XR router serial numbers are printed on the router device label and on the router retail box label at location ① in the diagrams below.

| XR Device Label |
| --- |
|  |
| **XR Retail Box Label** |
|  |
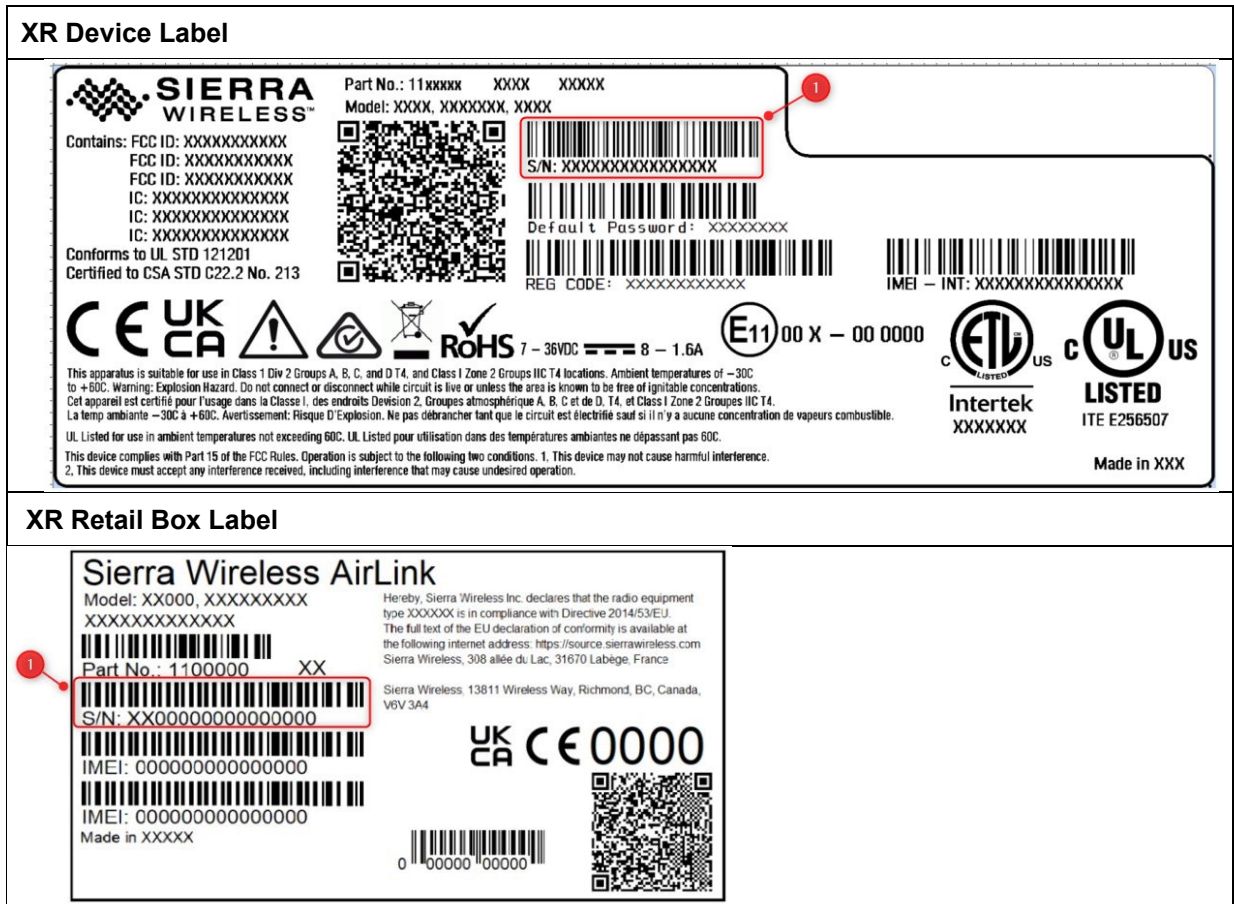
Router serial numbers are a 16-character identifier. The fields of interest are:
- Date code: The 3rd through 5th characters "NNN" indicate the date code.
- Factory code: The 4th character "F" from the right is the Factory Code:
    - e.g., xxNNNxxxxxxxFxxx
        - contains NNN date code
        - contains F Factory Code
    - Affected routers have Factory code F and a date code lower than 320
        - e.g., xx320xxxxxxxFxxx and higher (Unaffected)
        - e.g., xx319xxxxxxxFxxx and lower (Affected)

If the Factory Code is not "F", your router is unaffected and can be deployed.

If the Factory Code is "F" and the date code is 319 or lower, you can either:

- Return your router for replacement by referring to **REPLACEMENT PROCESS**, or
- Verify the GNSS is working by referring to Appendix B

## Appendix B: How to Verify Your GNSS is Working

Regardless of the serial number, XR routers with a functioning GNSS can be deployed. Note that due to the nature of the manufacturing issue, functioning XR routers will remain functional in the future.

This Appendix will help you verify that your router has a functioning GNSS.

The GNSS LED is the leftmost LED. The LED states discussed below require the GNSS to be enabled and an active GNSS antenna connected to your router.
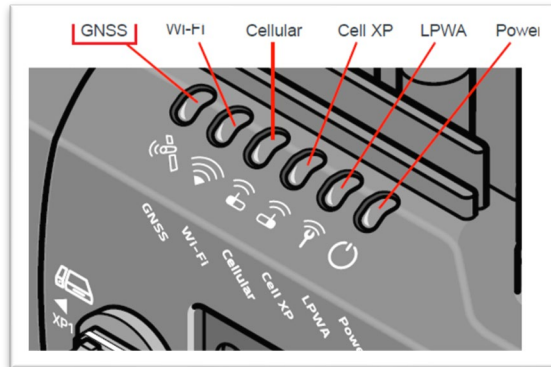


The GNSS LED is designed to indicate a detected GNSS antenna connection issue. On affected routers, the GNSS LED flashes red fast or slowly without an actual GNSS error. This is the condition this procedure is verifying.

Note – Solid LEDs indicate normal operation states. This procedure focuses on the flashing states.

**Table 2-12: LED Behavior**

| GNSS | |
| --- | --- |
| **Solid Green** | 🟩 |
| Satellite fix is available and Dead Reckoning[a] is enabled and calibrated[b] or Satellite fix is available and Dead Reckoning is disabled | |
| **Solid Yellow** | 🟨 |
| Satellite fix is available and Dead Reckoning is enabled, but not calibrated | |
| **Solid Red** | 🟥 |
| Searching for a satellite fix | |
| **Fast Flashing Red** | |
| GNSS antenna is open or shorted. | |
| *Note:* Antenna may appear to be connected, but current draw is too high or too low. | |
| **Slow Flashing Red** | |
| GNSS antenna is disconnected. | |
| *Note:* Current draw is below predefined threshold. | |
| **Off** | |
| GNSS is off/disabled | |

*(Reference: AirLink XR80/XR90 Hardware User Guide –
[source.sierrawireless.com/resources/airlink/hardware_reference_docs/airlink_xr_series_userguide/](http://source.sierrawireless.com/resources/airlink/hardware_reference_docs/airlink_xr_series_userguide/))*

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**GNSS Verification Procedure**

This procedure is used to verify your GNSS is working correctly. This procedure uses the GNSS LED and ALMS/AirLink OS user interface to diagnose a fault in the GNSS antenna detection circuitry.

An affected router, with a known-good GNSS antenna connected, will indicate the antenna is disconnected or the antenna is shorted.

On an affected router, the GNSS LED will flash red fast or slowly and ALMS/AirLink OS will display "Disconnected" or "Short".

**Step 1:** Power up your router with a connected <u>active GNSS antenna</u>.

**Step 2:** Ensure the router has "GNSS Antenna Detection" enabled (factory default state).
- Services → Location → General



- NOTE: The router's FAKRA connector will only be mated once during this procedure. The FAKRA connector on the GNSS antenna is rated for up to 100 mating cycles. To avoid false negative test results due to a worn out GNSS antenna FAKRA connector, ensure the GNSS antenna connector has not exceeded 100 mating cycles.

**Step 3:** Observe the GNSS LED pattern and if the LED flashes red fast or slowly your router is affected. Alternatively, for deployed routers with active GNSS antennas, where it is difficult to observe the LEDs, ALMS/AirLink OS will indicate "Disconnected" or "Short" in the "GNSS ANTENNA STATE" field on affected routers.
- Status / Monitoring → Services → Location → GNSS ANTENNA STATE
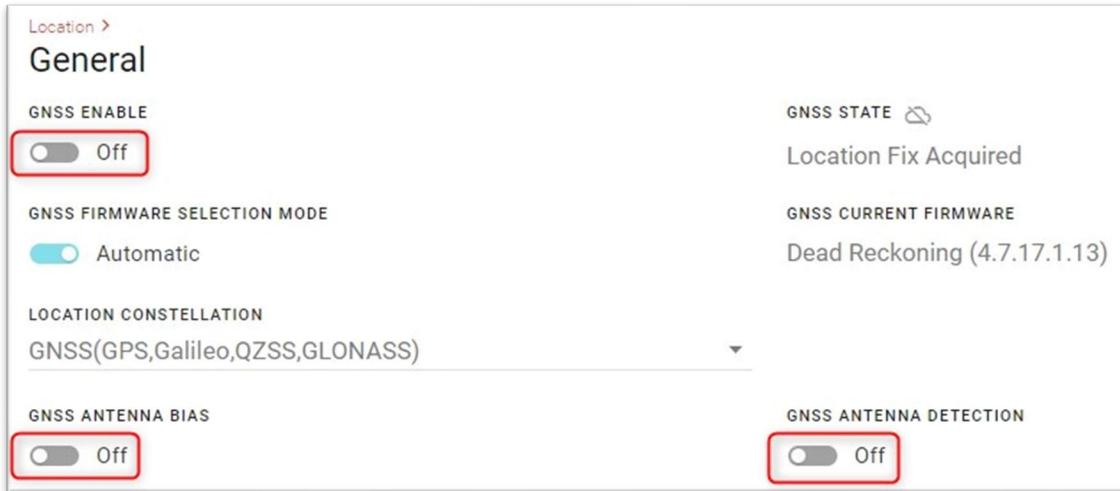
**Step 4:** Affected routers must be returned for replacement. Note that due to the nature of the manufacturing issue, functioning XR routers will remain functional in the future.

## Appendix C: How to Disable Your GNSS

All routers not requiring GNSS can be deployed by disabling the GNSS. It is a normal best practice to disable GNSS when you don't require GNSS.

To disable the GNSS using ALMS or AirLink OS, navigate to *Services → Location → General*
1. Set *GNSS ENABLE* Off
2. Set *GNSS ANTENNA BIAS* Off
3. Set *GNSS ANTENNA DETECTION* Off
4. Click "Save" to apply the setting