Inseego Wavemaker™

5G Cellular Router FX4200

Wireless failover and failback, edge router functionality, and configuration

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Contents

Introduction

![AT&T Business logo]

Model: Inseego Wavemaker 5G Cellular Router FX4200

The Inseego FX4200 has the following capabilities and benefits:

Capabilities

- **Failback and failover:** Automates the swap between primary internet connection and the wireless connection, keeping business operations uninterrupted.

- **Remote management portal:** Allows one-to-many device configuration, monitoring, and management (e.g., status monitoring, data usage, device health.)

- **Safe and secure:** Advanced security, encryption, and VPN support help to ensure protection of sensitive personal data.

Benefits

- Uninterrupted internet access during ISP outages.

- **Zero-touch failover** using SD-WAN health checks.

- **Support for critical applications** (POS, VoIP, VPNs, cloud access).

- **Remote location connectivity** where wired service is unavailable or unreliable.

Key features

- Rechargeable 5050 mAh LI-ion backup battery

- Single-line LCD display

- 2x 2.5 GbE LAN/WAN switchable ports

- 2x 1 GbE LAN ports

- WAN policy and health checks

- Wi-Fi 7 for up to 256 clients

- 2.4 GHz band and 5 GHz bands
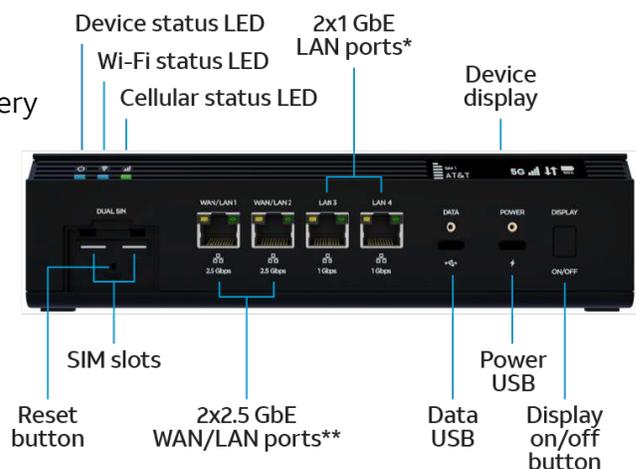
* When running on battery, ports 3 and 4 are disabled when the battery charge level is below 40%.

** 2.5 GbE Ethernet ports can be configured as WAN or LAN in the admin web UI or Inseego Connect with Network > Ethernet.

To ensure continuous connectivity in the event of a primary internet outage, there are different setup options for the Inseego FX4200 with an AT&T SIM for wireless backup.

Inseego setup options

The Inseego FX4200 router is designed to help deliver reliable wireless backup connectivity for business-critical operations. Here are two common setup options:

- **Inline WAN Failover: Automatic Backup for Wired Connection**
  In this setup, the FX4200 router is configured to use a wired WAN (like fiber, cable, or DSL) as the primary internet connection and the internal modem as a backup WAN. The FX4200 router continuously monitors the health of the primary WAN using methods like DNS and HTTP checks. If a wired link failure is detected, the FX4200 router automatically switches network traffic to the wireless connection, helping to ensure seamless continuity. Once the wired service is restored, the FX4200 router automatically reverts to primary WAN.

- **IP Passthrough: Integration with SD-WAN/Edge Routers**
  When integrated into networks with SD-WAN/edge appliance or external firewall, the FX4200 router can be configured to operate in IP Passthrough mode. In this setup, the FX4200 router transparently passes the public IP address directly to the downstream device. This allows the SD-WAN appliance or firewall to manage all routing and failover policies, leveraging the FX4200 router solely as a modem.

Inline WAN failover

January 23, 2026

Purpose

To help ensure business continuity by providing automatic failover using the FX4200 as an edge router for wireless backup.

FX4200 Edge Router is designed to support continuous internet connectivity by utilizing a wired WAN connection (e.g., fiber, cable, or DSL) as the primary path and a built-in 5G/4G LTE modem as the backup. FX4200 actively monitors the health of primary WAN and will automatically switch to the wireless connection if an outage is detected, based on predefined health check policies.

By default, the FX4200 also provides Wi-Fi connectivity on both 2.4 GHz and 5 GHz bands, enabling basic Wi-Fi access.
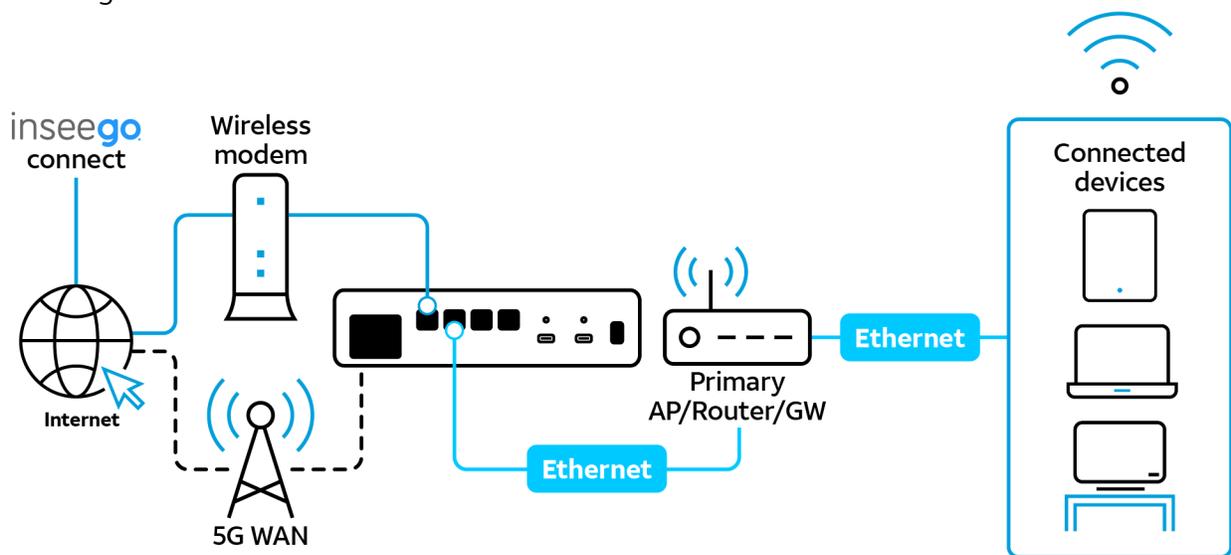
How it works

The FX4200 includes two 2.5 GbE WAN/LAN ports and two 1 GbE LAN ports. You can configure the WAN/LAN ports to be either WAN or LAN, but only one port can be set to WAN at a time. The designated WAN port connects to wired internet service, and a LAN port connects to internal devices or the local network. The modem acts as a secondary WAN path, activated only when the wired connection is unavailable.

The FX4200 router continuously monitors WAN connectivity using health checks to determine WAN status. If the primary WAN fails, the router initiates failover to wireless connection. Once the primary connection is restored and stable, the router automatically performs failback, returning traffic to the wired path, helping to ensure seamless internet connectivity.

Failover and failback policies

The table below outlines failover and failback policies that can be configured to maintain continuous network connectivity when setting up the FX4200 with Primary WAN (Wireline) and Backup WAN (Cellular).

Feature	Failover	Failback
Scenario	Primary ISP (wireline) fails over to backup (cellular) connection	Backup (cellular) connects/falls back to the primary ISP (wireline) connection
Trigger	Primary WAN failure detection	Primary WAN recovery detection
Purpose	Maintain continuity	Restore preferred routing
Configuration	Automatic once set up	Ability to customize health checks and set priority of WAN interfaces

SIM card requirements

To enable wireless connectivity on the FX4200 for failover and failback modes, the following are required and must be separately obtained:

- **4FF Nano SIM card:** The FX4200 is designed to use 4FF Nano SIM cards. Ensure you have the correct size SIM for insertion (as shown in the diagram).

SIM slots

4FF Nano
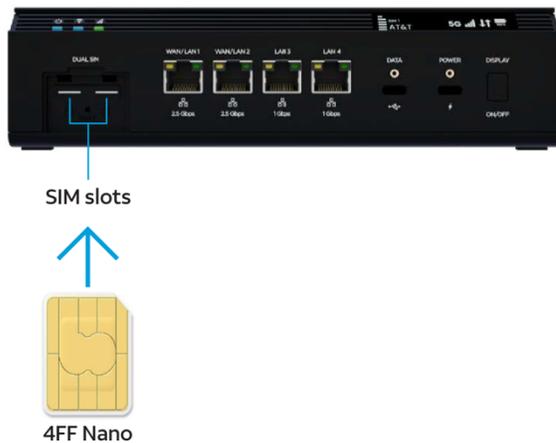
- **Active AT&T Wireless^{SM} data plan:** A valid and active AT&T Wireless data plan is necessary for the FX4200 to connect to the AT&T wireless network and transmit data. This plan must be provisioned for data usage. Contact your AT&T representative to ensure you have the appropriate data plan for your needs.

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Configure inline failover

You can configure inline failover using the local admin web UI or Inseego Connect.

- **Admin web UI**

  On a device connected to the router, open any web browser, and go to http://192.168.1.1.

  Select **Log In** (in the top-right corner of the screen) and enter your **admin password**. If this is your first time logging in, use the Admin Password printed on the bottom of the FX4200.
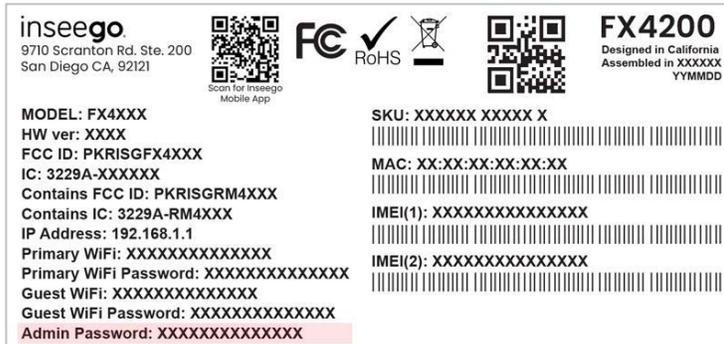
- **Inseego Connect**

  On a device connected to the router, log in to Inseego Connect. Click on the Device Name of the FX4200 you want to configure. Then click **Configure**.
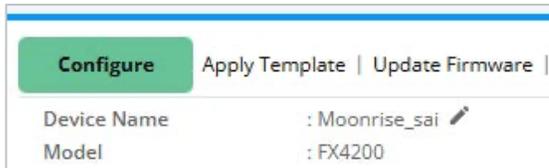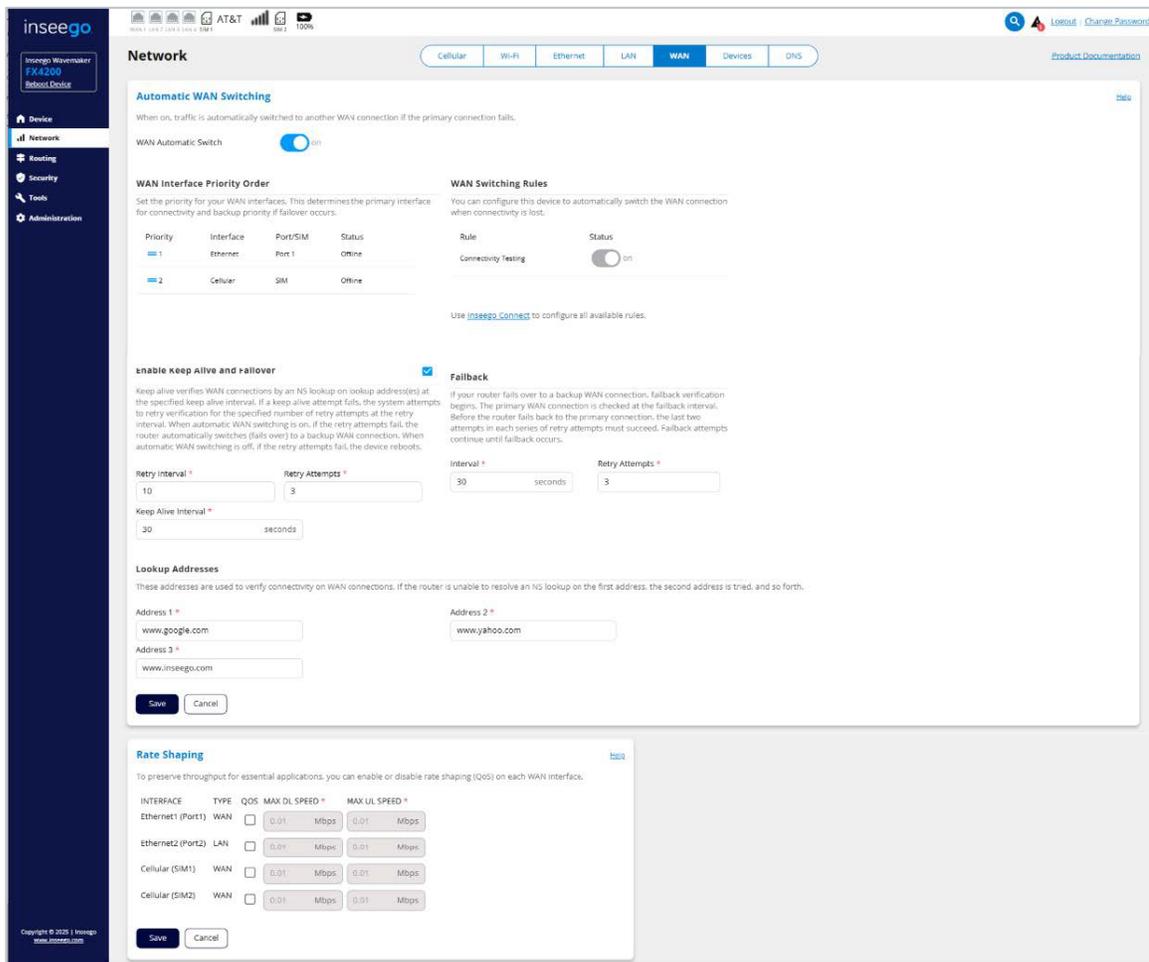

- On either application, select **Network** from the left navigation pane.

- Select the **Ethernet** tab to designate which WAN/LAN Ethernet port is the WAN port. The WAN port is the port that supports the wired primary internet connection. By default, Port 1 is set to WAN.
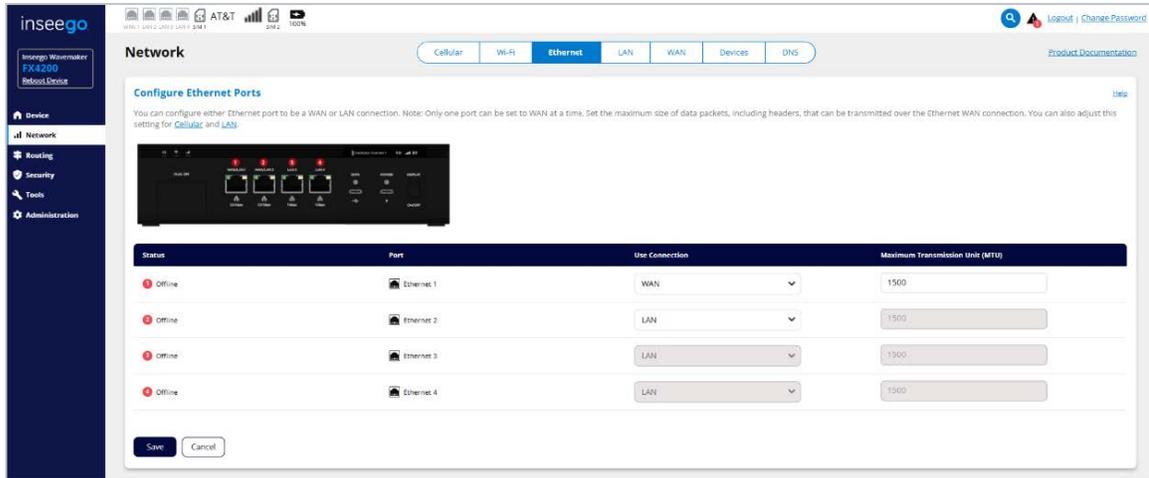
- Select the **WAN** tab.

- Ensure that the **WAN Automatic Switch** is enabled. (This allows rerouting of network traffic to your backup WAN (cellular) connection if the primary WAN (wired) connection fails.)

Automatic WAN Switching

When on, traffic is automatically switched to another WAN connection if the primary connection fails.

WAN Automatic Switch ⬤ on

- Set the **priority of your WAN interfaces**. Drag the two blue lines up or down to change the priority. For this purpose, make sure Ethernet is Priority 1.

WAN Interface Priority Order

Set the priority for your WAN interfaces. This determines the primary interface for connectivity and backup priority if failover occurs.

Priority	Interface	Port/SIM	Status
= 1	Ethernet	Port 1	Offline
= 2	Cellular	SIM	Offline

- Ensure **Keep Alive and Failover** checkbox is checked.

Enable Keep Alive and Failover ☑

- **Keep Alive** verifies your WAN connections by performing an NS lookup on lookup address(es) at the **Keep Alive Interval** (every 30 seconds by default). If a Keep Alive attempt fails (the FX4200 is unable to resolve an NS lookup on any of the three lookup addresses), the system retries the connection at the **Retry Interval** (every 10 seconds by default) for the set number of **Retry Attempts** (3 attempts by default). You can modify these values as needed.

Enable Keep Alive and Failover ☑

Keep alive verifies WAN connections by an NS lookup on lookup address(es) at the specified keep alive interval. If a keep alive attempt fails, the system attempts to retry verification for the specified number of retry attempts at the retry interval. When automatic WAN switching is on, if the retry attempts fail, the router automatically switches (fails over) to a backup WAN connection. When automatic WAN switching is off, if the retry attempts fail, the device reboots.

Retry Interval *

| 10 |

Retry Attempts *

| 3 |

Keep Alive Interval *

| 30 | seconds |

- If the **Retry Attempts** fail, the connection fails over to your backup WAN (cellular) interface for uninterrupted connectivity and **Failback** is automatically initiated.

- **Failback** checks connectivity on the priority WAN (wired) connection at the specified interval (30 seconds by default) and continues checking until connectivity is verified and the router switches back to the wired connection.

Failback

If your router fails over to a backup WAN connection, failback verification begins. The primary WAN connection is checked at the failback interval. Before the router fails back to the primary connection, the last two attempts in each series of retry attempts must succeed. Failback attempts continue until failback occurs.

Interval *	Retry Attempts *
30 seconds	3

- The number of **Retry Attempts** indicates how many health check attempts are made on the priority 1 WAN interface in a series of attempts, the last two of which must succeed for failback.

  - **Notes**: For failback to the primary WAN connection to occur, the **last two** attempts in the number of Retry Attempts must succeed. For example, if Retry Attempts is set to 5 and attempts 1-4 succeed, but attempt 5 fails, failback does not occur. Attempts #4 and 5 must succeed. When set to 3, attempts #2 and 3 must succeed, etc.

  - Failback attempts continue until failback to the priority WAN occurs. The number of Retry Attempts determines how many attempts to try in a series of attempts, not the total number of attempts, which is unlimited, providing you with assurance that your router will automatically switch to your priority WAN connection as soon as it is verified to be stable.

- **Lookup Addresses** are used to verify connectivity on WAN connections. If the router is unable to resolve a DNS lookup on the first address, the second address is tried, and so forth. You can use the default addresses or enter new ones.

Lookup Addresses

These addresses are used to verify connectivity on WAN connections. If the router is unable to resolve an NS lookup on the first address, the second address is tried, and so forth.

Address 1 *	Address 2 *
www.google.com	www.yahoo.com

Address 3 *

www.inseego.com

[Save] [Cancel]

- Click **Save** to save your settings.
- Plug in your Primary wireline connection to the port you configured as WAN.

Managing static IPs during failover and failback

A public static IP address is strongly recommended for automatic failover with an AT&T Business Wireless Backup connection.

When using AT&T Business wireless backup with a static IP, it's important to understand how it works alongside your existing internet provider's static IP.

Static IP scenarios

Each static IP is tied to its respective path. Customer applications may temporarily break if they are tied to a specific IP and not configured for both.

- Normal Operation has wired internet (WAN1) ISP-assigned Static IP.
- Failover with Wireless Backup (FX4200) uses AT&T-assigned Static IP.
- Failback to wired internet (resumed) reverts to ISP-assigned Static IP.

What does this mean?

Any applications that rely on the original ISP's static IP (like VPNs or whitelisted IPs) will no longer work unless updated to recognize the AT&T static IP.

When the primary connection fails, the Inseego router activates the wireless backup. AT&T static IP becomes the public-facing address.

To maintain seamless operations during both failover and failback, do the following:

- Update VPN/firewall policies to accept traffic from both static IPs.
- Whitelist both IPs for any remote access, cloud platforms, or IP-restricted services.
- Use dynamic DNS to automatically switch domains between the two IPs.
- Ensure port forwarding or NAT rules are configured for both IP addresses on the router or firewall.

Key considerations

- AT&T static IP is only active during failover—it cannot replace the primary ISP IP.
- After failback, the network resumes using your original ISP's static IP.
- AT&T and Inseego do not support IP handoff between networks. This non-support prevents seamless IP-level continuity unless applications or DNS are designed to accommodate both.

IP passthrough

Purpose

To help ensure business continuity by providing redundant internet connectivity using a wireless (5G/5G+/LTE)* connection as a backup WAN to a third-party SD WAN or edge router.

This setup relies on the third-party SD-WAN or edge router to actively manage the WAN status of both the primary internet connection (e.g., fiber, cable, or DSL) and the backup internet connection (wireless). The SD-WAN or edge router will then perform actions based on failed WAN health checks and defined WAN policy. The Inseego FX4200 in this configuration acts as a modem providing the backup WAN interface to the SD-WAN or edge router.
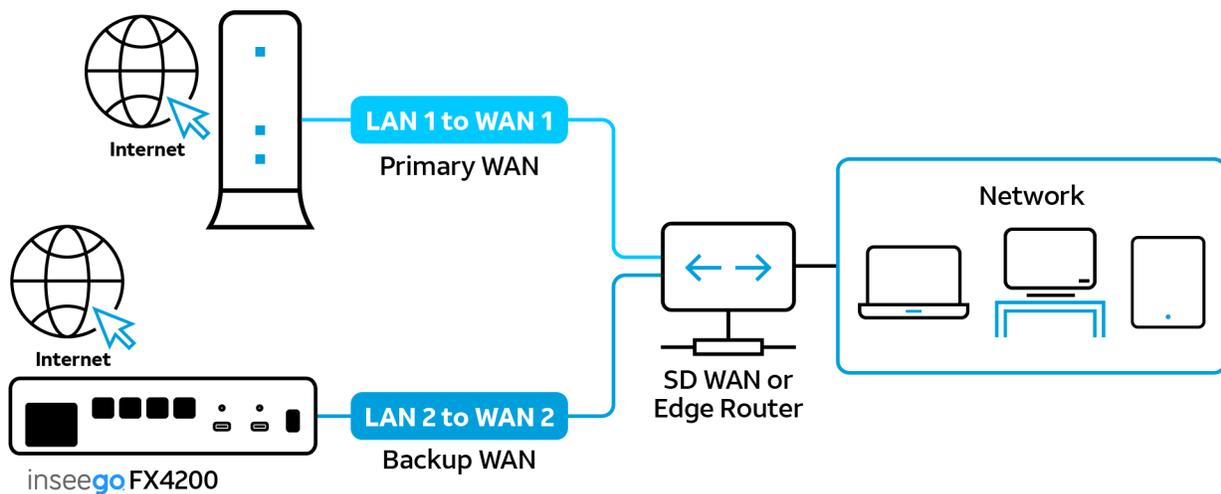
How it works

The FX4200 router interfaces with an SD-WAN or edge router via an Ethernet connection. It is configured to operate in either DHCP mode or IP Passthrough (bridge mode). When utilizing IP Passthrough, the FX4200 router assigns its public IP address directly to the WAN interface of the connected SD-WAN appliance or router.

The SD-WAN or edge router is programmed to classify the FX4200 wireless connection as a secondary WAN link, acting as a failover to the primary wired WAN link, such as fiber, cable, or DSL. WAN link health is continuously monitored using predefined metrics, including DNS resolutions and HTTP checks, alongside failover policy configurations.

Upon detecting a failure in the primary WAN link, the system initiates an automatic failover to the FX4200 wireless link to maintain uninterrupted internet connectivity. Once the primary WAN connection is restored, the failback configuration reverts traffic to the primary WAN, helping to ensure seamless, uninterrupted network operations.

*Coverage not available everywhere. 5G+ is offered in limited locations in specific cities. See att.com/5Gnetwork for details.

SIM card requirements

To enable wireless connectivity on the FX4200 for IP passthrough, the following are required and must be separately obtained:

- **4FF Nano SIM card:** The FX4200 is designed to use 4FF Nano SIM cards. Ensure you have the correct size SIM for insertion (as shown in the diagram).

SIM slots

4FF Nano
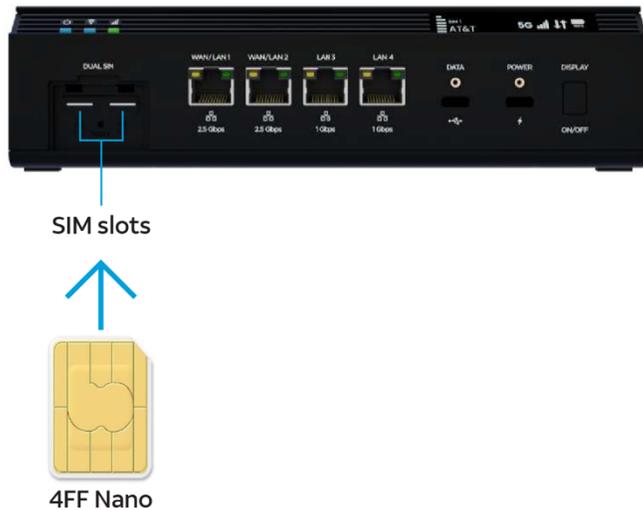
- **Active AT&T Wireless^SM data plan:** A valid and active AT&T wireless data plan is necessary for the FX4200 to connect to the wireless network and transmit data. This plan must be provisioned for data usage. Contact your AT&T representative to ensure you have the appropriate data plan for your needs.

Configure IP passthrough

You can configure IP passthrough using the local admin web UI or Inseego Connect.

- **Admin web UI**

  On a device connected to the router, open any web browser, and go to
  http://192.168.1.1.

  Select **Log In** (in the top-right corner of the screen) and enter your **admin password**. If
  this is your first time logging in, use the Admin Password printed on the bottom of the
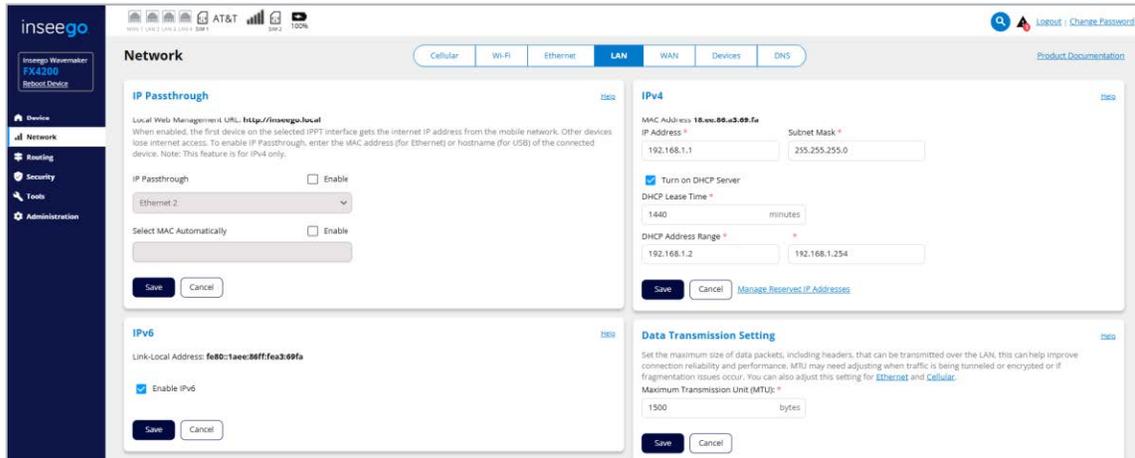 FX4200.

- **Inseego Connect**

  On a device connected to the router, log into Inseego Connect. Click on the Device
 Name of the FX4200 you want to configure. Then click **Configure**.
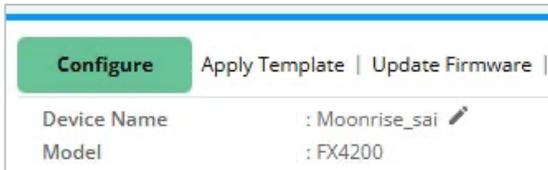
- On either application, select **Network** from the left navigation pane.

- Select the **LAN** tab.

- To **enable IP Passthrough**, check the Enable checkbox and ensure Ethernet 2 is displayed. Then either enter the MAC address of the device connected for IPPT or check the **Enable** box to find the MAC address automatically. This is the MAC address of the only device connected to the selected Ethernet port that can obtain the IP address assigned to the mobile network.
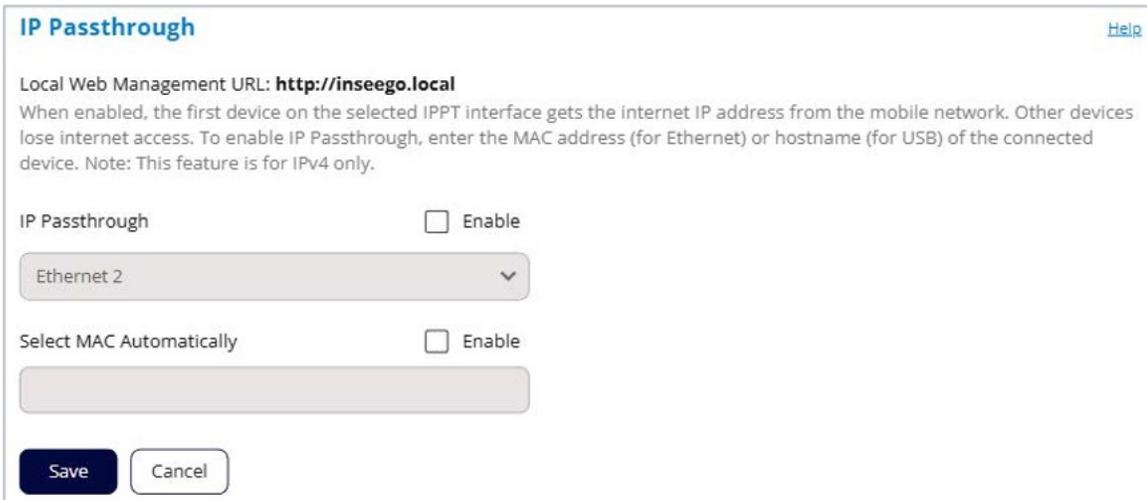
  - **Note:** Ethernet 2 is set to LAN by default. If it has been set as WAN, IP Passthrough cannot be enabled. To allow configuration, go to **Network > Ethernet** and change Ethernet 2 to LAN.

- Click **Save**.

WAN monitoring with Inseego Connect

Purpose

The Inseego FX4200 includes an onboard network monitoring agent that integrates directly with the Inseego Connect Management Portal. This agent provides comprehensive visibility into the router's WAN health and performance.

How it works

Network Monitoring Agent operates on a scheduled interval—typically every 15 minutes—automatically generating and transmitting data packages to the Inseego Connect Management portal. The data collected includes critical information about the router's WAN health, connection status, failover events, signal strength, and other key performance indicators. This telemetry enables near real-time visibility and historical analysis, empowering IT teams with actionable business intelligence. The insights provided through Inseego Connect support proactive network management and improve uptime by highlighting issues before they impact operations.

WAN monitoring tools in Inseego Connect include Data Connection Status and Signal Quality graphs. From the main dashboard, click on the name of the device you want to monitor.

Data connection status

Scroll down to see the **Data Connection Status** bar, which provides a visual summary of device connectivity over time.

This information is continuously updated in real time to reflect the current state of device connectivity. The graph provides a timeline of when the device has been online (connecting with Inseego Connect) and offline (not connecting with Inseego Connect).
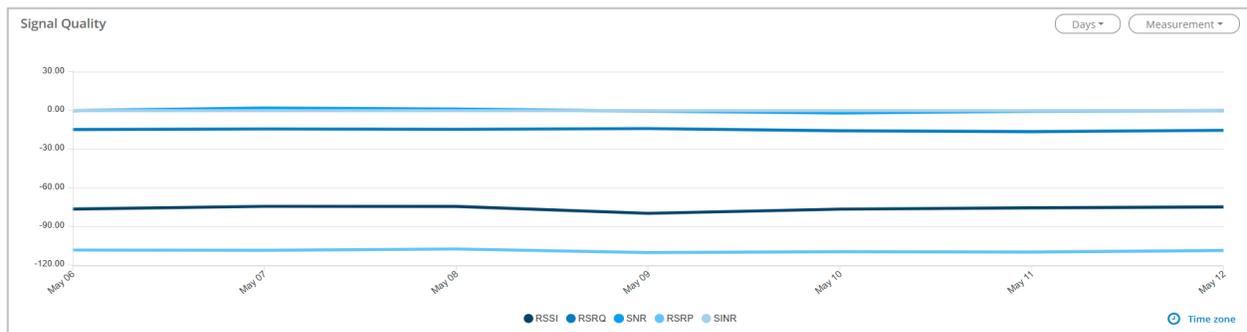
You can:

- Hover over a color segment in the graph for details.
- Use the **WAN View** slider in the upper right to view data connection status by WAN connection.
- Use the **Days** dropdown to display usage for previous 7- or 30-day periods.
- Use the **Operations** dropdown to filter by the type of operation.

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Use cases:

- **Troubleshooting:** Quickly identify if, and when, connectivity issues occurred.
- **Operational monitoring:** Confirm consistent up-time over the selected timeframe.
- **Device performance evaluation:** Spot recurring offline patterns that may indicate issues.

Signal quality

The signal quality graph provides signal quality information for a device by day.

You can:

- Hover over a line on the graph for details.
- Use the dropdowns in the upper right to change the number of days displayed or to filter on a specific measurement (RSSI, RSRQ, SNR, RSRP, and SINR).
- Hover over **Time zone** in the bottom right to see the time zone used to calculate values.

Use cases:

- Quickly assess signal strength, quality, and potential interference.
- Toggle between 7-day and 30-day views for trend analysis, proactive monitoring, and troubleshooting network performance.

RSSI (Received Signal Strength Indicator)

The estimated measure of how well the device can hear a signal from a radio transmitter.

- **What it measures:** Total received power including signal and noise/interference.
- **Unit:** dBm (decibels milliwatt).
- **Typical range:** -30 dBm (excellent) to -120 dBm (very poor).
- **Ideal value:** Closer to 0 (e.g., -50 dBm is stronger than -90 dBm).
- **Good:** -70 dBm or better.
- **Poor:** Below -90 dBm.

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RSRQ (Reference Signal Received Quality)

A calculated value from RSRP and RSSI that provides a measure of signal and interference.

- **What it measures:** Quality of the received reference signal, factoring in interference and noise.
- **Unit:** dB.
- **Typical range:** -3 dB (excellent) to -20 dB (poor).
- **Ideal value:** Closer to 0 (e.g., -5 dB is better than -15 dB).
- **Good:** -10 dB or better.
- **Poor:** Below -15 dB.

SNR (Signal-to-Noise Ratio)

The ratio of signal power to noise power expressed in decibels. SNR is a positive value, and higher numbers are better.

- **What it measures:** Ratio of signal power to noise power.
- **Unit:** dB.
- **Typical range:** -20 dB to +30 dB.
- **Ideal value:** Higher values indicate better signal quality.
- **Good:** 20 dB or better.
- **Poor:** Below 5 dB.

RSRP (Reference Signal Received Power)

The measure of signal strength similar to RSSI, but RSRP measures lower than RSSI due to the method of calculation.

- **What it measures:** Strength of the reference signal from a cell tower (used in LTE).
- **Unit:** dBm.
- **Typical range:** -44 dBm (excellent) to -140 dBm (unusable).
- **Ideal value:** -80 dBm or better.
- **Good:** -90 dBm or higher.
- **Poor:** Below -100 dBm.

SINR (Signal-to-Interference-plus-Noise Ratio)

The measure of signal quality, taking interference and noise into account. SINR values are positive, and higher numbers are better.

- **What it measures:** Quality of the signal considering both noise and interference.
- **Unit:** dB.

- **Typical range:** 0 dB to 30 dB.

- **Ideal value:** Similar to SNR; higher is better.

- **Good:** Above 20 dB.

- **Poor:** Below 10 dB.

Need help configuring your Inseego router?

Visit: www.inseego.com/support