Nanoprecise

Prediction with Precision

Installation and Connectivity Guide
Cellular-Wi-Fi (Cel-Fi) Booster

Content

Introduction

In industrial environments where cellular connectivity is weak or inconsistent, maintaining stable data transmission can be a challenge. The Cellular-Wi-Fi (Cel-Fi) Booster solves this by capturing weak signals from nearby cellular towers through its external antenna, amplifying them, and redistributing the stronger signal via the internal antenna to connected devices like Nanoprecise sensors.

This boosted connectivity ensures reliable communication between sensors and the cloud platform, enabling real-time data flow and uninterrupted performance. It helps reduce installation delays, minimizes signal dropouts, and improves the accuracy and timeliness of predictive maintenance insights. Importantly, better connectivity also contributes to longer battery life by reducing the energy sensors expend while attempting to connect or resend data.

Including the Cel-Fi Booster in your setup means faster deployments, fewer connectivity issues, and better long-term reliability for your Nanoprecise solution.

Need more information or assistance? Reach out to us at customer-success@nanoprecise.io or click the ⑦ button in your dashboard for setup guidance or troubleshooting tips.

Booster Installation Instructions

Booster Preparation

- Power up the booster through the power cord.
- Install internal antenna on the internal antenna port (The side with a cellphone symbol)
- Install external antenna on the external antenna port (The side with a tower symbol)

Antenna Positioning

- The internal antenna should be placed in the direct line of sight of the sensors
- The external antenna should be positioned out in the open so it can receive signals from the tower.

Various Booster Parts

The Booster

The Power Cord

Internal Antenna

Internal Antenna Port

External Antenna Port

External Antenna

Understanding Signal Metrics

To help interpret the connectivity data from your network test sensor, here's a quick guide to what each value means and how to identify good or weak signal strength:

These values can help diagnose installation locations or signal performance when deploying Nanoprecise solutions. If most values fall in the "poor" range, consider using a Cel-Fi booster or repositioning the sensor.

Network Type	Parameter	Excellent	Good	Poor
4G (LTE) and LTE-M (CAT-M1)	RSRP (dBm)	>-90	-90 to -110	<-110
	RSRQ (dB)	>-9	-9 to -12	<-12
3G (WCDMA)	RSRP (dBm)	>-70	-70 to -95	<-11
	RSRQ (dB)	>-7	-7 to 2-11	>-100
2G (GSM)	RSSI (dBm)	>-90	-90 to -100	>-100
Wi-Fi	RSSI (dBm)	>-30	-30 to -80	>-90

Checking the Connection Status

The connection status of the booster can be checked using the Cel-Fi WAVE App, which is available on smartphones and tablets via the apple app store or the google play store. Instructions on how to check the connectivity are detailed below. The link to download the Cel-Fi Wave app is : https://www.cel- fi.com/software/
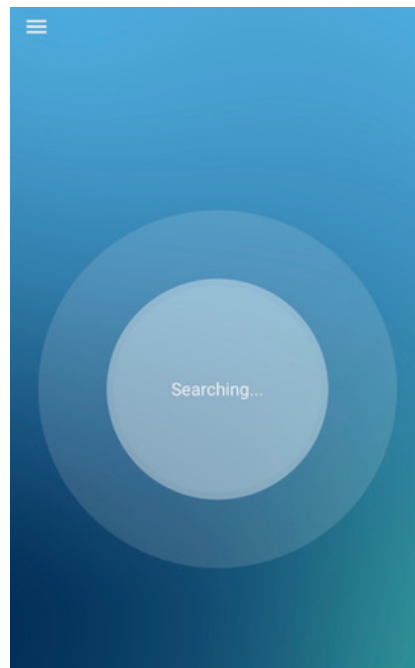
Instructions

Have your network testing sensor ready and running. Example: MCC and MNC is for Canada – Rogers AT&T Wireless Band 12. if you don't have a network test sensor to reach out to the Nanoprecise Account team.
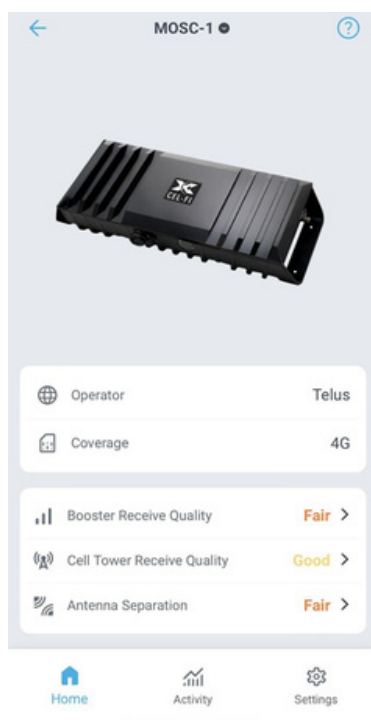
Net Monitor

Device is connected

RSSI used for GSM/2G
80

lac for GSM/2G/3G/4G
11240

cellid for GSM/2G/3G/4G
53765634

Access Technology
LTE
SM /2G
FDD LTE

RSRP/RSCP CAT M1/3G/4G
-117

SINR CAT M1/4G
96

RSRQ/ECIO CAT M1/3G/4G
-19

MCCMNC 3 digits MCC and 3 MNC for carrier mcc-mnc.com
302220

BAND
LTE BAND 4

Channel Type
2325

time
0.193198s

Speed
165.63319kB/s

An image detailing connectivity information obtained from the network test sensor via the Nanoprecise provided link.

Start the Cel-Fi app

The app will automatically start looking for the booster using Bluetooth

Searching...

Once the app is connected to the cellular booster. It will show the booster information

MOSC-1

| Operator | Telus |
Coverage	4G
Booster Receive Quality	Fair >
Cell Tower Receive Quality	Good >
Antenna Separation	Fair >

Home   Activity   Settings

A screenshot of the Cel-Fi app showing the booster information

Confirm with the Nanoprecise team the network that the sensors are connected to and the Band or use the information provided by the network testing sensor. Look for MCC-MNC to get the operator's name and check the band.

Click on "settings" and choose the operator.

Allow the booster to download the new update. This process should take 1-3 minutes
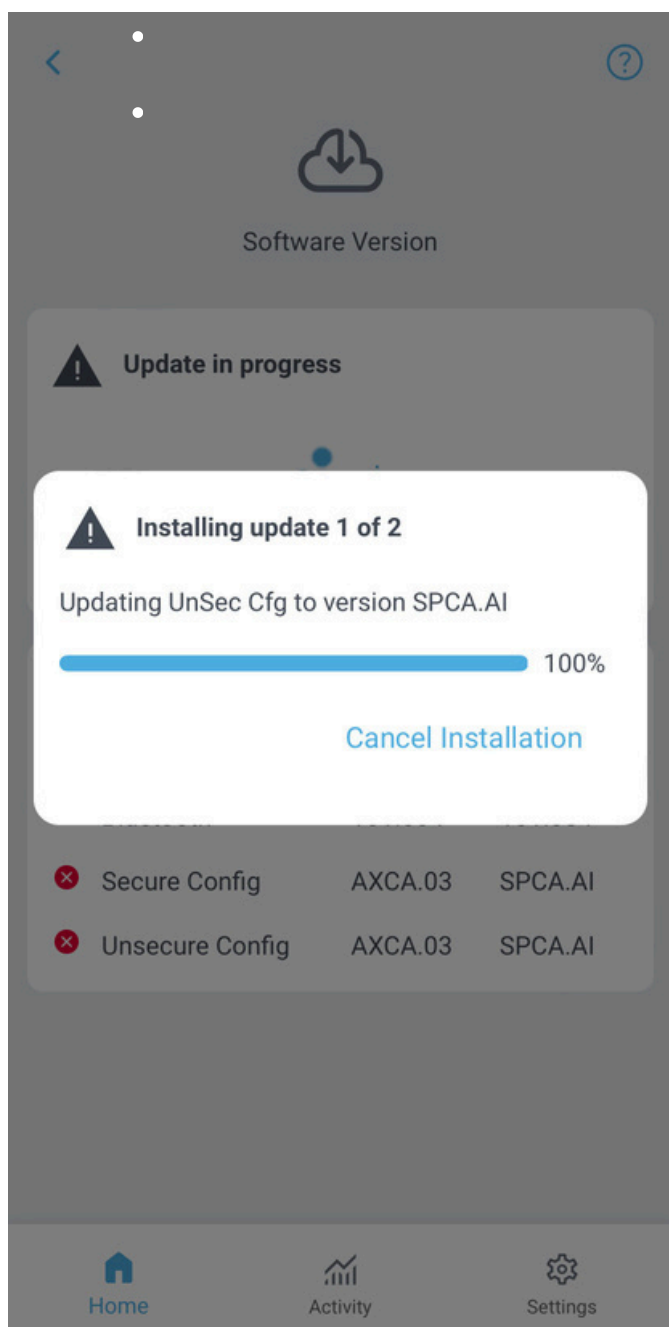
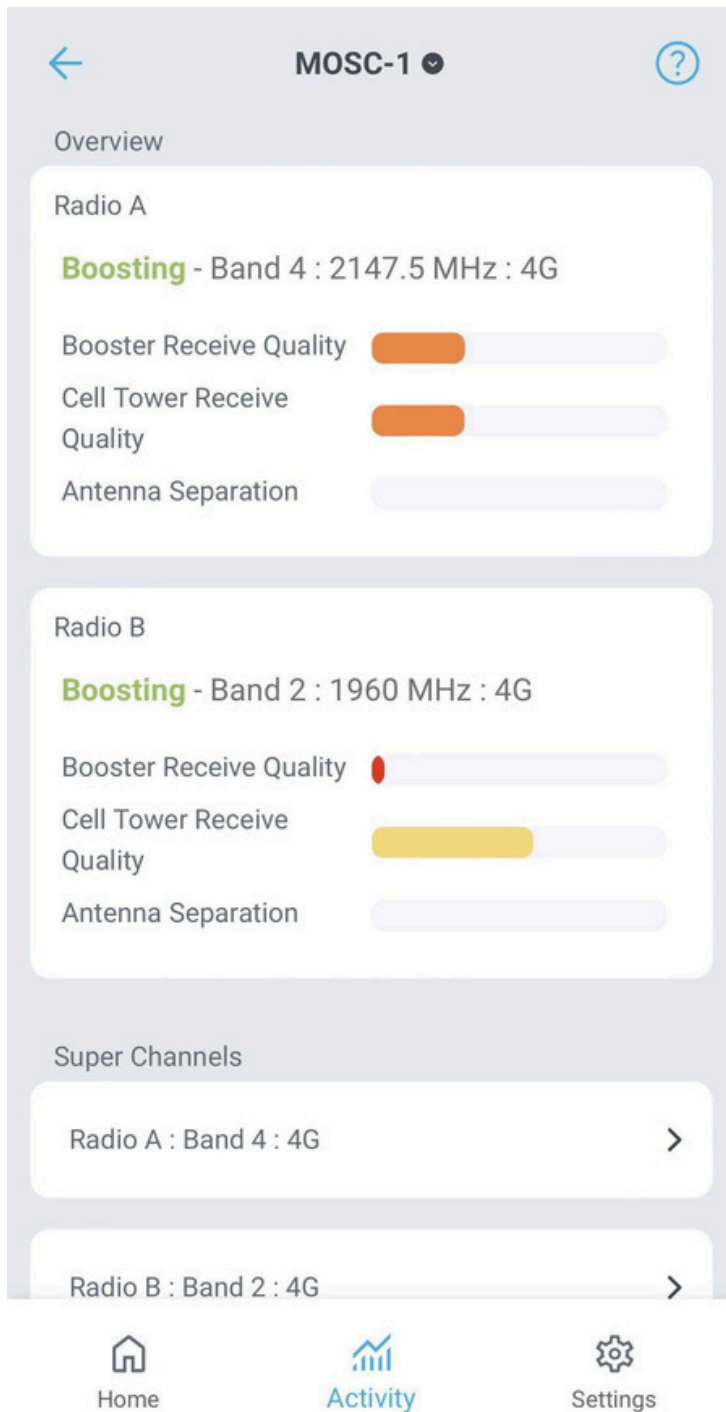A screenshot of the Cel-Fi app showing the update installation.

Go to Band settings. And unselect all bands and only keep the band provided by Nanoprecise Team or from the network testing sensor:

Note: for North America LTE-M is on Band 12:4G. [most of the time]
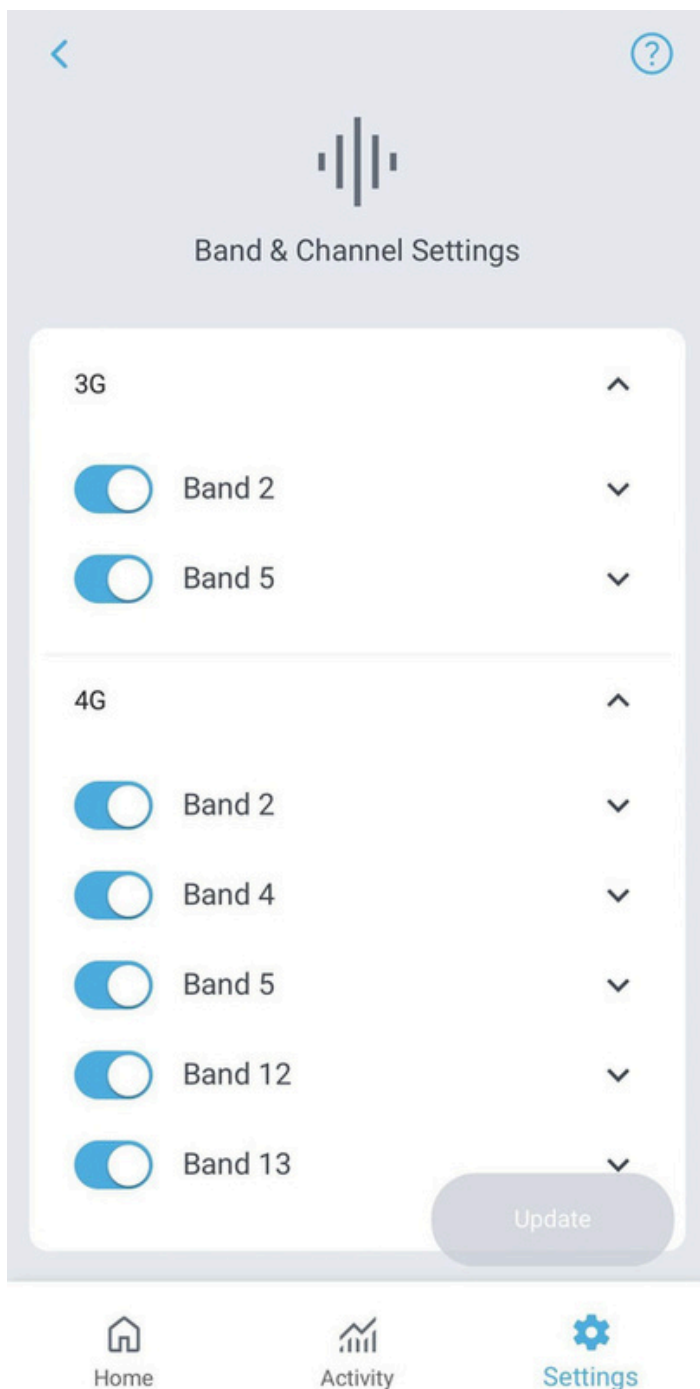
A screenshot of the Cel-fi ap showing band selection options. p

Go to Advance and check the band boosted along with signal quality, Signal strength, and antenna separation.

A screenshot of the Cel-Fi app showing connection information

MOSC-1

Overview

Radio A

Boosting - Band 4 : 2147.5 MHz : 4G

Booster Receive Quality

Cell Tower Receive Quality

Antenna Separation

Radio B

Boosting - Band 2 : 1960 MHz : 4G

Booster Receive Quality

Cell Tower Receive Quality

Antenna Separation

Super Channels

Radio A : Band 4 : 4G

Radio B : Band 2 : 4G

Home   Activity   Settings

Check the network testing sensor again. The signal should increase by at least 10 dBm for RSSI and RSRP.

Net Monitor

Device is connected

RSSI used for GSM/2G
80

Iac for GSM/2G/3G/4G
11240

cellid for GSM/2G/3G/4G
53765634

Access Technology
LTE

SM /2G
FDD LTE

RSRP/RSCP CAT M1/3G/4G
-117

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2325

time
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Speed
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A screenshot of the net monitor web page showing signal gain post booster installation and configuration