TARANA

BROADBAND REINVENTED

Base Node Installation Guide

18-0026-001, Rev 2.1.4

December 8, 2025

Table of Contents

Supported Hardware

This guide covers the following base node models:

Model Name	Model Number	Description
G2 BN-3+6	G2BNF356900	3 GHz and 6 GHz Multiband Base Node
G1 BN-6	G1BN6ASI002	6 GHz Base Node
G1 BN-5	G1-BN5ASI002	5 GHz Base Node
G1 BN-3	G1-BN3ASI001	3 GHz CBRS Base Node

Hardware Compatibility

The following table includes the degree of compatibility of remote node models with base node models:

	G1 BN-3	G1 BN-5	G1 BN-6	G2 BN-3+6 (Multiband Mode)	G2 BN-3+6 (4-carrier Single Band Mode)
RN-3	★ ★	☆ ☆	☆ ☆	★ ★	☆ ☆
RN-5	☆ ☆	★ ★	★ ☆	★ ☆	★ ☆
RN-6	☆ ☆	★ ☆	★ ★	★ ★	★ ★
RNm-3+6	★ ★	★ ★	★ ★	★ ★	★ ★
RNv-6	☆ ☆	★ ☆	★ ★	★ ★	★ ★

Legend:

☆ ☆	The remote node cannot connect to the base node.
★ ☆	The remote node can connect to the base node, but the capabilities do not match completely. For example, the remote node can only connect on two of the four available carriers, or cannot connect on all available frequency bands.
★ ★	The remote node connects to the base node and the capabilities match with no limitations.

Base Node Software Requirements

G1 base nodes need to run the latest software compatible with your network operation.

G2 base nodes must run device software version 4.0 or later.

Single-band remote nodes require version 3.0 or later to connect to a G2 base node.

Dual-band remote nodes require version 4.0 or later to connect to a G2 base node.

To use the latest features and stability improvements, always run the latest device software compatible with your network operation.

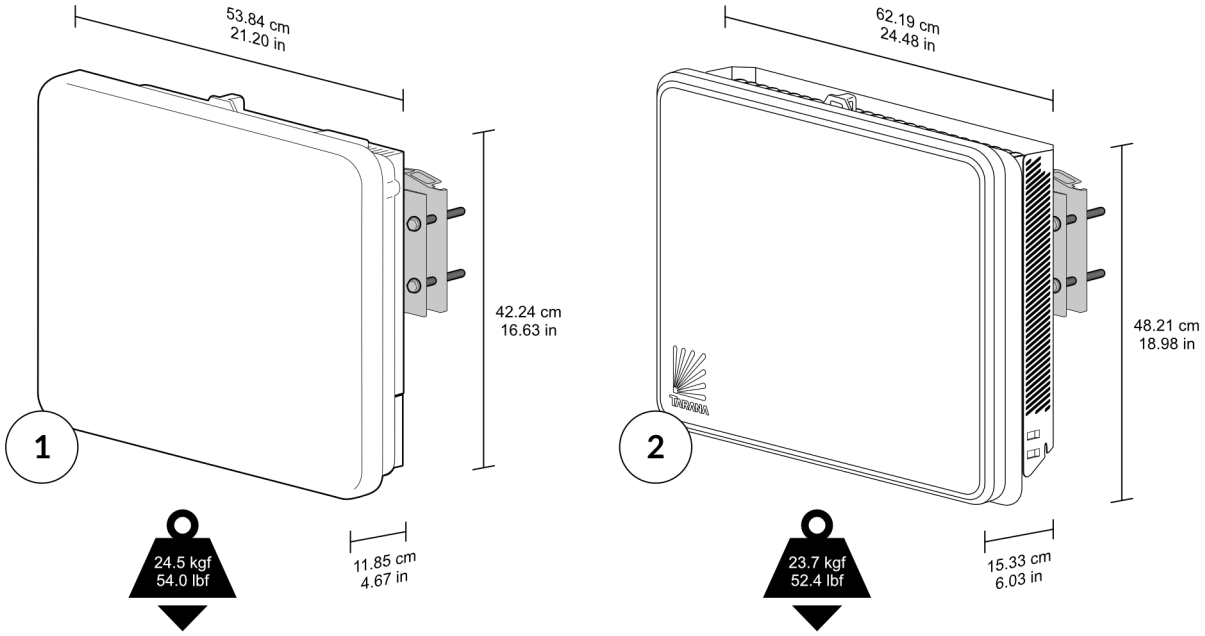
G2 Base Node Package Contents

The G2 base node package contains the following items:

- G2 Base Node with fan assembly attached
- Base Node Grounding Kit

Base Node Weight and Dimensions

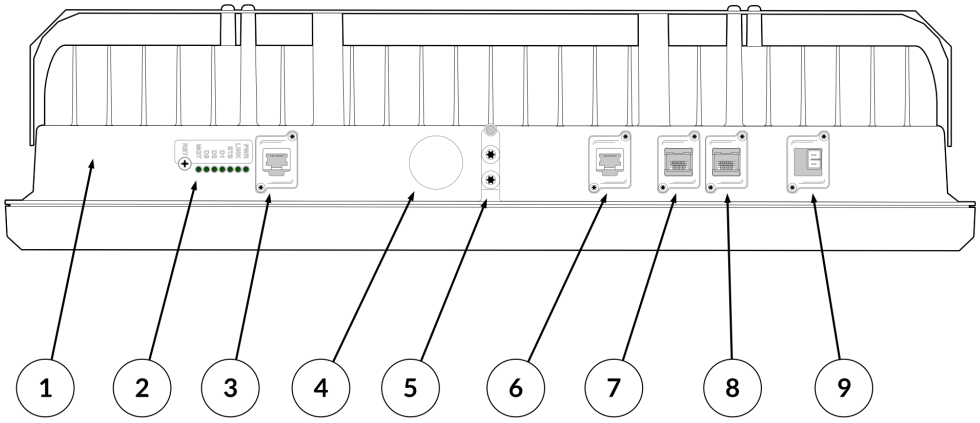
The G2 base node is slightly wider, taller, and deeper that the G1 base node.



Index	Description
1	G1 Base Node
2	G2 Base Node

G2 Base Node Ports and Connections

Like the G1 base node, the G2 base node ports and connections are on the bottom face of the base node chassis. Refer to the following illustration for the G2 base node ports and connections.



Index	Name	Connection Type	Description
1	Chassis	N/A	G2 base node chassis. In this illustration, the base node is oriented in the recommended position: so that the radome faces downward, the cooling fins and heat shield face upward, and the ports and connections face the viewer. In this orientation, the running base node cools more efficiently and does not interfere with satellite communication.
2	LEDs	N/A	The LED panel indicates the status and activity of the base node.
3	MGMT	RJ-45 Ethernet	This Ethernet port only operates at 1 Gbps, so devices that connect to it must support 1 Gbps data rate.
4	Fan	Multi-pin Connector	You must connect the fan assembly where required to dissipate additional heat.
5	Ground	Crimp Lug	Grounding and bonding are extremely important. Be sure to use the appropriate type and size grounding wire, and to position and mount them to prevent ground loops.
6	DATA 3	RJ-45 Ethernet	This Ethernet port only operates at 1 Gbps and does not function with devices that operate at other data rates.
7	DATA 2	OCTIS SFP+	The SFP+ port is a standard SFP+ port, but be sure to use only supported SFP+ modules.
8	DATA 1	OCTIS SFP+	The SFP+ port is a standard SFP+ port, but be sure to use only supported SFP+ modules.
9	Power	OCTIS Power	The power port uses a two-pin 48 V connection.

Base Node Accessories

You can order the following base node accessories and replacement items using the included Tarana part number. You can refer to the Tarana part number if necessary when ordering accessories through your distributor.

G2 Base Node Accessories

Ordered by Tarana part number.

Description	Tarana Part Number	Qty
Base node pole mounting kit	34-0028-001	1
OCTIS SFP/SFP+ Cable Plug Kit	72-0188-001	1
OCTIS RJ-45 Cable Plug Kit	72-0190-001	1
OCTIS Universal Receptable Cap	72-0193-001	1
OCTIS Power Cable Plug Kit	72-0207-001	1
Ethernet Lightning Surge Protector	73-0016-001	2
SFP+ Long Range Industrial Temp Duplex LC Connector Single Mode Optical Transducer	73-0031-001	2
SFP+ Short Range, Industrial Temp, Duplex LC connector Optical Transceiver Multi-Mode Optical Transducer	73-0032-001	2

G1 Base Node Accessories

Ordered by Tarana part number.

Description	Tarana Part Number	Qty
Harting Terminated Power Cable, 10 m	33-0004-010	1
Harting Terminated RJ-45 Cat 5e Ethernet Cable, 5 m	33-0007-005	1
Harting Terminated SFP+ Module Cable, 10 m	33-0022-010	1
Harting Terminated SFP+ Module Cable, 70 m	33-0022-070	1
Harting Terminated SFP+ Module Cable, 100 m	33-0022-100	1
Harting Terminated SFP+ Module Cable, 150 m	33-0022-150	1
Harting Terminated Power Cable with SPD Coordination Module, 10 m	33-0050-001	1
Base Node Power Supply Termination Kit, 14 AWG Maximum	34-0003-001	1
Base node pole mounting kit	34-0028-001	1
Power Supply Outdoor AC_DC, 90-264V AC IN, 54V DC Out, 480W	44-0013-001	1
Ethernet Lightning Surge Protector	73-0016-001	2
SFP+ Long Range Industrial Temp Duplex LC Connector Single Mode Optical Transducer	73-0031-001	2
SFP+ Short Range, Industrial Temp, Duplex LC connector Optical Transceiver Multi-Mode Optical Transducer	73-0032-001	2

More Information

You can download the latest base node installation guide at the following URL:

https://www.taranawireless.com/bn_manual

Information about configuration is in the G1 Administration Guide.

You can find additional information and videos on the Tarana support page.

MODIFIED SCREENSHOTS

Some or all screenshots in this document might be manipulated or modified to simplify the information provided or to protect personal and network details. Modified elements include but are not limited to device hostnames, serial numbers, IP address, email addresses, user names, domain names, and tabular data.

Modifications do not affect how the feature is perceived to function nor the veracity of the feature description.

Safety and Warnings

Tarana base nodes are designed for installation and use by trained professionals and requires adherence to all relevant regulatory, safety, and telecom industry best practice guidelines for outdoor radios.

Failure to observe these safety precautions may result in personal injury or damage to equipment.

General Warnings

Failure to observe these safety precautions may result in personal injury or damage to equipment.

- Follow all warnings and instructions marked on this product.
- Use standard safety guidelines when mounting. Installation and maintenance procedures must be followed and performed by trained personnel only.
- Before unmounting the product, disconnect power input to reduce the risk of hazards.
- Do not exceed 60 VDC of input to the device.
- Do not open the device. Opening the device by anyone other than authorized Tarana repair personnel voids the warranty.
- Do not stack anything on the radome.
- Dust covers must be installed on all connectors when not in use.
- Cable ends must be protected from weather if not connected to the device.
- When the SFP+ port is used, this is a Class 1 laser product. Invisible laser radiation can be emitted from the aperture of the port when no fiber is connected; therefore, avoid exposure to laser radiation and do not stare into open apertures.

Exposure Safety

The general population uncontrolled limit for maximum permissible exposure (MPE) is 1 mW/cm2. To meet this MPE requirement, the operator must be at a minimum distance away from the radome cover of the system. Refer to the following table for additional information:

Model	Description	Regulatory Domain	Regulatory Standard	Minimum Separation Distance (cm)
G2 BN-3+6 G2BNF356900	3 GHz and 6 GHz Multiband Base Node	FCC (USA)	FCC 47 CFR Part 2.1091	162
		ISED (Canada)	RSS-102	26
G1 BN-6 G1BN6ASI002	6 GHz Base Node	FCC (USA)	FCC 47 CFR Part 2.1091	26
		ISED (Canada)	RSS-102	26
G1 BN-5 G1BN5ASI002	5 GHz Base Node	FCC (USA)	FCC 47 CFR Part 2.1091	20
		ISED (Canada)	RSS-102	20
		CE (European Union)	EN 50665: 2017	55
G1 BN-3 G1-BN3ASI001	3.6 GHz CBRS Base Node	FCC (USA)	FCC 47 CFR Part 1.1307	96

Reference: 47 CFR §1.1307 and 47 CFR §2.1091

NOTE
All base nodes require professional installation.

General Health and Safety Information

The following table summarizes general health and safety topics.

Topic	Explanation
Flammability	The equipment is designed and constructed to minimize the risk of smoke and fumes during a fire.
Hazardous Materials	No hazardous materials are used in the construction of this equipment.
Hazardous Voltage	The G1 and G2 systems meet global product safety requirements for safety extra-low voltage (SELV) rated equipment.
Safety Signs	External warning signs or other indicators on the equipment are required.
Surface Temperatures	The external equipment surfaces become warm during operation, due to heat dissipation. The temperatures reached are considered hazardous.

HEAVY EQUIPMENT

Tarana base nodes are very heavy. Be sure that you comply with health and safety best practices, such as using proper lifting and mechanical hoisting techniques when installing them.

- The G1 base node weighs 19.1 kg (42.0 lbs).
- The G2 base node weighs 22.1 kg (48.6 lbs).

Health and Safety Warning

- All personnel must comply with the relevant health and safety practices when working on or around the G1 and G2 radio equipment.
- The G1 and G2 systems have been designed to meet relevant US and European health and safety standards.
- Local safety regulations must be used if required. Safety instructions in this section should be used in addition to the local safety regulations. In the case of conflict between safety instructions stated herein and those indicated in local regulations, mandatory local norms will prevail. Should local regulations not be mandatory, then safety norms herein will prevail.

Warning Labels

WARRANTY VOID DO NOT BREAK THE TAMPER SEALS ON HARDWARE. OPENING THE DEVICE BY ANYONE OTHER THAN AUTHORIZED TARANA REPAIR PERSONNEL WILL VOID THE WARRANTY.
WARNING Making adjustments and/or modifications to this equipment that are not in accordance with the provisions of this User Guide, the Installation Guide or other supplementary documentation may result in personal injury or damage to the equipment, and may void the equipment warranty.
AVERTISSEMENT Tout réglage ou modification faits à cet équipement hors du cadre édicté par ce guide d'utilisation ou par toute autre documentation supplémentaire pourraient causer des blessures ou endommager l'équipement et peut entraîner l'annulation de sa garantie.
WARNUNG Die an diesen Geräten gemachte Einstellungen und/oder Änderungen, welche nicht gemäß dieser Bedienungsanleitung, oder gemäß anderen zusätzlichen Anleitungen, ausgeführt werden, können Verletzungen oder Materialschäden zur Folge haben und eventuell die Garantie ungültig machen.
ATENCIÓN Llevar a cabo ajustamientos y/o modificaciones a este equipo, sin seguir las instrucciones provistas por este manual u otro documento adicional, podría resultar en lesiones a su persona o daños al equipo, y anular la garantía de este último.
警告 對本设备进行不符合本用户指南，安装手册，或其他补充文件规定的调整和/或 修改可能會导致人身伤害或设备损坏, 并可能导致失去设备的保修。

General Hazards

Refer to the following table for general hazards.

Topic	Explanation
Chassis Earthing	The base node chassis must be connected directly to the DC supply system earthing conductor, or to a bonding jumper from an earthing terminal bar, or bus to which the DC supply system earthing is connected.
Protection from RF Exposure	When installing, servicing, or inspecting an antenna always comply with the following: • Locate the antenna such that it does not infringe the RF Exposure Limit Distance, relating to the Compliance Boundary General Public. (See Exposure Safety table) • Stay aware of the potential risk of RF exposure and take appropriate precautions. • Do not stand in front of or look into an antenna without first ensuring the associated transmitter or transmitters are switched off. • At a multi-antenna site ask the site owner or operator for details of other radio services active at the site and for their requirements/recommendations for protection against potentially harmful exposure to RF radiation. • When it is not possible to switch transmitters off at a multi-antenna site and there is potential for exposure to harmful levels of RF radiation, wear a protective suit.
Fiber Optic Cables	• Handle optical fibers with care. Keep them in a safe and secure location during installation. • Do not attempt to bend them beyond their minimum bending radius. • Protect/cover unconnected optical fiber connectors with dust caps.
Grounding Connections	Reliable grounding of the base node chassis must be maintained.
Mains Power Supply Routing	Base node DC power is not to be routed with any AC mains power lines. They are also to be kept away from any power lines which cross them.
Maximum Ambient Temperature	The ambient temperature range for the base node is -40 degrees C to 55 degrees C. To ensure correct operation and to maximize long term component reliability, ambient temperatures must not be exceeded. Operational specification compliance is not guaranteed for higher ambients. The base node must be mounted in such a way as to permit the vertical free flow of air through its cooling fins.
Mechanical Loading	When installing the base node on a tower, ensure that the tower is securely anchored. Ensure that the additional loading of devices will not cause any reduction in the mechanical stability of the tower.
Power Supply Connection	The base node operates from a nominal -54 VDC power supply.
Power Supply Disconnect	An appropriate power supply disconnect device should be provided as part of the installation.
Rack Mount Temperature Considerations	The base node is designed to operate in an outdoor environment with no significant obstructions in front of the radome. Do not install the base node in a closed or multi-unit rack assembly, because such a closed rack would impede the propagation of the RF signals. The maximum ambient temperature applies to the immediate operating environment of the base node.

Network Architecture

Tarana network architecture consists of the following elements:

- Tarana Base Node (BN): Base nodes are deployed at the site tower, elevated to provide coverage and line-of-sight advantages to remote nodes.
- Tarana Remote Node (RN): Remote nodes are deployed at the subscriber site and do not require line-of-sight coverage from the base node.
- Tarana Cloud Suite (TCS): TCS is the cloud-based management and monitoring platform. Because it is cloud-based, administrators can access it from any Internet-connected device.
- Tarana API: Administrators can use APIs to access TCS data and make it available to third-party portals and support systems.

Planning and deploying a Tarana network is straightforward. When you connect base nodes to power and a backhaul path, they automatically contact and register with the TCS management platform over an encrypted connection. With a frequency reuse of 1, you can install multiple base nodes on the same frequency in an array formation (referred to as a cell). A collection of cells at a single location is called a site. There can be multiple cells at a site. When operating in a licensed spectrum, deploying a single-channel cell can reduce licensing fees.

When you connect a remote node to a power source, it automatically finds the base node with the best link quality and generates a list of alternate base nodes within range, called a neighbor list. After discovering and connecting to the appropriate base node, the remote node uses beamforming to optimize its signal path to its associated base node. Beamforming creates a main RF lobe that points toward the receiving antenna and creates RF nulls in the direction of interference sources. Interference sources can include self-interference from the operator's equipment or other nearby devices. After the remote node and base node adjust the RF link power and signal, the remote node registers and authenticates with the network.

After you deploy the base and remote node, the pair monitor and adjust the link parameters to maintain a high quality link in both directions while rejecting interference from interference sources.

G1 base nodes support up to 209 concurrent remote node connections, which is 836 remote node connections per cell. By contrast, G2 base nodes support up to 256 concurrent remote node connections, which is 1024 remote node connections per cell.

For more information on planning and deployment, see the Network Planning and Deployment Guide.

Preparation

Make sure you have all the required items before beginning the installation. Verify the contents of the Tarana-supplied hardware.

Tools

- 13mm combination wrench
- Torque wrench, 13 mm, 6 - 15 Nm (4 lbf-ft - 11 lbf-ft)
- T30 Torx driver
- Crimping tool (6 AWG)
- Spirit level or adjustable digital level / angle finder
- An accurate tool to confirm azimuth or heading. A cell phone's compass is adequate but more accurate tools are preferred.

Customer-Supplied Equipment

- Power cable, outdoor rated, of suitable size for the cable run, or as per local code
- Ground wire (4 - 6 AWG)
- One Ethernet cable, shielded CAT5e or CAT6, for initial pre-deployment setup
- PC laptop with admin rights
- TCS user ID with admin rights

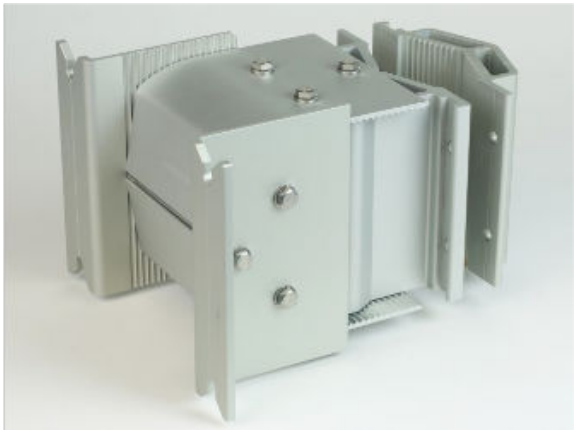
Tarana Hardware Peripherals

- AC power supply (optional)
- Harting push-pull connectors for G1 Base Nodes
  - Harting push-pull DC power pigtail
  - Harting push-pull optical cable
  - Harting push-pull RJ-45 cable
- OCTIS connectors for G2 Base Nodes
  - OCTIS power connector

  - OCTIS optical SFP+ connector
  - OCTIS RJ-45 connector
- Lightning and surge protection devices
- Base node radio unit
- Base node mounting kit

Base Node Mounting Kit Contents

- Four M8 bolts, 1.25 x 120 mm for large pole diameter deployments
- Four M8 bolts, 1.25 x 80 mm for small pole diameter deployments
- Four M8 bolts, 1.25 x 25 mm to attach base node to mounting bracket
- Four M8 nuts, 1.25 mm to match the 25 mm bolts
- Four M8 washers, wedge-lock to secure the 25 mm bolt attachment
- One Base node pole-mount bracket assembly



Surge Protectors

NOTE
Tarana recommends that you assemble and test all power and surge protector cables in the lab prior to installation in the field.

Surge protectors, sometimes called transient voltage suppressors (TVS) or, more commonly, surge protection devices (SPD), are vital to the health of your physical network. Improperly protected base nodes leave the network vulnerable to outages caused by nearby lightning strikes and voltage surges from other sources such as power grid disruptions.

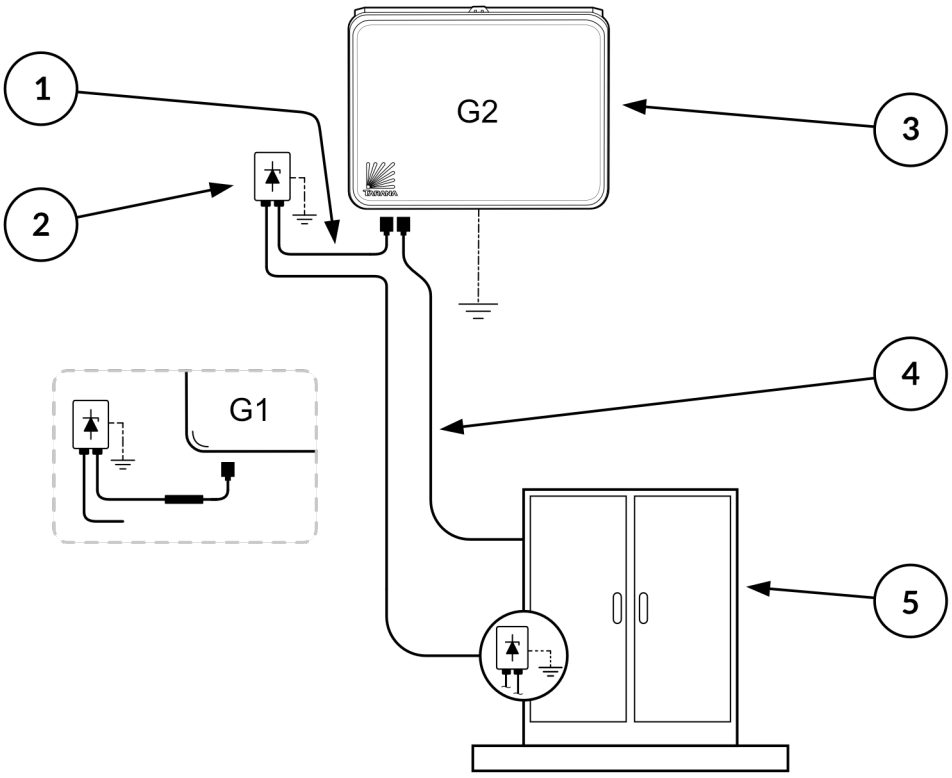
WARNING
Failure to comply with the SPD requirements mentioned in this section makes the affected base nodes ineligible for warranty RMA.

Tarana requires the use of two SPDs on the power circuit of every base node installation. The following table includes a selection of SPDs for use with G1 and G2 base nodes:

SPD Model Name or Number	MFR	MFR Part Number	Comments
DC Defender 48-5	Transector	1101-1110-KT	Compatible only with G1 base nodes. Coordination power cable not required.
DC230S-48DC	Citel	390411	G1 coordination power cable required for new G1 base node installations. Install G1 coordination power cable on existing installations when at the mounting site. Suitable for G2 base node installations.
DC SPD 48VDC Two-pole, DIN-rail	Transector	I2R-T2DC-48T-TT	G1 coordination power cable required for new G1 base node installations. Install G1 coordination power cable on existing installations when at the mounting site. Suitable for G2 base node installations.

SPD Model Name or Number	MFR	MFR Part Number	Comments
Outdoor Hybrid Enclosure (PDF) OHE-12-xSPD1-S-G3 OHE-xx-xSPD1-R-G4 OHE-xx-xSPD1-M-G6	viaPhoton	OHE-12-xSPD1-S-G3 OHE-xx-xSPD1-R-G4 OHE-xx-xSPD1-M-G6	G1 coordination power cable required for new G1 base node installations. Install G1 coordination power cable on existing installations when at the mounting site. Suitable for G2 base node installations.
RTRDC-0100-P-48	Raycap	RTRDC-0100-P-48	Suitable for G2 base node installations.
RTRDC-0406-PF-48	Raycap	RTRDC-0406-PF-48	Suitable for G2 base node installations.
VAL-US-48	Phoenix Contact	2910345	G1 coordination power cable required for new G1 base node installations. Install G1 coordination power cable on existing installations when at the mounting site. Suitable for G2 base node installations.

Refer to the following illustration for placement requirements for the two required SPDs:



Index	Description
1	Power cable from the SPD to the base node. This recommended length of this section of cable is between 30 and 100 cm (1.0 - 3.3 ft). For G1 base nodes, use the coordination cable for additional surge protections (see inset).
2	SPD placed physically near the base node, grounded
3	Base node
4	Fiber data line; fiber does not require SPD protection.
5	Secondary SPD, grounded, located at or near the equipment cabinet

Tarana requires that customers protect their base nodes by installing an SPD in the physical proximity of the base node and a second SPD at the equipment cabinet.

Permanently connecting the copper Ethernet port on the base node increases the risk of surge damage, and limits the data transfer rate to the 1 Gbps interface speed instead of the higher data rate of the optical interfaces.

Base Node Power Requirements

IMPORTANT
Tarana recommends that you power on the base node and set up an initial configuration before you mount it on the vertical asset.

The base node requires a -48 VDC power supply and a data connection to TCS to function. You can provide -48VDC either from the site or from the Tarana outdoor-rated power supply. G1 base nodes use about 270 W of power, 330 W under high load conditions; G2 base nodes use about 420 W of power, 460 W under high loads.

Power Connections

G1 and G2 base nodes have different power interfaces and require different connectors, as the following table illustrates:

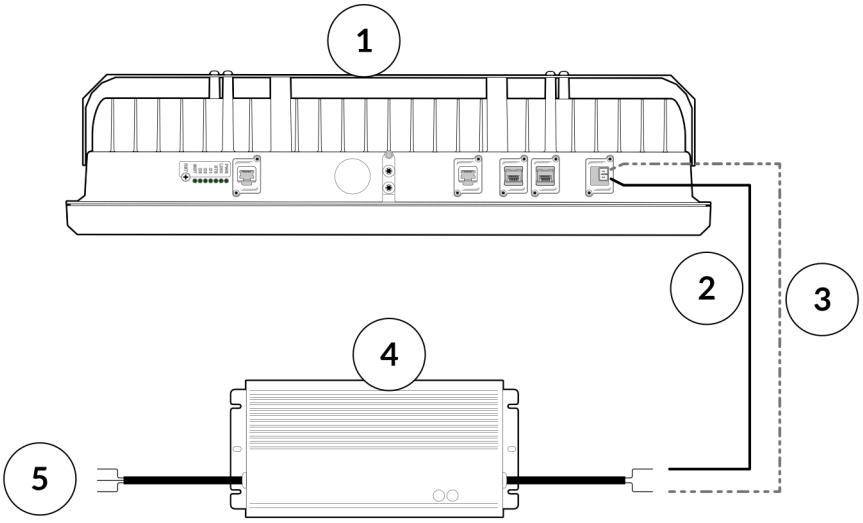
Base Node	Power Interface	Connector Type	Intrusion Protection[a.]
G1 Base Node	Four-pin	Harting Push-pull	IP67
G2 Base Node	Two-pin	OCTIS	IP67

[a.]Ingress protection (IP) codes are defined in the NEMA American National Standard for Degrees of Protection Provided by Enclosures, ANSI/IEC 60529-2020 at https://www.nema.org/standards/view/american-national-standard-for-degrees-of-protection-provided-by-enclosures.

Most vertical assets have -48 VDC power available so, after inserting the SPDs (see Surge Protectors), you can connect the power cable directly to the power source. In this case, the red conductor connects to -48 VDC, and the black conductor and cable shield connect to ground.

If your vertical asset does not have -48 VDC available, you can use external power regulators, such as the Mean Well 480 W or 600 W power supply, which accepts AC line voltage at its input and delivers -48 VDC to the base node.

CAUTION
The radios are electrically isolated from the chassis and do not share a physical ground connection. You can bond the two ground potentials together by connecting the radio reference ground wire to the ground cable at the power supply and SPDs.

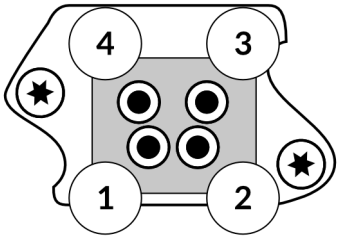


G2 base node power connections—SPDs omitted for simplicity

Index	Description
1	G2 base node with two-pin power interface
2	-48 VDC power connected between base node power pin 1 and Mean Well power supply -Vo wire (blue)
3	Radio reference ground connected between base node power pin 2 and Mean Well power supply +Vo wire (brown)
4	Mean Well switching power supply
5	Mean Well AC power input. AC line input (brown), AC neutral input (blue), and ground (green and yellow)

Harting Push-pull Connectors

Harting push-pull connectors used by G1 base nodes with a four-pin power port are molded to the terminations and cable ends to prevent dust and liquid intrusion, so you purchase Harting power connectors as a dongle with 10 meters of cable attached. Pin 4 is connected to the red wire of the cable, which carries -48 VDC supply voltage. Pin 1 is connected to the black wire of the cable, which carries the reference ground for the radios. Pin 3 is connected to the braided cable shield and carries the base node chassis ground potential. Pin 2 is not used. The following table summarizes the pin assignments:



Harting Push-pull Connectors

The G1 base node has a four-pin power interface that accepts the Harting push-pull power connector.

Pin Number	Function
1	Radio Reference Ground
2	Not Connected
3	Chassis Ground
4	-48 VDC

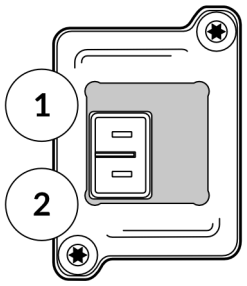
G1 BASE NODE COORDINATION POWER CABLE

The coordination power cable is required for all new G1 base node installations and existing installation that currently use surge protection devices (SPDs) with longer clamping times or lower suppression capabilities.

OCTIS Connectors

OCTIS connectors used by G2 base nodes with a two-pin power port are manually assembled and attached to the terminated power cable end. OCTIS connectors come in form factors that are specific to the connector type. For example the OCTIS power connector is different from the OCTIS Ethernet connector. Each OCTIS connector is assembled using the cable—terminated by the appropriate interface connectors—and the appropriate OCTIS connector for the termination. Silicone split glands seal the connector to prevent dust and liquid intrusion.

As you view the G2 base node ports with the radome facing upward, the leftmost port is the power port, Pin 1 of the power receptacle is the top pin and receives the -48 VDC power. The bottom pin is the radio reference ground.



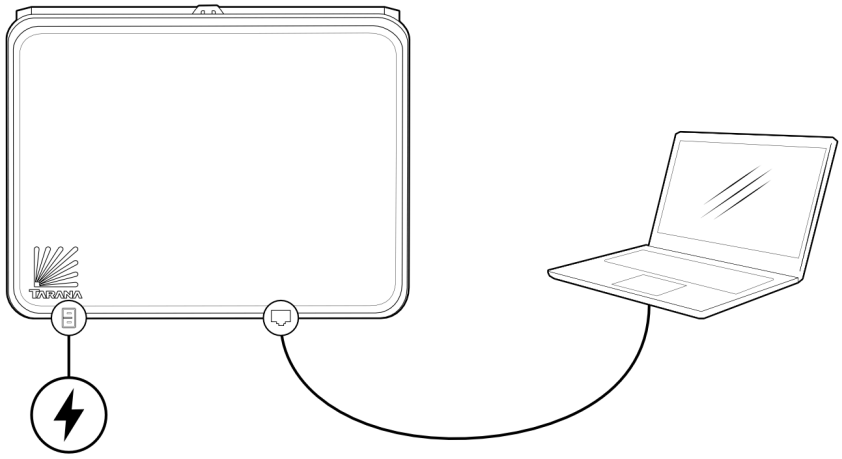
The G2 base node power port has a two-pin interface that accepts the OCTIS power connector.

Index	Description
1	Pin 1, -48 VDC
2	Pin 2, radio reference ground.

Set Up the Initial Configuration

The base node communicates with TCS through one of the data ports. The MGMT port is for initial configuration. You can also use this port for on-site management, also known as out-of-band (OOB) management.

Before you mount the base node on the vertical asset, connect the power and DATA3 management ports for the initial configuration.



IMPORTANT

Base node ports are designed to accept the appropriate cable termination properly mounted to either Harting push-pull connectors for G1 base nodes or OCTIS connectors for G2 base nodes. Do not use a standard Ethernet cable in this port because you can damage the port trying to remove it.

DATA1 and DATA2 are optical SFP+ interfaces. Devices connected to these data ports must support SFP+ (10Gbps) or the ports will not come up. Tarana offers an industrial-temperature SFP+ module for data connection at the base node on the vertical asset. This SFP+ module is MEF certified with an extended temperature range of -40° to +85°C. DATA3 is a copper interface that supports only 1Gbps. Devices connected to DATA3 must be Gigabit Ethernet or the port will not come up.

The following SFP+ modules are compatible with Tarana base nodes.

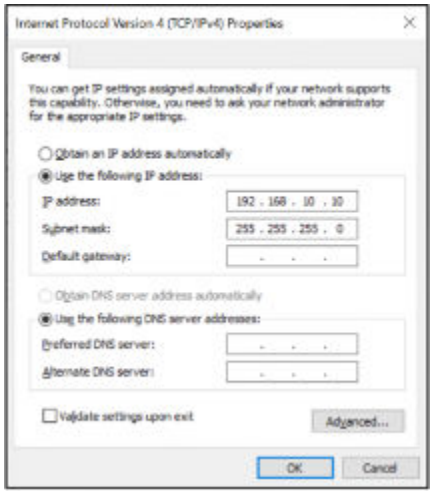
Vendor	Model	Wavelength	Mode	G1 BN	G2 BN
ADDON	FTLX1471D3BTL	1310 nm	Single Mode	Yes	Yes
Apex-9	APX-SFP-IND-10G	1310 nm	Single Mode	Yes	Yes
Cyclone	CYG-SFPP-10GLRI	1310 nm	Single Mode	Yes	Yes
FINISAR	FTLX8574D3BTL	850 nm	Multimode	Yes	Yes
FINISAR	FTLX1471D3BTL	1310 nm	Single Mode	Yes	Yes
FINISAR	FTLX1475D3BTL	1310 nm	Single Mode	Yes	Yes
JABIL, Inc.	SP10LRLCI000L13	1310 nm	Single Mode	Yes	Yes
PROLABS	SFP10GBXD20I-PLV	1310 nm	Single Mode	No	Yes
PROLABS	SFP10GBXU20I-PLV	1310 nm	Single Mode	No	Yes
Winncom	SFP-10G-LR-I-WIN	1310 nm	Single Mode	Yes	Yes

IMPORTANT
Be sure to use supported modules to prevent unintended or unpredictable behavior.

NOTE
Only one of the three data ports can be active at a time.

Connect to the Management Port

1. Connect a laptop to the MGMT Gigabit Ethernet port of the base node.
2. On the laptop, assign a static IP address in the same subnet as the default IP of the MGMT port. This example uses a 192.168.10.10 IP address and a 255.255.255.0 subnet mask. No default gateway or other IP information is required to connect to the management port.



3. The MGMT port has a default IP of 192.168.10.2/24 with no VLAN. Enter this address into a web browser to access the base node's web interface. Google Chrome is the supported browser.
   `https://192.168.10.2`
4. Enter the default login **admin** and password **admin123** in to the login dialog, and then select **Login**.

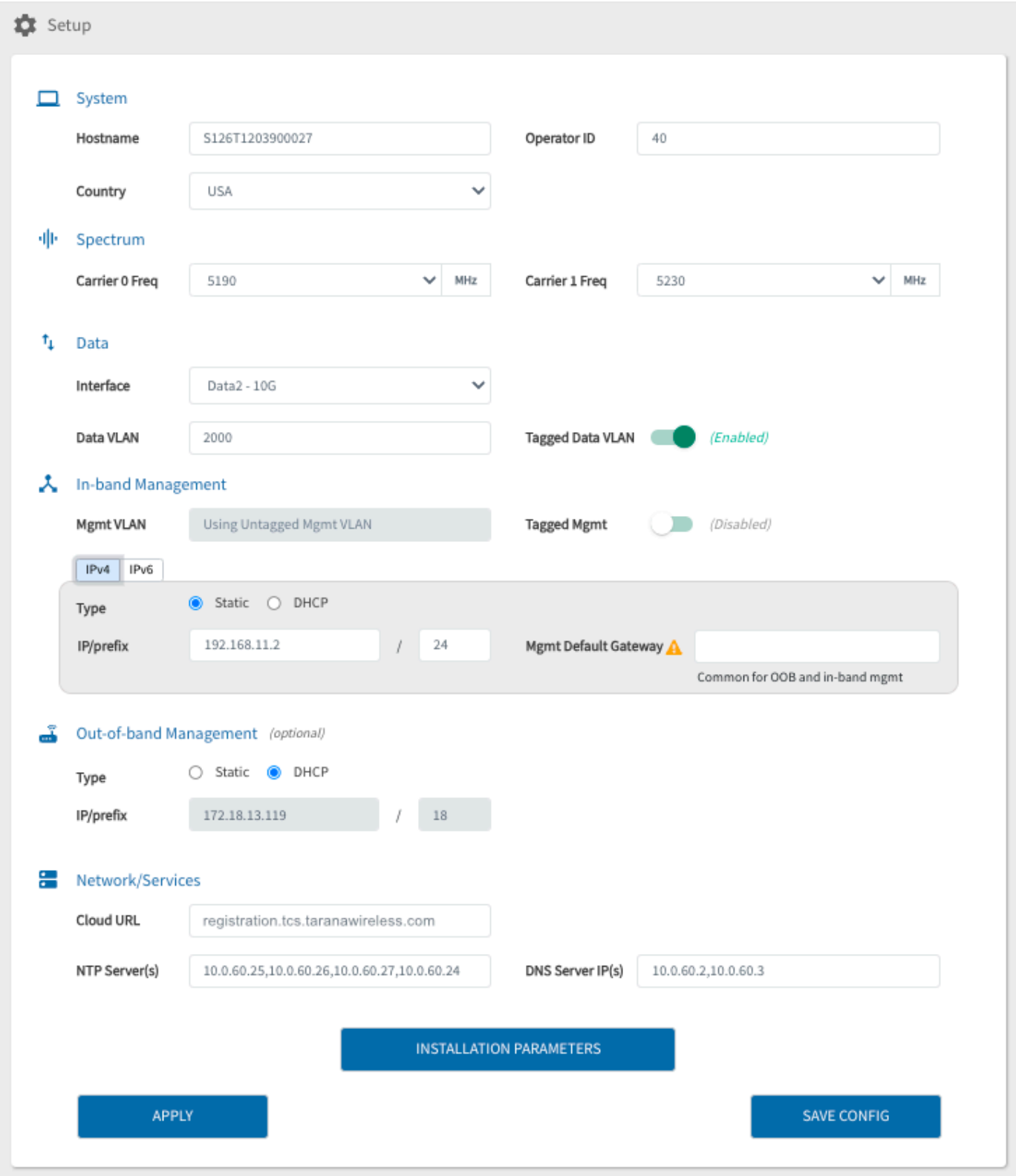
You can also assign a management IP statically or with a DHCP server if there's a DHCP server on the network.

DHCP isn't enabled by default and you must enable it through the base node's web UI. It's not possible to enable DHCP for both the in-band management and out-of-band management interfaces simultaneously.

Configure the Base Node

This procedure is for the 5 GHz and 6 GHz base nodes. For CBRS, see CBRS Installations (page 33) for additional information.

If you're configuring the base node pre-deployment in a lab, it helps to keep it close to a window so it can get a GPS sync with satellites. If the base node can't achieve a GPS lock, it won't transmit. Contact Tarana support if you need a temporary workaround.

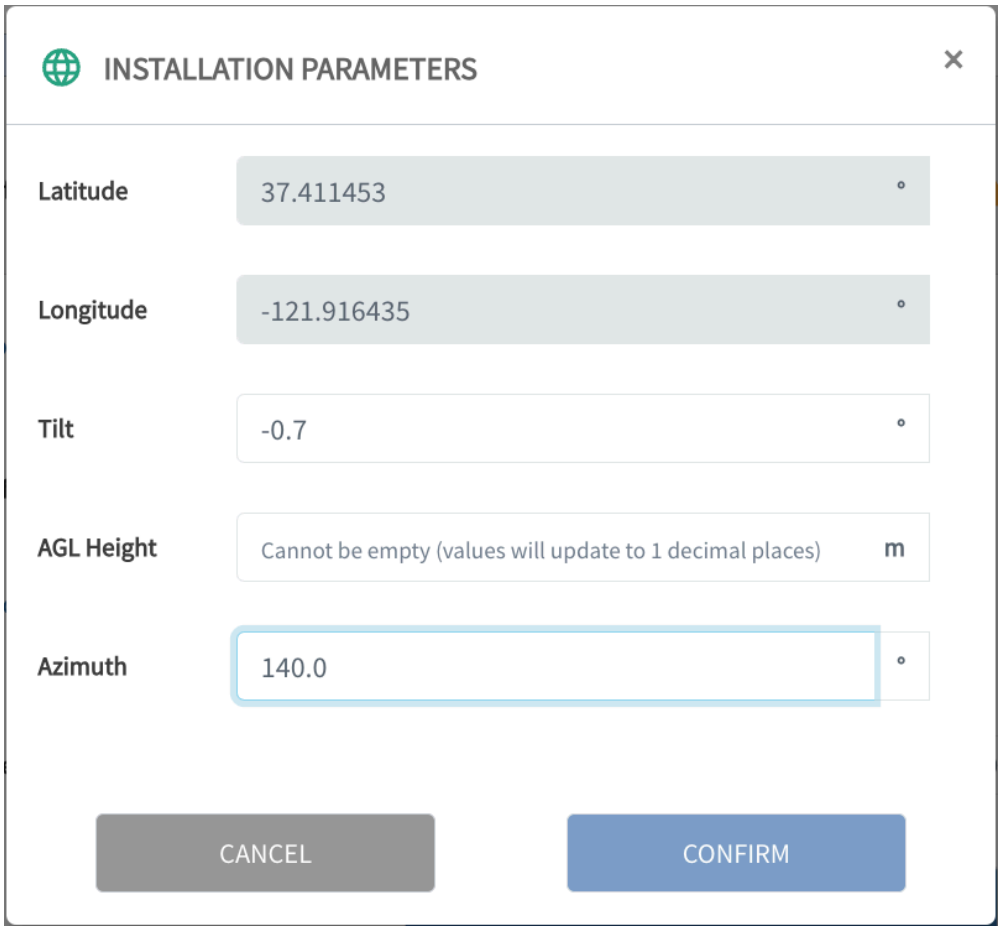


Use the base node web UI to configure this information:

- Enter the Hostname, following these rules:
  Hostname must be from 1 to 63 characters long. Valid characters are ASCII(7) letters from a to z, A to Z, digits 0 to 9, hyphen, and underscore. It may not start or end with a hyphen. Consecutive hyphens (2 or more) are not allowed. Hostname is case-sensitive. Not allowed: spaces, special characters, periods.
- For in-band management (on the selected data port), enter a static IP within the subnet of the LAN gateway or enable DHCP to have a DHCP server give the base node an IP address. For DHCP Option 82, see DHCP Option 82 Support in the G1 Administration Guide.

NOTE
If DHCP is enabled for the in-band management IP address, you can't use it for the out-of-band management address.

- Tarana recommends that you configure the Data VLAN on the data port, though it's not required. You can change the default Data VLAN using the base node's web UI. For information about using VLANs in a G1 network, see VLANs and Quality of Service in the G1 Administration Guide.
- Enter the Mgmt Default Gateway IP. This is the gateway for the in-band management IP address you configured in Step 1. It must be on the same subnet as the In-band Management IP address.
- Enter the Cloud URL for the TCS system associated with this operator. `registration.tcs.taranawireless.com:443`.
- By default, the NTP Server(s) is set to **2.pool.ntp.org,1.pool.ntp.org,0.pool.ntp.org**. You can configure this parameter using an IP address or FQDN. This parameter cannot be left blank, but by default, the NTP is not used because the base node uses GPS for synchronization.
  If you need this value for lab testing (when the base node doesn't have a view of the sky for GPS synchronization), contact Tarana Support for assistance.
- Verify the connection to TCS by confirming that the Hostname appears in green text at the top of the screen.
- Select **Installation Parameters** to verify the values, You can edit **Tilt**, **AGL Height**, **Height Uncertainty**, and **Azimuth**.

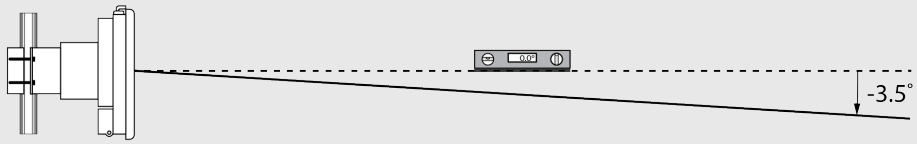


IMPORTANT
A professional installer or operator must enter the height and uncertainty. Installers are obligated to verify the accuracy of the height during the configuration of the device.

- **Tilt**: The vertical angle, measured in degrees relative to the true (horizontally level) horizon. 5 GHz base nodes that are tilted down have a negative tilt (0 through -180 degrees), while those that are tilted up have a positive tilt (0 through 180 degrees).

ELECTRICAL TILT

G1 BN-3 base nodes have an electrical tilt of -3.5°. This means that when the G1 BN-3 base node is aimed parallel to the ground, the actual beam center is angled toward the ground by 3.5°. G2 base nodes that operate in the 3 GHz band do not have an electrical tilt.



- **Height (AGL)**: Installed height of the device above ground level (AGL).
- **AGL Height Uncertainty**: The potential margin of error in determining the antenna height in relation to the ground level.
- **Azimuth**: Horizontal angle of the device aim measured clockwise from true north.

- Unmute the radio by setting the Radio Control toggle to **Connected**.

NOTE

For safety, radios are muted by default. After you verify the base node is functioning, Tarana recommends that you mute the radio until after the base node is installed on site.

- Select **Save Config**.
- Mute the radio by setting the Radio Control toggle to **Muted**.

Notes

- These values are reserved and you can't use them as any part of a G1 network:
  - Reserved VLANs: 4092, 4093, and 4094
  - Reserved IP subnets: 172.27.0.0/18, 10.240.0.0/12
- The Data VLAN (optional but strongly recommended in a production environment) and the Management VLAN (optional) are on the data port. They must be separate VLANs.
- On the switch north of the base node, the IP subnet associated to the Data VLAN entering the base node's data port must be different from the In-band Management IP subnet.
- Out-of-band management is optional. If you use it, you must configure it to use a different IP subnet as In-band management.

- It's not possible to enable DHCP for both the in-band and out-of-band management interfaces simultaneously.
- For DHCP with Option 82 to function properly the following must be true:
  - You must configure the client device to request an IP address via DHCP.
  - You must configure the base node to act as a DHCP relay and it must have the required sub-options, such as the Agent Circuit ID or Agent Remote ID configured. In a Tarana network, the Agent Circuit ID identifies the remote node, and the Agent Remote ID identifies the base node. In Tarana Cloud Suite (TCS), the Agent Circuit ID and Agent Remote ID are combined in a single control labeled Remote / Circuit Identifier Type, which can use either the MAC address or the serial number of the devices.
  - You must configure the DHCP server to accept and respond to DHCP Option 82. Because the base node defines the Option 82 values using lower case, configure the DHCP server accordingly.
  - For more about DHCP with Option 82, see the G1 Administration Guide
- These ports must be open in order to allow the base node to reach TCS:
  - 443 (TCP for HTTPS)
  - 53 (UDP for DNS)
  - 123 (UDP for network time)

  Also, the TCS URL(s) used by the G1 devices should be in a permit / allow list so all Tarana devices can connect to TCS.
- Once you've completed the initial deployment, don't use the web UI for configuration changes. Configuration settings in TCS overwrite web UI settings. To avoid misconfiguration, always use TCS once the device is registered and connected to TCS. TCS flags configuration mismatches with an alarm.

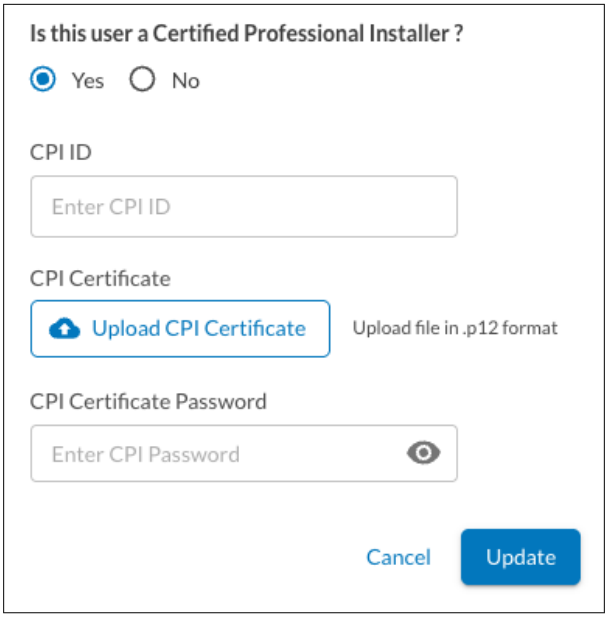
CBRS Installations

CBRS installations are unique to the United States and are tightly regulated by the FCC. As a result, CBRS installations require additional information and configuration, and a certified professional installer (CPI).

Step 1: Enter CPI Information in the User Profile

To configure the CPI-ID within the user profile, do the following:

1. Log in to TCS.
2. Navigate to **User Profile > Edit Profile**.
3. Select **Yes** after the prompt, **Is this user a Certified Professional Installer?**.
4. Enter your CPI ID, upload your CPI certificate as a .p12 file, and then enter your CPI certificate password.
5. Select **Update**.



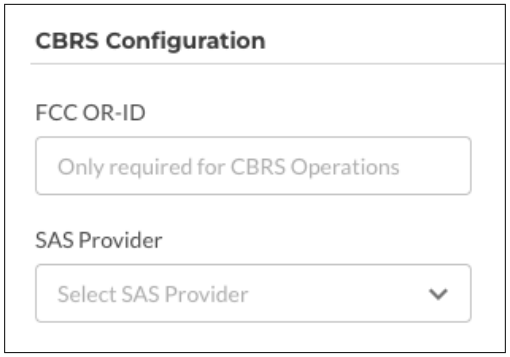
Step 2: Configure CBRS at the operator level.

At the operator level, you configure your FCC OR-ID and your SAS provider. Your SAS provider issues you a unique FCC OR-ID, which identifies your organization and the equipment.

To configure CBRS at the Operator Level, do the following:

1. Log in to TCS.
2. Navigate to **Admin > Network Configuration**, and then select **Operator** in the network hierarchy.
3. Select **Edit**.
4. In the CBRS section, enter your FCC OR-ID, and then select your SAS provider from the drop-down list.

5. Select **Done**.



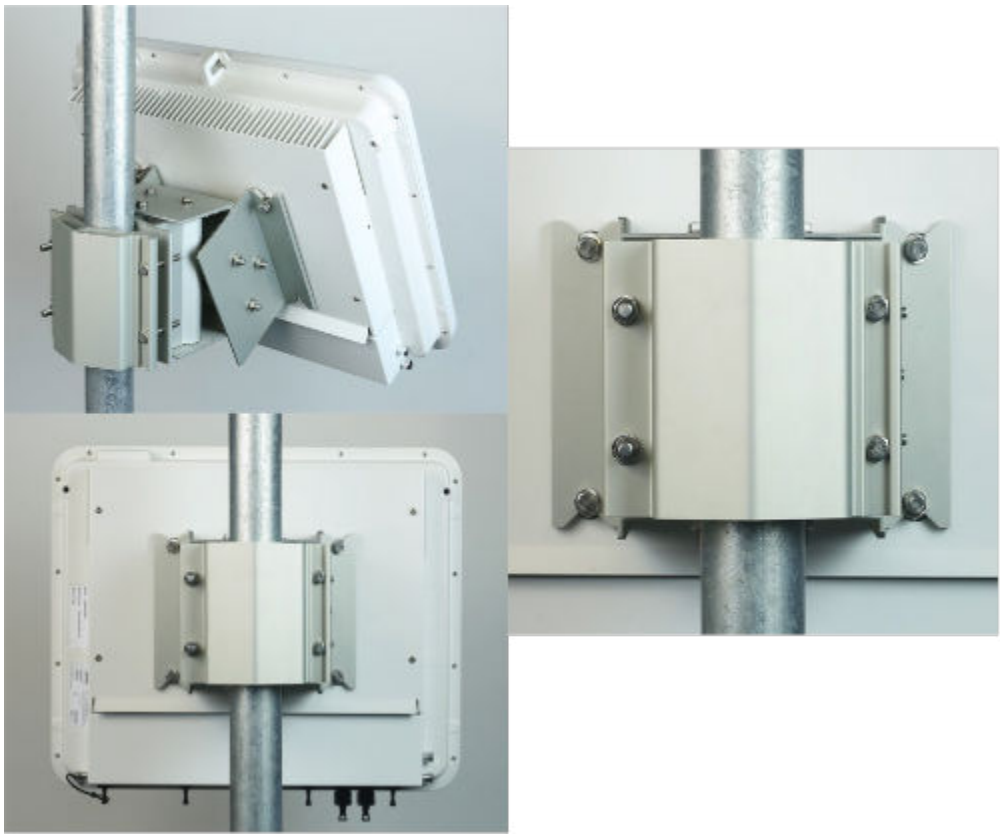
Step 3: Enter or verify device installation parameters.

The SAS does not grant any spectrum without the installation parameters present on the device.

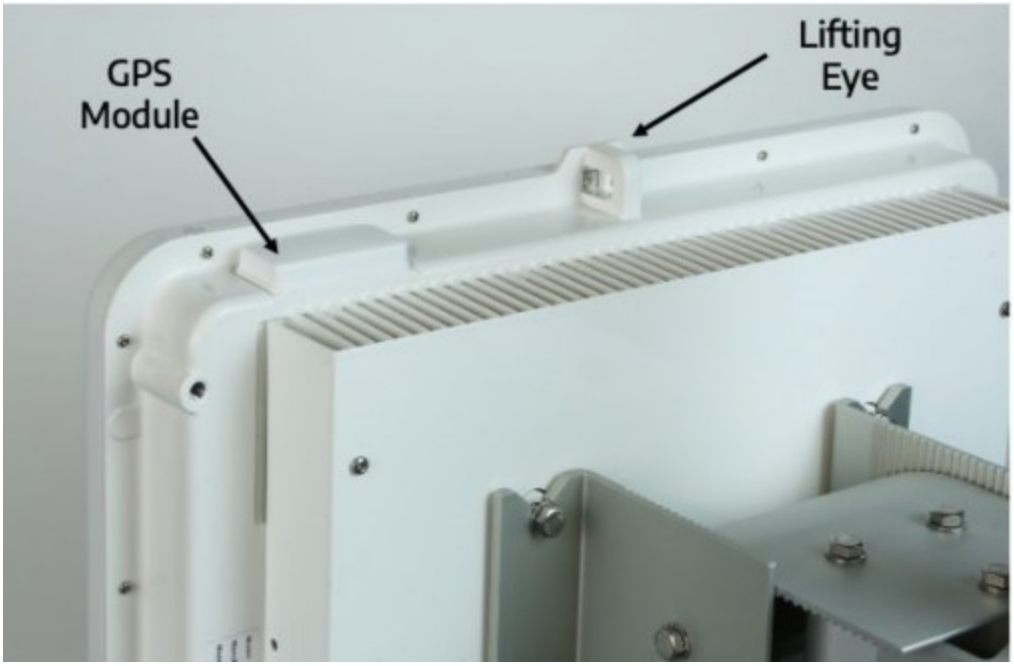
Mount the Base Node

The base node mount is a saddle clamp that's adjustable in azimuth and tilt.

NOTE
The hardware supplied for pole mounting and adjustment have a pre-applied anti-seize, dry film coating. There's no need to apply anti-seize lubricant to these fasteners.

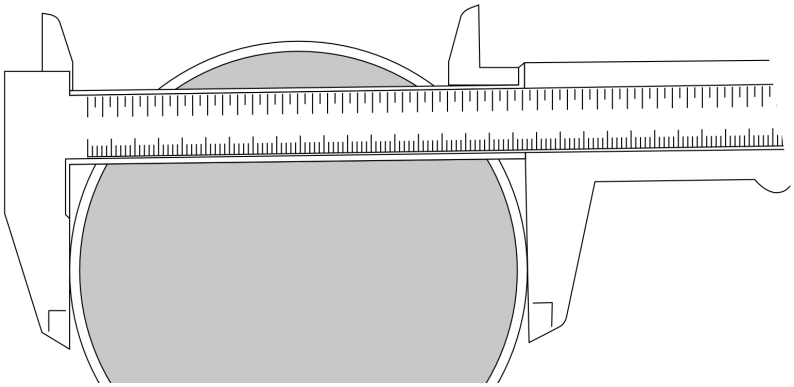


NOTE
The maximum load on the lifting eye is 100 lbs. (45 Kg).

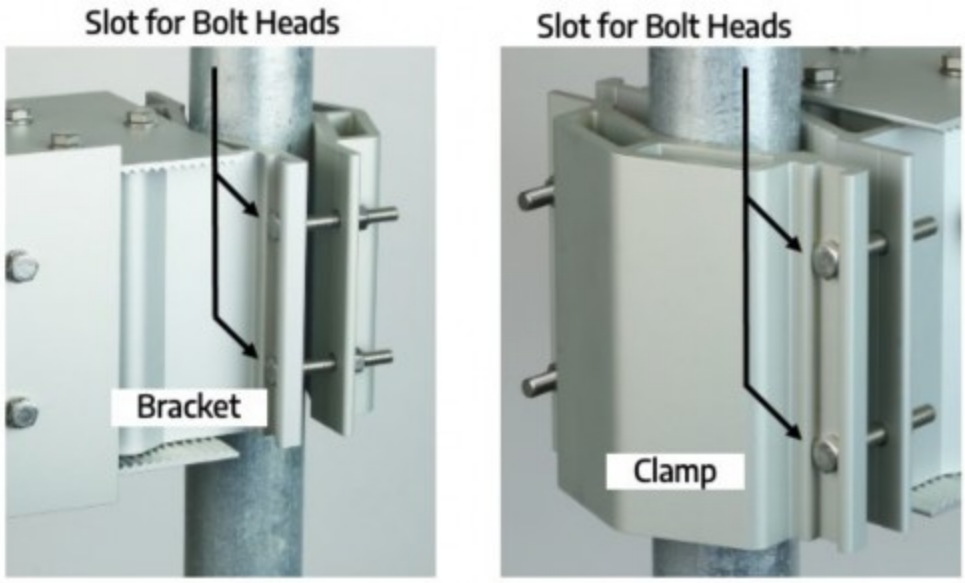


Assemble the Pole-Mount Bracket

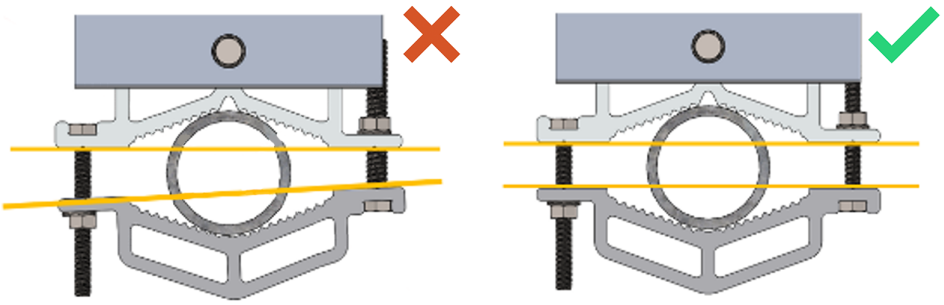
1. Measure the pole outside diameter to determine which length of M8 bolt to use to hold the base node bracket to the pole. For poles 60.3 mm – 101.6 mm (2 3/8” – 3 1/2”), use the 80 mm bolts. For poles 101.6 mm – 127 mm (3 1/2” – 5”), use the 120 mm bolts.



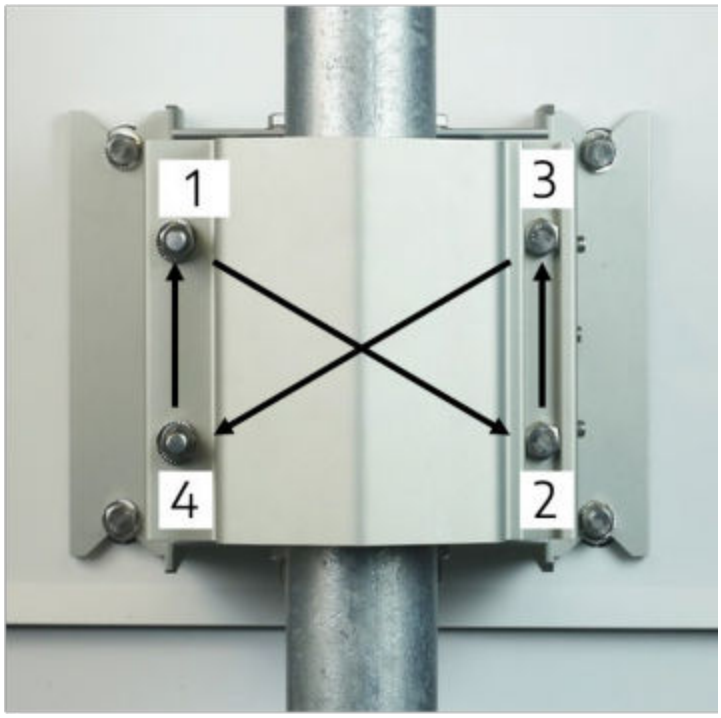
2. Install the base node bracket on the pole. There are slots for the bolt heads on both the bracket and the clamp.
3. Insert the bolts on the right side of the clamp and thread on the nuts.
4. Insert the bolts on the right side of the bracket and thread on the nuts.



5. Gradually engage (4) bolts ensuring clamp halves stay parallel to each other and are spaced evenly on either side of the clamp.



6. With the clamp in the final position, torque 4 bolts with incremental steps at approximately 40%, 70%, and 100% of full torque rating while ensuring the brackets stay parallel.
   Follow the torque sequence 1-2-3-4 shown below to torque all bolts to values of approximately 40% (6 N-m/ 4.4 lb.-ft).
   Continue with the same sequence for all bolts at approximately 70% (10 N-m/ 7.4 lb.-ft).
   Repeat the torque sequence for all bolts until each bolt is stabilized at 15 N-m/ 11 lb.-ft).



Adjust the Bracket Ears

Tarana recommends that you install the base node bracket to the pole before attaching the base node to the bracket.

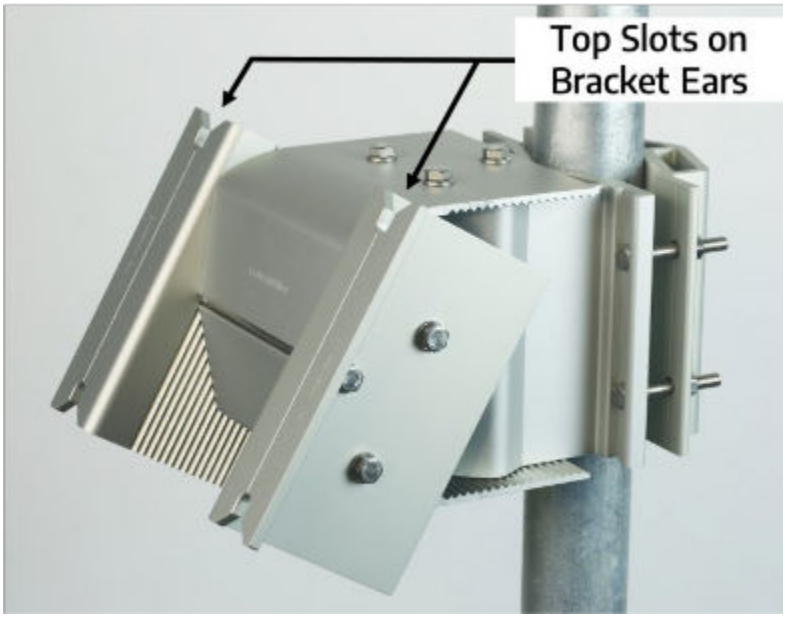
1. Register the tilt adjustment to the upper limit. This ensures that the flange ears where the base node attaches are aligned properly.
2. Snug the tilt adjustment bolts enough to hold bracket ears firmly while mounting the base node.

Aligned Ears in High-Tilt Position

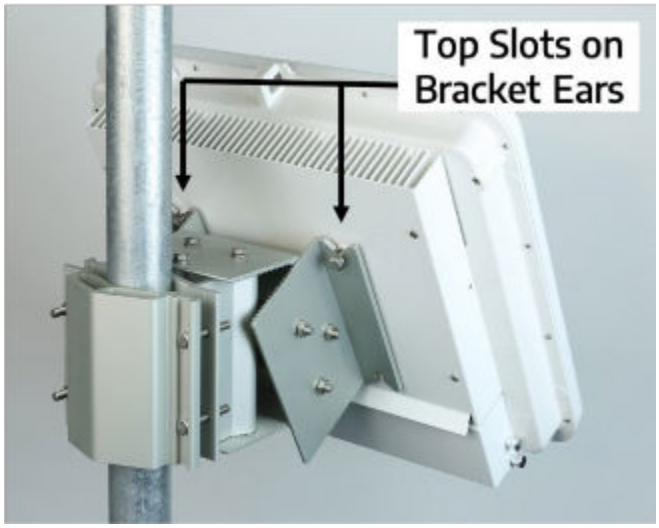
Attach the Base Node to the Bracket

1. Install 2 M8 x 25mm bolts with wedge lock washers in the top holes on the back of the base node as shown below. Partially thread the bolts into the chassis halfway (~12mm). This provides a sufficient gap for the bolt heads and washer to slide into the top slots on the bracket ears.

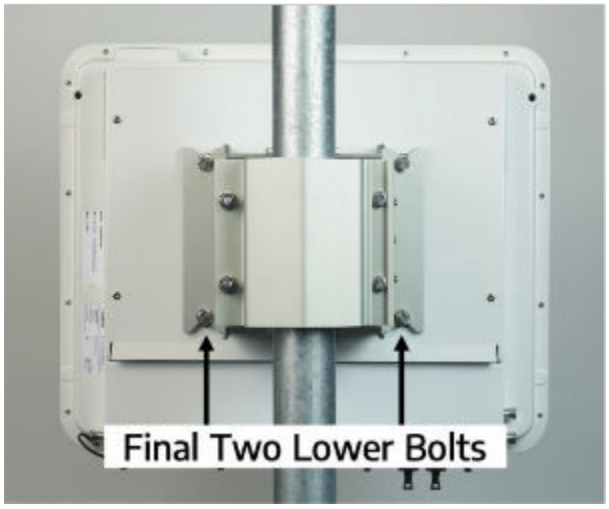
These 2 bolts slide into the top slots on the bracket ears.



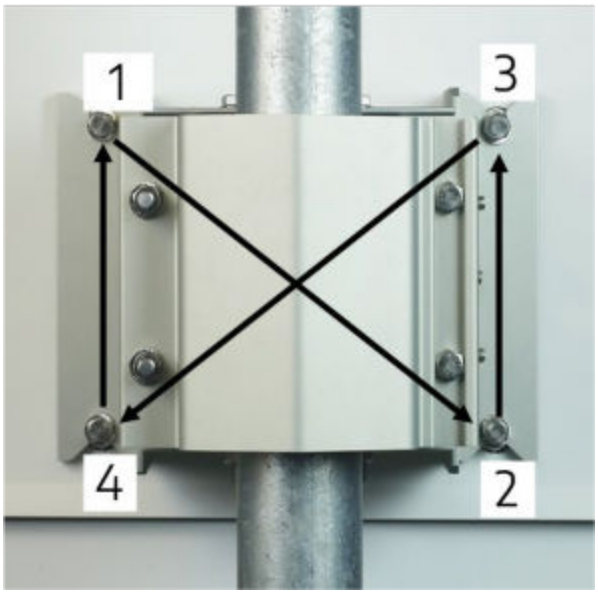
2. Slide the base node into the top slots in the bracket ears using the partially-installed bolts from Step 1. Make sure that the wedge lock washers are on the outside of the bracket and not between the base node and the bracket.



3. Install 2 M8 x 25 mm bolts with wedge lock washers in the two remaining lower slots on the bracket ears. Make sure that the wedge lock washers are on the outside of the bracket and not between the base node and the bracket.



4. Torque all 4 of these bolts using the same torque sequence demonstrated earlier.
    1. With the clamp in the final position, torque the 4 bolts with incremental steps at approximately 40%, 70%, and 100% of full torque rating.
    2. Follow the torque sequence shown to torque all bolts to values of approximately 40% (6 N-m/ 4.4 lb.-ft).
    3. Continue with the same sequence for all bolts at approximately 70% (10 N-m/ 7.4 lb.-ft).
    4. Repeat the torque sequence for all bolts until each bolt is stabilized at 15 N-m/ 11 lb.-ft.

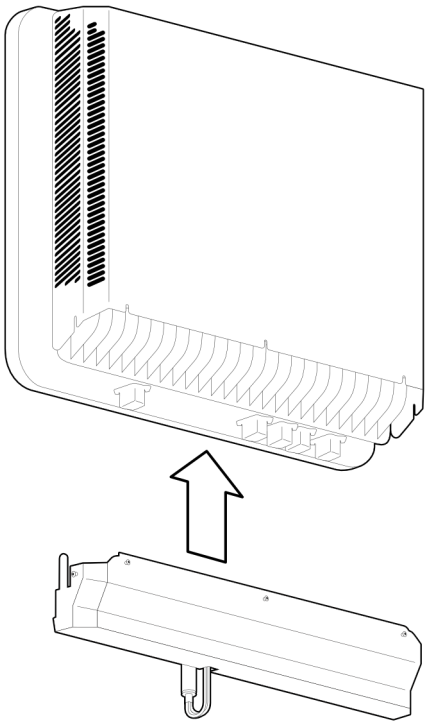


Install the G2 Fan Module

The G2 fan module attaches to the base node from the bottom. Tabs on the side of the fan module slide into guide on the side of the base node heat shield, and the five set screw on the fan fit into five matching grooves on the bottom edge of the heat shield (refer to the illustration below).

To install the fan module, do the following:

1. Ensure that the fan module set screws are inserted but loose.
2. Insert the fan module into the G2 base node heat shield guides at the at the bottom of the base node.
3. Continue to insert fan module upward to align the set screws into the grooves at the bottom of the heat shield.
4. Tighten the screws.
5. Attach the fan module cable bundle connector to the matching port at the bottom of the base node.



Aim the Base Node

Adjust the azimuth and tilt as appropriate to the network design.

NOTE
You must set and torque the azimuth before you adjust the tilt. If you do these steps in reverse, the torque setting for the tilt may not be accurate. This can cause the mount to lose tilt adjustment after some temperature cycles or vibration and lead to a tower climb or service disruptions.

Adjust the Azimuth

Adjust the azimuth by loosening 3 bolts on top of the bracket assembly as seen below. Torque the 3 M8 x 180mm in a gradual triangular pattern.

NOTE
The total adjustable azimuth allowed by the mounting bracket is 60 degrees.

1. Follow a clockwise torque sequence to torque all bolts to values of approximately 40% (6 N-m/ 4.4 lb.-ft).

2. Continue with the same sequence for all bolts at approximately 70% (10 N-m/ 7.4 lb.-ft).
3. Repeat the torque sequence for all bolts until each bolt is stabilized at 15 N-m/ 11 lb.-ft.

Adjust the Tilt

Adjust the tilt only after you've adjusted the azimuth.

1. Adjust the tilt to the desired angle using a digital level with < 0.2-deg accuracy.
2. Torque the 3 M8 x 180mm in a gradual triangular pattern.

NOTE
The total adjustable tilt is ±20 degrees.

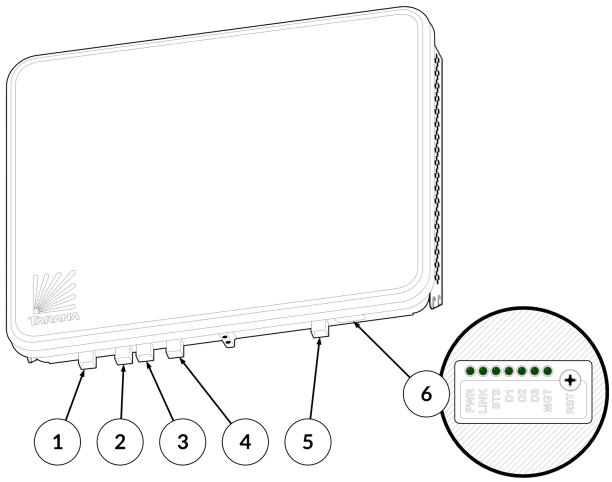
1. Torque the bolts in a clockwise pattern.
2. Torque all bolts to values of approximately 40% (6 N-m/ 4.4 lb.-ft).
3. Continue with the same sequence for all bolts at approximately 70% (10 N-m/ 7.4 lb.-ft).
4. Repeat the torque sequence for all bolts until each bolt is stabilized at 15 N-m/ 11 lb.-ft.

Connect the Data Ports

There are three options for a data connection: two SFP+ ports (DATA 1, DATA 2), and one Gbps Ethernet port (DATA 3), only one of which is enabled at a time. By default, DATA 1 is enabled, but you choose DATA 2 or DATA 3 instead within the device UI. For in band management, the default IP address for these ports is 192.168.11.2. The default data VLAN is 2000.

For initial configuration and (optional) OOB management, an Ethernet connection on the MGMT port is required. The default IP address for this port is 192.168.10.2.

NOTE
Don't use the Reset button at this time.



Index	Description
1	Power
2	Data1 (SFP+)
3	Data2 (SFP+)
4	Data3 (RJ-45)
5	MGMT (RJ-45)
6	LED display and reset button

Connect Base Node Power

After you mount and aim the base node, use the following procedure to connect the base node power.

1. Pre-assemble the power line completely to include the following components:
    a. Harting push-pull (for G1 base nodes) or OCTIS (for G2 base nodes) connector
    b. Properly terminated power cable, between 30 and 100 cm (1 to 3.3 ft) long
    c. Primary SPD
    d. Intermediate length of power cable, such as Belden 5240F1 shielded cable, about 3 m (10 ft) long
    e. Secondary SPD
    f. Main run of power cable sufficient to reach from the base node mounting location to the equipment cabinet
    g. Tertiary SPD, mounted at or near the equipment cabinet
    h. Sufficient length of power cable to reach from the tertiary SPD to the power source
2. Install 6 AWG ground wire onto the base node enclosure.
3. Install the Harting DC pigtail assembly into the power port. You can use the LEDs on the bottom side of the base node to verify operation (see Boot the Device (page 49)).

If the device doesn't power on, make sure that the polarity is correct.

For on-site OOB management, follow these additional steps:

1. Pre-assemble the Harting RJ45 pigtail + upper lightning arrester + ground wire + shielded CAT5e/CAT6 + lower lightning arrester for OOB management connection. Tarana recommends that you assemble and lab-test these items before installation onto the base node mounting site.
2. Install the Harting RJ45 pigtail assembly into MGMT Gigabit Ethernet of the base node for OOB management.

Ground the Chassis

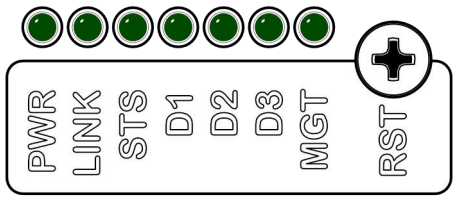
Install the ground wire only after aiming and final torque of all related fasteners.

1. Attach the ground system to the chassis. There are 2 stainless M6 screws and ground lug provided in a bag taped to the base node radome. Use these to attach a 6 AWG (13 mm2) ground wire to the base node.
2. You must use the provided ground lug for the base node. Torque the screw to 6 N-m (4.4 lb.-ft). Make sure the ground wire doesn't interfere with antenna adjustment.

Additional local electrical codes and ordinances may apply to grounding. Compliance in this area is the responsibility of the installation company.

Boot the Device

When you apply power, the base node goes through a boot and initialization process. This takes about 5 - 7 minutes. A set of LEDs on the bottom edge of the base node cycles through patterns and colors while this takes place.



At the end of this period, the LEDs show one of these normal operation states.

State	Power	Link	Status
Power off	Off	Off	Off
Startup[a.]	Red (blinking)	Off	Off
Initial boot loader	Amber (solid)	Amber (solid)	Amber (solid)
Linux booting	Green (blinking)	Off	Off
Linux booted	Green (solid)	Any color or state	Off
Radio not initialized	Green (solid)	Off	Off
Radio initializing	Green (solid)	Amber (blinking)	Green (solid)
Waiting for GPS lock / spectrum allocation	Green (solid)	Red (blinking)	Green (solid)
Radio calibration	Green (solid)	Amber (solid)	Green (solid)
Operational (no remote nodes connected)	Green (solid)	Green (blinking)	Green (solid)
Operational (remote nodes connected)	Green (solid)	Green (solid)	Green (solid)
Radio muted (no link)	Green (solid)	Red (solid)	Any color or state
Factory reset	Amber (blinking)	Amber (blinking)	Amber (blinking)

[a.]May indicate a hardware failure if the base node stays in this state for more than approximately 1 minute.

NOTE
Do not use the base node reset button.

For more information about LED behavior see the section on Device LED Lights in the G1 Administration Guide.

Connect Management Paths Using Web UI

In-band Management refers to managing the base node using the physical data ports (DATA1, DATA 2, DATA 3). You can access the base node's web UI by using the default in-band management IP of 192.168.11.2 in a browser as `https://192.168.11.2`

An in-band management IP address can also be assigned statically or by a DHCP server if there is a DHCP server on the network. DHCP is disabled by default and you must enable it through the web UI. If DHCP is used for the in-band management IP address, you must use a static address for the out-of-band management address (if used).

Optionally, you can assign in-band management traffic to a VLAN.

Out-of-Band (OOB) Management refers to managing the base node using the physical MGMT port. You can access the base node's web UI by using the default OOB IP of 192.168.10.2 in a browser window as `https://192.168.10.2`.

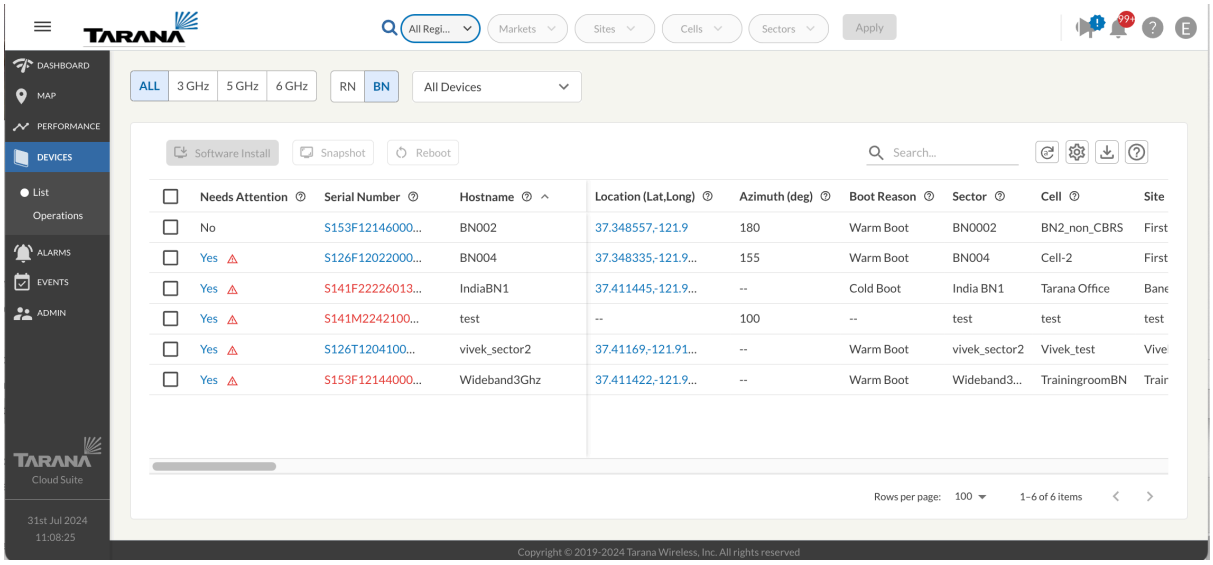
An OOB management IP can also be assigned statically, or by a DHCP server if there is a DHCP server on the network. DHCP is disabled by default and you must enable it through the web UI. If DHCP is used for the out-band management IP address, a static address must be used for the in-band management address.

Verify Base Node Connection to Tarana Cloud Suite (TCS)

To verify the base node is accessible from TCS, use an Internet connection external to the base node.

NOTE
The base node communicates to TCS across Data Port 1, 2, or 3. One of those ports must be connected to the Internet for the base node to contact TCS. Data Ports 1 and 2 are 10 Gbps only. Data Port 3 is 1 Gbps only.

1. Log in to the Tarana Cloud Suite (TCS) using the username and password provided by the network administrator and the following URL:.
   `https://tcs.taranawireless.com`
2. Select **Devices** in the left navigation pane and select **BN** to view the list of base nodes.
3. Verify the base node is online as indicated by its Serial Number in blue text.



NOTE
If the base node doesn't appear in the Devices page, it may not have been assigned to a Sector in TCS. Under Admin > Network Configuration, check if this base node is listed in the BN Devices: Unassigned folder. The base node must be assigned to a created Sector before a remote node can associate to it. To make this change, you must be a TCS user with OP Admin rights.

For more information on Network Configuration, see the G1 Administration Guide.

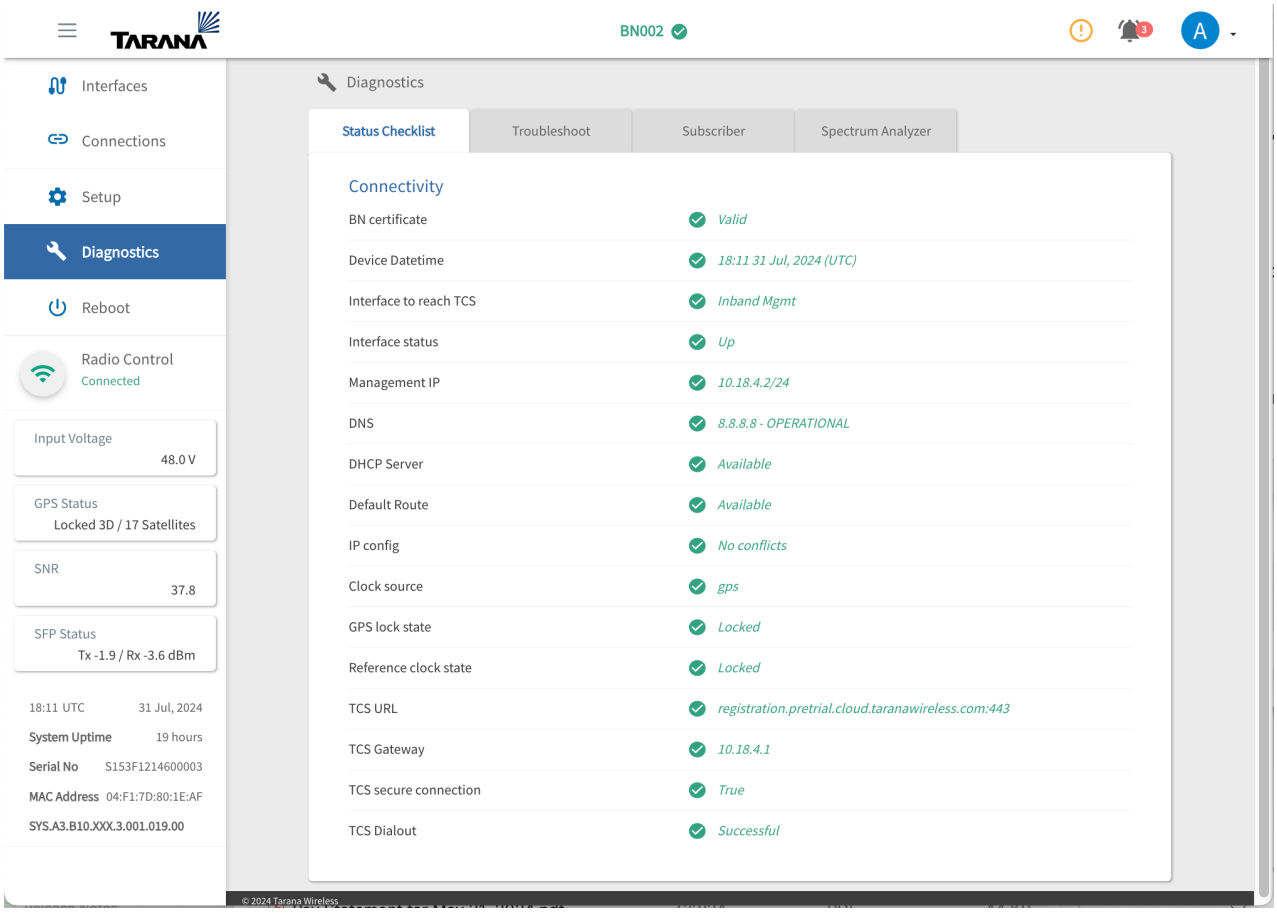
Unmute Radios

Unmute radios by selecting the **Configuration** icon in the upper right corner of the base node's device page. Select **Configure Network Parameters**. Select **Transmit**, then **Done** to enable the radios on this base node.

You must be logged in as a NOC Operator or OP Admin to perform this action.

Check Device Diagnostics

If something isn't working as expected, check the Diagnostics section of the device's web UI. This provides troubleshooting information. From TCS, log in to the base node's web UI. You must be logged in as a NOC Operator or OP Admin to perform this action.



Other diagnostics are available from TCS. From the device page, select the **Diagnostics icon** (🔧) and select Troubleshoot.

For more information about troubleshooting, see the Troubleshooting section in the G1 Administration Guide.

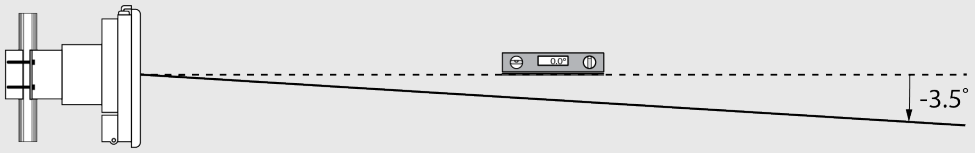
Beamwidth Reference

Refer to the following table of horizontal and vertical beamwidths for base nodes.

	G1 BN-3 CBRS	G1 BN-5	G1 BN-6	G2 BN-3+6
3 dB Horizontal Beamwidth	68˚	64˚	60˚	Low Band: 80° High Band: 60°
6 dB Horizontal Beamwidth	98˚	98˚	95˚	Low Band: 115° High Band: 87°
3 dB Vertical Beamwidth	12.5˚	8.5˚	6.8˚	Low Band: 11.5° High Band: 6.5°
6 dB Vertical Beamwidth	17˚	11.8˚	9.7˚	Low Band: 16.5° High Band: 10.5°

ELECTRICAL TILT

G1 BN-3 base nodes have an electrical tilt of -3.5°. This means that when the G1 BN-3 base node is aimed parallel to the ground, the actual beam center is angled toward the ground by 3.5°. G2 base nodes that operate in the 3 GHz band do not have an electrical tilt.



Refer to the following table of horizontal and vertical remote node beamwidths:

	RN-3 CBRS	RN-5	RN-6	RNv-6	RNm-3+6
3 dB Horizontal Beamwidth	63˚	58˚	66˚	15°	Low Band: 70° High Band: 50°
6 dB Horizontal Beamwidth	95˚	83˚	97˚	20°	Low Band: 102° High Band: 73°
3 dB Vertical Beamwidth	17.6˚	14˚	12.1˚	16°	Low Band: 19° High Band: 11°

	RN-3 CBRS	RN-5	RN-6	RNv-6	RNm-3+6
6 dB Vertical Beamwidth	24.3˚	19.5˚	16.4˚	22°	Low Band: 28° High Band: 14°

Regulatory and Compliance Information

This section contains information regarding safe and correct base node installation.

You can find current declarations of conformance at the following URL:

https://www.taranawireless.com/legal/#declarations-of-conformity

U-NII Band Support

The following table provides information about U-NII bands 3 to 7, their respective frequency ranges, and whether each is governed by the FCC or ISED. Refer to it to determine whether your device supports the following U-NII bands in your regulatory domain:

U-NII Band	Frequency Range (GHz)	FCC (USA)	ISED (Canada)
U-NII-3	5.725-5.850	Yes	Yes
U-NII-4	5.850–5.925	No	Yes
U-NII-5	5.925–6.425	Yes	Yes
U-NII-6	6.425–6.525	No	Yes
U-NII-7	6.525–6.875	Yes	Yes

Regulatory Standard

Compliance Domain	Regulatory Standard
Safety	EN IEC 62368-1:2020+A11:2020, 3rd Edition IEC 60950-22:2016 for use in conjunction with IEC 60950-1:2005, AMD1:2009, AMD2:2013 IEC 60529, Edition 2.2 - 2013-08 IEC/EN 60950-22
Radio Approvals	FCC Part 15 Subpart E §15.407 RSS 247, RSS 248 FCC Part 96 WINNF-TS-0122 Version V1.0.2
EMI and Susceptibility	ISED ICES-003 Issue 7 Class A FCC 47 CFR FCC Part 15 Subpart B Class A CAN ICES-(A)/NMB-(A)

Compliance Domain	Regulatory Standard
RF Exposure	FCC 47 CFR FCC Part 1.1307 RSS 102

FCC Statement (US Deployment)

This device complies with FCC Part 15 rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

The operation of this device is prohibited on oil platforms, cars, trains, boats, and aircraft.

Operation of transmitters in the 5.925 - 7.125 GHz band is prohibited for control of or communications with unmanned aircraft systems.

Modifications not expressly approved by Tarana Wireless Inc. could void the user's authority to operate the equipment.

NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with FCC RF exposure limits. This equipment should be installed and operated with a minimum distance between the radiator and user as defined in the Exposure Safety table. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Industry Canada Statement (Canada Deployment) - EN

This Class A Digital apparatus meets all the requirements of ICES-003.

To satisfy IC RF exposure requirements for RF transmitting devices, a safe distance must be maintained between the antenna of this device and persons during device operation as referenced in the Exposure Safety table.

This device has been designed to ensure that radio frequency emissions are maintained within the band of operation under all normal operating conditions listed in this manual.

Devices shall not be used for control of or communications with unmanned aircraft systems.

Devices shall not be used on oil platforms.

Devices shall not be used on aircraft, except for the low-power indoor access points, indoor subordinate devices, low-power client devices, and very low-power devices operating in the 5925-6425 MHz band, that may be used on large aircraft as defined in the Canadian Aviation Regulations, while flying above 3,048 metres (10,000 feet).

Devices shall not be used on automobiles.

Devices shall not be used on trains.

Devices shall not be used on maritime vessels.

This device complies with Industry Canada RSS standard(s). Operation is subject to the following two conditions:

- This device may not cause interference, and
- This device must accept any interference, including interference that may cause undesired operation of the device.

The antenna height shall be determined by the installer or operator of the standard-power access point or fixed client device, or by automatic means. This information shall be stored internally in the device. Provision of accurate device information is mandatory.

Modification not expressly approved by Tarana Wireless, Inc., could void the user's authority to operate the equipment.

Industry Canada Statement (Canada Deployment) - FR

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Dans l'ordre de satisfaire les réglementations des appareils qui émettent par radio, une distance minimum, spécifiée par la table d'exposition, entre les antennes et l'opérateur doit être maintenue durant les opérations de radio.

Ce dispositif a été conçu pour veiller à ce que les émissions de radiofréquences sont maintenus dans la bande de fonctionnement dans toutes les conditions normales de fonctionnement figurant dans ce manuel.

Les appareils ne doivent pas être utilisés pour contrôler ou communiquer avec des systèmes d'aéronefs sans pilote.

Les appareils ne doivent pas être utilisés sur les plates-formes pétrolières.

Les appareils ne doivent pas être utilisés sur les avions, à l'exception des points d'accès intérieure à faible puissance, des dispositifs subordonnés intérieurs, des dispositifs clients de faible puissance et des dispositifs de très faible puissance fonctionnant dans la bande 5925-6425 MHz, qui peut être utilisée sur de grands avions tel que défini dans la réglementation de l'aviation canadienne, tout en volant au-dessus de 3 048 mètres (10 000 pieds).

Les appareils ne doivent pas être utilisés sur les automobiles.

Les appareils ne doivent pas être utilisés dans les trains.

Les appareils ne doivent pas être utilisés sur les navires maritimes.

Cet appareil est conforme la norme d'Industrie Canada RSS (s). Son fonctionnement est soumis aux deux conditions suivantes:

- Cet appareil ne peut pas causer d'interférences, et.
- Cet appareil doit accepter toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement de l'appareil.

La hauteur de l'antenne doit être déterminée par l'installateur ou l'opérateur du point d'access, sous tension standard, ou du dispositif client fixe, ou par des moyens automatiques. Ces informations doivent être stockées dans l'appareil. La mesure de la hauteur doit être obligatoirement précise.

Tarana Wireless, Inc. n’approuve aucune modification apportée à l’appareil par l’utilisateur, quelle qu’en soit la nature. Tout changement ou modification peuvent annuler le droit d’utilisation de l’appareil par l’utilisateur.

EU and UK Statement

DECLARATION OF CONFORMITY

Operating Frequency Band: 5725 MHz – 5785 MHz

Maximum output power: 36 dBm/20 MHz

Hereby, Tarana Wireless Inc. declares that the 5.8 GHz Base Node is in compliance with Directive 2014/53/EU and UK Radio Equipment Regulations 2017 (SI 2017/1206).

The full context of the EU declaration of conformity is available at the following URL:

https://www.taranawireless.com/legal/#declarations-of-conformity

Recycling

The crossed out wheeled bin symbol on your product and/or accessories means that the item is classified as electrical and electronic equipment. Such items should not be mixed with general household waste, and must be taken to dedicated collection points at the end of their working life for proper treatment, recovery and recycling. This way you help save valuable resources and promote recycling of materials.

Resolution 680: Brazil

Regulamento Anatel sobre equipamentos de Radiocomunicação de Radiação Restrita (Resolução nº 680): “Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados – Para maiores informações, consulte o site da Anatel https://www.gov.br/anatel/pt-br/.

Base Node Homologation Country List

G2 BN-3+6 base node model G2BNF356900

- USA (FCC)
- Canada (ISED)
- Uganda (UCC)

G1 BN-5 base node model G1BN5ASI002

- Argentina (Enacom)
- Australia (RCM)
- Barbados (MIST)
- Benin (ARCEP)
- Botswana (BOCRA)
- Brazil (ANATEL)
- Burkina Faso (ARCEP)
- Cameroon (ART)
- Canada ISED (RSS-247)
- Colombia (CRC)
- Congo, Democratic Republic of (ARPTC)
- Congo, Republic of (ARPCE)
- Costa Rica (SUTEL)
- Dominican Republic (INDOTEL)
- Eswatini (ESCCOM)
- European Union (CE)
- Ghana (NCA)

- Hong Kong (OFCA)
- Indonesia (SDPPI)
- Kenya (CAK)
- Liberia (LTA)
- Libya (ACI)
- Malaysia (SIRIM)
- Mexico (NOM-019 and NOM-208)
- Mozambique (INCM)
- Namibia (CRAN)
- New Zealand (RSM)
- Nigeria (NCC)
- Oman (TRA)
- Paraguay (CONATEL)
- Peru (MTC)
- Philippines (NTC)
- Saudi Arabia (CITC)
- Senegal (ARTP)
- South Africa (ICASA)
- Suriname (TAS)
- Togo (ARCEP)
- UAE (TDRA)
- Uganda (UCC)
- UK (UKCA)
- Uruguay (URSEC)
- USA FCC (Part 15E)
- Venezuela (CONATEL)
- Vietnam (MIC)

G1 BN-6 base node model G1BN6ASI002

- Australia (ACMA)
- Canada (ISED)
- Guyana (TA)
- Nigeria (NCC)
- Saudi Arabia (CITC)
- Uganda (UCC)
- USA (FCC)

CBRS Required Information

The Tarana base node must be installed by a certified professional installer (CPI) as defined in Section 96.39 and 96.45 of FCC part 96 requirements. The base node is Classified as a Category B CBSD (Citizen Broadband Radio Device), which requires the following information be recorded and uploaded as part of the CPI process per section 96.45.

The FCC regulates CBRS devices (CBSDs) and categorizes them as Category A or Category B devices. CBSD categories are defined in 47 CFR Part 96 Section 96.3:

https://www.ecfr.gov/current/title-47/chapter-I/subchapter-D/part-96/subpart-A/section-96.3

The FCC also records or monitors several parameters to manage the CBRS spectrum. The following table describes the parameters that are required for CBRS Category A and B devices.

Parameter	Description	Required for Category B Devices
Geographic Location	Latitude and longitude values of the device	Yes
Antenna Height (AGL)	Height of the installed device above the ground	Yes
CBSD Class	Refers to the Category (A or B) of the device	Yes
Requested Authorization Status	PAL (priority access license), a paid service with higher access priority or GAA (general authorized access), which is has no licensing costs but is a lower priority than PAL.	Yes
FCC ID	Unique identifier for CBRS transmitters, issued by the FCC	Yes
Call Sign (PAL Only)	Unique identifier for CBRS stations, issued by the FCC	Yes
User Contact Information	User name, email, phone number	Yes
Air Interference Technology		Yes
Serial Number	Device serial number	Yes
Sensing Capability		Yes
Limited to Outdoor Operation	Lower-power devices can operate indoors or outdoors. Higher-power devices cannot operate indoors and must operate outdoors only.	Yes
Antenna Gain	The gain of an antenna is related to its directionality.	Yes
Antenna Beam Width	The beam of highly directional antennas has two properties: the beam height is the vertical angle that contains the beam; the beam width is the horizontal angle that contains the beam.	Yes
Antenna Azimuth	The compass direction of the antenna in decimal degrees, where 0 degrees is true north.	Yes
Antenna Tilt Angle		Yes

Warranty

Tarana warrants that commencing from the date of shipment to you (and in case of resale to you by a Tarana partner, commencing not more than 90 days after our original shipment), and continuing for a period of twelve (12) months, the hardware will be free from defects in material and workmanship under normal use. This limited warranty is not transferable. Your sole and exclusive remedy and our entire liability under this limited warranty will be, at our option, shipment of a replacement or a refund of the purchase price, if you notify us of the defect within the warranty period and return the hardware to us freight and insurance prepaid. Parts used in replacement may be new or reconditioned. Our obligations are conditioned upon the return of affected hardware in accordance with our then-current standard Return Material Authorization (RMA) procedures. This limited warranty does not cover (a) damage resulting from (i) use in other than the wireless transport applications defined in our product documentation; (ii) use not in accord with applicable spectrum regulations; (iii) handling, testing, installation, operation, maintenance, service, repair, alteration, modification, or adjustment outside of practices and conditions defined in our product documentation; (iv) other general misuse, accident, liquid intrusion, or neglect; (v) unauthorized radio connection to equipment not supplied by us; (vi) illegal or unauthorized alteration of software or firmware; (vii) acts of nature (such as lightning) or performance failure of other equipment (including electrical transients and over/under voltage); (b) scratches, discoloration, or other cosmetic damage to surfaces that do not affect operation; (c) normal and customary wear and tear; and (d) any product where serial number, revision level, part number, date code, warranty data, tamper-proof seals, or quality assurance decals have been removed or altered.

DISCLAIMER: Except as specified above, all express or implied conditions, representations, and warranties including, without limitation, any implied warranty or condition of merchantability, fitness for a particular purpose, non-infringement, satisfactory quality, non-interference, accuracy of informational content, or arising from a course of dealing, law, usage, or trade practice, are hereby excluded to the extent allowed by applicable law and are expressly disclaimed by us. To the extent an implied warranty cannot be excluded, such warranty is limited in duration to the express warranty period. This disclaimer and exclusion will apply even if the express warranty set forth above fails of its essential purpose.

Tarana products are not designed, intended, or certified for use in communication systems for, or relating to (a) weapons or weapons systems, (b) nuclear facilities, (c) air traffic control or other mass transportation systems, (d) life support systems or other medical devices, (e) applications where electrical sparks could trigger explosions or fires, or (f) any other systems, devices or applications in which the failure of the product to operate as intended may lead to death, bodily injury, or catastrophic property damage (each an

“Unauthorized Use”).. Many of such Unauthorized Uses would require specific industry certification which has not been sought or obtained for the Tarana products.

LIABILITY. Tarana will not be liable for any special, incidental, indirect, or consequential damages (including lost profits or property damage) arising out of or relating to the sale of the goods to you or your possession, installation, use, operation or repair of the goods, even if the goods are nonconforming, defective, infringing, delayed, or not delivered, and even if Tarana has been advised of the possibility of such damages. You agree to indemnify and hold us harmless from any claims, suits, demands and causes of action arising out of or relating to your possession, installation, use, operation or repair of the goods. Notwithstanding any other provisions of this document, in no event will our total liability in connection with or relating to the goods exceed the amount you have paid us for the goods.