TARANA

GIGABIT 1

Base Node Installation Guide (CBRS)

vIG_BN_CBRS_2021-09

PN: 18-0008-001 Rev. 1.0

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NOTE: For the most up-to-date instructions, please download the latest version of this document on our customer portal:
www.taranawireless.com/bn_manual_cbrs

Safety and Warnings

Tarana G1 equipment is 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.

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 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 SPF+ 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.

FCC Information

The FCC occupational controlled limit for maximum permissible exposure (MPE) is 5 mW/cm^2. It is estimated that the maximum power density at the radome is 1.25 mW/cm^2, which is below the FCC MPE limit. Since the power density for an occupational controlled environment is less than the FCC limit, no additional precautions are necessary. The occupational uncontrolled environment limit for maximum permissible exposure (MPE) is 1 mW/cm^2. To meet this MPE requirement, the operator must be at a distance of 37.8 in or 96 cm away from the radome cover of the system.

General Health and Safety Information

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 system meets global product safety requirements for safety extra-low voltage (SELV) rated equipment.
Safety Signs	Surface temperature and heavy equipment warning signs are required on this equipment.
Surface Temperatures	The external equipment surfaces become warm during operation, due to heat dissipation. The temperatures reached are considered hazardous.

WARNING! HEAVY EQUIPMENT. SEE INSTALLATION INSTRUCTIONS BEFORE LIFTING.

The Tarana BN weighs ~20 kg (~42 lbs.).

Use proper lifting techniques for lifting heavy equipment. Be sure to follow all established local practices and safety precautions when hoisting the equipment.

Keep knees bent, back as straight as possible, and the load close to the body.

Health and Safety Warning

All personnel must comply with the relevant health and safety practices when working on or around the G1 radio equipment.

The G1 system has been designed to meet relevant US and European health and safety standards as outlined in IEC Publication 62368-1, 2nd edition.

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. DOING SO WILL VOID THE WARRANTY.

WARNING

Making adjustments and/or modifications to this equipment that are not in accordance with the provisions of this Installation Guide, User 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

Topic	Explanation
Chassis Earthing	The BN chassis earth 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. • 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 BN chassis must be maintained.
Mains Power Supply Routing	• BN 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 maximum ambient temperature for the BN product is 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 BN should be mounted in such a way as to permit the vertical free flow of air through its cooling fins.
Mechanical Loading	• When installing the BN 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 BN operates from a nominal -48 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 BN is designed to operate in an outdoor environment with no significant obstructions in front of the radome. Do not install G1 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 G1 product.

Supplier's Declaration of Conformity

Tarana Wireless Inc., as the grantee of this project (FCC ID: 2ABOF-G1-BN3ASI001/ Brand Name: Tarana / Model No.: G1BN3ASI001), we would like to declare that the BN device section categorized as computer peripheral has been evaluated, reference - Sporton report No.: FD210405002, and is in compliance with FCC Part 15B rules. The final product shall consequently comply with the FCC rule applicable for SDoC Procedure.

Filing Type: Supplier's Declaration of Conformity
FCC ID: 2ABOF-G1-BN3ASI001
Equipment: Base Node (BN)
Brand Name: Tarana Wireless
Model Name: G1-BN3ASI001
Marketing Name: G1
FCC Grantee contact person information.
Applicant: Tarana Wireless, Inc
Manufacturer: Tarana Wireless, Inc.
590 Alder Drive, Milpitas, CA 95035
URL: http//: Taranawireless.com

Standard: FCC 47 CFR FCC Part 15 Subpart B Class A

Signature _____

Name: Christopher Saleem
Title: Regulatory Compliance Manager
Email: Certifications@taranawireless.com
Phone: 408.351.4085

Regulatory Information

Compliance	
Safety	• IEC62368-1, Second Edition, Rev. February 26, 2014 and EN 62368-1: 2014, Second Edition, + A11:2017, Audio/Video, Information and Communication Technology Equipment • IEC 60529, Edition 2.2 - 2013-08 • IEC/EN 60950-22
Radio Approvals	• FCC Part 96
EMI and susceptibility	• FCC 47 CFR FCC Part 15 Subpart B Class A

Responsible party: Tarana Wireless, Inc.

590 Alder Drive, Milpitas, CA 95035

URL: www.taranawireless.com

Deployment in the US — FCC Statement

This product must be professionally installed.

This device complies with FCC Part 15 rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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 FCC 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 of 96 cm (37.8 in.) between the radiator and user. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

USA CBRS Band Category B Device

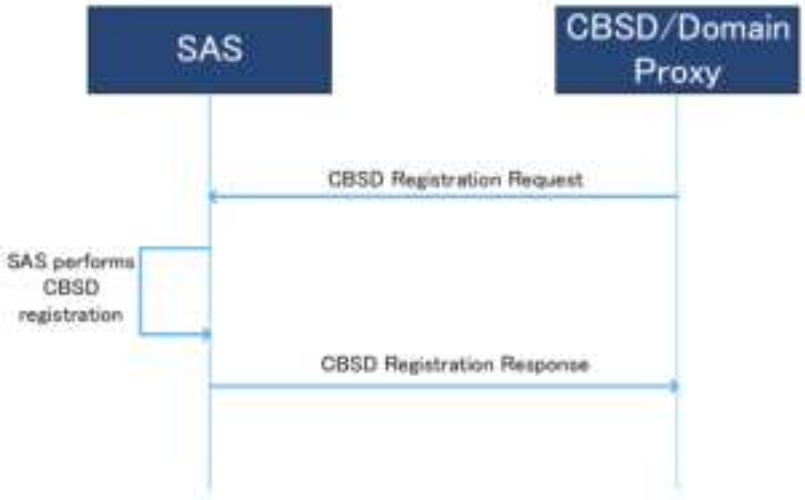
The Tarana BN requires installation by a CPI (Certified Professional Installer) as defined in Section 96.39 and 96.45 of FCC part 96 requirements. The BN is Classified as a Category B CBSD (Citizen Broadband Radio Device), which requires the following information be recorded and uploaded as part of the CPI process per section 96.45.

All CSBDs	Category B Devices
• Geographic location • Antenna height AGL (m) • CBSD class (Category A or B) • Requested authorization status (PAL or GAA) • FCC ID • Call sign (PALs only) • User contact info • Air interference technology • Serial # • Sensing capability (if supported)	• Limited to Outdoor operation • Antenna gain • Antenna Beam-width • Antenna Azimuth • Antenna Down tile angle

CBSD Protocol

The SAS-CBSD protocol is based on the HTTPS (HTTP over TLS) protocol. The HTTPS protocol provides transport level assurance that a message has been received by the intended recipient. During discovery, the HTTPS protocol manages SAS-CBSD message delivery.

Communications between the CBSD and SAS are initiated by the CBSD when it is in an Unregistered state.



TLS mutual authentication shall be performed per whenever a CBSD or Domain Proxy communicates with a SAS. TLS-v1.2 shall be used to perform authentication. Previous versions of TLS (e.g., TLS-v1.1 per RFC-4346, TLS-v1.0 per RFC-2246 or SSL-v3.0) shall not be used. During the TLS exchange, mutual authentication shall be performed. The CBSD/Domain Proxy initiating the TLS connection shall authenticate the SAS, and the SAS shall authenticate the CBSD/Domain Proxy.

During the TLS message exchange, the CBSD/Domain Proxy shall authenticate a SAS. Server certificate validation shall be performed. A CBSD or Domain Proxy which is unable to successfully authenticate a SAS shall abort the TLS connection establishment procedure. It is implementation specific when the CBSD should re-attempt the TLS connection establishment procedure.

During the TLS message exchange, the CBSD/Domain Proxy provides its client certificate to the SAS. The SAS shall perform client certificate validation.

A SAS which is unable to successfully authenticate a CBSD or Domain Proxy shall abort the TLS connection establishment procedure. A CBSD or Domain Proxy which is unable to successfully setup such an encrypted connection with a SAS shall abort the TLS connection establishment procedure. It is implementation specific when the CBSD/Domain Proxy should re-attempt the TLS connection establishment procedure.

Subsequent to successful authentication, the CBSD/Domain Proxy and SAS shall negotiate a ciphersuite to use for encrypting all communications between the two entities. The ciphersuite shall be selected from the following list (ref. [n.1]):

- TLS RSA with AES 128 GCM SHA256
- TLS RSA with AES 256 GCM SHA384
- TLS ECDHE ECDSA with AES 128 GCM SHA 256

In the absence of the domain proxy, the CBSD first creates a secure association. The CBSD then initiates the Registration procedure by sending a *RegistrationRequest* object to the SAS with parameters that identify the CBSD to the SAS, provide specific information on the CBSD equipment capabilities, and identifies the measurement reporting capabilities of the CBSD. Optionally the CBSD may request the SAS to enroll the CBSD as a member of one or more Groups.

The SAS responds to the CBSD with parameters that indicate whether the registration succeeded or failed.

If the CBSD has any existing Grants prior to sending the Registration Request, all Grants shall be deleted. If the SAS had any existing Grants assigned to the CBSD, upon receiving the Registration Request from the CBSD, all such Grants shall be deleted.

If there is a Domain Proxy and the Domain Proxy is performing bulk CBSD registration, the Domain Proxy aggregates registration information for multiple CBSDs. The Domain Proxy sends an array of Registration Requests to the SAS which represents the aggregated CBSD registration information. Each Registration Request contains one instance of a registration request for a CBSD

that the Domain Proxy is registering. Upon reception of the array of Registration Requests, the SAS initiates registration for each CBSD. The SAS responds with an array of Registration Requests, each containing a registration response to a CBSD with parameters that indicate whether the registration succeeded or failed.

Preparation

Use the following checklists to ensure you have all the required items before beginning a Tarana BN installation. Verify the contents of the Tarana supplied hardware.

Tools

- ☐ 13mm combination wrench
- ☐ Torque wrench
- ☐ T30 Torx driver
- ☐ Crimping tool (6 AWG)

Customer Supplied Equipment

- ☐ Power cable – a 2-wire outdoor rated cable of suitable size for the cable run, or as per local code
- ☐ Ethernet cable - shielded CAT5e/CAT6
- ☐ Grounding wire (6 AWG)
- ☐ PC laptop with admin rights

Tarana Hardware and Peripherals

- ☐ AC power supply (optional)
- ☐ Harting DC pigtail
- ☐ Harting optical cable
- ☐ Harting RJ45 cable
- ☐ Lightning and surge protection devices
- ☐ BN radio unit (16.4 x 21 x 4.6 in; 41.7 x 53.3 x 11.6 cm)
- ☐ BN mounting kit

BN Mounting Kit Contents:

- ☐ (4) M8 bolts: 1.25 x 120 mm
- ☐ (4) M8 bolts: 1.25 x 80 mm
- ☐ (4) M8 bolts: 1.25 x 25 mm
- ☐ (4) M-8 nuts: 1.25
- ☐ (8) M-8 washer, wedge-lock
- ☐ (1) BN-pole-mount bracket assembly

Figure 1: BN Mounting Kit Contents

Surge Protectors:

Two models of DC Defender surge protectors are available. Model 1101-1027 should be used when the cable size used to power the BN is larger than 10AWG.

A. DC Defender (DC Surge Protector) w/Mounting Kit (1101-1110)

B. DC Defender (DC Surge Protector) w/Mounting Kit (1101-1027)

A 

B 

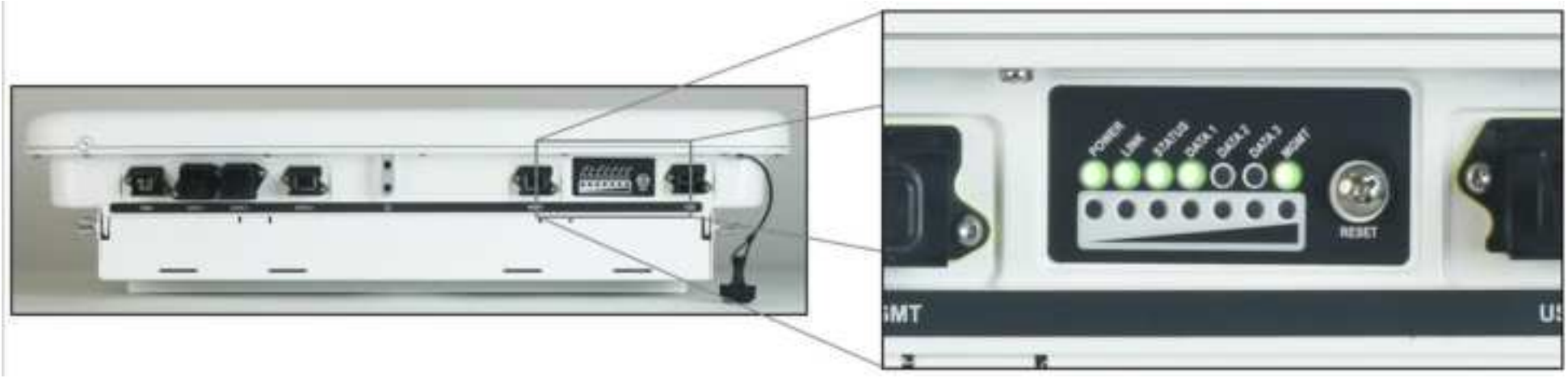
Use the instructions provided with the surge protector for installing. It is recommended that all power and surge protector cables be assembled and tested in the lab prior to installation in the field.

Initial Configuration

Tarana recommends that the BN be powered and get an initial configuration prior to being mounted on the tower. The BN requires power and a connection on a data port for Tarana Cloud Suite (TCS) operation. The voltage required is -48 VDC supplied on the Harting power connector through the power port only. The estimated power draw is 300W.

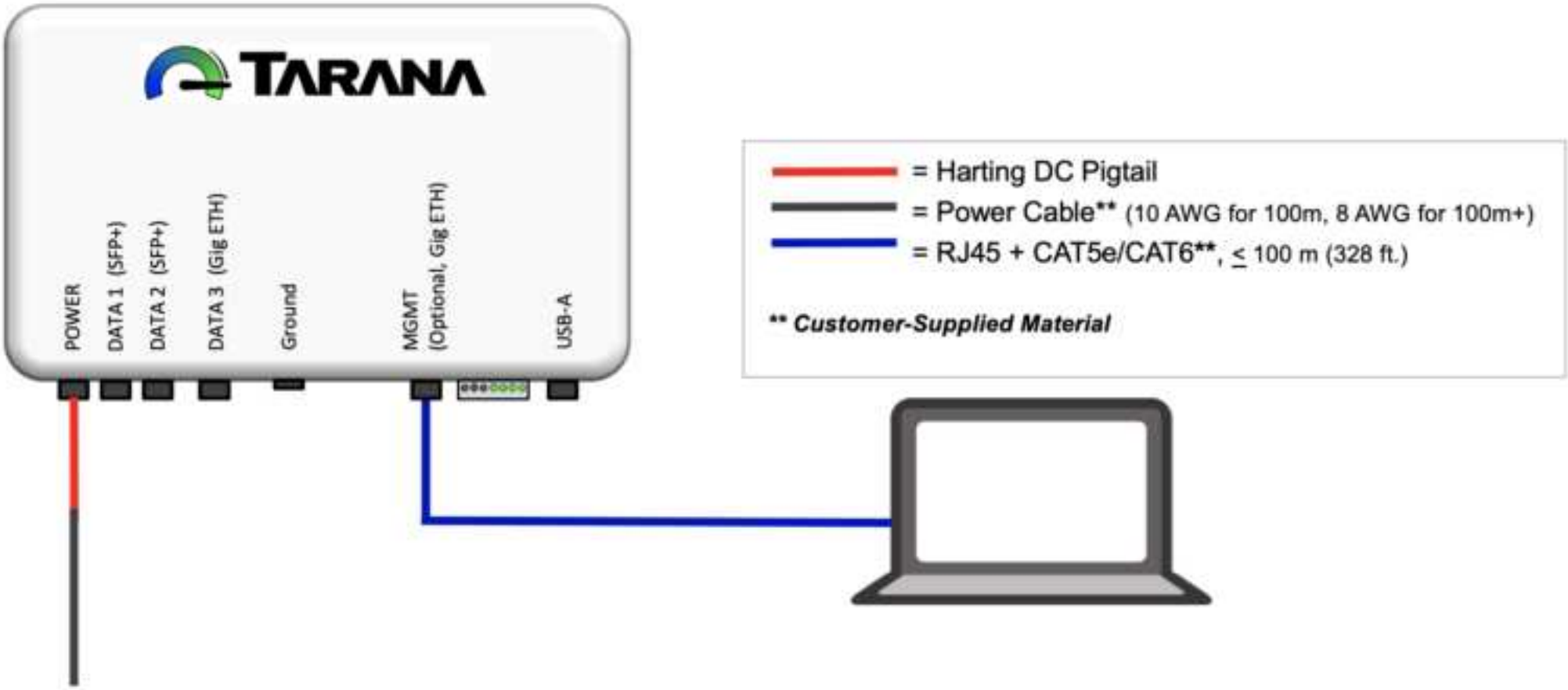
For initial configuration, use a Harting Push-Pull Ethernet cable assembly plugged into the MGMT port on the BN. Using a standard Ethernet cable in this port will make removing the cable difficult and *could damage the port*. Harting Ethernet cable assemblies for this purpose are available through Tarana.

Upon receiving power, the BN will undergo the booting and initialization process for a period of 5-7 minutes. There are a set of LEDs on the bottom edge of the BN that will cycle through patterns and colors during this time.



Note: Only one of the three data ports can be active at a time. 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 supplies an industrial-temperature SFP+ module for data connection at the BN on the tower. DATA3 is a copper interface and only supports 1Gbps. Devices connected to DATA3 must be Gigabit Ethernet or the port will not come up.

The BN communicates to the TCS through one of the data ports. The MGMT port is for initial configuration. Optionally this port can be used for on-site management, also called Out of Band (OOB) management.



Accessing the MGMT Port

Step 1. Connect a laptop to the MGMT Gigabit Ethernet port of the BN.

Step 2. Assign a static IP address of **192.168.10.10** to the laptop.

Step 3. Type **192.168.10.2** into a web browser to access the BN's web interface.
Note: Chrome is the recommended and supported browser.

Step 4. For the username and password, enter "**admin**" and "**admin123**", respectively. This will bring up the BN's web interface.

A management IP can also be assigned statically or by a DHCP server if there is a DHCP server on the network. DHCP must be enabled through the BN's Web UI.

Configuration

From the BN's web UI the following information needs to be configured:

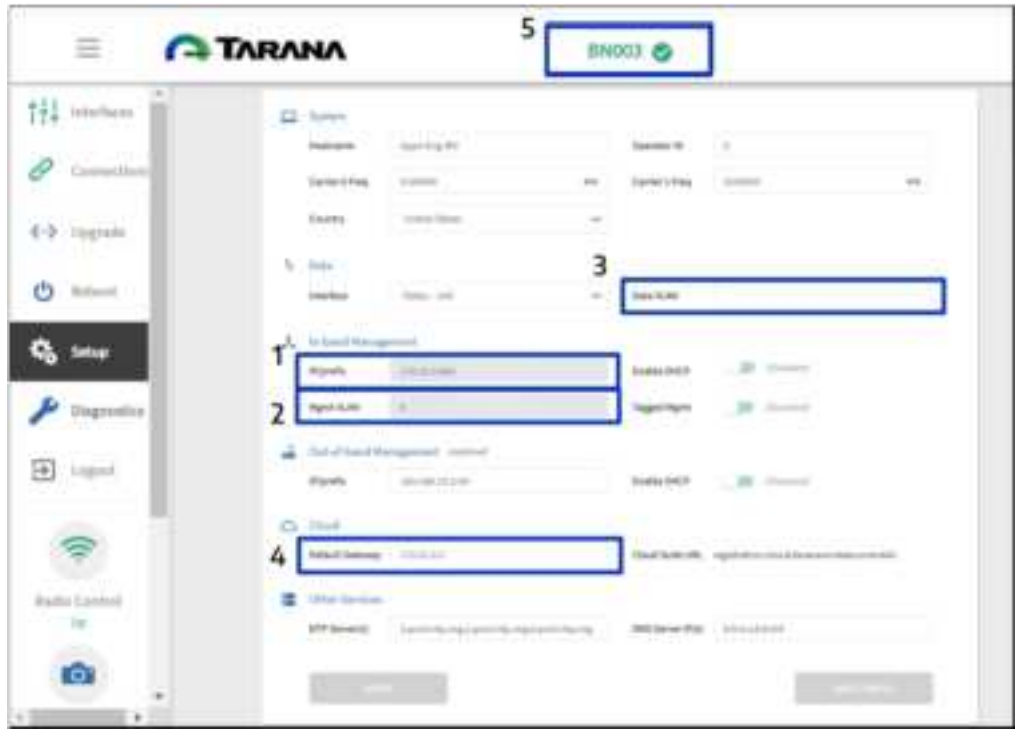
Step 1. Enter a static IP within the subnet of the LAN gateway or enable DHCP to have a DHCP server give the BN an IP address.

Step 2. Optionally, enter a management VLAN.

Step 3. Configure the Data VLAN.

Step 4. Enter the default IP gateway.

Step 5. Verify the connection to the TCS by confirming the Hostname appears in green text at the top of the screen.



Important Notes:

The following IP information is reserved on the BN and may not be used as part of the configuration:

- Reserved VLANs: 4092,4093, and 4094
- Reserved IP subnets: 172.27.0.0/18, 10.240.0.0/12

The following IP ports must be open in order to allow the BN to reach TCS:

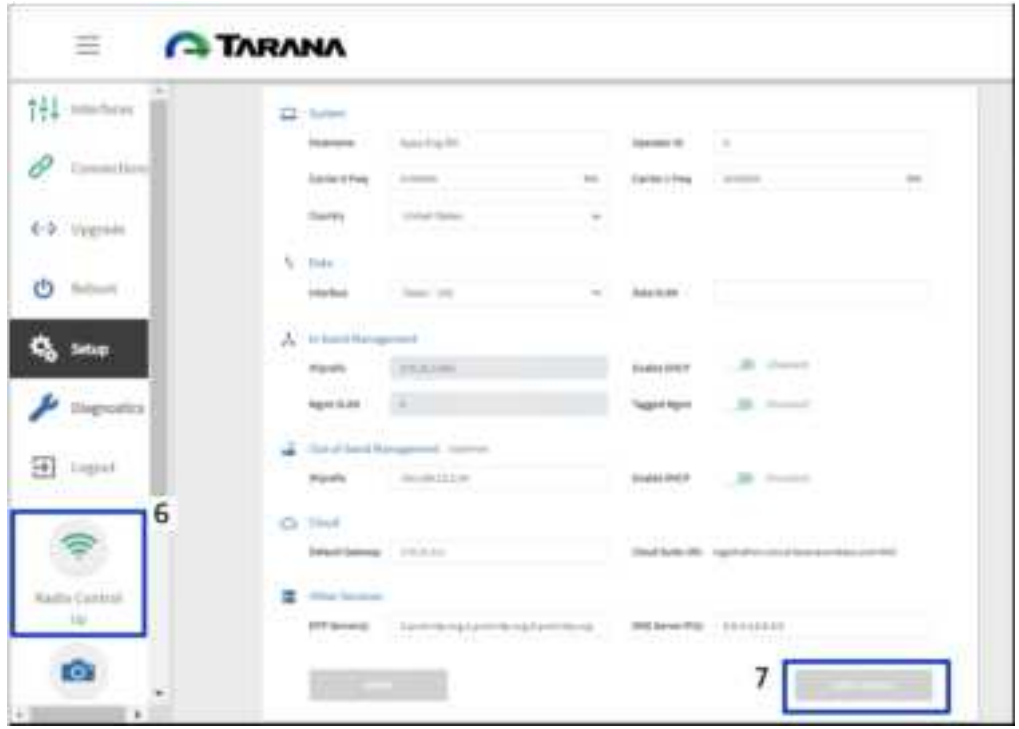
- 443 (TCP)
- 53 (UDP)
- 123 (UDP)

Unmute Radios

Step 6. Click "Radio Control" → Up

Note: For safety, the radios are muted by default. After verifying functionality, **mute the radios again** until after the BN is installed on site.

Step 7. Click "SAVE CONFIG".



TCS Confirmation

To verify the BN is accessible from the Tarana Cloud Suite (TCS), use an Internet connection external to the BN.

Note: The BN communicates to the TCS across Data Port 1, 2, or 3. One of those ports must be connected to the Internet for the BN to contact the TCS. Remember that Data Ports 1 and 2 are 10 Gbps only. Data Port 3 is 1 Gbps only.

Step 1. Login to Tarana Cloud Suite (TCS) using the URL: cloud.taranawireless.com

For the username and password, contact the TCS system administrator.

Step 2. From the left column, click on “DEVICES”.

Step 3. Verify that “BN” is selected from the RN/BN switch.

Step 4. Finally, verify the BN is online as indicated by its Serial Number being in green text.

Physical Installation

The BN mount is a saddle clamp that is adjustable in azimuth and tilt. The tilt should be set to zero degrees and the azimuth to the required direction.

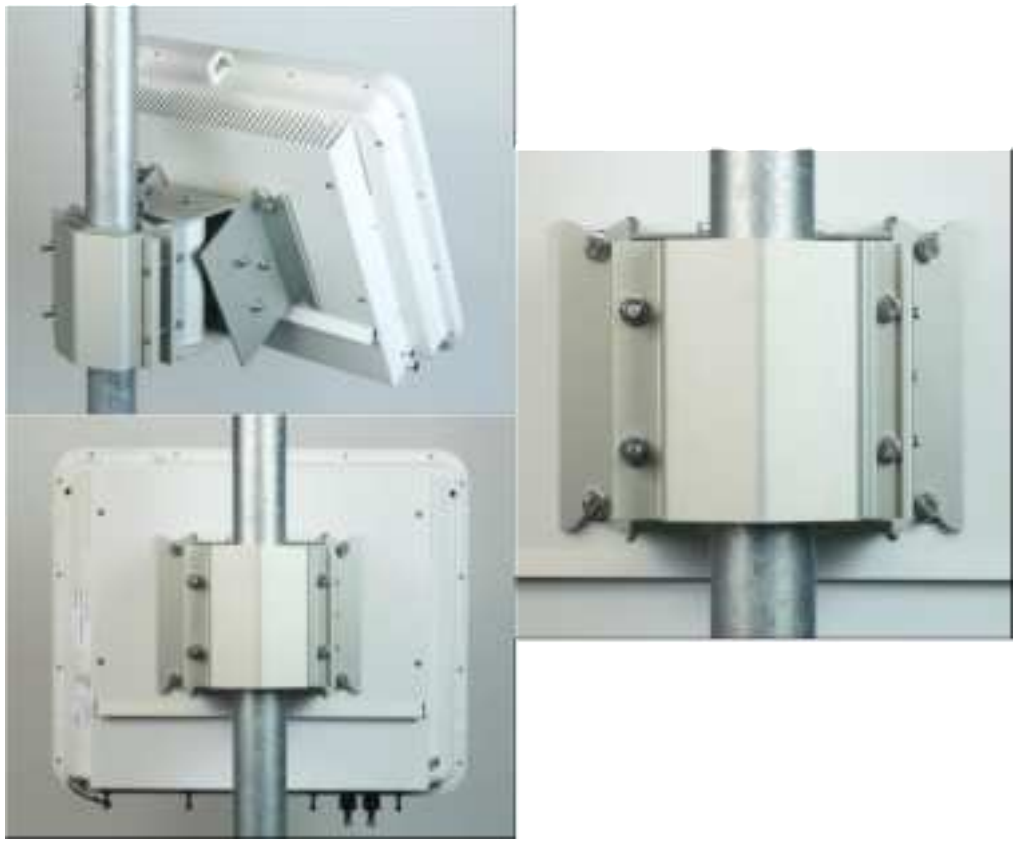
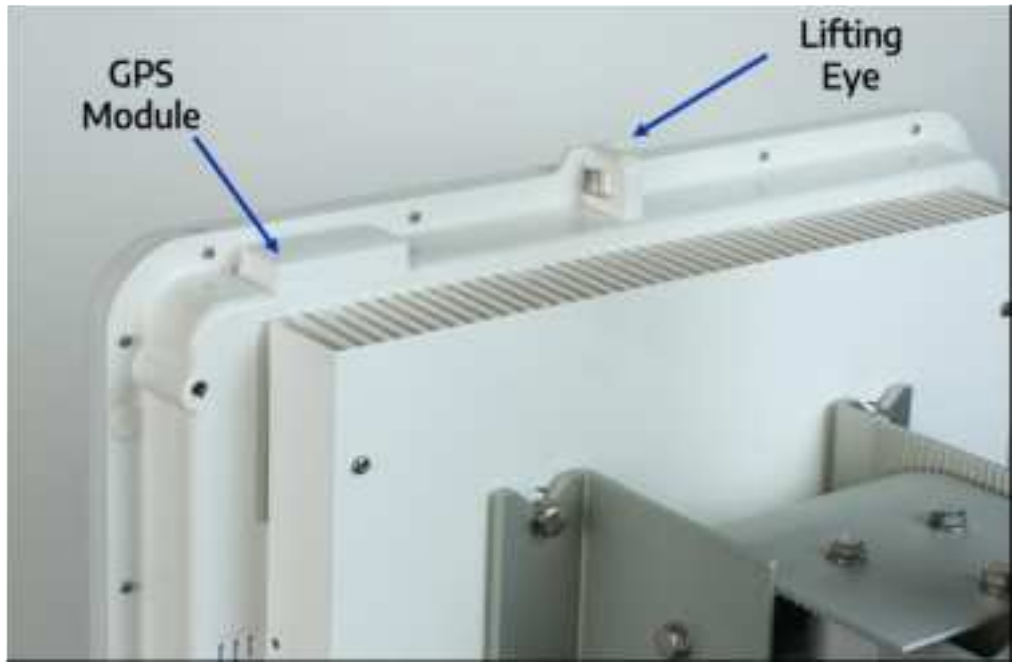


Figure 2: BN Mounting

Note: The GPS antenna mounted on the top of the BN must have a clear view of the sky to establish synchronization.

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



Mounting

BN Pole-Mount Bracket Assembly

Measure the pole diameter to determine which length of M8 bolt to use to hold the BN bracket to the pole.

NOTE: The pole diameter listed below is Outside Diameter (O.D.) and not Nominal Diameter (N.D.)

- ☐ Use (4) M8 1.25 x 80 mm bolts for poles 60.3 mm – 101.6 mm (2 3/8" – 3 ½").
- ☐ Use (4) M8 1.25 x 120 mm bolts for poles 101.6 mm – 127 mm (3 ½" – 5").
    - Measure Pole Diameter (95mm in this example)

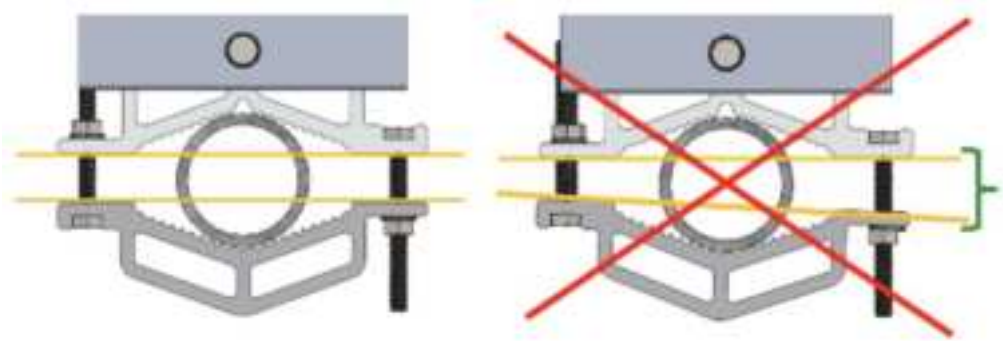
Figure 3: Measure Pole Diameter

Step 1. Install the BN bracket on the pole.
Note: There are slots for the bolt heads on both the bracket *and* the clamp.

Step 2. Insert the bolts on the right side of the clamp and thread on the nuts.

Step 3. Insert the bolts on the right side of the bracket and thread on the nuts.

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



Step 5. 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

- Following the torque sequence 1-2-3-4 shown below, 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).

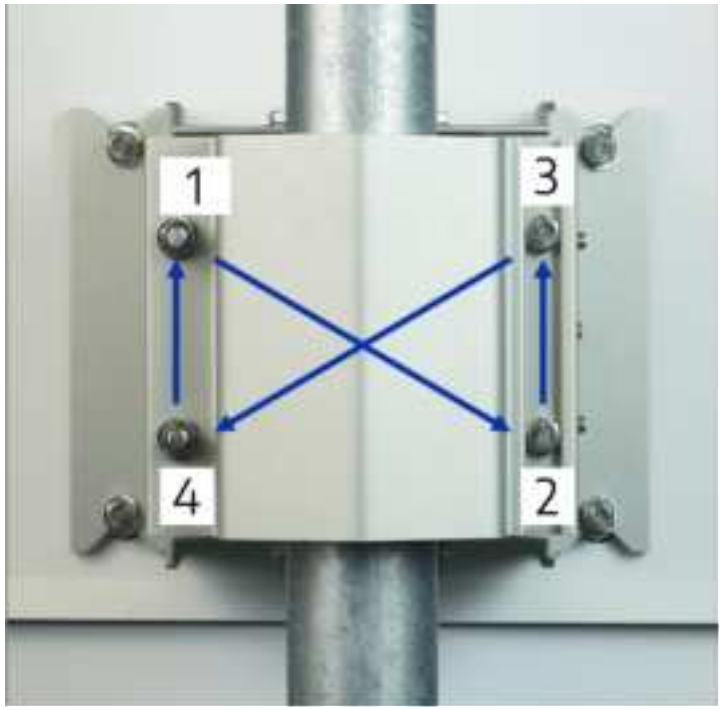


Figure 4: Torque Sequence

Mounting the Bracket Ears

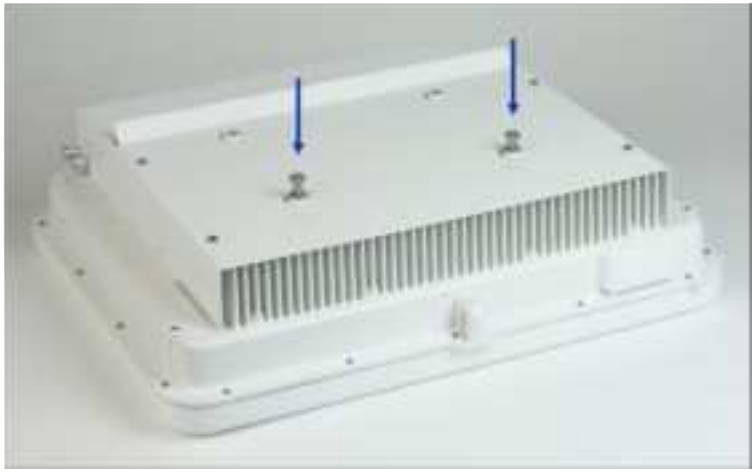
When installing the BN bracket to the pole before attaching the BN to the bracket (recommended), register the tilt adjustment to the upper limit. This ensures that the flange ears where the BN will be attached are aligned properly. Snug the tilt-adjustment bolts enough to hold bracket ears firmly while mounting the BN.

Figure 5: Twisted Bracket Ears

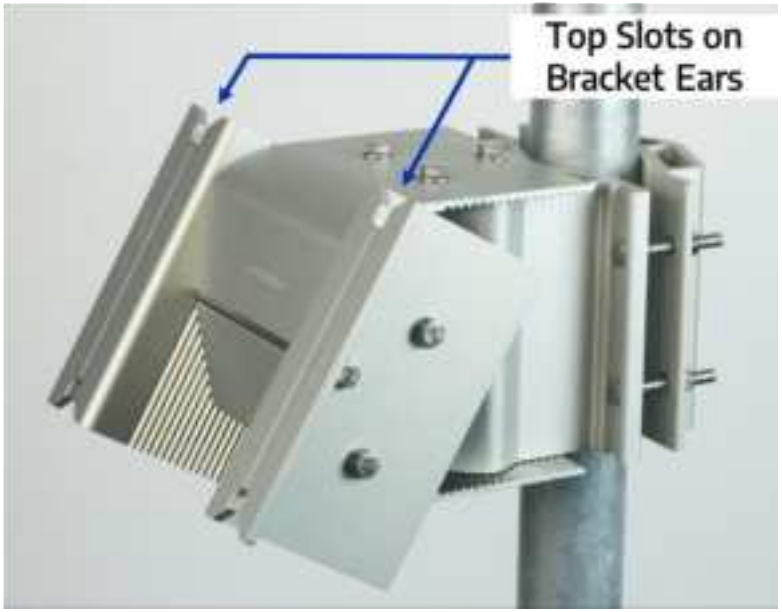
Figure 6: Aligned Ears in High-Tilt Position

Mounting the BN to the Bracket

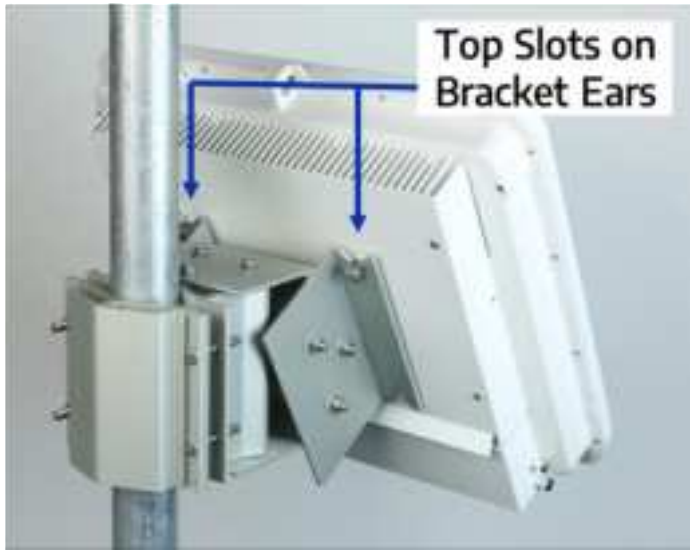
Step 1. Install 2 M8 x 25mm bolts with wedge lock washers in the top holes on the back of the BN as shown below. Partially thread the bolts into the chassis halfway (~12mm). This will provide a sufficient gap for the bolt heads and washer to slide into the top slots on the bracket ears.



The BN must be slid into the top slots on the bracket ears using these two bolts.



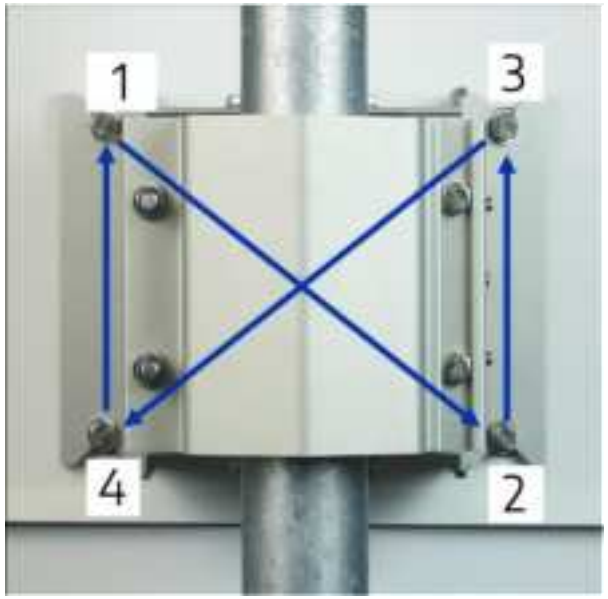
Step 2. Slide the BN into the top slots in the bracket ears using the partially-installed bolts from Step 1. Ensure that the wedge lock washers are on the outside of the bracket and NOT between the BN and the bracket.



Step 3. Install 2 M8 x 25 mm bolts with wedge lock washers in the two remaining lower slots one the bracket ears. Ensure that the wedge lock washers are on the outside of the bracket and NOT between the BN and the bracket.

Step 4. Torque all 4 of these bolts using the same torque sequence demonstrated earlier.

- With the clamp in the final position, torque the 4 bolts with incremental steps at approximately 40%, 70%, and 100% of full torque rating
- Following the torque sequence shown, 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.



Antenna Aiming

The BN has a 90-degree field of view. The azimuth should be adjusted as appropriate to the network design.

Note: Adjust the azimuth before adjusting the tilt.

The azimuth must be set and torqued before the tilt. If done in reverse, there is a good chance that the torque setting for the tilt will not be accurate. This can cause the mount to lose tilt adjustment after some temperature cycles or vibration. In turn, this will cause a tower climb and/or service disruptions.

Adjusting the Azimuth

Step 1. 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 is 60 degrees.

- Following a clockwise torque sequence, 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.

Adjusting the Tilt

Step 1. Adjust the tilt to the desired angle using a digital level with < 0.2-deg accuracy. Torque the 3 M8 x 180mm in a gradual triangular pattern.
NOTE: The total adjustable tilt is ±20 degrees.

- Torque the bolts in a clockwise pattern.
- 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.

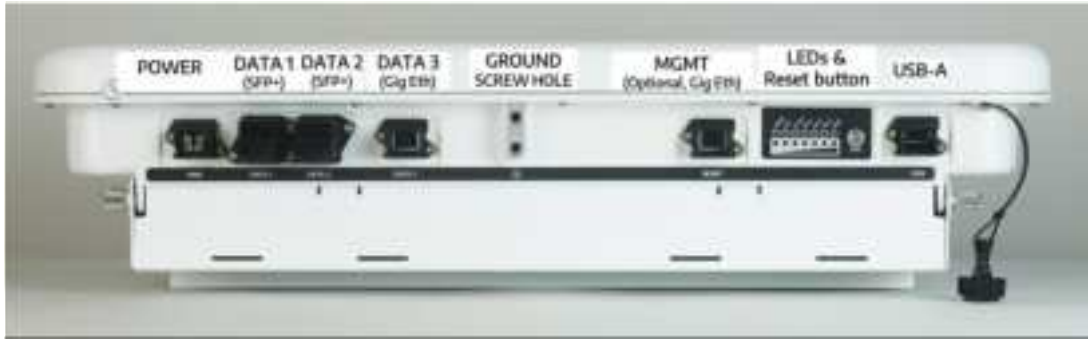
Power and Connectivity

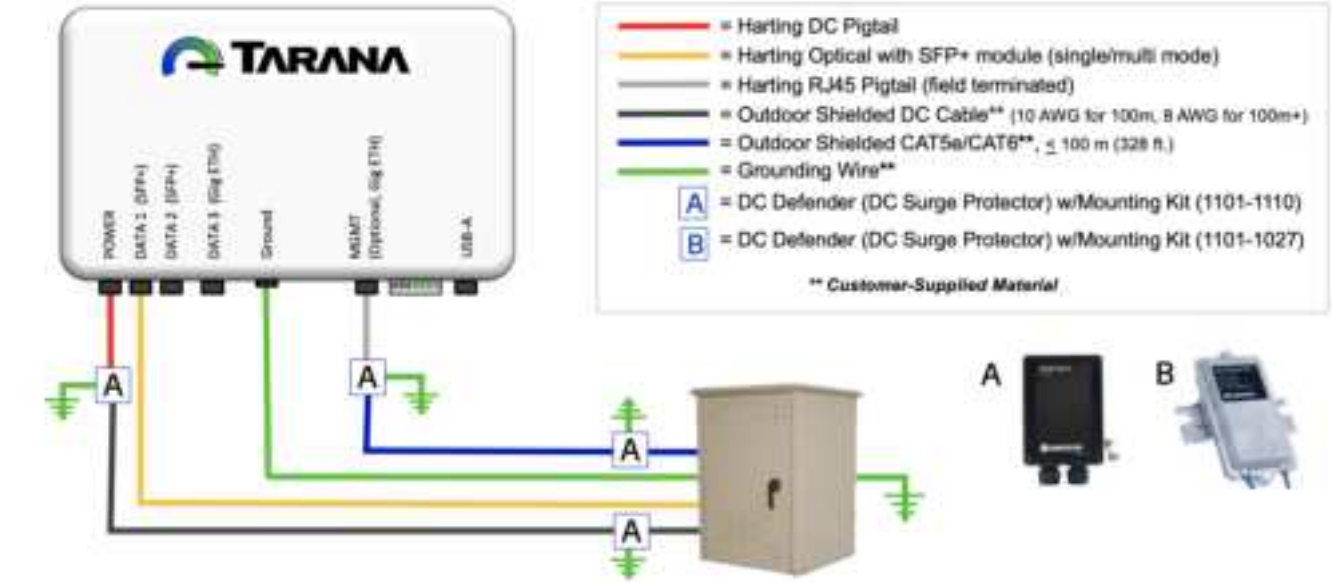
Physical Connections

The BN requires power and a data connection for operation. All connectors are from the Harting push/pull connector family and are IP67-compliant.

The voltage required is -48 VDC supplied on the Harting power connector. There are three options for a data connection: two SFP+ ports (DATA 1, DATA 2), and one Gbps Ethernet port (DATA 3). For initial configuration and (optional) OOB management, an Ethernet connection on the MGMT port is required.

Note: At this time, the Reset button should not be used.





NOTE: “B" will replace all instances of "A" when the cable size used to power the BN is larger than 10AWG.

Physical Connection Sequence

It is recommended that the physical connections be installed to the BN *after* the BN is properly mounted and aimed and that the following steps be performed in the order described. Please refer to the diagram on the previous page when going though these steps.

Step 1. Pre-assemble the Harting DC pigtail + upper lightning arrestor with attached grounding wire + Belden 5240F1 or equivalent + lower lightning arrestor. It is recommended that these items be assembled and lab-tested before installation onto the BN mounting site.

Step 2. Install the grounding wire (6 AWG) onto BN enclosure.

Step 3. Install the Harting DC pigtail assembly into the power port.

Step 4. The LEDs on the bottom side of BN can be used to verify operation (see the “Booting” section of this document)

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

Step 5. Pre-assemble the Harting RJ45 pigtail + upper lightning arrestor + grounding wire+ shielded CAT5e/CAT6 + lower lightning arrestor for out-of-band management connection. It is recommended that these items be assembled and lab-tested before installation onto the BN mounting site.

Step 6. Install the Harting RJ45 pigtail assembly into MGMT Gigabit Ethernet of the BN for out-of-band management.

Grounding

Step 1. Attach the ground system to the chassis. There are 2 stainless M6 screws installed on the BN that are used for attaching a 6 AWG (13 mm^2) ground wire.

Step 2. The ground lug for the BN is provided and must be used. Torque the screw to 6 N-m (4.5 lb.-ft). The grounding wire should not limit the adjustment of the antenna.

NOTE: Install the grounding after aiming and final torque of all related fasteners.

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

Booting

Upon receiving power, the BN will undergo the booting and initializing process for a period of 5-7 minutes. There are a set of LEDs on the bottom edge of the BN that will cycle through patterns and colors during this time.

At the end of this period, the LEDs will settle into one of a few common states as described below.

LED INDICATOR	LED BEHAVIOR	DESCRIPTION
POWER		The LED is solid green: The system is powered.
LINK		The LED is solid green: The BN has established an RF link to at least one RN.
STATUS		The LED is solid green: The system has booted successfully.
DATA		The LED will blink occasionally at random intervals: This confirms a data connection (DATA 1, 2 or 3.)
MGMT		The LED is solid green: This confirms a connection on the MGMT port.

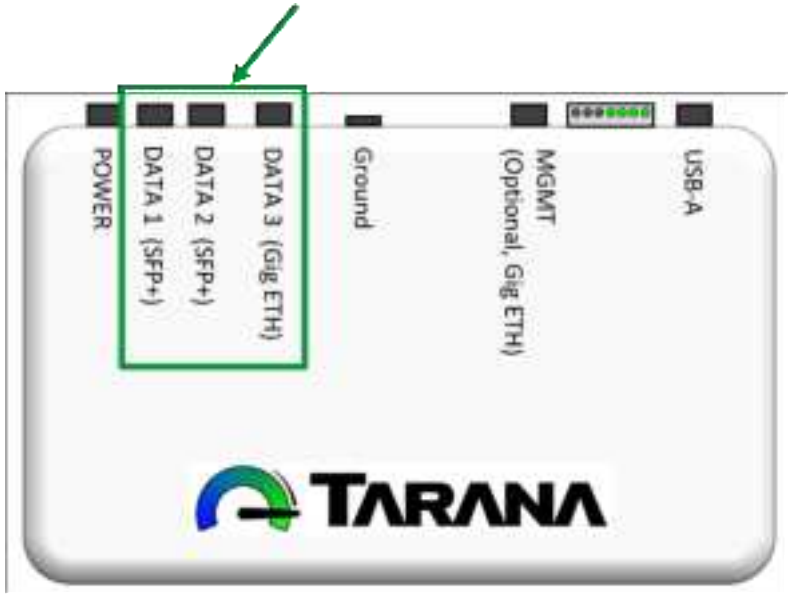
Management Paths BN Web UI

In-Band Management

In-band Management refers to managing the BN via the physical data ports (DATA 1, DATA 2, DATA 3). The BN's web UI can be accessed by typing the default in-band management IP of **192.168.11.2** into a browser window.

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 must be enabled through the web UI.

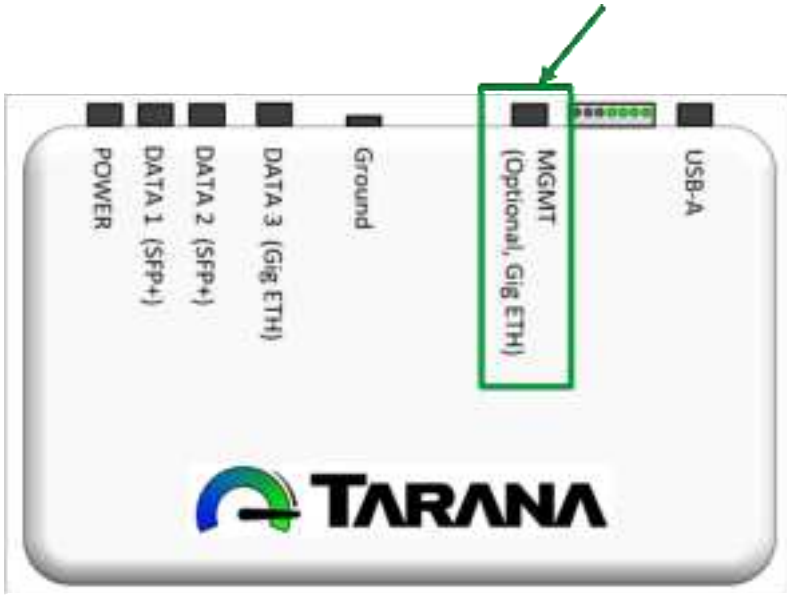
It is optional to assign in-band management traffic to a VLAN.



Out-of-Band Management

Out-of-band (OOB) Management refers to managing the BN via the physical MGMT port. The BN's web UI can be accessed by typing the default OOB IP of **192.168.10.2** into a browser window.

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 must be enabled through the web UI.



TCS Confirmation

To verify the BN is accessible from Tarana Cloud Suite (TCS), use an Internet connection external to the BN. Note: This can be done from the NOC.

Step 1. Login to Tarana Cloud Suite (TCS) using the URL: cloud.taranawireless.com

For username and password, contact the TCS system administrator.

Step 2. From the left column, click on "DEVICES".

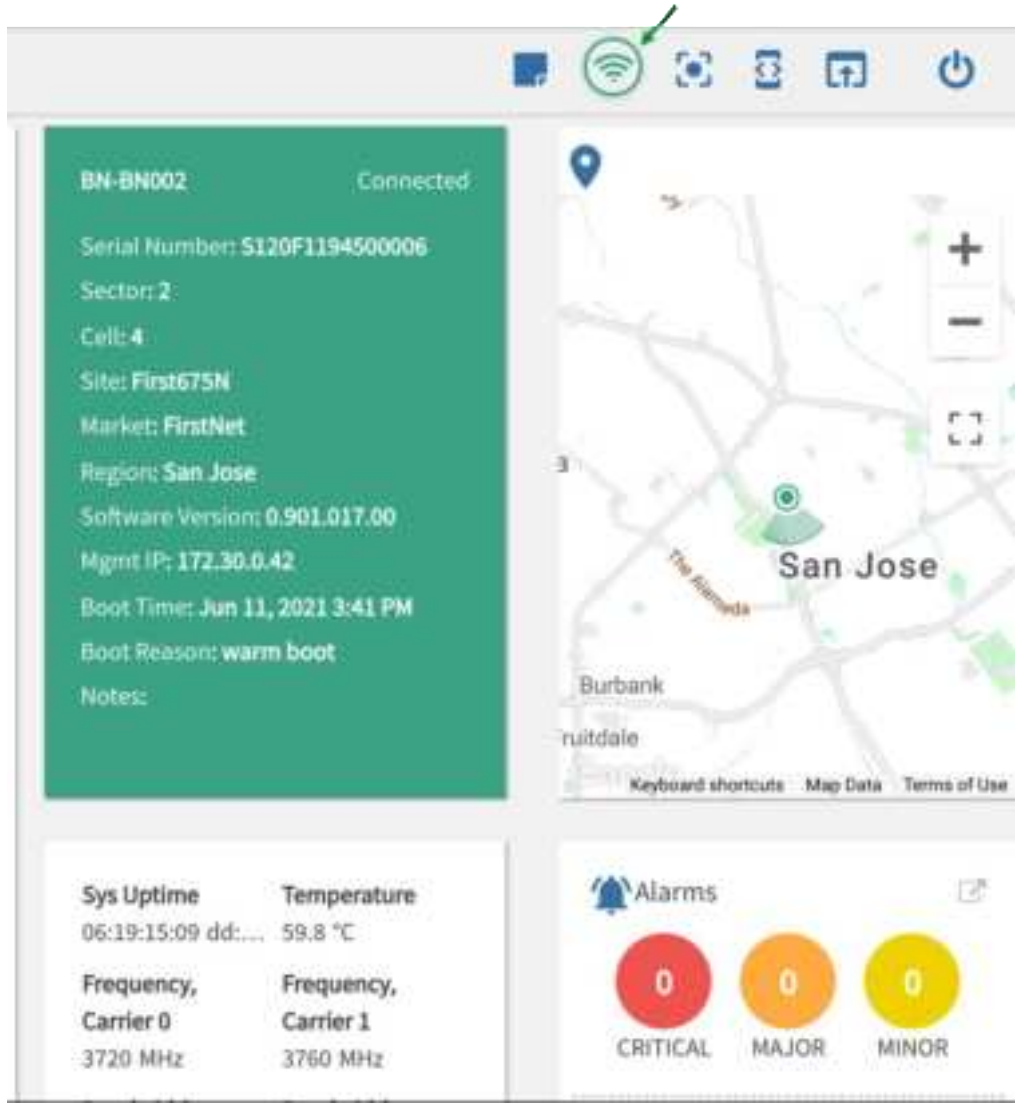
Step 3. Verify that "BN" is selected from the RN/BN switch.

Step 4. Verify the BN is online as indicated by its Serial Number being in green text.

Unmute Radios

Step 5. Click the "transmitting" icon in the upper right corner of the window.

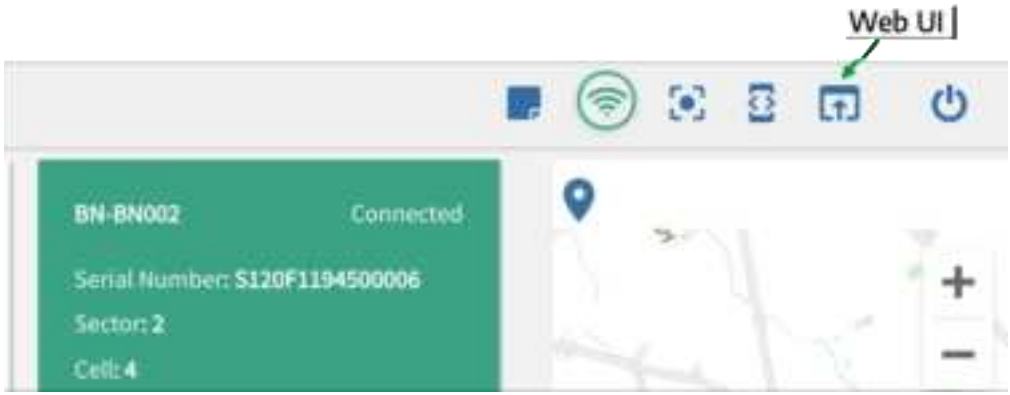
Note: This is a dynamic setting. Once clicked, the icon will turn green and the BN radios will begin transmitting. OP Admin rights are required for this step.



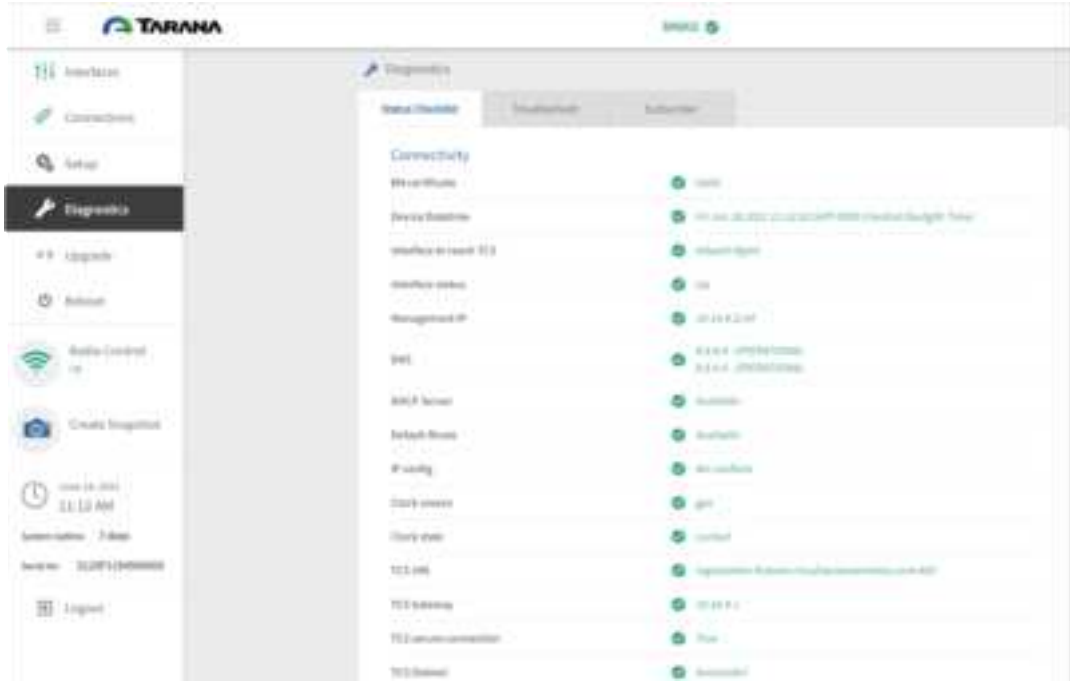
Diagnostics

From TCS, login to the BN's Web UI. NOTE: This will require OP Admin rights.

Step 1. Log in to the BN Web UI



Step 2. Check the Diagnostics page. This is an important step and provides information if something is not working as expected.



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 transferrable. 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.

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