

FW-300i Quick Installation Guide



Online Help Portal: [support.blinqnetworks.com](https://support.blinqnetworks.com)

SYSTEM PARAMETERS		
SYSTEM		
Configuration	3 x eNBs with frequency reuse 2 and 3	
Connectivity	Default: 1 x Copper 1000BaseT; Optional: 1 x SFP	
Synchronization	Integral GPS antenna (GPS, GLONASS, BeiDou), Optional: External GPS, 1588v2	
ANTENNA SPECIFICATIONS		
Antenna System	3 antennas with 60deg azimuthal coverage each; 3 x 2x2 MIMO radios with spatial multiplexing/Tx & Rx diversity	
Antenna Gain	17dBi	
RADIO SPECIFICATIONS		
3GPP LTE Feature Set	Release 10 (upgradable to Release-13*) LTE-Advanced feature support: 2x2 MIMO, DL 256QAM* , UL 64-QAM, 3CC Carrier Aggregation (CA)*	
Frequency Band	3.40-3.80GHz (LTE Band 42/43), 3.55-3.70GHz (LTE Band 48 - CBRS)	
Transmit Power	LTE Band 42/43: -10dBm up to 36dBm LTE Band 48: -10dBm up to 30dBm (33dBm for Sector 1)	
Channel Bandwidth	3x10MHz or 3x20MHz (15MHz*)	
PERFORMANCE		
Throughput	L2 aggregate uplink and downlink: 115 Mbps per eNB Supports up to 480 Mbps per eNB*	
	TDD Configuration	Max. Throughput (per eNB)
	2-7 (default)	DL: 105Mbps UL: 10Mbps
	1-7	DL: 83Mbps UL: 20Mbps
OPERATIONS, ADMINISTRATION AND MANAGEMENT (OAM)		
Configuration	WebUI / CLI, radio, Ethernet performance monitoring	
EMS Integration	SNMP v2c	
OAM Protocols	HTTP, HTTPS, FTP, SFTP, SSH	
MECHANICAL/ENVIRONMENTAL/COMPLIANCE		
Dimensions (L x W x D)	13.78in x 22.4in x 8.9in (350 x 570 x 227 mm)	
Weight	30.8 lbs (14 kg)	
Survival Wind Speed	> 124 mph (200 km/hr)	
Operational Temperature	-40 to 60 degrees Celsius (-40 to 140 degrees Fahrenheit)	
Enclosure Protection	IP67	
POWER		
Power Consumption	180 W maximum	
Current Draw (AC/DC)	4 Amp maximum	
Power	48 VDC	
Circuit Breaker	20A max	

\* Software upgrade required

FW-300i SETUP

**Recommendation:**  
Pre-configure units in the warehouse then deploy  
Record Serial number, MAC, location for each radio

- Please prepare tools necessary for each item:**
- 1/4 in. Slot Head Screw (for DC surge protector)
  - 1/4 in. Phillips Screw (for DC surge protector)
  - 3/8 in.-16 Hex Nuts (11/16 in. Width)
  - 1/4 in.-20 Hex Screw (7/16 in. Head Width)
  - 3/8 in.-16 Hex Screw (9/16 in. Head Width)

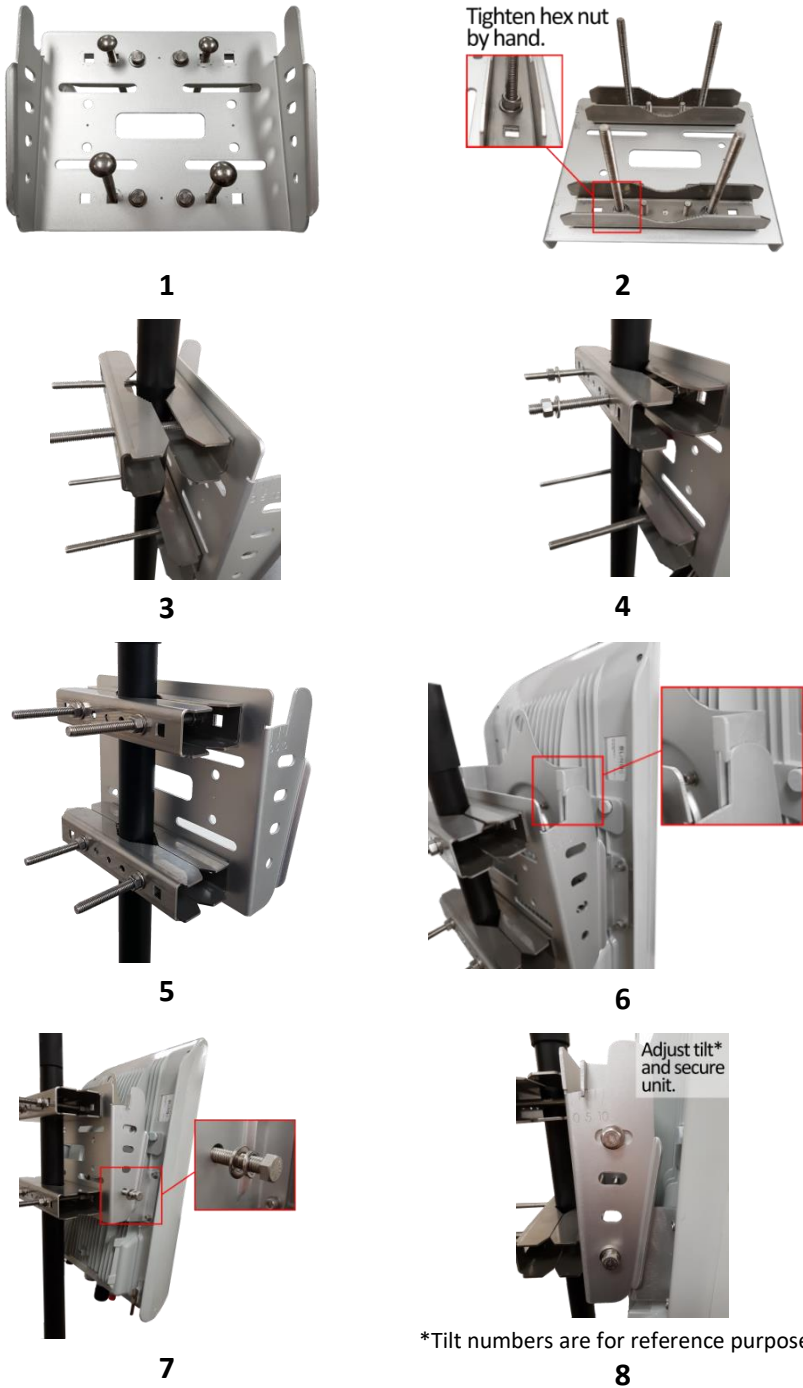
RECOMMENDED TORQUE VALUES

ITEM	TORQUE
3/8 in.-16 Hex Screws	16.3Nm or 12lb-ft
3/8 in.-16 Hex Nuts	16.3Nm or 12lb-ft
1/4 in.-20 Hex Screw (Grounding)	5Nm or 3.69lb-ft

CABLING REQUIREMENTS

- Power Cables (Prepare the proper extension cable)
- Outdoor Rated Ethernet Cable
- Grounding Cable
  - ➔ Make sure all cables and extensions are weatherproofed

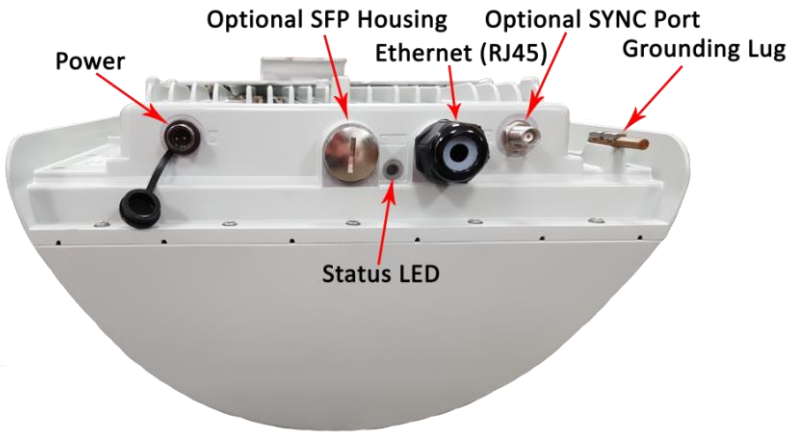
INSTALLING POLE MOUNT AND UNIT



\*Tilt numbers are for reference purposes.

CABLES

CABLE CONNECTIONS ON FW-300i

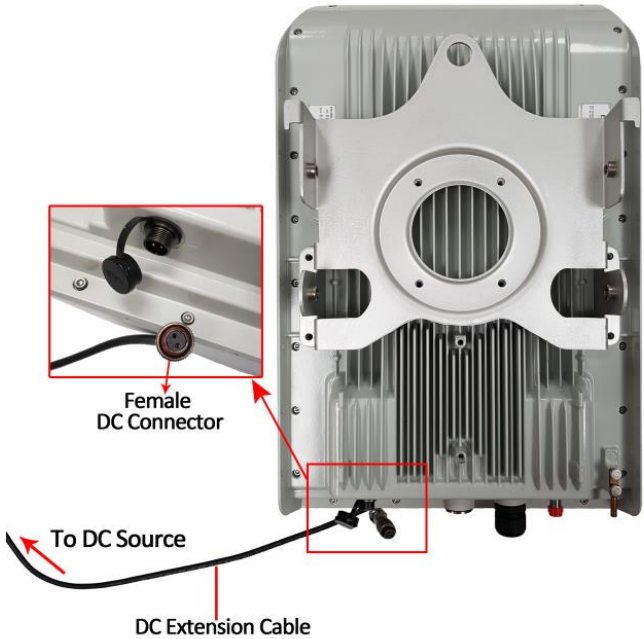


If you notice any of the connectors on the unit is loose or broken:

1. Do **NOT** plug in any cables
2. Stop installing the unit and
3. Call BLiNQ Networks Technical Support

CONNECTING TO DC POWER SOURCE

You can easily connect the FW-300i to your DC power source by using the DC cable that came with the FW-300i unit. This cables comes with the female DC connector on one end that is made specifically for the FW-300i unit. Plug the female DC connector into the unit. Hand-tighten the swivel nut on the female connector. **DO NOT OVER-TORQUE – Max. torque is 0.8Nm (0.6 lbf-ft).** Connect the other end of the cable to your DC power source or the surge protector that came with the 150ft/300ft DC extension kit.



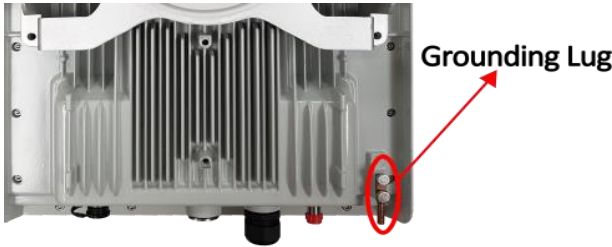
CONNECTING TO AC POWER SOURCE

The optional AC/DC Power Kit comes with a Universal AC/DC Power Supply that will enable you to connect to your AC power source. Please see FW-300i Installation Guide for more details.

AC CABLE COLOR CODE

ON POWER SUPPLY KIT	NORTH AMERICAN EQUIVALENT
ACL (Brown)	AC Line (i.e., in USA - Black)
ACN (Blue)	AC Neutral (i.e., in USA - White)
Ground (Green/Yellow)	AC Ground

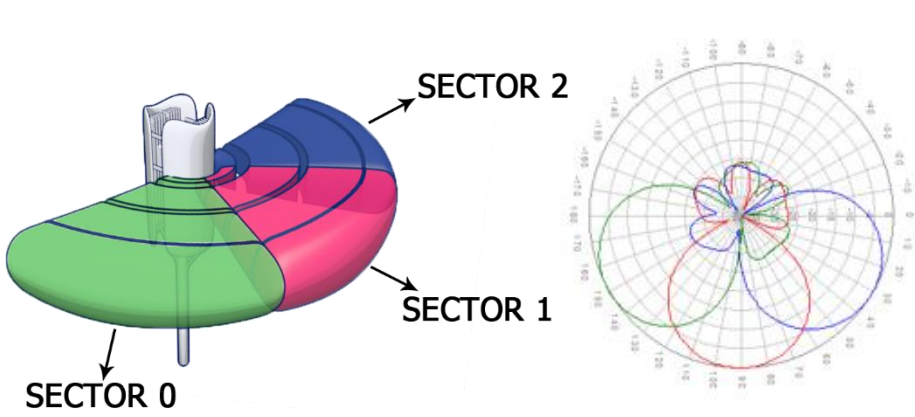
GROUNDING



LED INDICATORS

LED COLOUR	MEANING
Solid Red	Initial Power-up
Blinking Red	Critical Fault
Blinking Amber	Booting
Solid Amber	Radio operational. One or more non-critical faults
Solid Green	Radio operational. No faults.

FW-300i SECTORS



FW-300i ADJUSTMENTS

A few notes to keep in mind while adjusting your FW-300i unit. Generally, increasing the downtilt results in less coverage; lowering the FW-300i height (keeping tilt the same) also has the same impact.

Electrical Tilt: 0 degrees	Mechanical Tilt: 0 - 10 degrees
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WEBUI CONFIGURATION

**NOTE:** Please refer to FW-300i User Guide for detailed WebUI configuration steps.

DEFAULT CONFIGURATIONS

The default configuration settings on the FW-300i include:

DHCP: ON

Fixed, non-routable local craft IP address: 169.254.1.1

WebUI: Enabled

Channel bandwidth: 20 MHz

Operating Frequencies: B42/43 - 3620,3640,3660MHz (eARFCN: 55940, 56140, 56340) / B48 - 3580,3600,3620MHz (eARFCN\*: 55540, 55740, 55940)

TDD Frame Configuration: 2 (Special Subframe: 7)

Cell State: Enabled

Transmit Power: 23 dBm

Clock source: GPS

CBSD: Certificates installed; parameters not configured.

\*Multiband Frequency Indicator is enabled by default, therefore the unit will also transmit corresponding Band 42/43 EARFCN for the operating frequencies.

LOGGING IN

**Local login:** SSH or WebUI. Use Local Craft IP: 169.254.1.1

**Login from network:** DHCP address or manually configured IP.

- Default Username/Password: admin/admin

SYSTEM SETUP

- On the WebUI, navigate to **Setup > System > Network Connectivity**
- Choose **Static** to assign IP address manually for WAN interface or use **DHCP** to configure automatically.
  - Set management **IPv4 address**, **Subnet Mask** and **Default Gateway** if you chose Static
- Commit any changes by clicking the **Commit** button in the top right corner.

CARRIERS SETUP

- Navigate to **Setup > Carriers > Carriers Baseline Parameters**
  - Under “**Channel Size**”, set radio bandwidth to either **10MHz** or **20MHz** (drop down menu).
  - Assign the operating frequency mode (**EARFCN** or **Frequency**) from the drop down menu in **Frequency Setting Mode**.
- Go to **Setup > Carriers > Cells 0-2 RF Parameters**
  - Enable or disable cells and set **Carrier Frequency** and **Carrier TX Power** as desired.
- Commit any changes by clicking the **Commit** button in the top right corner.

LTE BASELINE SETUP

- Navigate to **Setup > LTE Baseline > LTE Baseline Parameters**
  - Define new/different values (if needed) for:
    - Baseline eNB ID (should be unique per FW-300i)
    - PCI Seed Value
  - BLiNQ Networks recommends keeping the rest of the fields with their default values.
- Go to **Setup > LTE Baseline > EPC Settings**
  - Define the values for:
    - **PLMN ID**
    - **MME Name** and **MME Host** (IP Address) External EPC (under **MME Host**) or contact BLiNQ Support if using embedded EPC.
- Commit any changes by clicking the **Commit** button in the top right corner.

SAS

SAS server connectivity is required for operation within LTE Band 48. Operating frequency, RF transmission and transmit power per sector are configured based on the grants received by the SAS server.

To configure your unit CBSD settings, please navigate to **Setup > CBSD**.

COMMON SETTINGS

- **User ID:** A string of character generated by your SAS provider to register the CBSDs to the SAS server.

- **SAS Server URL:** The link to your SAS server of choice. For the list of these links, please visit our knowledge base <https://support.blinqnetworks.com/portal/en/signin>
- **CPI ID:** The code provided to the CPI by the company who has certified the installer.
- **CPI Name:** The name of the installer (Last name, First name)

ANTENNA SETTINGS

- **Azimuth:** The heading value of the FW-300i after installation
- Tilt: The configured tilt settings per installation outcome.
  - The FW-300i incorporates 3 different eNBs / CBSD within one box. Since only sector 1 (middle sector) is configurable from an azimuth and tilt perspective, the software will calculate the heading and tilt for the other two cells, and request their respective grants if enabled.

SYNCHRONIZATION

FW-300i contains integrated GPS receiver.

- Holdover period after loss of sync: 10 minutes
- PPS port also available for external GPS integration

**Note:** Radio stops transmitting after holdover period expires.

EPC SETUP

If you are using BLiNQ’s EEPC (Embedded Evolved Packet Core) system, please sign up to our support portal and navigate to our knowledge base to find instructions on how to download and install our software and license.

- Please bear in mind that in order to use the EEPC, a license need to be purchased upfront.

If you are using a centralized third party system, refer to the manufacturer instructions.

CONFIGURATION

- Navigate to **Setup > LTE Baseline > EPC Settings**
  - Define the **PLMN ID**
  - Choose your EPC Option: **External** or **Embedded**
- For External EPC, please enter the **MME Name** and **MME Host** (IP Address). Click on the “**Commit**” button on the top right corner to apply the changes. Then refer to its manufacturer instructions for further details.
- For Embedded EPC:
  - Click on “**Commit**” at the top right corner to apply the changes so that a new section will be available in your menu bar.
  - Go to **Setup > Embedded EPC**
  - Click on “**Add APN**” to open up a window that will enable you to add an APN. Enter the name and network address that you would like to use. Once you have filled in the fields, click on “**+ Add APN**” to commit the changes.
  - Under the “**UE Templates**” section, you can add UE templates which serve as the plans that you offer throughout the system. You will have the option to assign UL/DL speeds and link each template to an existing APN via the drop-down menu.
  - Add your subscriber by navigating to the lower section of the page and clicking on “**+ Add UE**”. Fill in the required fields (IMSI, K, OPC, AMF) on the popup window and click on “**+ Add UE**”
    - SIM Cards information and security parameters provided by your vendor will be needed.
    - You will also have to assign a UE template to each UE.

TROUBLESHOOTING		
SYMPTOM	POSSIBLE CAUSE	SOLUTION
State LED stuck continuously on red or amber	OS or configuration mismatch preventing the unit from entering functional state	Reboot unit. If problem persists over multiple reboots, contact BLiNQ Networks Support.
FW-300i cannot be accessed	VLAN mismatch	Connect computer to the FW-300i Ethernet port, open <a href="https://169.254.1.1">https://169.254.1.1</a> and verify configured VLAN (exchange with the craft IP is always untagged)
	Wrong IP is set	Connect computer to the FW-300i Ethernet port, open <a href="https://169.254.1.1">https://169.254.1.1</a> and verify that configured IP address, subnet mask and default gateway are set properly
	No dynamic IP address on FW-300i	If the FW-300i is configured for DHCP, verify your network and DHCP Server configuration
	Browser uses HTTP instead of HTTPS	Connect to the FW-300i using <a href="https://&lt;FW-300i_IP_Address&gt;">https://&lt;FW-300i_IP_Address&gt;</a>
	Forgotten username/password	Contact Blinq Support for recovery credentials
FW-300i unable to form S1 link with EPC	GPS is not synchronized	Make sure that the system clock source has been selected to GPS under Setup > Systems > System settings. If the unit is being set up for the first time, please ensure that it has outside visibility and the top of the unit is not heavily obstructed. Please keep in mind that after power disruption that is longer than 10 minutes, GPS synchronization may take up to 45 minutes.
	Wrong MME IP address set	Verify the MME IP address on FW-300i
	MME unreachable	Verify that there is network connectivity between FW-300i and MME
	SCTP/GTP filtering	Verify that firewall along the path does not filter SCTP or GTP traffic
CPE unable to form link with FW-300i	eNB related misconfiguration on EPC	Verify on EPC that eNB is allowed to connect to it (typically EPC will either work in unrestricted mode that allows any eNB to connect, or each eNB has to be allowed explicitly)
	Link is down due to loss of GPS sync	Reboot the FW-300i.
	Wrong RF channel number	Verify the RF channel number configured on CPE to confirm that it matches to FW-300i
	APN misconfiguration	Verify the APN configured on CPE is the same as in the CPE profile on EPC
CPE unable to pass data traffic	Cell range misconfiguration	Verify FW-300i cell range parameter is larger or equal to the distance of the furthest CPE
	Link is down	Confirm that the RF channel number is correctly configured on CPE. Restart CPE to trigger network entry again
	Link quality is poor	Analyze the link performance metrics (RSRP, CINR, Tx Pwr) on the CPE to determine if it's being served by the best available sector. Antenna orientation optimization may be required.
	APN misconfiguration	If CPE is operating in bridge mode, ensure that on EPC there is an APN defined for user traffic.
BLiNQ SUPPORT		

Signup to our BLiNQ Support Portal and navigate the knowledge base to access our latest document releases and technical guides.

You can sign up by sending an email with a related inquiry to [support@blingnetworks.com](mailto:support@blingnetworks.com) or simply head to <https://support.blingnetworks.com/> to create an account.

Visit our FAQs to find items such as:

- FW-300i User Guide
- How to upgrade the FW-300i to the latest software release?
- Full troubleshooting guides
- And many others