



ePMP™

Quick Start Guide

System Release 1.0

- Upgrade Notice
- Install Connectorized Radio
- Install Integrated Radio
- Power On
- Configure Units for Radio Link

SPECIAL SOFTWARE UPGRADE NOTICE

Important! All users of ePMP product users are strongly encouraged to upgrade both the Synchronized and Integrated units to the latest SW version 1.1.6. ePMP software updates may be downloaded from the Cambium Support website. Upgrading to ePMP Software Release v1.1.6 introduces several new features and bug fixes to enhance your ePMP deployment. For instructions on upgrading an ePMP device, see the *ePMP User Guide*. When upgrading a GPS-synchronized connectorized device from the factory, please perform the upgrade to v1.1.6 twice to ensure that both of the device software banks (active and backup) are updated. When upgrading multiple v1.0.3 integrated devices, ensure that the browser cache is cleared at the beginning of the upgrade process.

Installation features and improvements included in v1.1.6

- ePMP Station LEDs indicate when the radio is scanning for Access Points. Upon registration, the Station LEDs indicate the received signal level (RSSI). See the ePMP User Guide or the ePMP Installation Guide for more information about the ePMP radio LED functionality.
- The Station web management tab Monitor, Wireless Status contains an Available AP List table which displays in-range AP SSID, MAC address, Frequency, Channel Bandwidth, CINR, RSSI, Network Entry State, Time Since Last Network Entry, Time Since Last Scan, and Security Mode.
- The Station parameters AP RSSI Threshold and AP CINR Threshold may be configured to ensure that the Station only registers to APs which provide the STA with RSSI and CINR levels meet the requirements specified in the thresholds.
- Additional user login levels “installer” and “home” providing two additional restricted views of the device web management interface.
- Improved Spectrum Analyzer

Performance features and improvements included in v1.1.6

- Support for Maximum Information Rate (MIR) configuration – allowing operators to set up profiles for each STA to cap throughput
- Support for 40 MHz channel bandwidth, allowing data rates up to 150 Mbps
- Support for ABAB frequency reuse to improve performance of co-located sectors. See the ePMP User Guide for detailed information.
- Improved syslog capabilities

Web management interface features and improvements included in v1.1.6

- Improved statistics display
- Additional device information (such as hardware version, software information – active and backup)
- Bug fixes

ePMP Upgrade Times

During an upgrade process the units will display the following messages in your browser screen. Please also take note of the time duration between each of the steps:

1. In the bottom left corner of your browser a file upload status will be displayed – may vary per browser used (5 sec)
2. Once step 1 is complete, the system will display “Initializing Upgrade” (3 sec)
3. Once step 2 is complete, the system will display “Update is in progress. Uploading firmware to flash” (2 min)
4. Once step 3 is complete, the system will display “Upgrade successfully finished. Waiting for reboot. You must reboot device for the changes to take effect” (38 sec)

ePMP Post-upgrade IP Addressing

If **Device IP address Mode** is set to **DHCP** and the device is unable to retrieve IP address information via DHCP, the device management IP is set to fallback IP 192.168.0.1 (AP mode), 192.168.0.2 (STA mode), 192.168.0.3 (Spectrum Analyzer mode) or the previously-configured static Device IP Address. Units may always be accessed via the Ethernet port with IP 10.1.1.254.

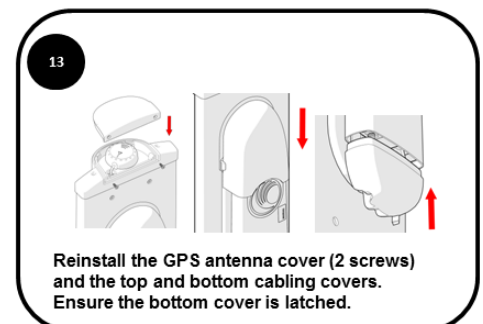
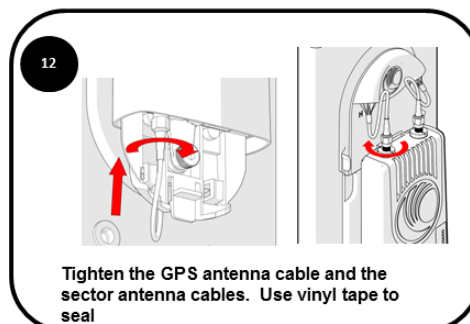
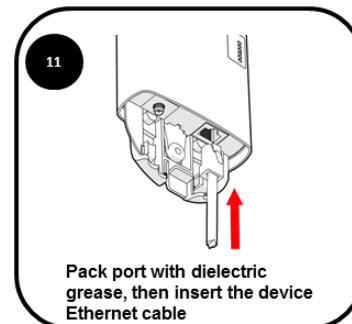
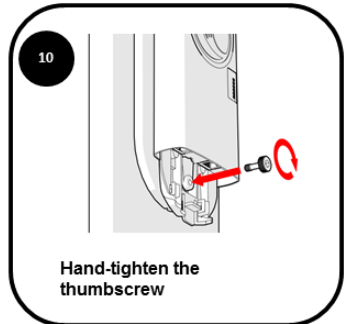
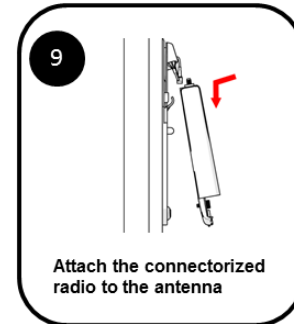
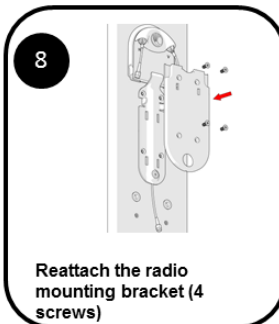
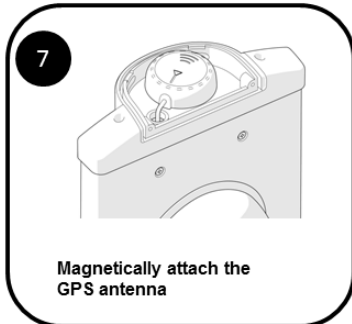
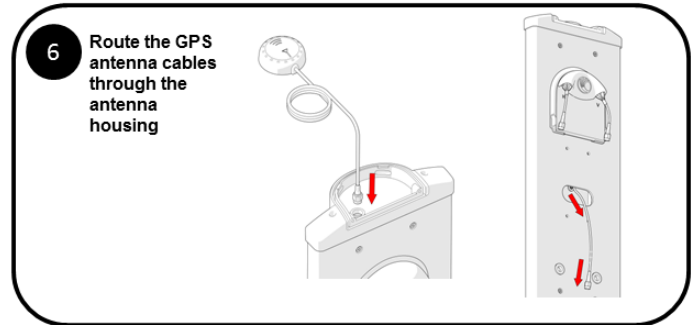
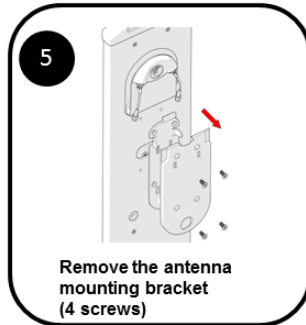
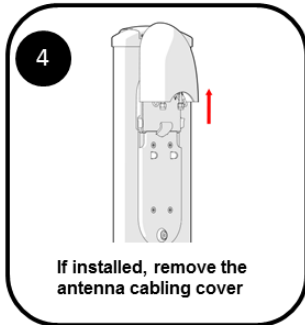
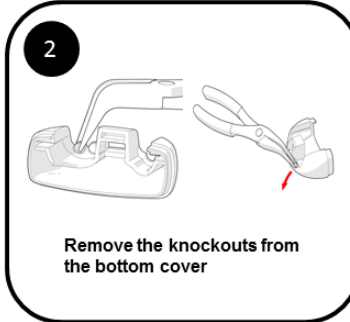
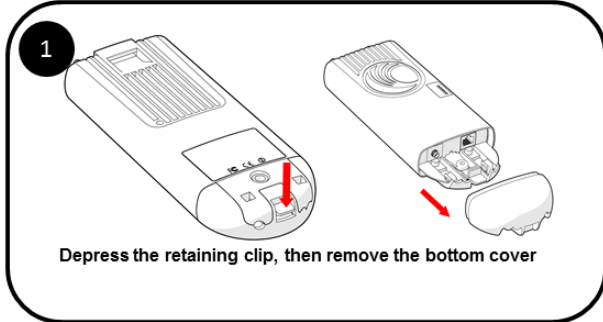
RELEASE SOFTWARE

The following software is provided with ePMP :

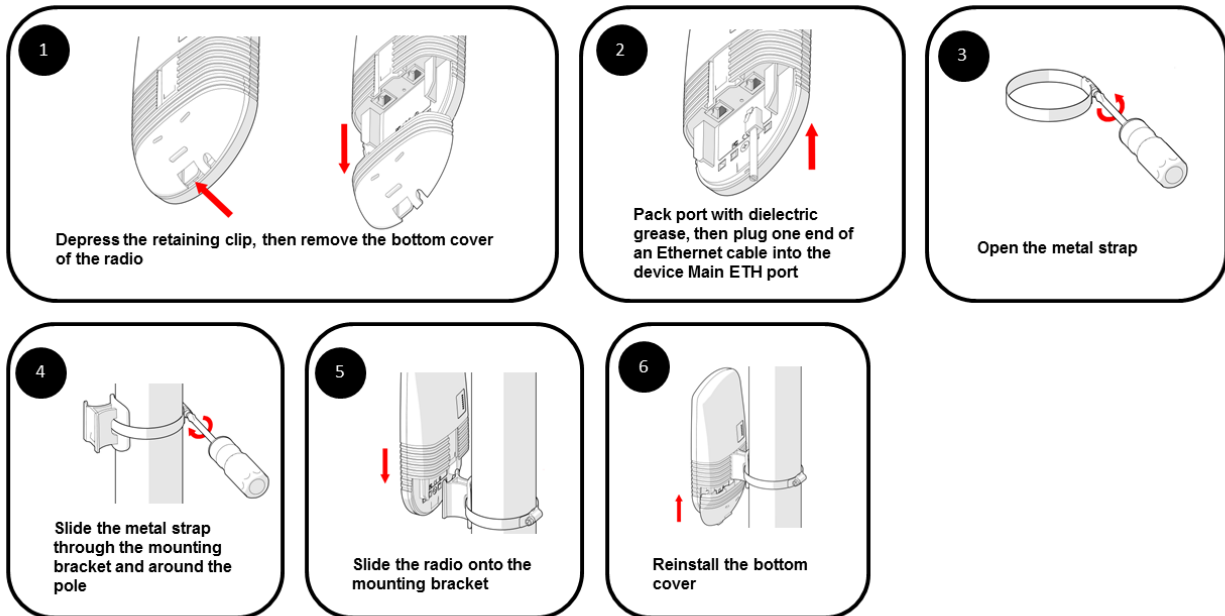
Device Description	Applicable Software Package
Connectorized Radio with GPS module	ePMP-GPS_Synced-v1.1.6.tar.gz
Integrated Radio	ePMP-Integrated-v1.1.6.tar.gz

When available, new ePMP software releases may be downloaded from:
www.cambiumnetworks.com/support/epmp/software

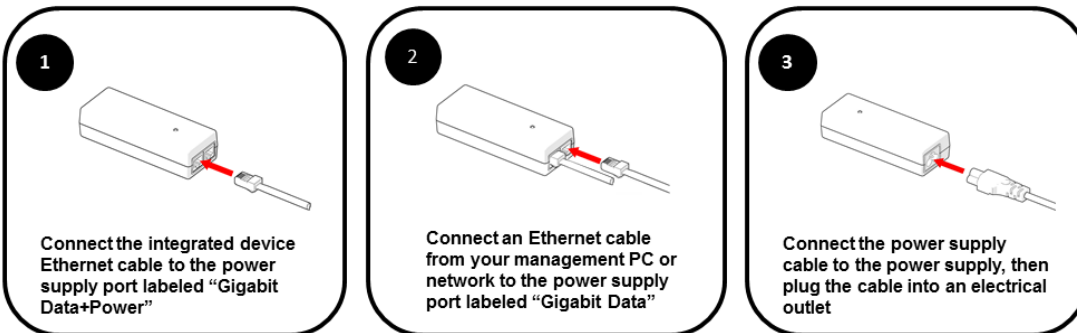
INSTALLING THE CONNECTORIZED RADIO ONTO THE ANTENNA



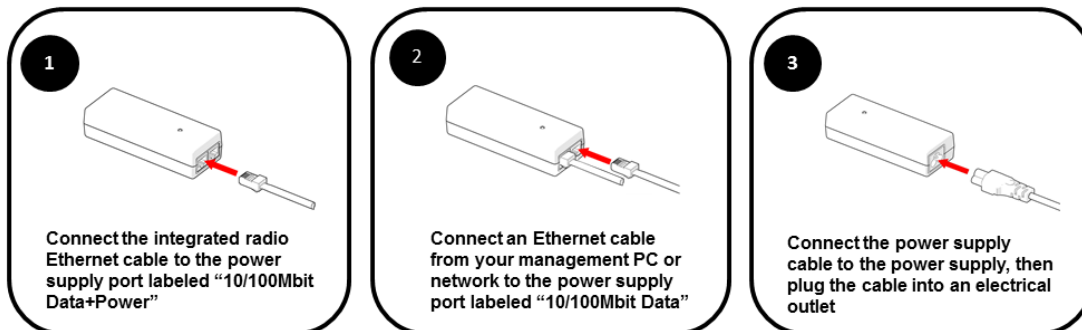
INSTALLING THE INTEGRATED RADIO



POWERING ON THE CONNECTORIZED RADIO



POWERING ON THE INTEGRATED RADIO



Connecting to the unit for management

To connect the unit to a management PC, use the following procedures:

- **Configuring the management PC** on page 6

CONFIGURING THE MANAGEMENT PC

Use this procedure to configure the local management PC to communicate with the ePMP module.

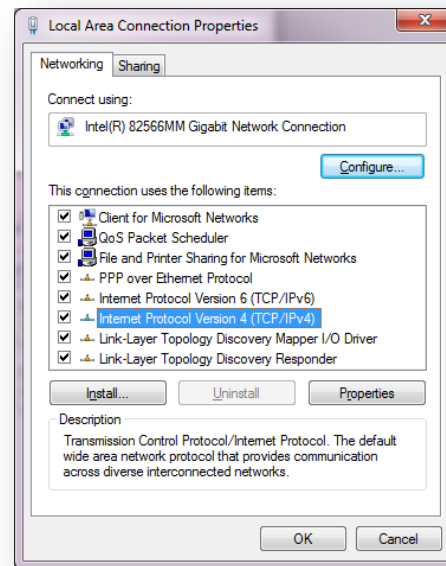
Procedure:

- 1 Select **Properties** for the Ethernet port.

In Windows 7 this is found in **Control Panel > Network and Internet > Network Connections > Local Area Connection**.

- 2 Select the Internet Protocol (TCP/IP) item:

- 3 Click **Properties**.



- 4 Enter an IP address that is valid for the 192.168.0.X network, avoiding:

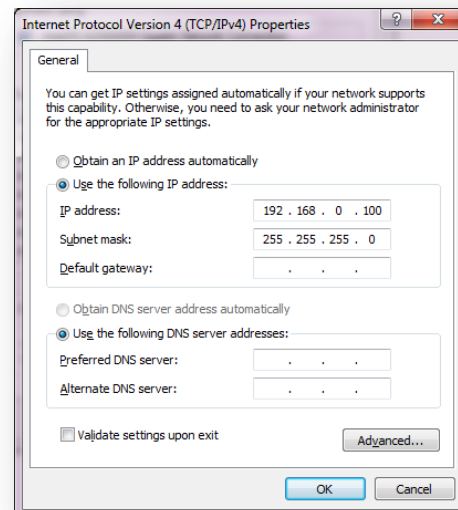
192.168.0.1, 192.168.0.2, and 192.168.0.3

A good example is 192.168.0.100:

- 5 Enter a subnet mask of 255.255.255.0.

Leave the default gateway blank.

- 6 Click OK, then click Close



Configuring AP units using the Quick Start menu

The Quick Start tab contains a listing of parameters required to configure a simple radio link and to configure requisite networking parameters. After configuring these parameters on the AP and STA and resetting both devices, the STA will be ready to associate (register) to the AP.



To configure an AP via the Quick Start menu, perform the following procedure.

Procedure:

1 Start the web browser from the management PC.

2 Navigate to menu **Quick Start**

3 Configure parameter **Device Mode**:

This parameter controls the function of the device – all ePMP devices may be configured to operate as an Access Point (AP), Station (STA), or as a Spectrum Analyzer. For initial link bring-up, choose **AP**

4 Configure parameter **Country Code**:

Country Code settings affect the radios in the following ways:

- Maximum transmit power limiting (based on radio transmitter power plus configured antenna gain)
- DFS operation is enabled based on the configured country code, if applicable
- Frequency selection limiting (based on valid frequencies for the configured **Country Code**)

Select the country in which your network will be operating.

5 Configure parameter **Frequency Carrier**:

Configure the frequency carrier for RF transmission. This list is dynamically adjusted to the regional restrictions based on the setting of the **Country Code** parameter. Ensure that a thorough spectrum analysis has been completed prior to configuring this parameter.

6 Configure parameter **AP Name (SSID)**:

The **AP Name (SSID)** is used to identify the AP, and is used to configure the STA with the appropriate AP with which to register. Ensure that this parameter is configured uniquely for each AP in the network.

7 Configure parameter **DL/UL Ratio**:

Specify the percentage of the aggregate throughput for the downlink (frames transmitted from the AP to the STA). For example, if the aggregate (uplink and downlink total) throughput on the AP is 90 Mb, then 75/25 specified for this parameter allocates 67.5 Mb for the downlink and 22.5 Mb for the uplink. The default for this parameter is 75/25.

**Caution**

You must set this parameter exactly the same for all APs in a cluster.

8 Configure parameter **Synchronization Source**:

This parameter defines the timing source for the device which can be GPS-based or internally generated. Select **GPS** if the AP will receive synchronization pulses from a connected GPS antenna. Select **CMM** if the device will receive GPS synchronization pulses from a co-located Cambium Cluster Management Module (see *PMP Synchronization Solutions User Guide*). Select **Internal** if no GPS synchronization source is available (in this mode, transmission between co-located devices will create radio interference).

9 Configure parameter **Device IP address Mode**:

If **DHCP** is selected, the DHCP server automatically assigns the IP configuration (Ethernet (LAN) IP Address, Ethernet (LAN) IP Subnet Mask, Gateway IP Address (LAN)) and the values of those individual parameters (below) are not used. To configure a simple test network, select mode **Static**.

10 Configure parameter **Device IP address**:

Internet Protocol (IP) address. This address is used by the family of Internet protocols to uniquely identify this unit on a network. To configure a simple test network, this field may be left at default (192.168.0.1).

If **Device IP address Mode** is set to **DHCP** and the device is unable to retrieve IP address information via DHCP, the device management IP is set to fallback IP **192.168.0.1** (AP mode), **192.168.0.2** (STA mode), **192.168.0.3** (Spectrum Analyzer mode) or the previously-configured static Device IP Address. Units may always be accessed via the Ethernet port with IP **10.1.1.254**.

11 Configure parameter **Device IP Subnet Mask**:

The Subnet Mask defines the address range of the connected IP network. To configure a simple test network, this field may be left at default (255.255.255.0).

12 Configure parameter **Device Gateway IP Address:**


The IP address of a computer on the current network that acts as a gateway. A gateway acts as an entrance and exit to packets from and to other networks. To configure a simple test network, this parameter may be left at default (blank).

13 Configure parameter **Authentication Type**

Open: All STAs requesting network entry are allowed registration.

WPA2: The WPA2 mechanism provides AES radio link encryption and STA network entry authentication. When enabled, the STA must register using the **Authentication Pre-shared Key** configured on the AP and STA.

14 Configure parameter **Authentication Pre-shared Key**

Configure this key on the AP, then configure each of the network STAs with this key to complete the authentication configuration. This key must be between 8 to 128 symbols. Click the visibility icon  to toggle the display of the key's contents.

15 Click the **Save** icon, then click the **Reset** icon

Configuring STA units using the Quick Start menu

The Quick Start tab contains a simple listing of parameters required to configure a simple radio link and to configure requisite networking parameters.

The screenshot displays the 'Quick Start' configuration page for a STA unit in the ePMP Station interface. The interface includes a top navigation bar with 'CONFIGURE', 'MONITOR', 'TOOLS', and 'QUICK START' tabs. The 'QUICK START' tab is active and highlighted in green.

Configuration parameters shown include:

- Device Mode:** AP, STA (selected), Spectrum Analyzer
- Country Code:** Follow AP CC
- Device Name:** Cambium-STA
- Device IP address Mode:** Static (selected), DHCP
- Device IP address:** 192.168.2.201
- Device IP Subnet Mask:** 255.255.255.0
- Device Gateway IP Address:** 192.168.2.1
- Authentication Pre-shared Key:** [Redacted]

Below these settings is a 'Preferred AP List' section with a 'collapse' button and an 'add new AP' button. A table lists the preferred APs:

#	AP SSID	Pre-shared Key
	Cambium-AP	[Redacted]

The 'Radio Frequency 20 MHz Scan List' section features a 'select all' button and an 'unselect all' button. It contains a grid of 20 MHz frequency channels with checkboxes for selection. The 5800 MHz and 5855 MHz channels are checked.

Radio Frequency 20 MHz Scan List									
5160 MHz	5165 MHz	5170 MHz	5175 MHz	5180 MHz	5185 MHz	5190 MHz	5195 MHz	5200 MHz	
5205 MHz	5210 MHz	5215 MHz	5220 MHz	5225 MHz	5230 MHz	5235 MHz	5240 MHz	5260 MHz	
5265 MHz	5270 MHz	5275 MHz	5280 MHz	5285 MHz	5290 MHz	5295 MHz	5300 MHz	5305 MHz	
5310 MHz	5315 MHz	5320 MHz	5325 MHz	5330 MHz	5335 MHz	5340 MHz	5480 MHz	5485 MHz	
5490 MHz	5495 MHz	5500 MHz	5505 MHz	5510 MHz	5515 MHz	5520 MHz	5525 MHz	5530 MHz	
5535 MHz	5540 MHz	5545 MHz	5550 MHz	5555 MHz	5560 MHz	5565 MHz	5570 MHz	5575 MHz	
5580 MHz	5585 MHz	5590 MHz	5595 MHz	5600 MHz	5605 MHz	5610 MHz	5615 MHz	5620 MHz	
5625 MHz	5630 MHz	5635 MHz	5640 MHz	5645 MHz	5650 MHz	5655 MHz	5660 MHz	5665 MHz	
5670 MHz	5675 MHz	5680 MHz	5685 MHz	5690 MHz	5695 MHz	5700 MHz	5705 MHz	5710 MHz	
5715 MHz	5735 MHz	5740 MHz	5745 MHz	5750 MHz	5755 MHz	5760 MHz	5765 MHz	5770 MHz	
5775 MHz	5780 MHz	5785 MHz	5790 MHz	5795 MHz	5800 MHz	5805 MHz	5810 MHz	5815 MHz	
5820 MHz	5825 MHz	5830 MHz	5835 MHz	5840 MHz	5845 MHz	5850 MHz	5855 MHz	5860 MHz	
	5865 MHz								

The 'Radio Frequency 40 MHz Scan List' section also features a 'select all' button and an 'unselect all' button. It contains a grid of 40 MHz frequency channels with checkboxes for selection.

Radio Frequency 40 MHz Scan List									
5170 MHz	5175 MHz	5180 MHz	5185 MHz	5190 MHz	5195 MHz	5200 MHz	5205 MHz	5210 MHz	
5215 MHz	5220 MHz	5225 MHz	5230 MHz	5270 MHz	5275 MHz	5280 MHz	5285 MHz	5290 MHz	
5295 MHz	5300 MHz	5305 MHz	5310 MHz	5315 MHz	5320 MHz	5325 MHz	5330 MHz	5490 MHz	
5495 MHz	5500 MHz	5505 MHz	5510 MHz	5515 MHz	5520 MHz	5525 MHz	5530 MHz	5535 MHz	
5540 MHz	5545 MHz	5550 MHz	5555 MHz	5560 MHz	5565 MHz	5570 MHz	5575 MHz	5580 MHz	
5585 MHz	5590 MHz	5595 MHz	5600 MHz	5605 MHz	5610 MHz	5615 MHz	5620 MHz	5625 MHz	
5630 MHz	5635 MHz	5640 MHz	5645 MHz	5650 MHz	5655 MHz	5660 MHz	5665 MHz	5670 MHz	
5675 MHz	5680 MHz	5685 MHz	5690 MHz	5695 MHz	5700 MHz	5705 MHz	5745 MHz	5750 MHz	
5755 MHz	5760 MHz	5765 MHz	5770 MHz	5775 MHz	5780 MHz	5785 MHz	5790 MHz	5795 MHz	
5800 MHz	5805 MHz	5810 MHz	5815 MHz	5820 MHz	5825 MHz	5830 MHz	5835 MHz	5840 MHz	
	5845 MHz	5850 MHz	5855 MHz						

At the bottom of the interface, the footer text reads: 'Cambium Support | Software Version: 1.1.6-RC14 | © Copyright 2013 Cambium Networks, All Rights Reserved.'

To configure an STA via the Quick Start menu, perform the following procedure.

Procedure:

- 1 Start the web browser from the management PC.
- 2 Navigate to menu **Quick Start**
- 3 Configure parameter **Device Mode:**

This parameter controls the function of the device – all ePMP devices may be configured to operate as an Access Point (AP), Station (STA), or as a Spectrum Analyzer. For initial link bring-up, choose **STA**
- 4 The **Country Code** is automatically retrieved from the AP, and does not require configuration. **Country Code** settings affect the radios in the following ways:
 - Maximum transmit power limiting (based on radio transmitter power plus configured antenna gain)
 - DFS operation is enabled based on the configured country code, if applicable
 - Frequency range of operation depending on local limitations
- 5 Configure parameter **Device Name:**

The STA Device Name is used to identify the device on the network. This parameter may be modified or left at the default value of **Cambium-STA**.
- 6 Configure parameter **Device IP address Mode:**

If **DHCP** is selected, the DHCP server automatically assigns the IP configuration (Ethernet (LAN) IP Address, Ethernet (LAN) IP Subnet Mask, Gateway IP Address (LAN)) and the values of those individual parameters (below) are not used. To configure a simple test network, this parameter should be configured to **Static**
- 7 Configure parameter **Device IP address:**


Internet Protocol (IP) address. This address is used by the family of Internet protocols to uniquely identify this unit on a network. To configure a simple test network, this field should be configured to 192.168.0.2.

If **Device IP address Mode** is set to **DHCP** and the device is unable to retrieve IP address information via DHCP, the device management IP is set to fallback IP **192.168.0.1** (AP mode), **192.168.0.2** (STA mode), **192.168.0.3** (Spectrum Analyzer mode) or the previously-configured static Device IP Address. Units may always be accessed via the Ethernet port with IP **10.1.1.254**.
- 8 Configure parameter **Device IP Subnet Mask:**

The Subnet Mask defines the address range of the connected IP network. To configure a simple test network, this field may be left at default (255.255.255.0).
- 9 Configure parameter **Device Gateway IP Address:**

The IP address of a computer on the current network that acts as a gateway. A gateway acts as an entrance and exit to packets from and to other networks. To configure a simple test network, this parameter may be left at default (blank).

10 Configure parameter **Authentication Pre-shared Key**

Configure each of the network STAs with this key (matching the AP's configured key) to complete the authentication configuration. This key must be between 8 to 128 symbols. Click the visibility icon  to toggle the display of the key's contents.

11 Configure the **Preferred AP List**

The **Preferred AP List** is comprised of a list of up to 16 APs to which the STA sequentially attempts registration. For each AP configured, if authentication is required, enter a **Pre-shared Key** associated with the configured **AP SSID**. If this list is empty, or if none of the configured APs are found, the STA will scan and register to the first AP found (with matching radio and/or authentication settings).

12 Configure parameter **Radio Frequency 20 MHz Scan List** and **Radio Frequency 40 MHz Scan List:**

The Radio Scan List determines the frequencies for which the STA will scan for AP signaling. For a simple radio network setup, click **Select All** to scan all frequencies.

13 Click the **Save** icon, then click the **Reset** icon