





USER GUIDE

Cambium Networks Installer

Release 2.7.3



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About This User Guide

This document explains how to deploy the Cambium Networks Installer[™] along with important safety measures. It is intended for use by the system designer, system installer, and system administrator.

Purpose

The Cambium Networks Installer document is intended to instruct and assist personnel in the operation, installation, and maintenance of the equipment and ancillary devices. It is recommended that all personnel engaged in such activities be properly trained.

Cambium Networks disclaims all liability whatsoever, implied or express, for any risk of damage, loss or reduction in system performance arising directly or indirectly out of the failure of the customer, or anyone acting on the customer's behalf, to abide by the instructions, system parameters, or recommendations made in this document.

Cross-references

References to external publications are shown in italics. Other cross-references, emphasized in blue text in electronic versions, are active links to the references.

This document is divided into numbered chapters that are divided into sections. Sections are not numbered but are individually named at the top of each page, and are listed in the table of contents.

Feedback

We appreciate feedback from the users of our documents. This includes feedback on the structure, content, accuracy, or completeness of our documents. To provide feedback, visit our support website: https://support.cambiumnetworks.com.

Introduction to the Cambium Networks Installer

The Cambium Networks Installer communicates with the SM LAN port through a wireless connection from a mobile device to a wireless router, as shown in Figure 1.

Figure 1



For optimal installation ergonomics, Cambium Networks recommends using a portable Wi-Fi access point (AP) with Power over Ethernet (PoE), such as the **LinkTechs PowerLINK**. The LinkTechs PowerLINK PoE patch cable is required and to ensure proper communication between the AP and the subscriber module (SM). For 450i SM installations, use a 48V power converter.

Installers can utilize a separate Wi-Fi access point (AP) in Bridge mode and a power supply to establish communication between the subscriber module (SM) and the Cambium Networks Installer.

By default, the Cambium Networks Installer is designed to communicate with factory default SMs using the IP address 169.254.1.1. Operators can also configure a custom IP address if needed.

Preparing to use Cambium Networks Installer in your network

Follow these steps to use Cambium Networks Installer in your network:

1. Acquire radio, network, and security settings.

Collaborate with your network administrator to identify the radio, network, and security settings used across networks, as well as the configuration of sectors and towers. These settings and security credentials are crucial to ensure that the SMs are properly configured by the Cambium Networks Installer and are ready to connect with the APs in your network.

2. Gather cnMaestro[™] credentials and configurations.



Note

Gathering the cnMaestro[™] credentials and configuration settings is optional.

The Cambium Networks Installer is designed to automatically onboard new SMs to cnMaestro[™]. To onboard SM devices, the network **CAMBIUM_ID** and **Onboarding Key** must be configured in the Cambium Networks Installer. The Cambium Networks Installer supports both Cloud and On-Premises cnMaestro[™] environments.

3. Prepare the wireless router.

To enable communication between the Cambium Networks Installer and the SM LAN port, the wireless router must be configured in **Bridge** mode. In this mode, packets are forwarded directly between the Cambium Networks Installer and the SM without additional routing.

Supporting Device Models

The table below describes the supported device models for the Cambium Networks Installer:

Table 1: Supporting Device Models

Device	Models
PMP 450	• PMP 450 SM
	PMP 450b SM
	• PMP 450i SM
	• PMP 450v 2x2
	Note: Firmware version 24.2 (currently in beta) or higher is required for the PMP 450v 2x2 to support the software upgrade functionality within the app.
	• PMP 450b6
ePMP	5 GHz Connectorized Radio
	5 GHz Integrated Radio
	2.4 GHz Connectorized Radio
	2.4 GHz Integrated Radio
	• 5 GHz Force 200 (ROW)
	• 5 GHz Force 200 (FCC)
	• 2.4 GHz Force 200
	• 5 GHz Force 180 (ROW)
	• 5 GHz Force 180 (FCC)
	5 GHz Force 190 Radio (ROW/ETSI)
	• 5 GHz Force 190 Radio (FCC)
	6 GHz Force 180 Radio
	6 GHz Connectorized Radio
	2.5 GHz Connectorized Radio

Device	Models
	5 GHz Force 130 Radio
	2.4 GHz Force 130 Radio
	5 GHz Force 200L Radio
	5 GHz Force 200L Radio V2
	• 5 GHz Force 300-25 Radio (FCC)
	• 5 GHz Force 300-25 Radio (ROW/ETSI)
	• 5 GHz Force 300-16 Radio (FCC)
	5 GHz Force 300-16 Radio (ROW/ETSI)
	5 GHz Force 300 Connectorized Radio without GPS (FCC)
	5 GHz Force 300 Connectorized Radio without GPS (ROW/ETSI)
	• 5 GHz Force 300-13 Radio (FCC)
	• 5 GHz Force 300-13 Radio (ROW/ETSI)
	• 5 GHz Force 300-19 Radio (FCC)
	• 5 GHz Force 300-19 Radio (ROW/ETSI)
	5 GHz Force 300-19R IP67 Radio (ROW/ETSI)
	• 5 GHz Force 300-19R IP67 Radio (FCC)
	5 GHz ePMP Client MAXrP IP67 Radio (FCC)
	5 GHz ePMP Client MAXrP IP67 Radio (ROW/ETSI)
	• 5 GHz Force 300-25 Radio V2 (FCC)
	5 GHz Force 300 CSML Connectorized Radio
	5 GHz Force 300-25L Radio V2
	• 5 GHz Force 300-13L Radio
	• 5 GHz Force 425 (ROW)
	• 5 GHz Force 425 (FCC)
	• 5 GHz Force 400C (FCC)
	6 GHz Force 4600C (ROW/FCC)
	• 5 GHz Force 4518 (ROW)

Device	Models
	5 GHz Force 4525 (ROW)
	5 GHz Force 4525L (ROW)
	• 5 GHz Force 4518 (FCC)
	• 5 GHz Force 4525 (FCC)
	6 GHz Force 4616 (ROW)
	• 6 GHz Force 4625 (ROW)
	6 GHz Force 4616 USB GPS Radio (FCC)
	6 GHz Force 4625 USB GPS Radio (FCC)
60GHz cnWave	cnWave V2000
Silvavo	cnWave V3000
	cnWave V5000
28GHz cnWave	cnWave 5G Fixed C100 CPE

Installing Cambium Networks Installer

To install the **Cambium Networks Installer** mobile application, download the application using the following links:

- For iOS
- For <u>Android</u>

Configuring the Cambium Networks Installer

Cambium Networks Installer setup

If you are using the Cambium Networks Installer application for the first time, you must configure cnMaestro[™] (if applicable), set the radio scanning parameters, and download the Subscriber Module (SM) software package. After the initial setup, you can update the configuration anytime by navigating to the **Settings** menu.

Configuring cnMaestro[™]

Follow these steps to configure cnMaestro™:

1. Open the Cambium Networks Installer (()) application from your mobile phone.

The Scanning for Device page appears.

Figure 2



2. Tap the **Settings** icon, as shown in Figure 2.

The Settings page appears.

a	
5:29 0	♥⊿∎
← Settings	
CNMAESTRO SETTINGS	
cnMaestro Server None	
None	۲
cnMaestro Cloud	0
onPremises	0
PMP SETTINGS	
Scan List Choose Bandwidth and Frequency of SM to configure	
PMP Software Images For SM software upgrade	
EPMP SETTINGS	
Scan List Choose Bandwidth and Frequency of SM to configure	
ePMP Software Images For SM software upgrade	
• •	

- 3. Select the required deployment type. The following options are supported:
 - cnMaestro Cloud

Note

• onPremises

Select the **None** option if you don't have a cnMaestro[™] account.

If you select the **cnMaestro Cloud** option, follow the steps listed in the <u>Configuring cloud server credentials</u> section.

If you select the **onPremises** option, follow the steps listed in the <u>Configuring onPremises server credentials</u> section.

Configuring cloud server credentials

Follow these steps to configure the cloud server credentials:

1. Select the **cnMaestro Cloud** deployment option.

The Cloud Settings option is displayed, as shown in Figure 4.

•	
3:32	© ♥∡∎
← Settings	
CNMAESTRO SETTINGS	
cnMaestro Server cnMaestro Cloud	
None	0
cnMaestro Cloud	۲
onPremises	0
Cloud Settings Configure your cloud server credentials	>
PMP SETTINGS	
Scan List Choose Bandwidth and Frequency of SM to configu	ire
PMP Software Images For SM software upgrade	
EPMP SETTINGS	
Scan List Choose Bandwidth and Frequency of SM to configu	ire
ePMP Software Images For SM software upgrade	
CNWAVE 28 GHZ SETTINGS	
Scan List	

a. Tap the Cloud Settings option.

The **Sign in** page appears.

© 1945 © ♥∡ I
Ƙ Cambium™ Networks Cambium Networks Installer
Sign in
😩 Email id
🔒 cambium id
ତନ୍ଦ୍ଦ onboarding key
DONE

- b. Tap **Sign in**.
- c. Enter and validate your credentials.



Note

- Internet connectivity for the mobile device is required.
- The user credentials must match the credentials created in cnMaestro[™]. For more information, see the Users section in the cnMaestro User Guide.
- After validating the credentials, you will be redirected to the **Sign in** page, where your email ID and cambium ID are auto-populated.
- The onboarding key must be pre-configured in cnMaestro[™] based on the user credentials. For more information, see the *Onboarding/Claim Device* section in the *cnMaestro User Guide*.
- d. Enter the onboarding key in the onboarding key field.
- e. Tap Done.

Configuring onPremises server credentials

Follow these steps to configure the onPremises server credentials:

1. Select the **onPremises** deployment option.

The **OnPremises Settings** option is displayed, as shown in Figure 6.

Figure 6

e	
4:11 0	•▲∎
← Settings	
CNMAESTRO SETTINGS	
cnMaestro Server onPremises	
None	0
cnMaestro Cloud	0
onPremises	۲
OnPremises Settings Configure your onPremises server credentials	>
PMP SETTINGS	
Scan List Choose Bandwidth and Frequency of SM to configure	
PMP Software Images For SM software upgrade	
EPMP SETTINGS	
Scan List Choose Bandwidth and Frequency of SM to configure	
ePMP Software Images For SM software upgrade	
CNWAVE 28 GHZ SETTINGS	
Scan List	_

a. Tap the **OnPremises Settings** option.

The Sign in page appears.

Ca	Cambium [™] Networks mbium Networks Installer
0	Cloud Server Url
Do	Email id
÷	Password
	Sign in
C 7	Installer's onboarding key
	DONE

- b. Enter the cloud server URL in the Cloud Server Url field.
- c. Enter the email ID in the **Email id** field.
- d. Enter the password in the **Password** field.
- e. Tap Sign in.
- f. Enter and validate your credentials.

Note



Internet connectivity for the mobile device is required.

- g. Enter the installer's onboarding key in the Installer's onboarding key field.
- h. Tap **Done**.

Installing Subscriber Modules (SMs)



Note

The installation and upgradation of Subscriber Module (SM) are supported in both Android and iOS operating systems.

Detecting the Subscriber Module

The Cambium Networks installer scans to detect PMP, ePMP, 60 GHz, or 28 GHz Subscriber Modules using the default IP address and credentials of the respective radios. Once it detects the SM, the home page is displayed with the information about the device.

Configuring the PMP SM

Configuring the PMP SM includes setting up the following features in the Cambium Networks Installer app:

- Device Details
- Configure Scan List
- SM software upgrade
- <u>Configure SM</u>
- AP evaluation
- SM Alignment
- Link Test
- OnBoard SM
- Installation Summary

Device Details

The **Device Details** page displays the basic details specific to each device.

You can configure the scan list on the Subscriber Module (SM) by navigating to the Settings page.

:51		◎ ▼⊿ ∎
Cambium Network	s Installer	
€ I a¥		000 000 000
Product Name C100		
ESN		
MSN		
IMSI		
Software Version 3.2		
Session Status Registered		
Operating Frequency 27000.000 MHz		Start
Polarisation Device Det	ails Work Order	
•	•	

Configure Scan List

You can configure the radio settings by selecting channel bandwidths and frequencies applicable to the overall network.

Follow these steps to configure the radio settings for PMP devices:

1. From the landing page, tap the **Settings** (5) icon.

The **Settings** page appears.

5:29 🛛	▼⊿∎
← Settings	
CNMAESTRO SETTINGS	
cnMaestro Server None	
None	۲
cnMaestro Cloud	0
onPremises	0
PMP SETTINGS	
Scan List Choose Bandwidth and Frequency of SM to configure	
PMP Software Images For SM software upgrade	
EPMP SETTINGS	
Scan List Choose Bandwidth and Frequency of SM to configure	
ePMP Software Images For SM software upgrade	
• •	

2. From the **PMP SETTINGS** section, tap the **Scan List** option.

The Configure Scan List page appears.

Figure 10



3. Select the required channel from the channel scan list. For example, 5.7GHz

The SM Bandwidth page appears.

Figure 11



4. Enable the required bandwidth option from the list. For example, 5MHz.

The SM Frequency page appears.

Figure 12

9 C		-
5:30 ← SM Fre	quency	© ▼⊿ ∎
Select Fre	equencies to Scar	n (5.7GHz)
5727.5	5730.0	5732.5
5735.0	5737.5	5740.0
5742.5	5745.0	5747.5
5750.0	5752.5	5755.0
5757.5	5760.0	5762.5
	Done	
•	٠	

5. Select the required frequency(s) to scan.

SM software upgrade

The SM software upgrade page is used to update the software version of Subscriber Module (SM). Software images can be downloaded and pushed to the SM. The current SM version is displayed on the **Device Details** page, as shown in Figure 13.

An upgrade icon appears (1) next to the SM version.

• —	
5:29	◊ ▼⊿ ∎
Cambium Networks	Installer 🌏 :
ے محمد ا	
Product	
MAC Address	
Serial Number	
Software Version CANOPY 22.1.1 SM 1	
Session Status REGISTERED	
Color Code 35	
Channel Frequency 5800.0 Mhz	🖍 Start
Channel Bandwidth	_
Device Deta	ils Work Order
•	•

Follow these steps to upgrade the SM software:

1. Tap the upgrade icon (¹) to navigate to the SM software upgrade page, as shown in Figure 14. Initially, all available software versions are listed.



Figure 14

- 2. Tap the refresh icon (C) at the top-right corner to get the latest available software versions list.
- 3. Tap the download software icon () to download the corresponding software version onto your device.
- 4. After the download is successful, the download icon is replaced by an install icon (Install).
- 5. Tap Install to initiate the installation of the selected software on the Subscriber Module (SM).

You can also navigate to the SM Software upgrade page from the **Settings** page. On the **Settings** page, the Software images option is available in the **PMP SETTINGS** section.



To download and upgrade the software, your device must be connected to the internet.

Note

Configure SM

SM configuration includes configuring SM security, Color code, and IP settings for the **Pre-shared key** and **AAA** security options.

Configuring SM for the Pre-shared key option

Follow these steps to configure SM for the **Pre-shared key** security option:

1. From the **Security** section, select the **Pre-shared key** option.

The following page appears.

5:31		◎ ▼⊿ ∎
← Configu	ire SM	<u></u>
Cevice Accessible	REGISTERED Color Code 35 5800.0 @ 10MHz	•
Security	—	
O None 💿	Pre-shared key	O 444
<pre>128 bit Hex key</pre>		•
<pre>256 bit Hex key (for v15.2+ <default></default></pre>	only)	•
Radio		
Color code		:
	Back	Next
4	•	

- 2. Enter the 128 bit hex key in the **128 bit Hex key** field.
- 3. Enter the 256 bit hex key in the 256 bit Hex key (for v15.2+ only) field.
- 4. In the **Radio** section, enter the color code in the **Color code** field.
- 5. Navigate to the IP Configuration section.



- 6. In the **IP Configuration** section, complete the following actions:
 - a. Enter the SM name in the **SM Name** field.
 - b. Enter the SM height in the SM Height (meters) from ground level field.

7. Tap **Next**.

The SM is configured successfully.



Configuring SM for the AAA option

Follow these steps to configure SM for the **AAA** security option:

1. From the **Security** section, select the **AAA** option.

The following page appears.



- 2. Select a username from the AAA Username drop-down list.
- 3. Enter the password in the **AAA Password** field.
- 4. In the Radio section, enter the preferred AP SSID in the Preferred AP SSID field.
- 5. Navigate to the IP Configuration section.



- 6. In the **IP Configuration** section, complete the following actions:
 - a. Enter the SM name in the **SM Name** field.
 - b. Enter the SM height in the SM Height (Meters) from ground level field.

7. Tap **Next**.

The SM is configured successfully.

AP evaluation

Adjust the SM location and re-evaluate if necessary. Configuring the DHCP option 66 may prohibit SM LAN access upon registration. You can manually enter the color code for PMP or preferred AP SSID for ePMP without performing an **AP evaluation**. This will display the list of available APs on the SM faster. If needed, you can restart the AP evaluation, which will perform a new AP scan on the SM.



Nearby APs

Nearby APs are displayed on maps where you can view the relative location of the AP with respect to the GPS location of the phone. You can calibrate the mobile device to locate the relative position of the AP with respect to the location. Nearby towers are available if cnMaestro[™] is configured, and Cambium Networks Installer displays the nearest visible APs, as shown in Figure 21.



SM Alignment

Note

After connecting to an AP, Cambium Networks Installer displays an **SM Alignment** page to finalize SM positioning adjustments. To achieve optimal link performance, ensure the Receive Power Level is at its maximum during alignment by adjusting the SM's direction.



Proper alignment is important to prevent interference in other cells.

Figure 22

• =	
5:33	0 ▼⊿ ∎
← SM Alig	nment 😪
Cevice Accessible	REGISTERED Color Code 35 5800.0 @ 10MHz
Best - 83.8 dBm	Current -84.8 dBm
Signal	Strength Ratio : 14.0 dBm
-10	
-20	
-30	
-40 -	
-50 -	
-60 -	
-70 -	
-80	
-90	
	Back Next
•	• •

Tips for alignment

- Slowly adjust the angle of the SM, sweeping through the adjustment angles at least twice to match the current receive power level as closely as possible to the best receive power level.
- The Signal Strength Ratio (SSR) displays the ratio of the vertical radio path received signal power to the horizontal radio path received signal power. This ratio can help identify multipath conditions (a high vertical-to-horizontal ratio) for the uplink. Multipath effects may increase or decrease the signal level, causing overall attenuation that could be higher or lower than expected based on link distance. This can be problematic near the margin of the link budget, where the standard operating margin (fade margin) might be compromised.



Note

- You can use the **Quick Align** option to re-align, as shown in Figure 23.
- You can test a previously installed link by using the **RUN AGAIN** option, as shown in Figure 24.

9	
5:29	◊ ◄⊿ ∎
Cambium Networks Ins	taller 🗞 🗄
Product	
MAC Address Serial Number	
Software Version CANOPY 22.1.1 SM 1	Configure 🔅
Session Status REGISTERED Color Code 35	Quick Align + +
Channel Frequency 5800.0 Mhz Channel Bandwidth	×
Device Details	Work Order
۰ ا	-

5:34			◎ ♥∡	
← Run Li	nk Test			%
C Device Accessible	F (58	REGISTERED Color Code 35 300.0 @ 10MH	z	
🛓 Downl	ink	<u>±</u>	Uplink	
9.8 _{Mb}	ps	6.	O _{Mbps}	
n/a		END: 40	2X	
SINK. OUB V, C	лавн	SINK, 40		
Link lest lype				_
Extrapolated Li	nk Test			•
	C RUI	N AGAIN		
▼ History				
Time	Do	wnlink	Uplink	
05:34 PM	9.8		6.0	
		Back	Ne	xt
•		•		

Link Test

The Link Test page allows you to measure the throughput of the radio link between two modules.

Figure 25





Notes

cnMaestro[™] conducts the Link Test with a packet length configuration of 1522 bytes.

The Link Test tool has two modes:

• Extrapolated Link Test

This test estimates link capacity by sending a small number of packets and measuring link quality. Once initiated, the radio starts the session at the lowest modulation level and increases modulation as data is successfully transmitted over the link (until the highest possible modulation level supported by the link is reached). Cambium Networks recommends running an **Extrapolated Link Test** on an active link with traffic present to obtain accurate measurements.



Note

Running the **Extrapolated Link Test** immediately after establishing a session will not provide accurate results.

• Link Test with Bridging

This test bridges the traffic to simulated Ethernet ports to provide a status of the link as a whole.

OnBoard SM

You can onboard subscriber modules (SMs) to cnMaestro[™]. During the onboarding process, you can also perform a software upgrade and apply the template configuration.

240 P I I I I I I I I I I I I I I I I I I		
240 CALL CALL CALL CALL CALL CALL CALL CAL		
230 C ORBOARD SM Covered Deverse BCGSTERED SSD Candaum(22 SSD Candaum(22		
OnBoard SM O	2:40	
REGISTRED Sub Candaum22 (BOOO B 20049) MC BCCATATS2161 Template Do change Defer Onboarding 1.1 you don't have access to cnMaestro now, you can defer this step and onboard late. 2.1 you don't want to on-board this SM to can defer this step and onboard late.	← OnBoard SM 🥰	•
Mac BSCTA752181 Template No change Defer Onboarding 1. If you don't have access to cnMaestro now, you can defer this step and on-board this SM to confuestro, you can skip it and finish the install. It was the install of the install of the install.	Contraction Contra	
Mace SBCTA752181 Template No change Defer Onboarding 1. If you don't have access to enMaestro now, you can defer this step and on-board later. 2. If you don't want to on-board this SM to enMaestro, you can skip it and finish the install.		
SBCTA7521E1 Template No change Defer Onboarding 1. If you don't have access to cnMaestro now, you can defer this step and on-baard later. 2. If you don't want to on-board this SM to cnMaestro, you can skip it and ficish the install.	Mac	
Template No change Defer Onboarding I if you don't have access to cnMaestro now, you can defor this step and onboard later. S. If you don't want to an-board his SM to cnMaestro, you can skip it and inten the install. Rect	58C17A7521E1	
No change Defer Onboarding 1. If you don't have access to cnMaestro now, you can defer this step and onboard later. 2. If you don't want to on-board this SM to cnMaestro, you can skip it and finish the install. Date Reck Next	Template	
No change		
Defer Onboarding 1. If you don't have access to cnMaestro now, you can defer this step and <u>on-board late</u> . 2. If you don't want to on-board this SM to onMaestro, you can skip it and <u>finish the instal</u> . Dack Nort	No change	
Defer Onboarding 1. grou don't have access to cnMaestro now, you can defer this step and on-board this SM to cnMaestro, you can skip it and (note) the install. It was a step of the step of the step of the step of the Install Next		J
Rack Next	Defer Onboarding 1. If you don't have access to cnMaestro now, you can defer this step and <u>on-board later</u> . 2. If you don't want to on-board this SM to cnMaestro, you can skip it and <u>finish the install</u> .	
	Back Next	



Note

For onboarding a subscriber module (SM) to cnMaestro™, an internet connection is required.

Installation Summary

The **Installation Summary** page displays a summary of the installation. Tap the **Detailed Summary** option to view the detailed summary.



Configuring the ePMP SM

Configuring the ePMP SM includes setting up the following features in the Cambium Networks Installer app:

- Device Details
- Configure Scan List
- SM software upgrade
- Configure SM
- AP evaluation
- SM Alignment
- Link Test
- OnBoard SM
- Installation Summary

Device Details

The **Device Details** page displays the basic details specific to each device.

You can configure the scan list on the Subscriber Module (SM) by navigating to the Settings page.



Configure Scan List

You can configure the radio settings by selecting channel bandwidths and frequencies applicable to the overall network.

Follow these steps to configure the radio settings for ePMP devices:

1. From the landing page, tap the **Settings** (2007) icon.

The **Settings** page appears.

Figure 29

4:31 0 ♥∡∎ ← Settings
EPMP SETTINGS
Scoll List Choose Bandwidth and Frequency of SM to configure
ePMP Software Images For SM software upgrade
CNWAVE 28 GHZ SETTINGS
Scan List Choose Frequency of CPE to configure
cnWave 28 GHz Software Images For CPE firmware upgrade
CAMBIUM NETWORKS INSTALLER SETTINGS
Device LAN IP 169.254.11
User Name admin
Password
< • •

2. From the EPMP SETTINGS section, tap the Scan List option.

The Configure Scan List page appears.



3. Select the required channel from the channel scan list. For example, 5.7GHz

The SM Bandwidth page appears.





4. Enable the required bandwidth option from the list. For example, 5MHz.

The **SM Frequency** page appears.



5. Select the required frequency(s) to scan.

SM software upgrade

The SM software upgrade page is used to update the software version of Subscriber Module (SM). Software images can be downloaded and pushed to the SM. The current SM version is displayed on the **Device Details** page, as shown in Figure 33.

There is an upgrade icon (1) next to the SM version.



Follow these steps to upgrade the SM software:

1. Tap the upgrade icon (¹) to navigate to the SM software upgrade page, as shown in Figure 34. Initially, all available software versions are listed.

:31		0 🗢	41
← ePMP Softw	vare Image	s	G
Enter URL to downlo	ad beta softw	vare image	
	DELETE	DOWNLO	AD
Jownload the software	images you v	want to use.	
自 ePMP 5.1.3 ☆			±
Not Downloaded			
🖹 ePMP 4.7.0 😭			<u>+</u>
Not Downloaded			
🖹 ePMP 4.6.2 😭			<u>*</u>
Not Downloaded			
🖹 ePMP 4.6.0.1 🕁			<u>+</u>
Not Downloaded			
🖹 ePMP 4.5.6 🕁			÷
	Done		
•	•		

Figure 34

- 2. Tap the refresh icon (C) at the top-right corner to get the latest available software versions list.
- 3. Tap the download software icon (^{*}) to download the corresponding software version onto your device.
- 4. After the download is successful, the download icon is replaced by an install icon (Install).
- 5. Tap Install to initiate the installation of the selected software on the Subscriber Module (SM).

You can also navigate to the SM Software upgrade page from the **Settings** page. On the **Settings** page, the software images option is available in the **EPMP SETTINGS** section.



To download and upgrade the software, your device must be connected to the Internet.

Note
Configure SM

SM configuration includes configuring the SM security, Preferred AP, and IP settings for the **Pre-shared key** and **AAA** security options.

Configuring SM for the Pre-shared key option

Follow these steps to configure SM for the **Pre-shared key** security option:

1. From the **Security** section, select the **Pre-shared key** option.

The following page appears.

4:40					0 •	₹ 4 1
← Confi	gure	SM				
Cevice Accessible		RE SSID 5800	GISTERI Cambiun).0 @ 201	E D 1123 MHz	i	
Security		_	-			
O None	۲	Pre-s	hared ke	, (C	AAA
- Enter Custom Key						8
Radio						_
Preferred AP SSI	D					:
IP Configuration	ı					
			Bac	:k		Next
4						

- 2. Enter the custom key in the Enter Custom Key field.
- 3. In the Radio section, enter the preferred AP SSID in the Preferred AP SSID field.
- 4. Navigate to the IP Configuration section.



- 5. In the **IP Configuration** section, complete the following actions:
 - a. Enter the SM name in the **SM Name** field.
 - b. Enter the SM height in the SM Height (meters) from ground level field.

6. Tap **Next**.

The SM is configured successfully.



Configuring SM for the AAA option

Follow these steps to configure SM for the **AAA** security option:

1. From the **Security** section, select the **AAA** option.

The following page appears.



- 2. Select a username from the **AAA Username** drop-down list.
- 3. Enter the password in the **AAA Password** field.
- 4. In the Radio section, enter the preferred AP SSID in the Preferred AP SSID field.
- 5. Navigate to the IP Configuration section.



- 6. In the **IP Configuration** section, complete the following actions:
 - a. Enter the SM name in the **SM Name** field.
 - b. Enter the SM height in the SM Height (meters) from ground level field.

7. Tap **Next**.

The SM is configured successfully.

AP evaluation

Adjust the SM location and re-evaluate if necessary. Configuring the DHCP option 66 may prohibit SM LAN access upon registration. You can manually enter the color code for PMP or preferred AP SSID for ePMP without performing an **AP evaluation**. This will display the list of available APs on the SM faster. If needed, you can restart the AP evaluation, which will perform a new AP scan on the SM.

0 G		
4:41		◎ ♥⊿ ∎
← Config	jure SM	%
Device Accessible	REGISTERED SSID Cambium123 5800.0 @ 20MHz	•
Security		
None	O Pre-shared key (
Radio		
Preferred AP SS	Q Scan for APs	
IP Configuration	😭 Show nearby APs (cr	nMaestro)
SM Name		
	Back	Next
•	٠	

Nearby APs

Nearby APs are displayed on maps where you can view the relative location of the AP with respect to the GPS location of the phone. You can calibrate the mobile device to locate the relative position of the AP with respect to the location. Nearby towers are available if cnMaestro[™] is configured, and Cambium Networks Installer displays the nearest visible APs, as shown in Figure 41.

4:41				∘ ▼⊿	
← Con	figure	SM			%
Device Accessible	I	REGIST SSID Cami 5800.0 @	ERED bium123 20MHz	Ð	
Security					
None	0	Pre-shared	key C) AA	4
Radio					
Preferred AP S	se q s	can for AP	s		
	🖬 s	how nearb	y APs (cn	Maestro)	-
IP Configurati	011				
SM Name					
			Back	Next	
•		•			

SM Alignment

Note

After connecting to an AP, Cambium Networks Installer displays an **SM Alignment** page to finalize SM positioning adjustments. To achieve optimal link performance, ensure the Receive Power Level is at its maximum during alignment by adjusting the SM's direction.



Proper alignment is important to prevent interference in other cells.

Figure 42

4:57 0 ♥ ♥ d 1 ← SM Alignment (Peression) Recistered Sido Zombumt22 ① Sido Zombumt22 ① Sido Zombumt22 ① Best -37.0 ② aBm abm		0
SM Alignment Corrent Secondary	◎ ◄⊿ ▮	4:57
REGISTERED Service June Accessible Best -37,0 aBen Current -44,0 aBm Best -44,0 aBm	Alignment 😪	← SI
Best -37.0 ↔ aBm -44.0 aBm -45.0 aBm -45.0 aB	REGISTERED SSID Cambium123 5800.0 @ 20MHz	Contraction Device Access
	t Current Current -44,0 dBm	-37
20 10 10 20 40 40 40 40 40 40 40 40 40 4		30
		20
		10
		0
		-10
-0 -0 -50 -60 -70 -80 -40 -70 -80 -40 		-20
		-40
-60 -70 -80 -90		-50
-70		-60
-80		-70
- 00-		-80
		-90
Best dBm Current dBm	Current dBm	Best dBi
Back Next	Back Next	
< ● ■	• •	•

Tips for alignment

- Slowly adjust the angle of the SM, sweeping through the adjustment angles at least twice to match the current receive power level as closely as possible to the best receive power level.
- The Signal Strength Ratio (SSR) displays the ratio of the vertical radio path received signal power to the horizontal radio path received signal power. This ratio can help identify multipath conditions (a high vertical-to-horizontal ratio) for the uplink. Multipath effects may increase or decrease the signal level, causing overall attenuation that could be higher or lower than expected based on link distance. This can be problematic near the margin of the link budget, where the standard operating margin (fade margin) might be compromised.



Note

- You can use the **Quick Align** option to re-align, as shown in Figure 43.
- You can test a previously installed link by using the **RUN AGAIN** option, as shown in Figure 44.

5:29	◎ ◄⊿ ∎
Cambium Networks In	staller 😪 :
Product	
PMP 450b Connectorized MAC Address	
1.001.000.000	
Serial Number	
Software Version CANOPY 22.1.1 SM 1	Configure 🔅
Session Status REGISTERED	Quick Align + +
35	
Channel Frequency 5800.0 Mhz	×
Channel Bandwidth	-
Device Details	Work Order
• •	

• =		-
4:57		◎ ▼⊿∎
🔶 🛛 Run Link	< Test	<u></u>
Contraction Device Accessible	REGISTEI SSID Cambia 5800.0 @ 24	RED um123 OMHz
🛓 Downlink	k	1 Uplink
55.2 _{Mbp}	is I	53.8 _{Mbps}
MCS 39		MCS 39
▼ History	🖰 RUN AGAIN	4
Time	Downlink	Uplink
04:57 PM	55.2	53.8
	в	ack Next
<	•	
		⇒

Link Test

The Link Test page allows you to measure the throughput of the radio link between two modules.

Figure 45



Note



cnMaestro[™] conducts the **Link Test** with a packet length configuration of 1522 bytes.

OnBoard SM

You can onboard subscriber modules (SMs) to cnMaestro[™]. During the onboarding process, you can also perform a software upgrade and apply the template configuration.

2:40 0 • 4
← OnBoard SM 🥝
Construction of the second sec
58C17A7521E1
Template
No change
Defer Onboarding 1. If you don't have access to cnMaestro now, you can defer this step and onsbaard later. 2. If you don't want to on-board this SM to cnMaestro, you can skip it and finish the install.
Bock Next



Note

For onboarding a subscriber module (SM) to cnMaestro™, an internet connection is required.

Installation Summary

The **Installation Summary** page displays a summary of the installation. Tap the **Detailed Summary** option to view the detailed summary.



Configuring the cnWave[™] 5G Fixed Customer Premise Equipment (CPE) device

Configuring the cnWave[™] 5G Fixed CPE device includes setting up the following features in the Cambium Networks Installer app:

- Device Details
- CPE Firmware Upgrade
- Configure Scan List
- Configure CPE
- CPE Alignment

Device Details

From the home page, tap **Start** to scan the cnWave[™] 5G Fixed CPE device. Once the cnWave[™] 5G Fixed CPE device is successfully detected, the following information is displayed on the **Device Details** page, as shown in Figure 48.

- Product name the name of the cnWave[™] 5G Fixed CPE device
- ESN Ethernet Serial Number of the cnWave™ 5G Fixed CPE device
- MSN Manufacturer Serial Number of the cnWave[™] 5G Fixed CPE device
- IMSI International Mobile Subscriber Identity of the cnWave[™] 5G Fixed CPE device
- Software version Current version of the software installed in the device
- Session status Status of the current session
- Operating frequency Device operating frequency
- **Polarisation** Polarisation of the cnWave[™] 5G Fixed CPE device
- Channel bandwidth Bandwidth of the channel being used

3.51 V VIIII Control C	
Cambium Networks Installer	3:51 🛛 🔍 🕶 🖬
Core Core Exi MSI MSI Software Vension 2.2 ① Coparating Frequency 27000.000 MHz Police Data Software Vension 2.2 ①	Cambium Networks Installer
Poduk Name Cricio ESN MSN MSS Software Vension 2.2 2 Operating Frequency 27000.000 MHz Podur Software Poduce Details Vench Cricio	
ESN MSN MSN 3.2 1 Serson Satus Registered Operating Requestory 27000.000 MHz Peterisotion Peterisotion	Product Name
MSN INSI Software Version 2.2 2 Service Software Service Deaths Version Start Start	ESN
IMSI Software Version 3.2 2 Session Satus Registered Coperating Prequency 27000.000 MH: Potarison Prequence Details Version Corder	MSN
Software Version 3.2 1 Session Status Registered Operating Frequency 27000.000 MHz Poterison Powice Details Version Coder	IMSI
Software Version 3.2 2 Sersion Status Registered Operating Frequency 27000.000 MHz Pdartisation Device Details Vork Order	ARE 10.101
Session Status Registered Operating Presumery 2000.000 MHz Polerisation Device Details Work-Order	Software Version 3.2 1
Operating Anguney 27000.000 MHz Pederoston Device Details Work-Order	Session Status Registered
Polarisation Device Details Work Order	Operating Frequency 27000.000 MHz
Device Details Work Order	Polarisation
	Device Details Work Order
< • •	< • •

CPE Firmware Upgrade

The CPE Firmware Upgrade page allows you to upgrade or downgrade the firmware version of the CPE. Firmware images can be downloaded and pushed to the device. The current firmware version is displayed

on **Device Details** page, as shown in Figure 49. There is an upgrade icon (1) next to the CPE version.



Follow these steps to upgrade the CPE firmware:

1. Tap the upgrade icon (¹) to navigate to the CPE firmware upgrade page as shown in Figure 50. Initially, all the available firmware versions are displayed in the list.

1:53	© 3G⊿∎
← CPE Firmware Upgrade	G
CnWave 28 GHz - 3.1.2 Not Downloaded	Ŧ
CnWave 28 GHz - 3.1.1 Downloaded	Install
CnWave 28 GHz - 2.1 Not Downloaded	Ŧ
CnWave 28 GHz - 3.0 Not Downloaded	ŧ
CnWave 28 GHz - 3.1 Not Downloaded	Ŧ

Figure 50

- 2. Tap the refresh icon (C) at the top-right corner to get the latest available firmware versions list.
- 3. Tap the download firmware icon (*) to download the corresponding firmware version to your device.
- After the download completes successfully, the download icon is replaced by an install icon (Install).
- 5. Tap Install to initiate the installation of the selected firmware into the CPE.

You can also navigate to the CPE Firmware upgrade page from the **Settings** page. On the **Settings** page, the software images option is available in the **CNWAVE 28 GHz SETTINGS** section.



Note

To download and upgrade the firmware, ensure your device is connected to the Internet.

Configure Scan List

Before proceeding with the CPE configuration and quick alignment, you must configure the radio scan frequencies. To perform the radio scan, follow these steps:

1. From the **Settings** page, tap the **Scan List** option to navigate to the scan list page, as shown in Figure 51.

Figure 51



The **Configure Scan List** page appears, as shown in Figure 52.



- 2. Tap the **Add frequency** button to add the desired frequencies.
- 3. The frequency pop-up appears, as shown in Figure 53.



4. Enter the frequency in MHz and tap **OK**.

Note



The frequency value must range between 24,250 MHz and 29,500 MHz.

The frequency is added to the list, as shown in Figure 54.



5. You can add multiple frequencies and select the required frequency values for scanning before configuring the CPE.

Configure CPE

Once the frequencies are set and the CPE has the minimum required firmware version installed, you can proceed with the CPE configuration. Tap the **Start** button on the home page to access the **Configure** and **Quick Align** options, as shown in Figure 55.

· · · · ·	_
7:09 🥑	0 3G⊿1
Combium Notworko Insta	llor :
Campium Networks Insta	ilei :
	\sum
	÷ 000 000 ∰ 000
Product Name	
C100	
ESN	
000 MIN TO THE	
MSN	
10102-012-020	
IMSI	Configure 🔅
Software Version	
3.1.2 👲	Quick Align 🚽 🔶
Session Status	
Down	
Operating Frequency	
Delevised and L	
Polansation	
Device Details	Work Order
•	

You can configure the saved scan frequencies and the device location data (latitude, longitude). Figure 56 shows the configuration page of CPE.

r:07 🛷	© 3G⊿∎
← Configure	CPE
Cevice Accessible	REGISTERED 27000.000 MHz @ 56 MHz @ -34 dBm
Security Default	O Non Default
Radio Configuration	
Polarisation	
 Horizontal 	
O Vertical	
O Auto Detect	
Back	Next
•	•

To configure the CPE, follow these steps:

1. Select the security type.

The following types are supported:

- Default
- Non-Default
- 2. Enter the Radio Configuration value.
- 3. Select the required **Polarisation** type.

The following types are supported:

- Horizontal
- Vertical
- Auto Detect
- 4. Type the CPE name and CPE height in the **System Info** section, and then tap **Next**, as shown in Figure 57.



5. For the **Non-Default** mode, enter the RADIUS password and RADIUS configuration certificate information, as shown in Figure 58, and tap **Next**.

07 🛷	© 3G⊿∎
Configure Devico Accessible	REGISTERED 27000.000 MHz Ø 56 MHz Ø -34 dBm
Security	Non Default
Password	0
RADIUS config cert	ificate
Max EIRP (dBm)	
5.0 Back	Next
	• •

The CPE configuration status page appears.

Figure 59



After the configuration is successfully completed, you are automatically redirected to the CPE Alignment page, as shown in Figure 60.



The **CPE Alignment** page displays the following data:

- Power of the received signal during the antenna alignment
- The best and current values in a graph
- Distance between the BTS and the CPE.

6. Tap Next.

The Installer Notes page appears, as shown in Figure 61.



7. Enter the detailed notes about the installation and tap Next.

The Installation Summary page appears, as shown in Figure 62.





8. Tap **Detailed Summary** to view the detailed information of the current installation. Figure 63 shows the **Detailed Summary** page.

•		•	
7:09 💋		© 3G⊿	•
← Detailed Sum	mary		
CPE Info			
Product Name C100			
MSN			
IMSI			
Software version 3.1.2			
Operating Frequency 27000.000 MHz			
Polarisation Horizontal			
ESN			
Bandwidth 56 MHz			
Session status Down			
Security Information			
Security DEFAULT			
•	•		

9. Tap the **back** icon to go back to the **Installation Summary** page and tap **Done**.

CPE Alignment

The **Quick Align** option is used when the CPE is already configured correctly and needs to be realigned.



Note

For quick alignment, the CPE must be connected to the BTS.

To align the CPE, follow these steps:

1. From the home page, tap **Quick Align**, as shown in Figure 64.

Figure 64

7:09 💋	Ø 3G ⊿ 🗎
Cambium Networks Ins	staller :
Product Name C100	
ESN	
IMSI	Configure
Software Version 3.1.2 Session Status	Quick Align
Down Operating Frequency 27000.000 MHz Polarisation	×
Device Details	Work Order
•	

The **CPE Alignment** page appears, as shown in Figure 65.



Configuring the cnWave[™] 60 GHz device

Configuring the cnWave[™] 60 GHz device includes setting up the following features in the Cambium Networks Installer app:

- Device Details
- Configure the device
- Alignment
- Work Order

Device Details

The **Device Details** page is used to view the device information. From the home page, tap **Start** to scan the cnWave[™] 60 GHz device. When the cnWave[™] 60 GHz device is detected successfully, the following device data is displayed on the device home page of the device, as shown in Figure 66.

- Type Type of the device
- E2E Connection Status Connection status of the E2E Controller
- Active links Number of active links
- Channel Channel number
- MAC Address MAC address of the device
- Serial Number Serial number of the device
- Software Version The software version installed on the device
- Wireless Security Wireless security name of the device

3:56	0 ▼⊿ 🗈
V2000	🗞 i
E2E Connection Status	
Connected 🚯	
Active Links	
Channel 3	
MAC Address	
Serial Number	
Software Version 1.3-dev114	Start
Wireless Security	_
Device Det	ails Work Order
•	• •

Tap the **Start** button to configure the device.

Configure the device

The **Device Details** page is used to configure the cnWave[™] 60 GHz device in the Cambium Networks Installer. Before aligning, you must configure the cnWave[™] 60 GHz device.

Follow these steps to configure the cnWave[™] 60 GHz device:

1. Tap the **Start** button on the home page of the device.

The **Device Details** appears, as shown in Figure 67.

Figure 67

3:57	° ₹4 1
v2000	
Type POP E2E Connection Status Connected Status 1 CD Channel 3 MAC Address Serial Number	Configure Quick Align
Software version 1.3-diev114 Wireless Seruitiv Device Detail	s Work Order

2. Tap the **Configure** button to configure the device.

The **Configure page** appears, as shown in Figure 68.



3. Select the type of the device, as shown in Figure 68.

The following options are supported:

- Point of Presence (PoP Node)
- Distribution Node (DN Node)
- Client Node (CN Node)
- 4. Select the required option from the PoP Routing parameter options, as shown in Figure 69.

The following options are supported:

- Border Gateway Protocol (BGP) Routing
- Static Routing



5. Select the PoP interface, as shown in Figure 70.

The following options are supported:

- Aux
- Main
- Disabled



- 6. Enter the PoP address and Gateway address, as shown in Figure 70.
- 7. Enter the E2E IPv6 address in the **E2E Settings** section, as shown in Figure 71. If this field is empty, then the PoP address is used by default.

		♥▼⊿∎
← Configure		%
2E Settings		^
E2E IPv6 Address		
2E Controller Address. If empty, PoP	Address will be used	· · · · ·
lorder Gateway Protocol (BGP)		^
Local ASN		
The autonomous system number (ASN lodes	I) assigned to the Ter	ragraph PoP
Neighbor ASN		
Jpstream router's ASN		
Neighbor IPV6		
Jpstream router's IPv6 address		
Advanced Config		^
	Back	Next

- 8. Set Local Anonymous System Number (ASN) assigned to the terragraph PoP nodes, Neighbor ASN, and Neighbor IPv6 under Border Gateway Protocol (BGP), as shown in Figure 71.
- 9. Set the **TCP Port of Aggregator** and the **TCP Port of E2E Controller** in the **Advanced Config** section, as shown in Figure 72.

	e
11:21 G	onfigure val
Local	ASN
The autor nodes	nomous system number (ASN) assigned to the Terrograph PoP
Neigh	bor ASN
Upstream	router's ASN
Neighl	bor IPV6
Upstream Advance	router's IPv6 address
Aggre	gator port
TCP Port	of Aggregator
Contro	oller port
TCP Port	of E2E Controller
	Back

10. Tap the **Next** button.

The Installation Summary page appears, as shown in Figure 73.

Figure 73

↔ Installation Summary	● ⊾ ● ● ⊘
Type POP	
E2E Connection Status Connected	
Model V2000	
MAC Address	
Serial Number	
Software Version 1.3-dev114	
Layer 2 Bridge Enabled (1 tunnel)	
System Time Jan 24 2024, 08:14:45 AM	
Duration 01 mins : 08 secs	
Detailed Summary	
Share	Done
< ●	

11. Tap the **Detailed Summary** button to view the detailed summary page, as shown in Figure 74.

·	
3:59	◎ ◄⊿ ∎
← Detailed Summary	:
Device Info	
Type POP	
Product node-V2000-PoP-1	
MSN	
MAC	
Software Version 1.3-dev114	
Model V2000	
E2E connection status Connected	
Layer 2 Bridge Enabled (1 tunnel)	
•	

12. Verify the details and tap the back icon to go the configuration page.

The cnWave[™] 60 GHz device is configured successfully.

Alignment

When the cnWave[™] 60 GHz device is configured correctly, the **Quick Align** option is used to realign the nodes.



Note

- Before starting alignment, visually align the local node to remote node using an alignment tube or scope.
- Adjust the azimuth and elevation alignment to position the highlighted cell in the center of the plot.

Follow these steps to align the cnWave[™] 60 GHz device:

1. From the home page, tap the **Quick Align** button, as shown in Figure 75.



9	_
3:57	◎ ▼⊿ 🗈
V2000	
` `` آ مها <u>ا</u> ب	
Type	
E2E Connection Status Connected	
Channel 3	Configure 🔅
MAC Address	Quick Align
Serial Number	
Software Version 1.3-dev114	×
Wireless Security	-
Device Details	Work Order
◀ ●	=

2. The Alignment page appears, as shown in Figure 76.



Figure 76

3. Tap the **Start** button on the **Alignment** page, as shown in Figure 77.



The **Confirm** dialog box appears with the link ignition will be disabled.

4. Tap the **Continue** button, as shown in Figure 78.





You can align both the nodes using Local Node and Time Frame graphs for the best alignment, as shown in Figure 79.



The Local Nodes graph provides the RSSI value and the Time frame graph provides the powering information of the nodes.

5. Tap the **Next** button and align both nodes to get the maximum RSSI value.

Work Order

The Work Order page displays the history of the operations performed on the device.

To view the Work Order, tap the work button (^{Work Order}) located on the home page of the cnWave[™] 60 GHZ device. The **Work Order** page appears, as shown in Figure 80.

E



Troubleshooting

For issues related to the Cambium Networks Installer, ensure the following:

- SM is not accessible through Cambium Networks Installer
 - Open the Wi-Fi settings and check that the Wi-Fi is connected to your desired Wi-Fi dongle
 - If mobile data is ON, turn it OFF and try again
 - Open a browser and check if you can access the SM web page using the 169.254.1.1 (SM IP address).
- SM is not registering
 - Verify the security settings
 - Verify the scan list is configured in Cambium Networks Installer's settings.
Cambium Networks

Cambium Networks delivers wireless communications that work for businesses, communities, and cities worldwide. Millions of our radios are deployed to connect people, places and things with a unified wireless fabric that spans multiple standards and frequencies of fixed wireless and Wi-Fi, all managed centrally via the cloud. Our multi-gigabit wireless fabric offers a compelling value proposition over traditional fiber and alternative wireless solutions. We work with our Cambium certified ConnectedPartners to deliver purpose built networks for service provider, enterprise, industrial, and government connectivity solutions in urban, suburban, and rural environments, with wireless that just works.

User Guides	http://www.cambiumnetworks.com/guides
Technical training	https://learning.cambiumnetworks.com
Support website	https://support.cambiumnetworks.com
Main website	http://www.cambiumnetworks.com
Sales enquiries	solutions@cambiumnetworks.com
Support enquiries	https://support.cambiumnetworks.com
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