Preparing to use cnArcher in your network

- Acquire radio, network, and security settings

  Work with your network administrator to determine which radio, network, and security settings are used network-wide and how sectors/towers are configured. This common list of configurations and security credentials is essential to ensure that SMs configured by cnArcher are ready to connect with APs in your network. Non-default SNMP Community Strings (for cnArcher read/write access to the device) may be configured in cnArcher menu Settings > Community string.

- Assemble cnMaestro credentials and configurations

  cnArcher is designed to automatically on-board new SMs to cnMaestro. Onboarding SM devices requires that the network CAMBIUM_ID and Onboarding Key are configured in cnArcher. If an on-premises cnMaestro is resident in the network, cnArcher supports both cloud and on-premises cnMaestro deployments.

- Try cnArcher’s Demo Mode

  This cnArcher feature may be utilized to step through the cnArcher installation sequence without physically installing the SM equipment.

- Prepare the wireless router

  To support communication between cnArcher and the SM LAN port, the wireless router should be configured in Bridge mode. In this mode, packets are forwarded between cnArcher and the SM with no additional routing.
Export and Import cnArcher configuration

Use the cnArcher Export Configuration and Import Configuration (located in Settings > App Settings) to share a cnArcher app configuration with other installers.

The Export Configuration function creates a JSON text file which can then be converted to a QR code. This QR code may be scanned by using the Import Configuration function.

Consider using a website such as http://goqr.me/ to create the QR code. Copy the text exported from cnArcher to create the code. Please note, large non-contiguous SM Scan Lists may create large export files which, when converted to QR codes, may be difficult to scan.

Upon import, cnArcher overwrites current settings with the configuration imported via QR code.

If the Wi-Fi is not managed by cnArcher (see right), the local Wi-Fi access point connection for SM access must be configured within cnArcher, not in Android OS. Through cnArcher’s guided initial setup, the mobile device Wi-Fi interface is assigned an IP address suitable for IP connectivity to the SM (via the Wi-Fi bridge-mode access point). By default, the mobile device is assigned a static IP address of 169.254.1.37 to allow IP connectivity to the SM factory default IP address 169.254.1.1.

Upon import, cnArcher overwrites current settings with the configuration imported via QR code.
cnArcher initial setup (one-time)
When starting cnArcher for the first time, a guided initial setup walks you through configuration of cnMaestro (if applicable), radio scanning parameters, and SM software package download. After initial setup is completed, the configuration can be updated at any time by navigating to the Settings menu.

1. **cnMaestro Configuration**
   - Select your cnMaestro deployment type or select No.

2. **Configure Scan List**
   - Select channel frequencies and bandwidths applicable for your overall network.

3. **Download SM Software Packages**
   - (Mobile device Internet connectivity required)
   - Downloaded software is utilized by cnArcher for upgrading SMs.

4. **Configure Wi-Fi**
   - Configure cnArcher to manage the Wi-Fi connection or configure the connection manually.

---

### cnMaestro cloud Configuration
- (Mobile device Internet connectivity required)
- Enter and validate cnMaestro User credentials and configure CAMBIUM_ID and Onboarding Key.

### cnMaestro on-premises Configuration
- (Mobile device Internet/network connectivity to on-premises cnMaestro server required)
- Enter and validate cnMaestro server URL, User credentials and configure Onboarding Key.

---

**Initial Setup Complete!**

**Power on and connect to SM**

Upon completion of the initial setup process, the Home screen is displayed.

Power on the SM - cnArcher will discover the device and display the Product type, MSN, ESN, and Software Version.

cnArcher requires software version 15.1.1 or greater to complete the installation sequence. Device software may be upgraded by selecting Upgrade Software or by clicking the displayed software version.

From the Home screen you may also reconfigure the Wi-Fi adapter of the mobile device, reconfigure the IP address of the connected SM, or configure the scan list to be used for the SM.

---

**The User credentials must match the User credentials as created in cnMaestro. See section Users in cnMaestro.**

**The Onboarding Key should be pre-configured in cnMaestro and this is based on the User credentials. See Onboarding / Claim Device in cnMaestro.**

---

**cnMaestro cloud Configuration**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, cnMaestro cloud</td>
<td>Enter and validate cnMaestro User credentials and configure CAMBIUM_ID and Onboarding Key.</td>
</tr>
</tbody>
</table>

**cnMaestro on-premises Configuration**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, cnMaestro on-premises</td>
<td>Enter and validate cnMaestro server URL, User credentials and configure Onboarding Key.</td>
</tr>
</tbody>
</table>

---

**Download SM Software Packages**

<table>
<thead>
<tr>
<th>Software &amp; Images</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cnMaestro cloud</td>
<td>(Mobile device Internet connectivity required) Downloaded software is utilized by cnArcher for upgrading SMs.</td>
</tr>
</tbody>
</table>

---

**Configure Wi-Fi**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cnMaestro cloud</td>
<td>(Mobile device Internet connectivity required) Downloaded software is utilized by cnArcher for upgrading SMs.</td>
</tr>
</tbody>
</table>

---

**Initial Setup Complete!**

**Power on and connect to SM**

Upon completion of the initial setup process, the Home screen is displayed.

Power on the SM - cnArcher will discover the device and display the Product type, MSN, ESN, and Software Version.

cnArcher requires software version 15.1.1 or greater to complete the installation sequence. Device software may be upgraded by selecting Upgrade Software or by clicking the displayed software version.

From the Home screen you may also reconfigure the Wi-Fi adapter of the mobile device, reconfigure the IP address of the connected SM, or configure the scan list to be used for the SM.
Updating SM software (required for SMs with software prior to 15.1.1)

Home page
- Click Upgrade Software or the displayed software version to initiate upgrade process

Prepare for Download
- Connect to a Wi-Fi or cellular internet connection

Software Download
- Latest software packages are downloaded to the mobile device (if not download previously)

SM Connection and Upgrade
- Reconnect to SM Wi-Fi to initiate software upgrade

Home page
- Device is ready for installation sequence.

cnArcher SM installation sequence

Home page (SM Scanning)
- Configure external antenna settings, if applicable

AP Evaluation
- Adjust SM location and re-evaluate if necessary*  
  DHCP option 66 configuration may prohibit SM LAN access upon registration

Align Antenna
- Adjust antenna alignment to maximize RSSI and minimize SSR*

Link Capacity Test
- Conduct multiple speed tests to verify link quality*

Network Configuration
- Enter device information and adjust NAT, DHCP, VLAN configuration parameters

cnMaestro Onboarding
- Configure management comments, firmware version, and apply templates* - Internet connection required

SM and cnMaestro interactions during installation

Configure Scan List and security settings
- Select AP, align antenna, and test link
- Secure SM mount
- Configure network
- SM Reboot
- Device info (including lat/long) and network configurations written to SM

DHCP and Zero Touch Configuration (DHCP Option 66) notice
Depending on network configuration, upon registration the SM may (via DHCP or DHCP Option 66 configuration push) be configured with a new IP address or with a configuration that limits access to the device via the LAN port.
**AP Evaluation Details**

AP Evaluation is conducted by cnMaestro to indicate which APs are within radio range of the SM. For each AP discovered, the AP MAC address, Color Code, frequency / channel bandwidth settings, and received signal strength are displayed.

At this stage of the installation, the installer is gaining an understanding of the AP which is most appropriate for connection at the deployment site. Finer antenna alignment is conducted after the AP Evaluation process.

**Using AP Evaluation Tags**

Prior to scanning for APs, cnArcher prompts for a Tag Name. This tag is an identifier for each AP Evaluation conducted, and is displayed for each AP in the list after each iteration.

With the information provided by the tags, the installer may easily compare results for evaluations from several sites.

**Alignment Details**

After connecting to an AP, cnArcher displays an alignment page to finalize SM positioning adjustments. To get best performance of the link, the user has to ensure the maximum Receive Power Level during alignment by pointing correctly.

Proper alignment is important to prevent interference in other cells.

**Tips for Alignment**

By slowly adjusting the angle of the SM, sweep through the appropriate adjustment angles at least two times to get the Current receive power level equal to close to the Best receive power level.

The Signal Strength Ratio displays the ratio of the vertical radio path received signal power to the horizontal radio path received signal power. This ratio can be useful for determining multipathing conditions (high vertical to horizontal ratio) for the uplink. Multipath may increase or decrease the signal level, resulting in overall attenuation that may be higher or lower than that caused by the link distance. This is problematic at the margin of the link budget, where the standard operating margin (fade margin) may be compromised.

**MECHANICALLY SECURE THE SM MOUNT AFTER ALIGNMENT**

Use **Quick Align** mode to re-align and test a previously installed link.

Access **Quick Align** mode via the tri-bar ☢ menu.

**Link Test Details**

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

cnMaestro conducts the link test with a packet length configuration of 1522 bytes.

The Link Test tool has two modes, **Extrapolated Link Test** and **Link Test with Bridging**.

**Extrapolated Link Test** estimates the link capacity by sending a small number of packets then measuring link quality. Once the test is initiated, the radio starts the session at the lowest modulation level and modulates up as data is successfully passed 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 get accurate measurements.

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

**Link Test with Bridging** bridges traffic to simulated Ethernet ports to provide a status of the link as a whole.
Work orders aggregate all information about customers, devices, and deployment records for the installer.

This information can be used for:

- Displaying open work orders sorted by distance
- Viewing completed installations, including configured parameters and installation time
- Navigation to the installation site

Create work orders

1. Scan the work order QR code using the device camera. Generate cnArcher work order QR codes here: https://www.cambiumnetworks.com/cnarcher-work-order/

2. Manually enter the work order details

Navigate to the site and begin the installation

The installation for each work order can be started by clicking Start Install in the work order or by ticking the checkbox next to the customer name in the Home screen.

SM installations associated with a work order display the work order icon upper-right:

Verify / share installation results

The installation summary contains information about all of the SM configuration parameters and installation.

Click the camera icon to take a photo of the installation site

SM configuration parameter settings are automatically populated by the work order, but are editable by the installer.

SM configuration parameter settings are not editable by the installer. All SM configuration parameters are applied by the current work order.
**cnMaestro Onboarding Details**

cnArcher includes cnMaestro onboarding and configuration as part of the installation process. cnArcher supports both cloud-based cnMaestro and on-premises cnMaestro configurations (on-premises cnMaestro server IP address and User credentials must be set up in cnArcher).

Optionally, installers may enter a comment for the device, select a device software version, or select a cnMaestro configuration template.

⚠️ SM onboarding includes SM location on the cnMaestro physical map.

**cnMaestro Configuration Templates**

cnMaestro Configuration Templates are textual representations of device settings that contain a full configuration or partial configuration. When a template is applied to a device, the only parameters changed are those in the template.

Configuration templates are created first in cnMaestro then applied via cnArcher at the time of installation.

cnMaestro administrators can embed variables into templates that will be replaced when the template is applied to a device. This allows one to leverage a shared, generic template, but to tailor it to individual devices when it is pushed.

For more information see the [cnMaestro online user guide](https://support.cambiumnetworks.com).

---

**Retrieving SM configuration details**

![Registered](image)

At any time during the installation, the registration status bar (above) may be clicked to display details about the SM.

The **SM Details** page also allows the installer to launch the SM web management interface (Launch GUI), reboot the device (Reboot), or perform a factory reset of the device (Factory Reset).

---

**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.

**Contacting Cambium Networks**

<table>
<thead>
<tr>
<th>Support website</th>
<th><a href="https://support.cambiumnetworks.com">https://support.cambiumnetworks.com</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Main website</td>
<td><a href="http://www.cambiumnetworks.com">http://www.cambiumnetworks.com</a></td>
</tr>
<tr>
<td>Sales enquiries</td>
<td><a href="mailto:solutions@cambiumnetworks.com">solutions@cambiumnetworks.com</a></td>
</tr>
<tr>
<td>Support enquiries</td>
<td><a href="https://support.cambiumnetworks.com">https://support.cambiumnetworks.com</a></td>
</tr>
<tr>
<td>Repair enquiries</td>
<td><a href="https://support.cambiumnetworks.com">https://support.cambiumnetworks.com</a></td>
</tr>
<tr>
<td>Telephone number list</td>
<td><a href="http://www.cambiumnetworks.com/contact-us/">http://www.cambiumnetworks.com/contact-us/</a></td>
</tr>
</tbody>
</table>

**Address**

Cambium Networks – Global Headquarters
3800 Golf Road, Suite 360
Rolling Meadows, IL 60008 USA