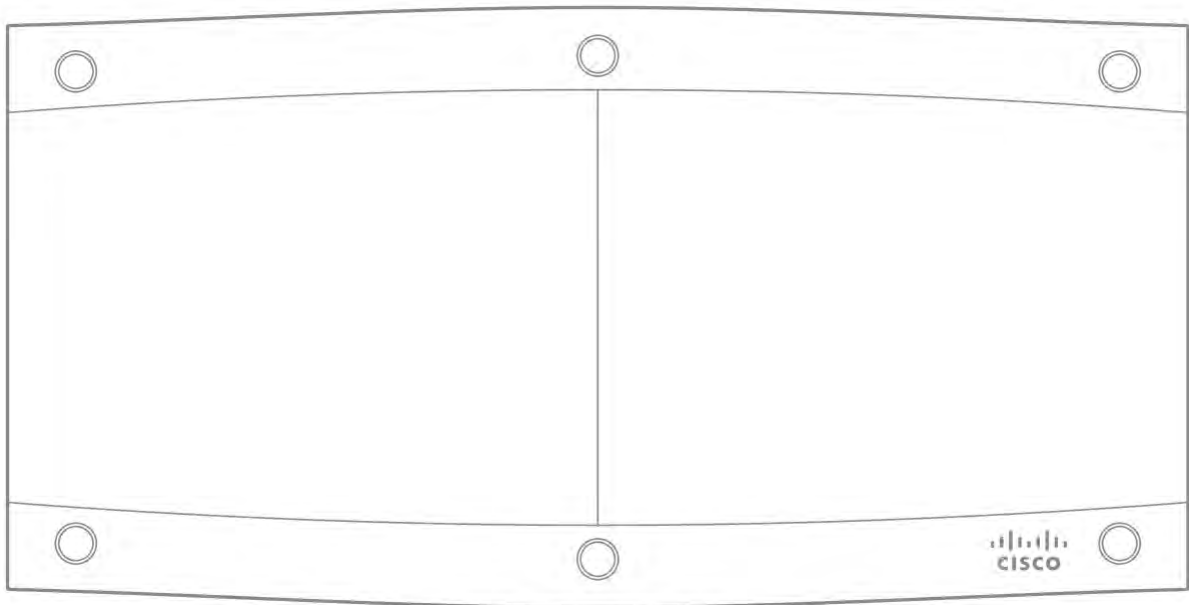




Meraki MR46E-HW

Hardware Installation Guide

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Warranty

Meraki, Inc. provides a lifetime warranty on this product. Warranty details may be found at www.meraki.com/legal.

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1 Scope of Document and Related Publications

The MR46E-HW Hardware Installation Guide describes the installation procedure for the MR46E-HW indoor access point. Additional reference documents are available online at www.meraki.com/library/product.

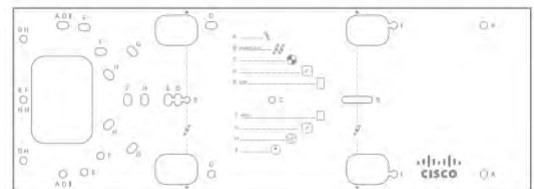
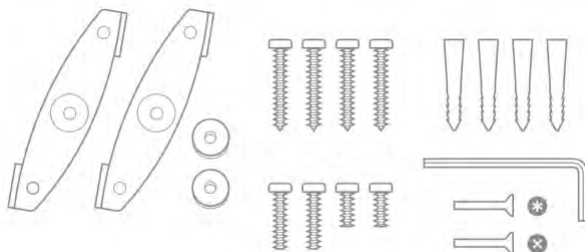
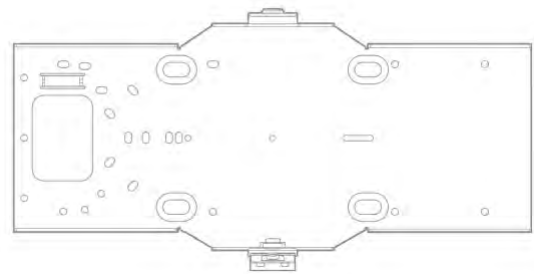
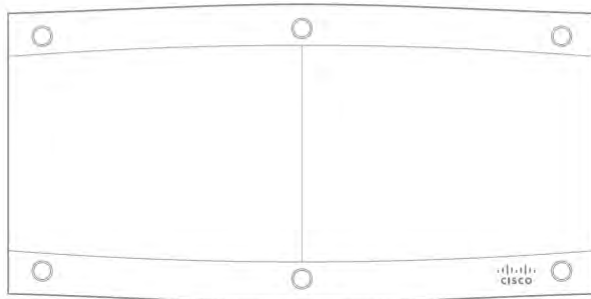
2 MR46E-HW Overview

The Meraki MR46E-HW is an enterprise-class, dual-concurrent 4x4 MIMO 802.11ax indoor access point designed for high-density deployments in offices, schools, hospitals and hotels. When connected to the Meraki Cloud Controller, the MR46E-HW enables the creation of ultra-high speed, reliable indoor wireless networks quickly, easily and cost- effectively.

2.1 Package Contents

The MR46E-HW package contains the following:

- MR46E-HW access point
- Mounting plate
- Drop ceiling mounting kit wall screws
- Security screws
- Mounting Template



2.2 Understanding the MR46E-HW

MR46E-HW Operation Temperature:

32 ° F to 104 ° F (0 ° C to 40 ° C)

Your Meraki MR46E-HW has the following features:

Kensington lock hard point

Mount plate attachment slots (2x)

Cable access bay

Desk mount feets (4x)

MR46E-HW cable access bay

Factory Reset Button

Ethernet port Power supplied by PoE: 50-57Vdc 0.6A

AC Adapter plug (sold separately) Power supplied by adapter: 12Vdc, 2.5A

Your MR46E-HW mount plate has the following features:

Access point mounting posts (2x)

Various mounting holes

2.3 Security Features

The MR46E-HW features multiple options for physically securing the access point after installation:

1. Security screw – The accessory kit includes screws that can be used to secure the access point to the mount plate. Engaging the security screw prevents accidental dislodging and theft.
2. Kensington lock – The access point contains a hard point that allows it to be secured to any nearby permanent structure using a standard Kensington lock.

2.4 Ethernet Ports

The MR46E-HW features an Ethernet RJ45 port that accepts 802.3at power (labeled “PoE”). This port should be used for uplink to your WAN connection.

2.5 Power Source Options

The MR46E-HW access point can be powered using either the Meraki AC Adapter or 802.3at PoE Injector (both sold separately) or a third-party 802.3at PoE switch.

2.6 Factory Reset Button

If the button is pressed and held for at least five seconds and then released, the MR46E-HW will reboot and be restored to its original factory settings by deleting all configuration information stored on the unit.

3 Pre-Install Preparation

You should complete the following steps before going on-site to perform an installation.

3.1 Configure Your Network in Dashboard

The following is a brief overview only of the steps required to add an MR46E-HW to your network. For detailed instructions about creating, configuring and managing Meraki wireless networks, refer to the Meraki Cloud Controller Manual (meraki.com/library/product).

1. Login to <http://dashboard.meraki.com>. If this is your first time, create a new account.
2. Find the network to which you plan to add your APs or create a new network.
3. Add your APs to your network. You will need your Meraki order number (found on your invoice if you ordered directly from Meraki) or the serial number of each AP, which looks like Qxxx-xxxx-xxxx, and is found on the bottom of the unit. You will also need your Enterprise Cloud Controller license key, which you should have received via email from shipping@meraki.com.
4. Go to the map / floor plan view and place each AP on the map by clicking and dragging it to the location where you plan to mount it.

3.2 Check and Upgrade Firmware

To ensure your MR46E-HW performs optimally immediately following installation, Meraki recommends that you facilitate a firmware upgrade prior to mounting your MR46E-HW.

1. Attach your MR46E-HW to power and a wired Internet connection. See p. 19 of this Hardware Installation Guide for details.
2. The MR46E-HW will turn on and the Power LED will glow solid orange. If the unit does not require a firmware upgrade, the Power LED will turn white within thirty seconds.

* If the unit requires an upgrade, the Power LED will begin blinking orange until the upgrade is complete, at which point the Power LED will turn solid white. You should allow about an hour for the firmware upgrade to complete, depending on the speed of your internet connection.

3.3 Check and Configure Firewall Settings

If a firewall is in place, it must allow outgoing connections on particular ports to particular IP addresses. The most current list of outbound ports and IP addresses can be found here:

<http://tinyurl.com/y79une3>

3.4 Assigning IP Addresses to MR46E-HWs

All gateway MR46E-HWs (MR46E-HWs with Ethernet connections to the LAN) must be assigned routable IP addresses. These IP addresses can be dynamically assigned via DHCP or statically assigned.

3.4.1 Dynamic Assignment

When using DHCP, the DHCP server should be configured to assign a static IP address for each MAC address belonging to a Meraki AP. Other features of the wireless network such as 802.1x authentication, may rely on the property that the APs have static IP addresses.

3.4.2 Static Assignment

Static IPs are assigned using the local web server on each AP. The following procedure describes how to set the static IP:

1. Using a client machine (e.g. a laptop), connect to the AP either wirelessly (by associating to any SSID broadcast by the AP) or over a wired connection.

If using a wired connection, connect the client machine to the MR46E-HW either through a PoE switch or a Meraki PoE Injector. If using a PoE switch, plug an Ethernet cable into the MR46E-HW's Ethernet jack, and the other end into a PoE switch. Then connect the client machine over Ethernet cable to the PoE switch. If using a Meraki PoE Injector, connect the MR46E-HW to the "PoE" port of the Injector, and the client machine to the "LAN" port.

2. Using a web browser on the client machine, access the AP's built-in web server by browsing to <http://my.meraki.com>. Alternatively, browse to <http://10.128.128.128>.
3. Click on the "Static IP Configuration" tab. Log in. The default user name is "admin". The default password is the AP's serial number, with hyphens included
4. Configure the static IP address, net mask, gateway IP address and DNS servers that this AP will use on its wired connection.
5. If necessary, reconnect the AP to the LAN.

3.4.3 Static IP via DHCP Reservations

Instead of associating to each Meraki AP individually to configure static IP addresses, an administrator can assign static IP addresses on the upstream DHCP server. Through "DHCP reservations", IP addresses are "reserved" for the MAC addresses of the Meraki APs. Please consult the documentation for the DHCP server to configure DHCP reservations.

3.5 Collect Tools

You will need the following tools to perform an installation:

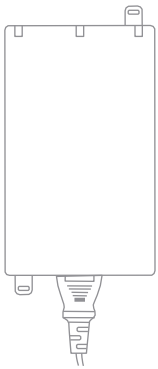


Phillips screwdriver

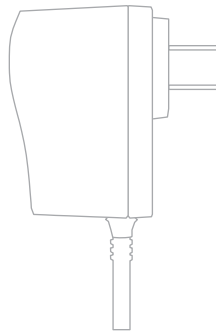


Hammer Drill with 1/4" (6.3mm) bits

3.6 Collect Additional Hardware for Installation



OR



802.3at PoE power source (either PoE switch or Meraki 802.3at PoE Injector)

AC Adapter



Network cables with RJ45 connectors long enough for your particular mounting location

4 Installation Instructions

4.1 Choose Your Mounting Location

A good mounting location is important to getting the best performance out of your MR46E-HW access point. Keep the following in mind:

1. The device should have unobstructed line of sight to most coverage areas. For example, if installing in an office filled with workspaces divided by mid-height cubicle walls, installing on the ceiling or high on a wall would be ideal.
2. Power over Ethernet supports a maximum cable length of 300 ft (100 m).
3. If being used in a mesh deployment, the MR46E-HW should have line of sight to at least two other Meraki devices. For more detailed instructions regarding access point location selection, reference the Meraki Network Design Guide (meraki.com/library/product).

4.2 Install the MR46E-HW

For most mounting scenarios, the MR46E-HW mount plate provides a quick, simple, and flexible means of mounting your device. The installation should be done in two steps. First, install the mount plate to your selected location. Then, attach the MR46E-HW to the mount plate.

!!! This equipment is only suitable for mounting at heights ≤ 2 m !!!

4.2.1 Attach the Mount Plate

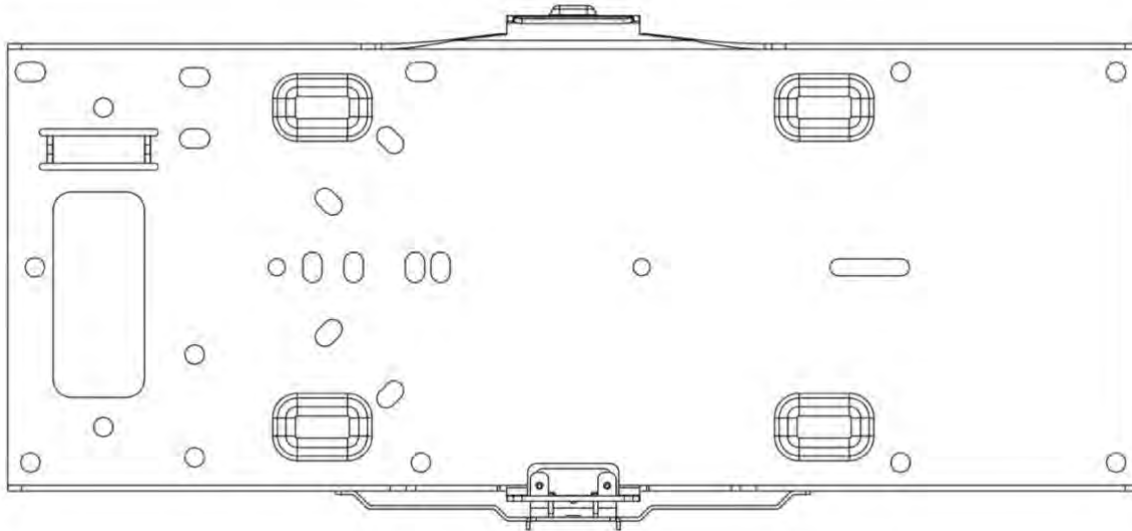
The MR46E-HW mount plate can be used to install your access point in a wide range of scenarios: wall or solid ceiling, below a drop ceiling, on various electrical junction boxes, or above a drop ceiling (in the plenum).

The mount plate contains a variety of hole patterns that are customized for each installation scenario. The mounting template (included in box with mount plate) should be used to drill holes for wall mounts and also to identify the correct hole patterns in the mount plate that should be used for each type of mount.

The following images also show the hole patterns that should be used for each type of mount:

4.2.1.1 Wall or Solid Ceiling Mount Using Mount Plate

Using included screws, attach the mount plate to your mounting wall or ceiling.



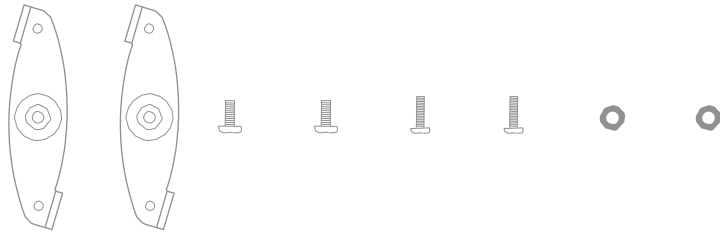
It is recommended that the MR46E-HW be mounted to a wall or solid ceiling using the mount plate for physical security reasons.

If mounting your MR46E-HW to a wall, skip to "Power the MR46E-HW" on P. 2!

4.2.1.2 Drop Ceiling Mount Using Mount Plate

To mount your MR46E-HW on a drop ceiling T-rail, use the included drop ceiling mounting accessory kit. The accessory kit can be used to mount to most 9/16", 15/16" or 1 1/2" T-rails.

The kit contains:

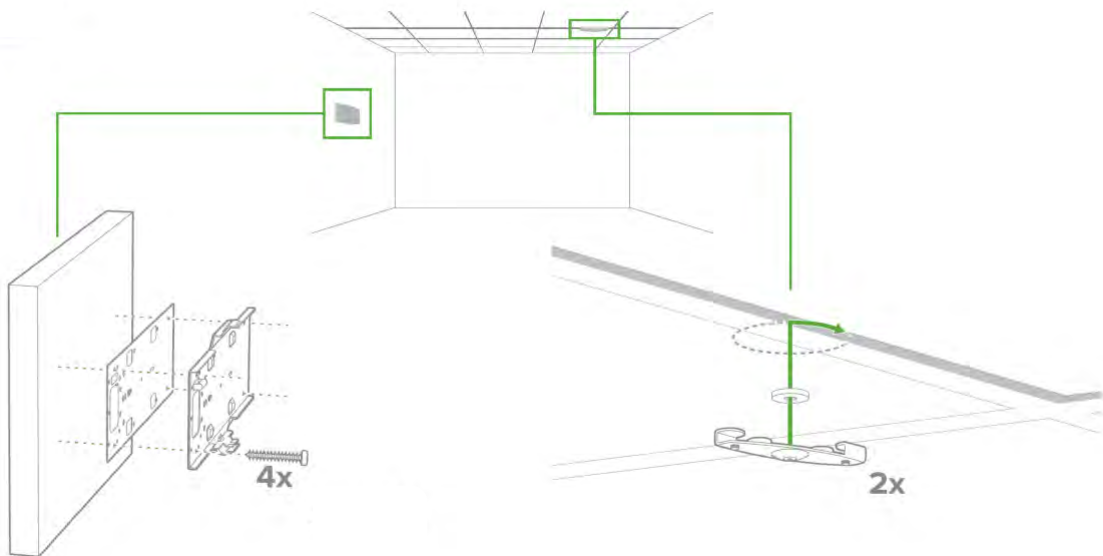


Dropped ceiling mounting clips with set screws

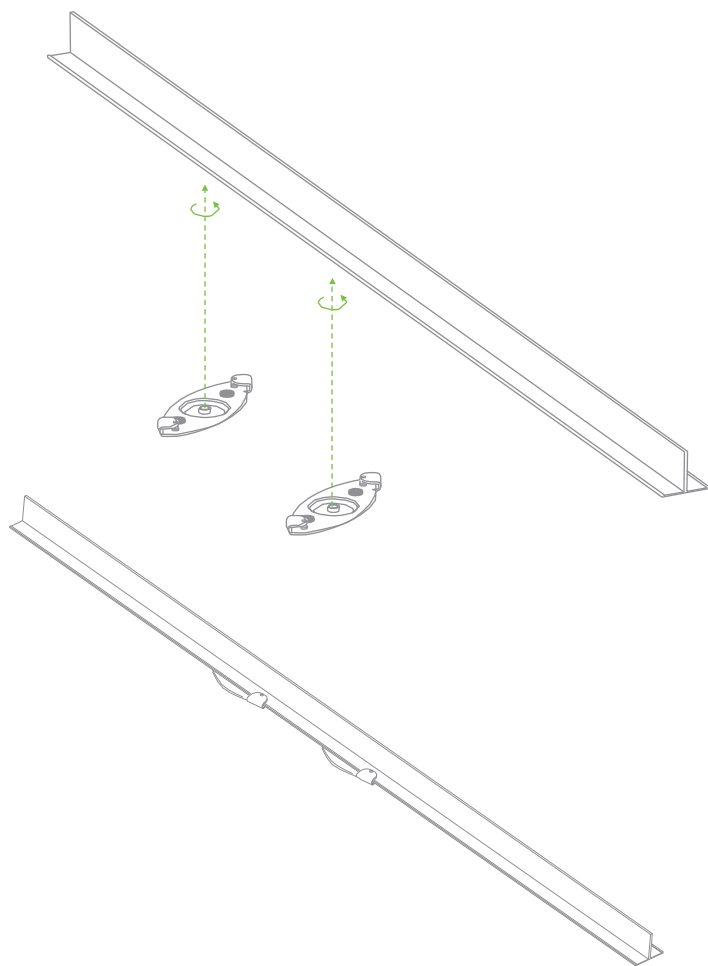
6-32x4 mm screws
Only used for recessed rail mount (uncommon)

6-32x7 mm

2 rubber spacers Only used for recessed rail mount (uncommon)

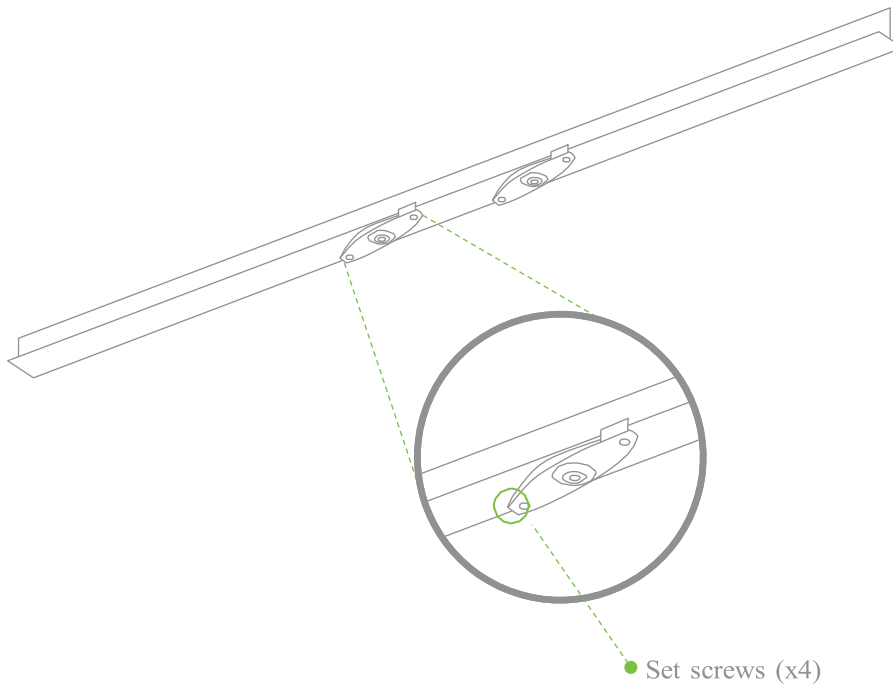


1. Attach the T-rail clips to the T-rail by rotating them and snapping them into place as shown. The black foam pads should be compressed slightly after installation.



2. Using the dashed lines on the mount plate template as a guide, set the proper spacing of the T-rail clips on the T-rail

3. Tighten the set screws on the T-rail clips to secure the clips using a 5/64"(2 mm) hex key.



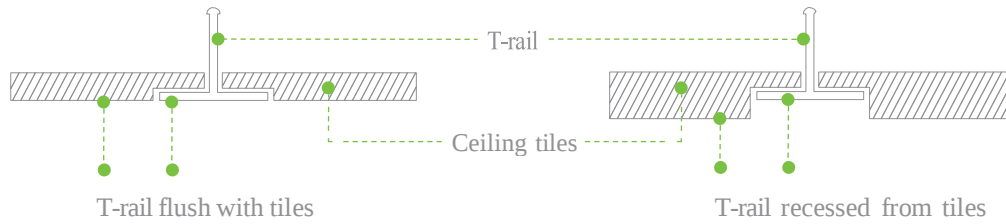
4. Attach the mount plate to the T-rail clips using the mount plate holes (marked with a "T").



To select the correct set of mounting hardware to use, first determine whether you are mounting to a “flush” or “recessed” rail. (See below images for clarification)

Flush T-rail

Recessed T-rail



4.2.1.3 Electrical Junction Box Mount Using Mount Plate

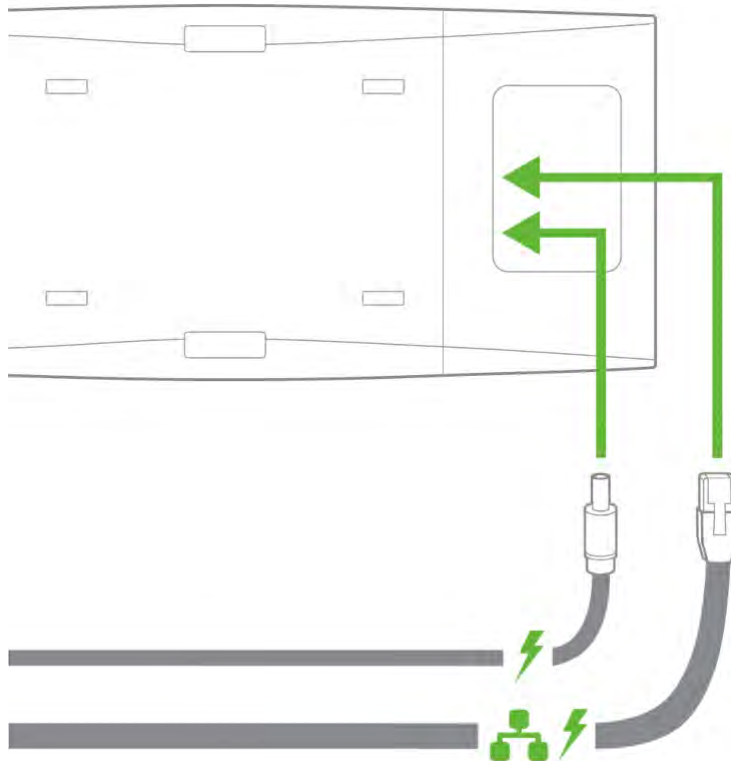
The MR46E-HW can be mounted to a 4" square cable junction box, a 3.5 or 4" round cable junction box, or various U.S. and European outlet boxes (mounting screws are not included).

Using appropriate mounting hardware for your specific type of junction box, attach the mount

4.2.2 Power the MR46E-HW

If mounting to an electrical junction box, feed the Ethernet cable through the cable access hole in the Mount Plate.

If mounting to a wall or ceiling, the Ethernet cable will feed through the cable slot on bottom of the MR46E-HW.



4.2.2.1 Powering the MR46E-HW with the Meraki AC Adapter (sold separately)

1. Plug the power cord into the MR46E-HW and the other end into a wall outlet.
2. Plug an Ethernet cable that is connected to an active Ethernet connection into the Eth0 port on the MR46E-HW.

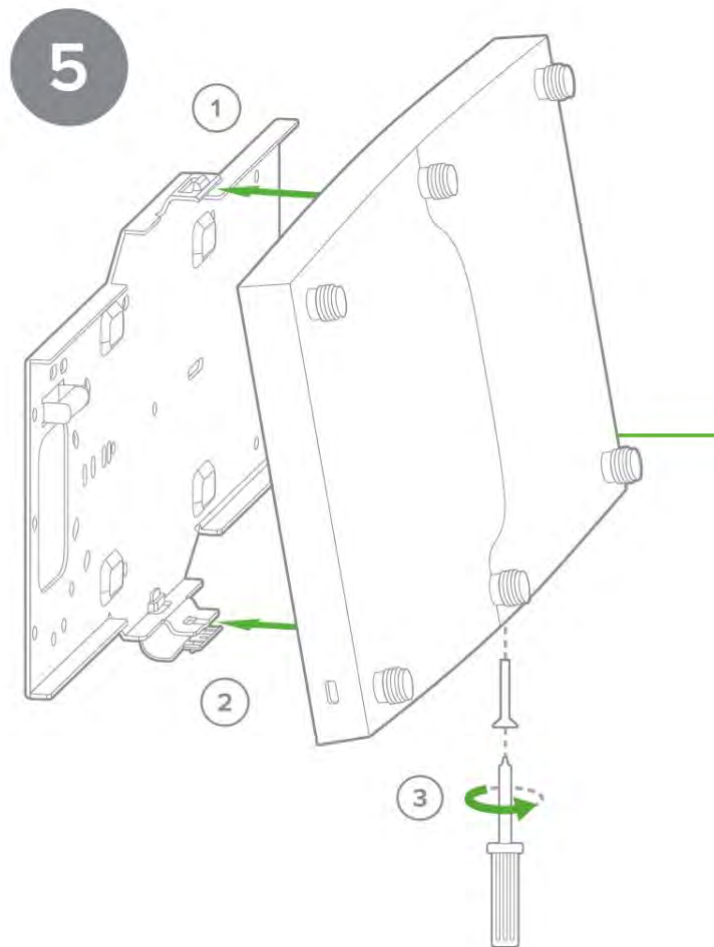
4.2.2.2 Powering the M410-HW with the Meraki 802.3at Power over Ethernet Injector (sold separately)

1. Plug the power cord into the PoE Injector and the other end into wall power.
2. Plug an Ethernet cable that is connected to an active Ethernet connection into the "IN" port on the injector.
3. Route Ethernet cable from the "OUT" port on the injector to the Eth0 port in the cable bay of the MR46E-HW.

4.2.2.3 Powering the MR46E-HW with an 802.3at Power over Ethernet Switch
Route Ethernet cable from a port on an active 802.3at PoE switch to the Eth0 port in the bay of the MR46E-HW.

! The MR46E-HW is Gigabit Ethernet-capable. To maximize device performance, a Gigabit-capable switch should be used.

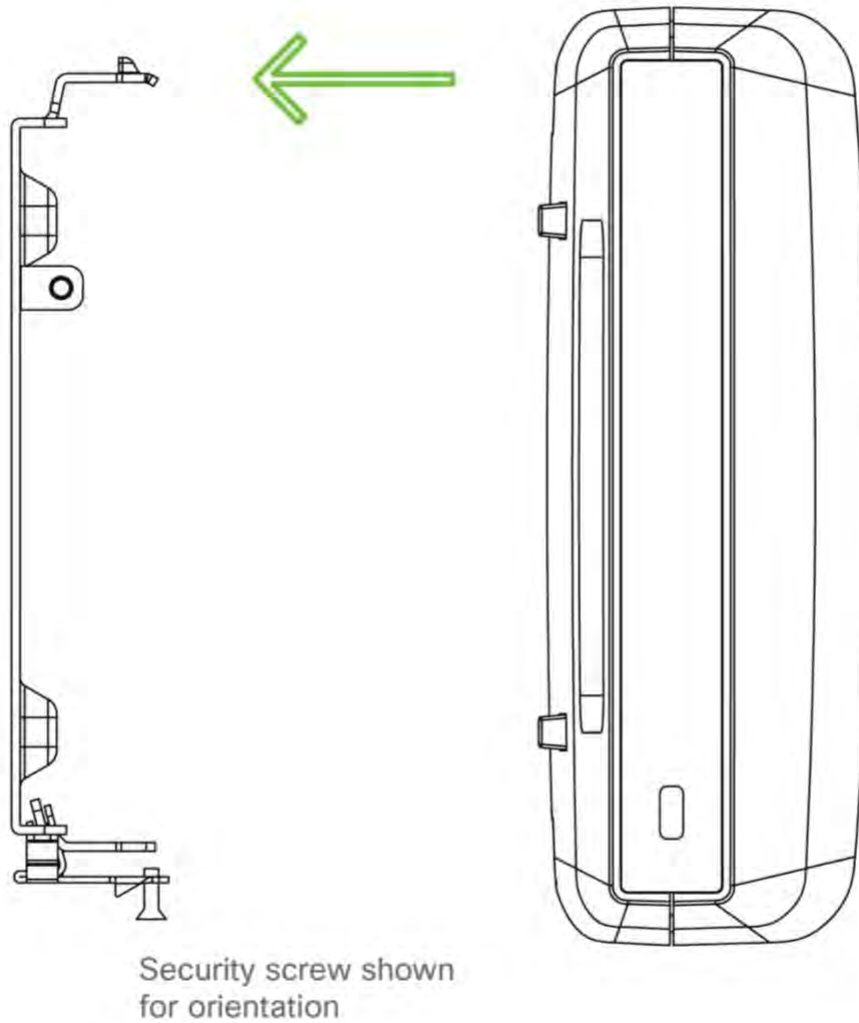
4.2.3 Mount the MR46E-HW



4.2.3.2 Assemble MR46E-HW to the Mount Plate

(This section applies to wall and/or solid ceiling, drop ceiling or electrical junction box mount where you have already installed the mount plate.)

Insert the top latch on the mount plate into the top mount plate attachment slots on the back of the device. Rotate the bottom of the unit into the bottom mount plate attachment slot. The unit will click into place.



4.2.3.3 Desk or Shelf Mount

The MR46E-HW can be placed on a desk or shelf resting on the non-scratch rubber feet. The mount plate is not necessary for a desk or shelf mounting.

4.3 Secure the MR46E-HW

Depending on your mounting environment, you may want to secure the MR46E-HW to its mount location. Your MR46E-HW can be secured in several ways. If the MR46E-HW has been installed using the mount plate, it can be secured via security screw (Torx and phillips head security screws are included; choose one), and/or Kensington lock. If the mount plate was not used, the MR46E-HW can still be secured using a Kensington lock.

4.3.1 Security Screw

Install the security screw in the lower mount plate tab.

4.3.2 Kensington Lock

Attach a Kensington lock cable to the access point at the hard point on the side of the device. Attach the other end of the cable to a secure location, such as a pipe or building fixture.

4.4 Verify Device Functionality and Test Network Coverage

1. Check LEDs

The LED should be solid white. If it is flashing orange, the firmware is automatically upgrading and the LED should turn green when the upgrade is completed (normally in under thirty minutes).

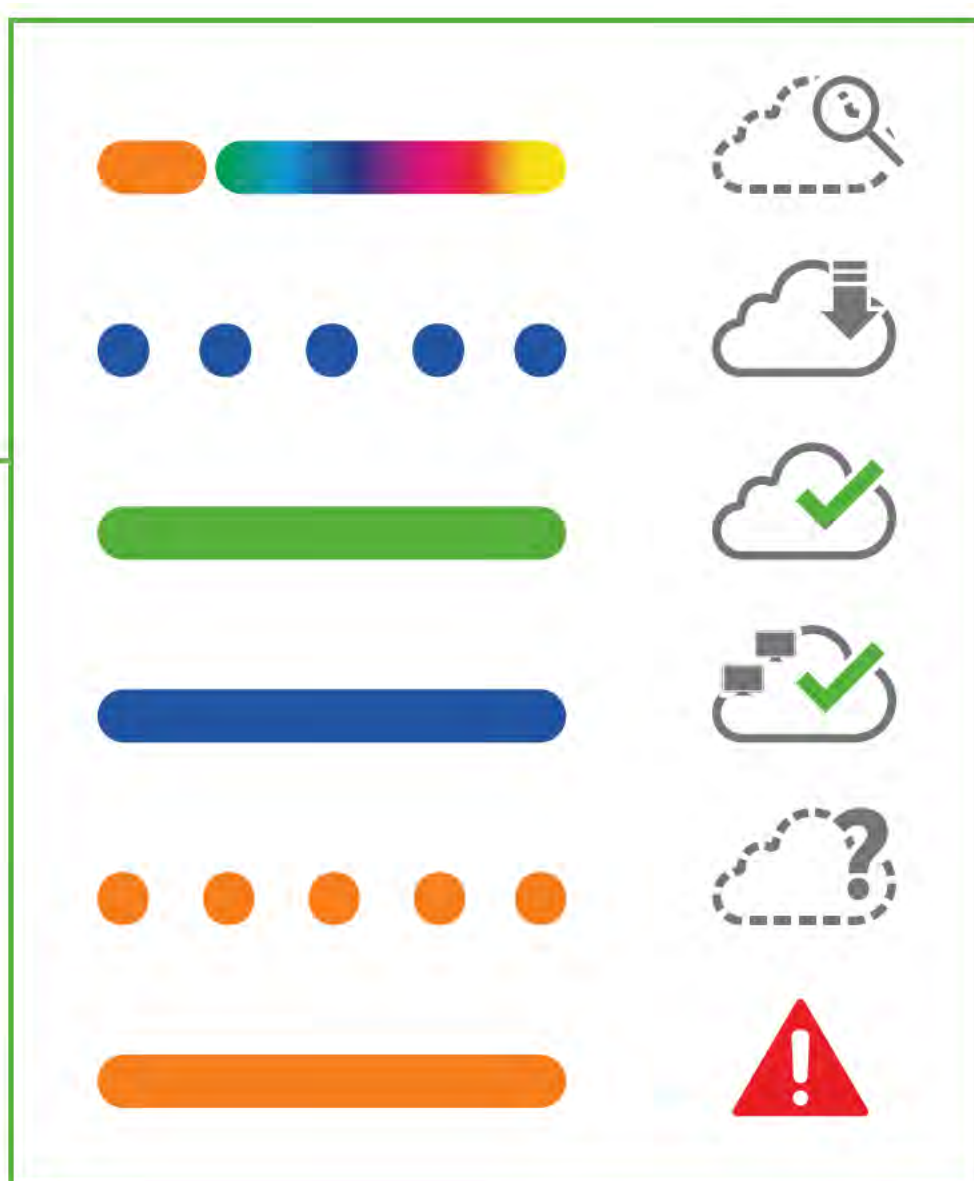
Note: Your MR46E-HW must have an active route to the Internet to check and upgrade its firmware.

2. Verify access point connectivity

Use any 802.11 client device to connect to the MR46E-HW and verify proper connectivity using the client's web browser.

3. Check network coverage

Confirm that you have good signal strength throughout your coverage area. You can use the signal strength meter on a laptop, smart phone, or other wireless device.



5 Troubleshooting

Reference the Meraki knowledge base at http://meraki.com/support/knowledge_base for additional

information and troubleshooting tips.

6 Regulatory

FCC Statement

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.

This device is restricted for indoor use.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 27cm between the radiator & your body.

Industry Canada Statement

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

(1) This device may not cause interference.

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil contient des émetteurs / récepteurs exempts de licence qui sont conformes au (x) RSS (s) exemptés de licence d'Innovation, Sciences et Développement économique Canada. L'opération est soumise aux deux conditions suivantes:

(1) Cet appareil ne doit pas provoquer d'interférences.

(2) Cet appareil doit accepter toute interférence, y compris les interférences susceptibles de provoquer un fonctionnement indésirable de l'appareil.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible.

Pour les produits disponibles aux États-Unis / Canada du marché, seul le canal 1 à 11 peuvent être exploités. Sélection d'autres canaux n'est pas possible.

This radio transmitter [6961A-060093010] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Le présent émetteur radio (6961A-060093010) a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal d'antenne. Les types d'antennes non inclus dans cette liste qui ont un gain supérieur au gain maximal indiqué pour tout type listé sont strictement interdits pour une utilisation avec cet appareil.

Antenna List

Set	Brand	P/N	Antenna Type	Connector	Gain (dBi)
1	CISCO	MA-ANT-3-A6	Dipole antenna	RP-TNC	Note 1
2	CISCO	MA-ANT-3-B6	Dipole antenna	RP-TNC	
3	CISCO	MA-ANT-3-C6	Omni antenna	RP-TNC	
4	CISCO	MA-ANT-3-D6	Omni-directional antenna	RP-TNC	
5	CISCO	MA-ANT-3-E6	Wide patch antenna	RP-TNC	
6	CISCO	MA-ANT-3-F6	Narrow patch antenna	RP-TNC	

Note1:

Radio 1 (2.4GHz)												
Set	Antenna Gain (dBi)				Cable Loss (dB)				True Gain (dBi)			
	Port 1	Port 2	Port 3	Port 4	Port 1 (Gray)	Port 2 (Black)	Port 3 (Blue)	Port 4 (White)	Port 1	Port 2	Port 3	Port 4
1	3.80	3.80	3.80	3.80	1.01	0.41	0.41	1.00	2.79	3.39	3.39	2.79
2	3.00	3.00	3.00	3.00	1.01	0.41	0.41	1.00	1.99	2.59	2.59	1.99
3	4.90	4.90	4.90	4.90	1.01	0.41	0.41	1.00	3.89	4.49	4.49	3.89
4	2.90	2.90	2.90	2.90	1.01	0.41	0.41	1.00	1.89	2.49	2.49	1.89
5	7.00	7.00	7.00	7.00	1.01	0.41	0.41	1.00	5.99	6.59	6.59	5.99
6	11.20	11.20	11.20	11.20	1.01	0.41	0.41	1.00	10.19	10.79	10.79	10.19

Radio 2 (5GHz)												
Set	Antenna Gain (dBi)				Cable Loss (dB)				True Gain (dBi)			
	Port 1	Port 2	Port 3	Port 4	Port 1 (Gray)	Port 2 (Black)	Port 3 (Blue)	Port 4 (White)	Port 1	Port 2	Port 3	Port 4
1	5.50	5.50	5.50	5.50	1.53	0.66	0.61	1.54	3.97	4.84	4.89	3.96
2	5.70	5.70	5.70	5.70	1.53	0.66	0.61	1.54	4.17	5.04	5.09	4.16
3	4.90	4.90	4.90	4.90	1.53	0.66	0.61	1.54	3.37	4.24	4.29	3.36
4	3.70	3.70	3.70	3.70	1.53	0.66	0.61	1.54	2.17	3.04	3.09	2.16
5	6.30	6.30	6.30	6.30	1.53	0.66	0.61	1.54	4.77	5.64	5.69	4.76
6	10.80	10.80	10.80	10.80	1.53	0.66	0.61	1.54	9.27	10.14	10.19	9.26

Radio 3 (2.4GHz + 5GHz)						
Set	Antenna Gain (dBi)		Cable Loss (dB)		True Gain (dBi)	
	Port 1		Port 1		Port 1	
	2.4GHz	5GHz	2.4GHz	5GHz	2.4GHz	5GHz
1	3.80	5.50	0.68	1.09	3.12	4.41
2	3.00	5.70	0.68	1.09	2.32	4.61
3	4.90	4.90	0.68	1.09	4.22	3.81
4	2.90	3.70	0.68	1.09	2.22	2.61
5	7.00	6.30	0.68	1.09	6.32	5.21
6	11.20	10.80	0.68	1.09	10.52	9.71

Radio 4 (Bluetooth)			
Set	Antenna Gain (dBi)	Cable Loss (dB)	True Gain (dBi)
	Port 1	Port 1 (Red)	Port 1
1	3.80	0.56	3.24
2	3.00	0.56	2.44
3	4.90	0.56	4.34
4	2.90	0.56	2.34
5	7.00	0.56	6.44
6	11.20	0.56	10.64

The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

les dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.

For indoor use only.

Pour une utilisation en intérieur uniquement.

IMPORTANT NOTE:

IC Radiation Exposure Statement:

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 33cm between the radiator & your body.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 33 cm de distance entre la source de rayonnement et votre corps.

Telec Statement

5GHz band (W52, W53): Indoor use only.

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