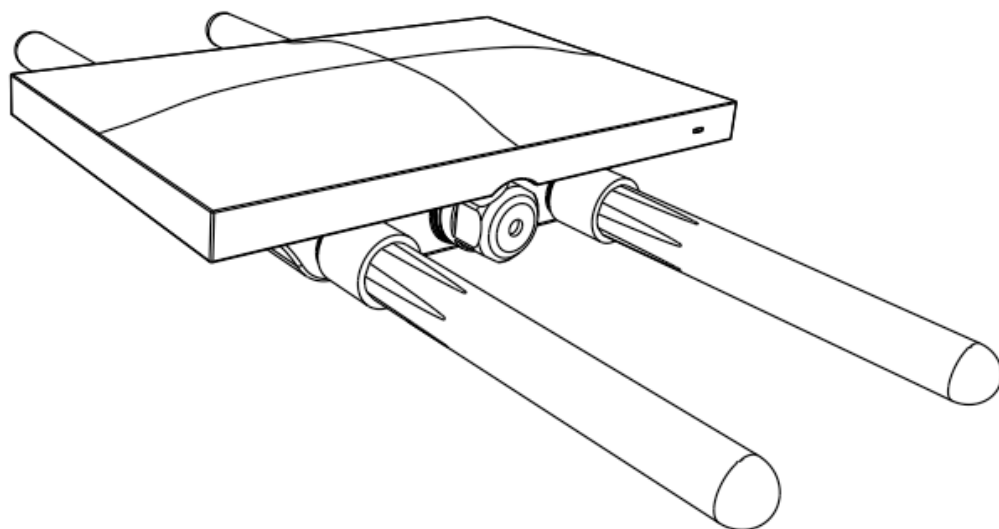# Meraki MR72

Hardware Installation Guide

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Warranty

Cisco Systems, Inc. provides a one year warranty on this product. Warranty details may be found at www.meraki.cisco.com/support.

Table of Contents

1 Scope of Document and Related Publications

The MR72 Hardware Installation Guide describes the installation procedure for the MR72 access point.

Additional reference documents are available online at meraki.cisco.com/support

2 MR72 Overview

The Meraki MR72 is an enterprise-class, 802.11abgn/ac outdoor access point designed for rugged environments. When connected to the Meraki Cloud Controller, the MR72 enables the creation of high-speed and reliable networks that cover large outdoor and industrial areas quickly, easily, and cost-effectively.

The Meraki MR72 has an operating temperature of -40º to 60º C.

2.1 Package Contents

The MR72 package contains the following:

- MR72 access point

- Wall screws & anchors

- Mounting plate

- Cable gland

- Mounting straps

2.2 Antennas and Ports

The Meraki MR72 has two radios. Each radio has two external antenna connectors; both connectors for a particular radio should be attached to the same type of antenna. The 5 GHz radio is used for mesh or client communication. The 2.4 GHz radio is primarily used for client communication. However, it can also communicate with Meraki 2.4 GHz access points.

Meraki offers a number of different antennas for use with the MR72: MA–ANT–20, MA–ANT–21, MA–ANT–23, and MA–ANT–25.

The Meraki MA–ANT–20 omni-directional antennas must be installed vertically.

The Meraki MA–ANT–25 patch antenna must be installed facing downward, at least 30 degrees from the horizon line.

2.3 Power Source Options

The MR72 access point can be powered using either an 802.3at capable PoE switch or the Meraki 802.3at PoE injector (sold separately).

2.4 LED Indicators and Run Dark Mode

Your MR72 uses a single LED to inform the user of the device's status.

Function	LED Status	Meaning

Power Up/Boot	Solid Orange	Power is applied
Connecting	Rainbow	Device in process of connecting to the Meraki Dashboard
Connected	Solid White	Fully operational
Upgrading	Flashing White	During boot or no WAN link

The MR72 may be operated in "Run Dark" mode for additional security and to reduce the visibility of the access point. In this mode, the LED will not be illuminated. This mode may be enabled through Meraki Dashboard.

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

Meraki recommends that you add your MR72 to a network in Dashboard before mounting it in the field. The following is a brief overview only of the steps required to add an MR72 to your network. For detailed instructions about creating, configuring and managing Meraki wireless networks, refer to the Meraki Cloud Controller Manual (cisco.meraki.com/support/#documentation).

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 nodes or create a new network.

3.   Add your nodes 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 node, which looks like Qxxx-xxxx-xxxx, and is found on the bottom of the unit.

4.   Finally, go to the map / floor plan view and place each node on the map by clicking and dragging it to the location where you plan to mount it. You can always modify the location later.

3.2 Check and Upgrade Firmware

To ensure your MR72 performs optimally immediately following installation, Meraki recommends that you facilitate a firmware upgrade prior to mounting your MR72.

1.   Attach your MR72 to power and a wired Internet connection.

2.   The MR72 will turn on and the LED will glow solid orange. If the unit does not require a firmware upgrade, the LED will turn solid white within 30 seconds.

* If the unit requires an upgrade, the LED will cycle rainbow 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 your network will be located behind a firewall, it must allow outgoing connections on particular ports to particular IP addresses in order for

the MR72 to be able to seamlessly communicate with the Cloud Controller. The most current list of outbound ports and IP addresses can be found here:

http://bit.ly/oZpMQ7

3.4 Assigning IP Addresses to MR72s

All gateway MR72s (MR72s 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 theproperty 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 MR72 either through a PoE switch or a Meraki PoE Injector. If using a PoE switch, plug an Ethernet cable into the MR72'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 MR72 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://ap.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 (e.g., Q2BD-551C-ZYW3).

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.

3.5 Collect Tools

You will need the following tools to perform an installation:

– Flat-head screwdriver

– Drill with appropriate bits for mounting wall anchors (if mounting to a wall)

– Phillips screwdriver

– Tin snips (if mounting with hose clamps)

– Power screwdriver with 5/16" (8 mm) nut driver, Phillips & flat heads (recommended)

3.6 Collect Additional Hardware for Installation

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

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

- Connection to the internet (if you are setting up your MR72 as a gateway to the internet)

- Appropriately sized metal straps (if mounting to a pole larger than 3.9" in diameter)

- Specialized mounting hardware if mounting to surface other than wood, stucco or stone

- Laptop with wireless to verify setup (recommended)

4 Installation Instructions

4.1 Choose Your Mounting Location

A good mounting location is important to getting the best performance out of your MR72 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 MR72 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 (cisco.meraki.com/support/#documentation).

4. The antennas should be as unobstructed as possible. Make sure that there is clearance around the MR72 for installation of all of your chosen antennas.

4.2 Install the MR72

For most mounting scenarios, the MR72 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 MR72 to the mount plate.

4.2.1 Remove the Mount Plate from the Access Point

Before installing the mount plate, you must remove it from the back of the access point.

1. Unscrew the mount plate attachment screw.

2. Lift the mount plate release tab upwards.

3. While holding the mount plate release tab up, slide the mount plate off the access point.

4.2.2 Attach the Mount Plate

The MR72 mount plate can be used to install your access point in a wide range of scenarios.

4.2.2.1 Wall or Solid Ceiling Mount Using Mount Plate

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

It is recommended that the MR72 be mounted to a wall or solid ceiling using the mount plate for physical security reasons.

4.2.2.2 Pole Mount Using Mount Plate

Use the included mounting straps to mount the AP to a pole less than 3.9" in diameter. Thread the mounting straps through the mounting strap slots to secure the mount plate in a horizontal or vertical

orientation.

4.2.3 Mount the MR72

Insert the posts on the mount plate into the attachment slots on the access point.

4.2.3.1 Attach Antennas

Remove protective plastic covers from all four N-type RF connectors. Attach appropriate antennas (and protective boots if included).

4.2.3.2 Aim Antennas

If you are using directional antennas, aim them appropriately to ensure optimal performance for your specific network topography. Omnidirectional antennas perform best in a mesh network when oriented vertically.

4.2.3.3 Powering the MR72 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 Ethernet port in the bay of the MR72.

For more details, see Meraki 802.3at Power Over Ethernet Injector datasheet.

4.2.3.4 Powering the MR72 with an 802.3at Power over Ethernet Switch

Route Ethernet cable from a port on an active 802.3at PoE switch to the Ethernet port in the bay of the MR72.

The MR72 is Gigabit Ethernet-capable. To maximize device performance, a Gigabit Ethernet-capable switch should be used.

4.2.3.5 Attach Power over Ethernet to the MR72

1. Remove the dust cover from the Ethernet port of the MR72. Unscrew it with a coin or flathead screwdriver.

2. Route the Ethernet cable from the PoE Injector "OUT" port to the MR72.

3. Install a cable gland on the MR72 end of the cable.

4. Plug the Ethernet cable into the Ethernet port of the Meraki MR72.

a. Connect the cable to the Ethernet port on the MR72.

b. Screw the gland body into the threaded hole of the port. Use an adjustable wrench to make sure the gland body is fully seated in the hole.

c. Insert the split ring gasket into the gland body.

d. Screw the cap tightly onto the gland. You may need a wrench to fully tighten the cap, but take care not to damage the cable in the process.

Optional: Make the MR72 a gateway

1. Connect an active internet connection to the "IN" port of the PoE injector.

4.2.3.6 Attach Grounding Strap

Connect one end of grounding strap to grounding post with included screw and washer. Securely attach the other end nearby metal structure.

4.4 Verify Device Functionality and Test Network Coverage

1. Check LEDs The Radio Power LED should be solid white. If it is cycling rainbow, the firmware is automatically upgrading and the LED should turn white when the upgrade is completed (normally in under thirty minutes).

2. Note: Your MR72 must have an active route to the Internet to check and upgrade its firmware.

3. Verify access point connectivity Use any 802.11 client device to connect to the MR72 and verify proper connectivity using the client's web browser.

4. 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/#kb for additional information and troubleshooting tips.

6 Regulatory

FCC Compliance Statement

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.

FCC 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 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 which the receiver is connected.

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

FCC Caution

Any changes or modifications no expressly approved by Meraki could void the user's authority to operate this equipment. This Transmitter must not be co-located or operation in conjunction with any other antenna or transmitter.

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 34 cm between the radiator and your body. This transmitter must not be co-located or operating in

conjunction with any other antenna or transmitter.

IEEE 802.11b or 802.11g operation of this product in the USA is firmware-limited to channels 1 through 11.

If the device is going to be operated in the 5.15 - 5.25 frequency range, then it is restricted to indoor environment only. This device meets all other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

Industry Canada Statement

This device complies with RSS-210 of the Industry Canada 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.

Ce dispositif est conforme à la norme CNR-210 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

Industry Canada Caution

(i) 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;

(ii) high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

Avertissement:

(i) les dispositifs fonctionnant dans la bande 5 150-5 250 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;

(ii) De plus, les utilisateurs devraient aussi être avisés que les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5 250–5 350 MHz et 5 650–5 850 MHz et que ces

radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

Industry Canada Radiation Exposure Statement

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 34 cm between the radiator & your body.

Déclaration d'exposition aux radiations

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non con trôlé. Cet équipement doit être installé et utilisé avec un minimum de 34 cm de distance entre la source de rayonnement et votre corps.