

# MR33

Dual-band, 802.11ac Wave 2 2x2:2 MU-MIMO Access Point with dedicated security and RF management radio as well as integrated Bluetooth Low Energy beacon and scanning radio



## Entry-level cloud-managed 802.11ac wireless

The Cisco Meraki MR33 is a quad-radio, cloud-managed 2x2:2 802.11ac Wave 2 access point with MU-MIMO support. Designed for next-generation deployments in offices, schools, hospitals, shops, and hotels, the MR33 provides performance, enterprise-grade security, and simple management.

The MR33 provides a maximum 1.3 Gbps\* aggregate frame rate with concurrent 2.4 GHz and 5 GHz radios. A dedicated third radio provides real-time WIDS/WIPS with automated RF optimization. An integrated Bluetooth Low Energy (BLE) radio delivers beacon and scanning capabilities.

The combination of cloud management, 802.11ac Wave 2, full-time RF environment scanning, and integrated Bluetooth technology delivers the throughput, reliability, and flexibility required by demanding business applications like voice and high-definition streaming video, today and tomorrow.

## MR33 and Meraki Cloud Management: A Powerful Combination

The MR33 is managed through the Meraki cloud, with an intuitive browser-based interface that enables rapid deployment without training or certifications. Since the MR33 is self-configuring and managed over the web, it can even be deployed at a remote location without on-site IT staff.

The MR33 is monitored 24x7 via the Meraki cloud, which delivers real-time alerts if the network encounters problems. Remote diagnostics tools enable real-time troubleshooting over the web, meaning multi-site, distributed networks can be managed remotely.

The MR33's firmware is always kept up to date from the cloud. New features, bug fixes, and enhancements are delivered seamlessly over the web, meaning no manual software updates to download or missing security patches to worry about.

### Product Highlights

- 2x2 MU-MIMO 802.11ac Wave 2
- 1.3 Gbps\* aggregate dual-band frame rate
- 24x7 real-time WIPS/WIDS, spectrum analytics, and WiFi location tracking via dedicated 3rd radio
- Integrated Bluetooth Low Energy Beacon and scanning radio
- Integrated enterprise security and guest access
- Application-aware traffic shaping
- Optimized for voice and video
- Self-configuring, plug-and-play deployment
- Sleek, low-profile design blends into any environment



## Features

### Aggregate data rate of up to 1.3 Gbps\*

A 5 GHz 2x2:2 radio supporting 80 MHz channel widths and a 2.4 GHz 2x2:2 radio supporting 40 MHz channel widths offer a combined dual-radio aggregate frame rate of 1.3 Gbps\*, with up to 866 Mbps in the 5 GHz band thanks to 802.11ac Wave 2 and 400 Mbps in the 2.4 GHz band.

### Multi User Multiple Input Multiple Output (MU-MIMO)

With support for the 802.11ac Wave 2 standard, the MR33 offers MU-MIMO for more efficient transmission to multiple clients. Especially suited for environments with numerous mobile devices, MU-MIMO enables multiple clients to receive data simultaneously. This increases the total network performance and improves the end user experience.

### Dedicated third radio delivers 24x7 wireless security and RF analytics

The MR33's sophisticated, dedicated dual-band third radio scans the environment continuously, characterizing RF interference and containing wireless threats like rogue access points. No more need to choose between wireless security, advanced RF analysis, and serving client data: a dedicated third radio means that all three occur in real-time, without any impact to client traffic or AP throughput.

### Bluetooth low energy Beacon and scanning

An integrated Bluetooth low energy radio provides seamless deployment of BLE Beacon functionality and effortless visibility of BLE devices within range of the AP. The MR33 enables the next generation of location-aware applications and engagement right out of the box.

### Automatic cloud-based RF optimization

The MR33's sophisticated, automated RF optimization means that there is no need for the dedicated hardware and RF expertise typically required to tune a wireless network. The real-time full-spectrum RF analysis data collected by the dedicated third radio is continuously fed back to the Meraki cloud. The Meraki cloud then automatically tunes the MR33's channel selection, transmit power, and client connection settings for optimal performance under the most challenging RF conditions.

### Secure wireless environments using 24x7 Air Marshal

No longer choose between a wireless intrusion prevention system (WIPS) and serving client data: thanks to the dedicated third radio, Air Marshal, a highly optimized built-in WIPS, scans continuously for threats and remediates them as commanded, all without disrupting client service. Alarms and optional auto-containment of rogue APs are configured via flexible remediation policies, ensuring optimal security and performance in even the most challenging wireless environments.

### Integrated enterprise security and guest access

The MR33 features integrated, easy-to-use security technologies to provide secure connectivity for employees and guests alike. Advanced security features such as AES hardware-based encryption and WPA2-Enterprise authentication with 802.1X provide wire-like security while still being easy to configure. One-click guest isolation provides secure, Internet-only access for visitors. Our policy firewall (Identity Policy Manager) enables group or device-based, granular access policy control. Meraki Teleworker VPN makes it easy to extend the corporate LAN to remote sites, without requiring all clients and devices to have client VPN software. PCI compliance reports check network settings against PCI requirements to simplify secure retail deployments.

### Application-aware traffic shaping

The MR33 includes an integrated layer 7 packet inspection, classification, and control engine, enabling you to set QoS policies based on traffic type. Prioritize your mission critical applications, while setting limits on recreational traffic, e.g., peer-to-peer and video streaming.

### Voice and Video optimizations

Industry standard QoS features are easy to configure like Wireless Multi Media (WMM) Access Categories, 802.1p, and DSCP.

### Low-profile, sleek, and compact design

Despite its robust feature set, the MR33 is packaged in a sleek, low-profile enclosure that blends seamlessly into any environment.

### Self-configuring, self-optimizing, self-healing

When plugged in, the MR33 automatically connects to the Meraki cloud, downloads its configuration, and joins the appropriate network. The MR33 then self-optimizes, determining the ideal channel, transmit power, and client connection parameters. As necessary, it will also self-heal, responding automatically to switch failures and other errors.

\*Refers to maximum over-the-air data frame rate capability of the radio chipset, and may exceed data rates allowed by IEEE Std 802.11ac-compliant operation.



# MR33 Tx / Rx Tables

## 2.4 GHz

Operating Band	Operating Mode	Data Rate	TX Power	RX Sensitivity
2.4 GHz	802.11b	1 Mb/s 2 Mb/s 5.5 Mb/s 11 Mb/s	20dBm 20dBm 20dBm 20dBm	-96dBm -93dBm -91dBm -89dBm
2.4 GHz	802.11g	6 Mb/s 9 Mb/s 12 Mb/s 18 Mb/s 24 Mb/s 36 Mb/s 48 Mb/s 54 Mb/s	20dBm 20dBm 20dBm 19dBm 19dBm 18dBm 18dBm 18dBm	-91dBm -90dBm -88dBm -87dBm -84dBm -81dBm -76dBm -75dBm
2.4 GHz	802.11n(HT20)	MCS0/8 MCS1/9 MCS2/10 MCS3/11 MCS4/12 MCS5/13 MCS6/14 MCS7/15	20/20 dBm 20/20 dBm 19/19 dBm 19/19 dBm 18/18 dBm 18/18 dBm 18/18 dBm 18/18 dBm	-91/91 dBm -88/-88 dBm -85/-85 dBm -82/-82 dBm -79/-79 dBm -75/-75 dBm -73/-73 dBm -70/-70 dBm
2.4 GHz	802.11ac(VHT20)	MCS0/0 MCS1/1 MCS2/2 MCS3/3 MCS4/4 MCS5/5 MCS6/6 MCS7/7 MCS8/8	20/20 dBm 20/20 dBm 19/19 dBm 19/19 dBm 18/18 dBm 18/18 dBm 18/18 dBm 18/18 dBm 17/17 dBm	-90/-90 dBm -88/-88 dBm -85/-85 dBm -83/-83 dBm -81/-81 dBm -79/-79 dBm -76/-76 dBm -72/-72 dBm -70/-70 dBm
2.4 GHz	802.11n(HT40)	MCS0/8 MCS1/9 MCS2/10 MCS3/11 MCS4/12 MCS5/13 MCS6/14 MCS7/15	20/20 dBm 20/20 dBm 19/19 dBm 19/19 dBm 18/18 dBm 18/18 dBm 18/18 dBm 18/18 dBm	-89/-89 dBm -86/-86 dBm -84/-84 dBm -82/-82 dBm -77/-77 dBm -73/-73 dBm -71/-71 dBm -70/-70 dBm



2.4 GHz	802.11ac(VHT40)	MCS0/0	20/20 dBm	-88/-88 dBm
		MCS1/1	20/20 dBm	-86/-86 dBm
		MCS2/2	19/19 dBm	-83/-83 dBm
		MCS3/3	19/19 dBm	-81/-81 dBm
		MCS4/4	18/18 dBm	-78/-78 dBm
		MCS5/5	18/18 dBm	-75/-75 dBm
		MCS6/6	18/18 dBm	-71/-71 dBm
		MCS7/7	18/18 dBm	-68/-68 dBm
		MCS8/8	17/17 dBm	-65/-65 dBm
		MCS9/9	16/16 dBm	-63/-63 dBm

## MR33 Tx / Rx Tables

### 5 GHz

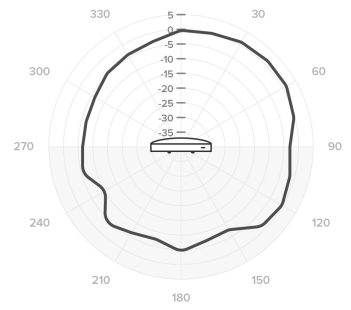
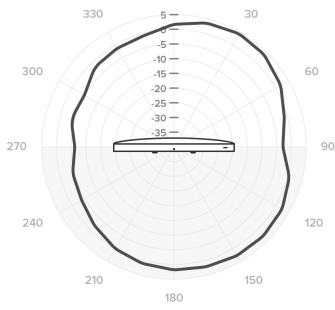
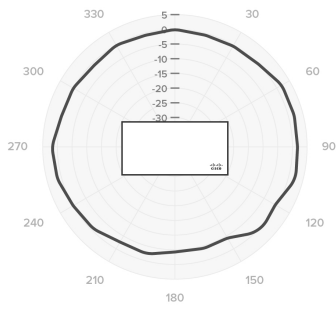
Operating Band	Operating Mode	Data Rate	TX Power	RX Sensitivity
5 GHz	802.11a	6 Mb/s	21dBm	-90dBm
		9 Mb/s	21dBm	-87dBm
		12 Mb/s	20dBm	-86dBm
		18 Mb/s	20dBm	-85dBm
		24 Mb/s	20dBm	-84dBm
		36 Mb/s	20dBm	-79dBm
		48 Mb/s	20dBm	-74dBm
		54 Mb/s	20dBm	-71dBm
5 GHz	802.11n(HT20)	MCS0/8	21/21 dBm	-88/-88 dBm
		MCS1/9	21/21 dBm	-85/-85 dBm
		MCS2/10	20/20 dBm	-83/-83 dBm
		MCS3/11	20/20 dBm	-79/-79 dBm
		MCS4/12	20/20 dBm	-76/-76 dBm
		MCS5/13	20/20 dBm	-72/-72 dBm
		MCS6/14	20/20 dBm	-71/-71 dBm
		MCS7/15	19/19 dBm	-69/-69 dBm
5 GHz	802.11n(VHT20)	MCS0/0	21/21 dBm	-88/-88 dBm
		MCS1/1	21/21 dBm	-86/-86 dBm
		MCS2/2	20/20 dBm	-83/-83 dBm
		MCS3/3	20/20 dBm	-79/-79 dBm
		MCS4/4	20/20 dBm	-77/-77 dBm
		MCS5/5	20/20 dBm	-75/-75 dBm
		MCS6/6	20/20 dBm	-72/-72 dBm
		MCS7/7	19/19 dBm	-70/-70 dBm
		MCS8/8	18/18 dBm	-67/-67 dBm



5 GHz	802.11n(HT40)	MCS0/8	21/21 dBm	-85/-85 dBm
		MCS1/9	21/21 dBm	-84/-87 dBm
		MCS2/10	20/20 dBm	-84/-84 dBm
		MCS3/11	20/20 dBm	-79/-79 dBm
		MCS4/12	19/19 dBm	-77/-77 dBm
		MCS5/13	19/19 dBm	-72/-72 dBm
		MCS6/14	19/19 dBm	-70/-70 dBm
		MCS7/15	19/19 dBm	-68/-68 dBm
5 GHz	802.11n(VHT40)	MCS0/0	21/21 dBm	-85/-85 dBm
		MCS1/1	21/21 dBm	-82/-82 dBm
		MCS2/2	20/20 dBm	-79/-79 dBm
		MCS3/3	20/20 dBm	-77/-77 dBm
		MCS4/4	19/19 dBm	-74/-74 dBm
		MCS5/5	19/19 dBm	-70/-70 dBm
		MCS6/6	19/19 dBm	-68/-68 dBm
		MCS7/7	19/19 dBm	-67/-67 dBm
		MCS8/8	18/18 dBm	-64/-64 dBm
		MCS9/9	17/17 dBm	-63/-63 dBm
5 GHz	802.11ac(VHT80)	MCS0/0	20/20 dBm	-83/-83 dBm
		MCS1/1	20/20 dBm	-81/-81 dBm
		MCS2/2	19/19 dBm	-79/-79 dBm
		MCS3/3	19/19 dBm	-76/-76 dBm
		MCS4/4	18/18 dBm	-73/-73 dBm
		MCS5/5	18/18 dBm	-70/-70 dBm
		MCS6/6	18/18 dBm	-67/-67 dBm
		MCS7/7	18/18 dBm	-66/-66 dBm
		MCS8/8	17/17 dBm	-62/-62 dBm
		MCS9/9	17/17 dBm	-60/-60 dBm

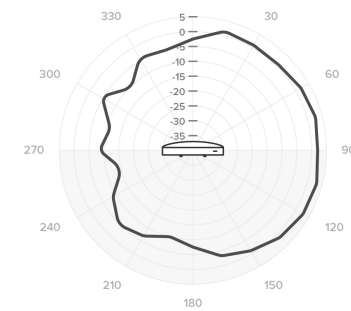
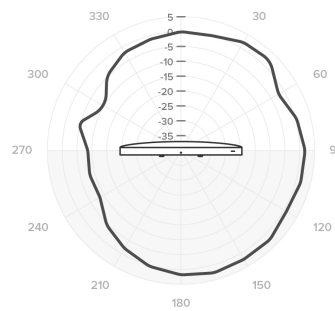
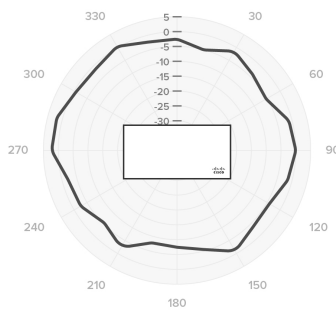
**MR33**

**Radiation Pattern for 2.4GHz Antennas**



**MR33**

**Radiation Pattern for 5GHz Antennas**





# Specifications

## Radios

- 2.4 GHz 802.11b/g/n/ac client access radio
- 5 GHz 802.11a/n/ac client access radio
- 2.4 GHz & 5 GHz WIDS/WIPS, spectrum analysis, and location analytics radio
- 2.4 GHz Bluetooth Low Energy (BLE) radio with beacon and BLE scanning support
- Concurrent operations of all four radios
- Supported frequency bands (country-specific restrictions apply):
  - 2.412-2.484 GHz
  - 5.150-5.250 GHz (UNII-1)
  - 5.250-5.350 GHz (UNII-2)
  - 5.470-5.600, 5.660-5.725 GHz (UNII-2e)
  - 5.725 -5.825 GHz (UNII-3)

## 802.11ac and 802.11n Capabilities

- 2 x 2 multiple input, multiple output (MIMO) with two spatial streams
- SU-MIMO and MU-MIMO support
- Maximal ratio combining (MRC) & Beamforming
- 20 and 40 MHz channels (802.11n), 20, 40, and 80 MHz channels (802.11ac)
- Up to 256 QAM on both 2.4 GHz and 5 GHz bands
- Packet aggregation

## Power

- Power over Ethernet: 37 - 57 V (802.3af compatible)
- Alternative 12 V DC input
- Power consumption: 11W max (802.3af)
- Power over Ethernet injector and DC adapter sold separately

## Mounting

- All standard mounting hardware included
- Desktop, ceiling, and wall mount capable
- Ceiling tile rail (9/16, 15/16 or 1 1/2" flush or recessed rails), assorted cable junction boxes
- Bubble level on mounting cradle for accurate horizontal wall mounting

## Physical Security

- Two security screw options (included)
- Kensington lock hard point
- Concealed mount plate with anti-tamper cable bay

## Environment

- Operating temperature: 32 °F to 104 °F (0 °C to 40 °C)
- Humidity: 5 to 95% non-condensing

## Physical Dimensions

- 8.5" x 4.3" x 1.3" (215 mm x 110 mm x 32 mm), not including deskmount feet or mount plate
- Weight: 13.2 oz (376.5 g)

## Antenna

- Integrated omni-directional antennas (3.8 dBi gain at 2.4 GHz, 3.9 dBi gain at 5 GHz)

## Interfaces

- 1x 10/100/1000 BASE-T Ethernet (RJ45)
- 1x DC power connector (5.5 mm x 2.5 mm, center positive)

## Security

- Integrated layer 7 firewall with mobile device policy management
- Real-time WIDS/WIPS with alerting and automatic rogue AP containment with Air Marshal
- Flexible guest access with device isolation
- VLAN tagging (802.1Q) and tunneling with IPSec VPN
- PCI compliance reporting
- WEP, WPA, WPA2-PSK, WPA2-Enterprise with 802.1X
- EAP-TLS, EAP-TTLS, EAP-MSCHAPv2, EAP-SIM
- TKIP and AES encryption
- Enterprise Mobility Management (EMM) & Mobile Device Management (MDM) integration

## Quality of Service

- Advanced Power Save (U-APSD)
- WMM Access Categories with DSCP and 802.1p support
- Layer 7 application traffic identification and shaping

## Mobility

- PMK, OKC, and 802.11r for fast Layer 2 roaming
- Distributed or centralized layer 3 roaming

## LED Indicators

- 2 Ethernet status
- 1 power/booting/firmware upgrade status

## Warranty

- Lifetime hardware warranty with advanced replacement included

## Ordering Information

- MR33-HW: Meraki MR33 Cloud Managed 802.11ac AP
- MA-PWR-30W-XX: Meraki AC Adapter for MR Series (XX = US, EU, UK or AU)
- MA-INJ-4-XX: Cisco Meraki 802.3at Power over Ethernet Injector (XX = US, EU, UK or AU)
- Note: Meraki Enterprise license required.