# MR78 Datasheet

## Entry Level Cloud Managed Outdoor Wi-Fi 6 Access Point

The Cisco Meraki MR78 is a Dual-band, 802.11ax, 2x2:2, cloud managed entry level outdoor Access Point. Designed for basic, medium-density deployments, the MR78 provides enterprise grade security and simple management.

The MR78 provides a maximum of 1.5 Gbps* aggregate frame rate with concurrent 2.4 GHz and 5 GHz radios.

With the combination of cloud management, high performance hardware, multiple radios, and advanced software features, enterprise-grade security, the MR78 makes an outstanding platform to provide reliable Wi-Fi for small business and home office networks that want reliable and secure wireless connectivity.

## MR78 and Meraki Cloud Management

Management of the MR78 is performed through the Meraki cloud, with an intuitive browser-based interface that enables rapid deployment without time-consuming training or costly certifications. Because the MR78 is self-configuring and managed over the web, it can be deployed at a remote location in a matter of minutes, even without on-site IT staff.

24x7 monitoring via the Meraki cloud delivers real-time alerts if a network encounters problems. Remote diagnostic tools enable immediate troubleshooting over the web so that distributed networks can be managed with a minimum of hassle.

The MR78's firmware is automatically kept up to date via the cloud. New features, security fixes, and enhancements are delivered seamlessly over the web. This

means no manual software updates to download or missing security patches to worry about.

## Product Highlights

- 2x2:2 MU-MIMO 802.11ax
- 1.5* Gbps dual-radio aggregate frame rate
- Enhanced transmit power and receive sensitivity
- Integrated enterprise security and guest access
- Application-aware traffic shaping
- Optimized for voice and video
- Self-configuring, plug-and-play deployment

## Features

**Dual–radio aggregate frame rate of up to 1.5 Gbps***

5 GHz 2x2:2 radio and 2.4 GHz 2x2:2 radio offer a combined dual–radio aggregate frame rate of 1.5 Gbps*, with up to 1,201 Mbps in the 5 GHz band and 286 Mbps in the 2.4 GHz band. Technologies like transmit beamforming and enhanced receive sensitivity allow the MR78 to support a higher client density than typical enterprise-class access points, resulting in better performance for more clients, from each AP.

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

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

With support for features of 802.11ax, the MR78 offers MU-MIMO and UL/DL OFDMA for more efficient transmission to multiple clients. Especially suited to 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.

**Automatic cloud-based RF optimization**

The MR78's sophisticated and automated RF optimization means that there is no need for the dedicated hardware and RF expertise typically required to tune a wireless network. The RF data collected by the dedicated third radio is continuously fed back to the Meraki cloud. This data is then used to automatically tune the channel selection, transmit power, and client connection settings for optimal performance under even the most challenging RF conditions.

**Integrated enterprise security and guest access**

The MR78 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 Enterprise authentication with 802.1X and Active Directory integration provide wired-like security while still being easy to configure. One-click guest isolation provides secure, Internet-only access for visitors. PCI compliance reports check network settings against PCI requirements to simplify secure retail deployments.

**Enterprise Mobility Management (EMM) & Mobile Device Management (MDM) integration**

Meraki Systems Manager natively integrates with the MR78 to offer automatic, context-aware security. Systems Manager's self-service enrollment helps to rapidly deploy MDM without installing additional equipment, and then dynamically tie firewall and traffic shaping policies to client posture.

**Application-aware traffic shaping**

The MR78 includes an integrated layer 7 packet inspection, classification, and control engine, enabling the configuration of QoS policies based on traffic type, helping to prioritize mission-critical applications while setting limits on recreational traffic like peer-to-peer and video streaming. Policies can be implemented per network, per SSID, per user group, or per individual user for maximum flexibility and control.

**Voice and video optimizations**

Industry standard QoS features are built-in and easy to configure. Wireless MultiMedia (WMM) access categories, 802.1p, and DSCP standards all ensure important applications get prioritized correctly, not only on the MR78 but on other devices in the network. Unscheduled Automatic Power Save Delivery (U-

APSD) and new Target Wait Time features in 802.11ax clients ensure minimal battery drain on wireless VoIP phones.

**Self-configuring, self-maintaining, always up-to-date**

When plugged in, the MR78 automatically connects to the Meraki cloud, downloads its configuration, and joins the appropriate network. If new firmware is required, this is retrieved by the AP and updated automatically. This ensures the network is kept up-to-date with bug fixes, security updates, and new features.

**Advanced analytics**

Drilling down into the details of network usage provides highly granular traffic analytics. Visibility into the physical world can be enhanced with journey tracking through location analytics. Visitor numbers, dwell time, repeat visit rates, and track trends can all be easily monitored in the dashboard and deeper analysis is enabled with raw data available via simple APIs.

**Bluetooth Low Energy Beacon and scanning radio**

An integrated fourth Bluetooth radio provides seamless deployment of BLE Beacon functionality and effortless visibility of Bluetooth devices.

# Specifications

| Category | Specifications |
| --- | --- |
| **Radios** | • 2.4 GHz 802.11b/g/n/ax client access radio<br>• 2.4 GHz Bluetooth Low Energy (BLE 5) radio with Beacon and BLE scanning support<br>• 5 GHz 802.11a/n/ac/ax client access radio<br>• Supported frequency bands (country-specific restrictions apply)<br>• Supported frequency bands (country-specific restrictions apply):<br>◦ 2.412-2.484 GHz<br>◦ 5.150-5.250 GHz (UNII-1)<br>◦ 5.250-5.350 GHZ (UNII-2)<br>◦ 5.470-5.600, 5.660-5.725 GHz (UNII-2e)<br>◦ 5.725 -5.825 GHz (UNII-3) |
| **Antenna** | • Internal Antenna (5.4 dBi gain at 2.4 GHz, 6 dBi gain at 5 GHz) |
| **802.11ax, 802.11ac Wave 2 and 802.11n Capabilities** | • DL-OFDMA**, UL-OFDMA**, TWT support**, BSS Coloring**<br>• 2 x 2 multiple input, multiple output (MIMO) with two spatial streams<br>• SU-MIMO, UL MU-MIMO** and DL MU-MIMO support<br>• Maximal ratio combining (MRC) & beamforming<br>• 20 and 40 MHz channels (802.11n); 20, 40, and 80 MHz channels (802.11ac Wave 2); 20, 40 and |

| | |
|---|---|
| | 80 MHz channels (802.11ax)<br>• Up to 1024-QAM on both 2.4 GHz & 5 GHz bands<br>• Packet aggregation |
| **Power** | • Power over Ethernet: 37 - 57 V (802.3af compatible)<br>• Power consumption: 15W max (802.3af). Note: actual power consumption may vary depending on the AP usage.<br>• Power over Ethernet injector sold separately<br>**Note:** Actual power consumption may vary depending on the AP usage. |
| **Interfaces** | • 1x 10/100/1000 BASE-T Ethernet (RJ45) |
| **Mounting** | • All standard mounting hardware included<br>• Desktop, ceiling, and wall mount capable<br>• Ceiling tile rail (9/16, 15/16 or 1 1⁄2” flush or recessed rails), assorted cable junction boxes<br>• Bubble level on mounting cradle for accurate horizontal wall mounting |
| **Physical Security** | • Two security screw options (included) (10 mm long and 2.5 mm diameter and 4.7 mm head)<br>• Concealed mount plate with anti-tamper cable bay |
| **Environment** | • Operating temperature: 32 °F to 104 °F (0 °C to 40 °C)<br>• Humidity: 5 to 95% non-condensing<br>• Operating altitude: Up to 40,000 feet (12,192 meters) |
| **Reliability** | • Mean Time Between Failure (MTBF): 257,215hrs at +25°C operating temperature |
| **Physical Dimensions** | • 9.65” x 4.53” x 1.18” (245 mm x 115 mm x 30 mm)<br>• Weight: 15.87 oz (0.45 kg) |
| **Security** | • Integrated Layer 7 firewall with mobile device policy management<br>• Flexible guest access with device isolation |

| | |
|---|---|
| | • VLAN tagging (802.1q) and tunneling with IPsec VPN<br>• PCI compliance reporting<br>• WEP***, WPA, WPA2-PSK, WPA2-Enterprise with 802.1X, WPA3 - Personal, WPA3 - Enterprise, WPA3 - Enhanced Open (OWE)**<br>• EAP-TLS, EAP-TTLS, EAP-MSCHAPv2, EAP-SIM<br>• TKIP and AES encryption<br>• Enterprise Mobility Management (EMM) & Mobile Device Management (MDM) integration<br>• Cisco ISE integration for Guest access and BYOD Posturing |
| **Quality of Service** | • Advanced Power Save (U-APSD)<br>• WMM Access Categories with DSCP and 802.1p support<br>• Layer 7 application traffic identification and shaping |
| **Mobility** | • PMK, OKC, & 802.11r for fast Layer 2 roaming<br>• Distributed or centralized layer 3 roaming |
| **Analytics** | • Embedded location analytics reporting and device tracking<br>• Global L7 traffic analytics reporting per network, per device, & per application |
| **LED Indicators** | • 1 power/booting/firmware upgrade status |
| **Regulatory** | • RoHS<br>• For additional country-specific regulatory information, please contact Meraki sales |
| **Warranty** | • 1-year hardware warranty with advanced replacement included |
| **Ordering Information** | • MR78-HW: Meraki MR78 Cloud Managed 802.11ax AP<br>• MA-INJ-6: Meraki Gigabit 802.3at Power over Ethernet Injector (XX = US/EU/UK/AU)<br>• Note: Meraki access point license required. |

** Software features that can be enabled via firmware updates

# Compliance and Standards

| Category | Standards |
| --- | --- |
| **IEEE Standards** | • 802.11a, 802.11ac, 802.11ax, 802.11b, 802.11e, 802.11g, 802.11h, 802.11i, 802.11k, 802.11n, 802.11r, and 802.11u*** |
| **Safety Approvals** | • CSA and CB 60950 & 62368<br>• Conforms to UL 2043 (Plenum Rating) |
| **Radio Approvals** | • Canada: FCC Part 15C, 15E, RSS-247<br>• Europe: EN 300 328, EN 301 893<br>• Australia/NZ: AS/NZS 4268<br>• Mexico: IFT, NOM-208<br>• Taiwan: NCC LP0002<br>• For additional country-specific regulatory information, please contact Meraki Sales |
| **EMI Approvals (Class B)** | • Canada: FCC Part 15B, ICES-003<br>• Europe: EN 301 489-1-17, EN 55032, EN 55024<br>• Australia/NZ: CISPR 22<br>• Japan: VCCI |
| **Exposure Approvals** | • Canada: FCC Part 2, RSS-102<br>• Europe: EN 50385, EN 62311, EN 62479<br>• Australia/NZ: AS/NZS 2772 |

*** Denotes a feature that can be enabled for required networks.

# Context and Comparisons

## 802.11ax, 802.11ac Wave 2 and 802.11n Capabilities

| MR78 | MR44 | MR46 | MR56 |
| --- | --- | --- | --- |

| | | | |
|---|---|---|---|
| DL-OFDMA**, UL-OFDMA**, TWT support**, BSS coloring** | DL-OFDMA**, UL-OFDMA**, TWT support**, BSS coloring** | DL-OFDMA**, UL-OFDMA**, TWT support**, BSS coloring** | DL-OFDMA**, UL-OFDMA**, TWT support**, BSS coloring** |
| 2 x 2 multiple input, multiple output (MIMO) with two spatial streams | 2.4GHz: 2 x 2 multiple input, multiple output (MIMO) with two spatial streams<br>5GHz: 4 x 4 multiple input, multiple output (MIMO) with four spatial streams | 4 x 4 multiple input, multiple output (MIMO) with four spatial streams | 8 x 8 multiple input, multiple output (MIMO) with eight spatial streams on 5 GHz<br>4 x 4 multiple input, multiple output (MIMO) with eight spatial streams on 2.4 GHz |
| Maximal ratio combining (MRC) & beamforming | Maximal ratio combining (MRC) & beamforming | Maximal ratio combining (MRC) & beamforming | Maximal ratio combining (MRC) & beamforming |
| SU-MIMO, UL MU-MIMO** and DL MU-MIMO support | SU-MIMO, UL MU-MIMO** and DL MU-MIMO support | SU-MIMO, UL MU-MIMO** and DL MU-MIMO support | SU-MIMO, UL MU-MIMO** and DL MU-MIMO support |
| 20 and 40 MHz channels (802.11n); 20, 40, and 80 MHz channels (802.11ac Wave 2); 20, 40 and 80 MHz channels (802.11ax) | 20 and 40 MHz channels (802.11n); 20, 40, and 80 MHz channels (802.11ac Wave 2); 20, 40 and 80 MHz channels (802.11ax) | 20 and 40 MHz channels (802.11n); 20, 40, and 80 MHz channels (802.11ac Wave 2); 20, 40 and 80 MHz channels (802.11ax) | 20 and 40 MHz channels (802.11n); 20, 40, and 80 MHz channels (802.11ac Wave 2); 20, 40 and 80MHz channels (802.11ax) |
| Up to 1024-QAM on both 2.4 GHz & 5 GHz bands | Up to 1024-QAM on both 2.4 GHz & 5 GHz bands | Up to 1024-QAM on both 2.4 GHz & 5 GHz bands | Up to 1024-QAM on both 2.4 GHz & 5 GHz bands |
| Packet aggregation | Packet aggregation | Packet aggregation | Packet aggregation |

## Power

**Note:** Actual power consumption may vary depending on the AP usage.

| MR78 | MR44 | MR46 | MR56 |
|---|---|---|---|
| Power over Ethernet: 37 - 57 V (802.af compliant) | Power over Ethernet: 42.5 - 57 V (802.3at) **or** 37 - 57 V (802.3af) - low power mode | Power over Ethernet: 42.5 - 57 V (802.3at compliant) | Power over Ethernet: 42.5 - 57 V (802.3at compliant) |
| Alternative: 12 V DC input | Alternative: 12 V DC input | Alternative: 12 V DC input | Alternative: 12 V DC input |
| Power consumption: 15W max (802.3af) | Power consumption: 30W max (802.3at) **or** 15W max (802.3af) - low power mode ** | Power consumption: 30W max (802.3at **required**) | Power consumption: 30W max (802.3at **required**) |

| | | | |
|---|---|---|---|
| Power over Ethernet injector sold separately | Power over Ethernet injector and DC adapter sold separately | Power over Ethernet injector and DC adapter sold separately | Power over Ethernet injector and DC adapter sold separately |

## Interfaces

| MR78 | MR44 | MR46 | MR56 |
|---|---|---|---|
| 1x 10/100/1000 BASE-T Ethernet (RJ45) | 1x 100/1000/2.5G BASE-T Ethernet (RJ45) | 1x 100/1000/2.5G BASE-T Ethernet (RJ45) | 1x 100/1000/2.5G/5G BASE-T Ethernet (RJ45) |
| 1x DC power connector (5.5 mm x 2.5 mm, center positive) | 1x DC power connector (5.5 mm x 2.5 mm, center positive) | 1x DC power connector (5.5 mm x 2.5 mm, center positive) | 1x DC power connector (5.5 mm x 2.5 mm, center positive) |

## Physical Dimensions

| MR78 | MR44 | MR46 | MR56 |
|---|---|---|---|
| 9.65” x 4.53” x 1.18” (245 mm x 115 mm x 30 mm) | 12.05" × 5.06" × 1.74" (30.6 cm × 12.84 cm × 4.43 cm), not including desk mount feet or mount plate | 12.05” x 5.06” x 1.74” (30.6 cm x 12.84 cm x 4.43 cm), not including desk mount feet or mount plate | 12.83” x 5.54” x 1.76” (32.6 cm x 14.079 cm x 4.47 cm), not including desk mount feet or mount plate |
| Weight: 15.87 oz (0.45 kg) | Weight: 26.07 oz (739 g) | Weight: 28.22 oz (800 g) | Weight: 35.27 oz (1 kg) |

# RF Performance Table

## 2.4 GHz

| Operating Band | Operating Mode | Data Rate | TX Power (conducted) | RX Sensitivity |
|---|---|---|---|---|
| 2.4 GHz | 802.11b | 1 Mb/s | 20 | -100 |
| | | 2 Mb/s | 20 | -90 |

| | | | | |
|---|---|---|---|---|
| | | 5.5 Mb/s | 20 | -90 |
| | | 11 Mb/s | 20 | -90 |
| | | 6 Mb/s | 19 | -94 |
| | | 9 Mb/s | 19 | -93 |
| | | 12 Mb/s | 19 | -91 |
| | | 18 Mb/s | 19 | -89 |
| 2.4 GHz | 802.11g | | | |
| | | 24 Mb/s | 16 | -86 |
| | | 36 Mb/s | 16 | -82 |
| | | 48 Mb/s | 16 | -78 |
| | | 54 Mb/s | 16 | -77 |
| | | MCS0 | 18.5 | -95 |
| | | MCS1 | 18.5 | -92 |
| | | MCS2 | 18.5 | -90 |
| | | MCS3 | 18.5 | -87 |
| 2.4 GHz | 802.11n (HT20) | | | |
| | | MCS4 | 18.5 | -83 |
| | | MCS5 | 14.5 | -79 |
| | | MCS6 | 14.5 | -78 |
| | | MCS7 | 14.5 | -76 |
| 2.4 GHz | 802.11ac (VHT20) | MCS0 | 18.5 | -95 |

| | | | | |
|---|---|---|---|---|
| | | MCS1 | 18.5 | -92 |
| | | MCS2 | 18.5 | -90 |
| | | MCS3 | 18.5 | -87 |
| | | MCS4 | 18.5 | -83 |
| | | MCS5 | 14.5 | -79 |
| | | MCS6 | 14.5 | -78 |
| | | MCS7 | 14.5 | -77 |
| | | MCS8 | 14 | -72 |
| | | MCS0 | 19 | -93 |
| | | MCS1 | 19 | -90 |
| | | MCS2 | 19 | -88 |
| | | MCS3 | 19 | -85 |
| | | MCS4 | 19 | -81 |
| 2.4 GHz | 802.11ax (HE20) | MCS5 | 14.5 | -77 |
| | | MCS6 | 14.5 | -76 |
| | | MCS7 | 14.5 | -75 |
| | | MCS8 | 14 | -70 |
| | | MCS9 | 14 | -68 |
| | | MCS10 | 13.5 | -65 |

| | | | | |
|---|---|---|---|---|
| | | MCS11 | 13.5 | -63 |

## 5 GHz

| Operating Band | Operating Mode | Data Rate | TX Power (conducted) | RX Sensitivity |
|---|---|---|---|---|
| 5 GHz | 802.11a | 6 Mb/s | 17.5 | -92 |
| | | 9 Mb/s | 17.5 | -91 |
| | | 12 Mb/s | 17.5 | -89 |
| | | 18 Mb/s | 17.5 | -87 |
| | | 24 Mb/s | 15 | -83 |
| | | 36 Mb/s | 15 | -80 |
| | | 48 Mb/s | 15 | -76 |
| | | 54 Mb/s | 15 | -76 |
| 5 GHz | 802.11n (HT20) | MCS0 | 17.5 | -93 |
| | | MCS1 | 17.5 | -90 |
| | | MCS2 | 17.5 | -88 |
| | | MCS3 | 17.5 | -85 |
| | | MCS4 | 17.5 | -81 |
| | | MCS5 | 13.5 | -77 |
| | | MCS6 | 13.5 | -76 |

| | | | | |
|---|---|---|---|---|
| | | MCS7 | 13.5 | -75 |
| | | MCS0 | 17.5 | -91 |
| | | MCS1 | 17.5 | -88 |
| 5 GHz | | MCS2 | 17.5 | -86 |
| | 802.11n (HT40) | MCS3 | 17.5 | -83 |
| | | MCS4 | 17.5 | -79 |
| | | MCS5 | 13.5 | -75 |
| | | MCS6 | 13.5 | -74 |
| | | MCS7 | 13.5 | -73 |
| | | MCS0 | 17.5 | -94 |
| | | MCS1 | 17.5 | -91 |
| 5 GHz | | MCS2 | 17.5 | -89 |
| | | MCS3 | 17.5 | -86 |
| | 802.11ac (VHT20) | MCS4 | 17.5 | -82 |
| | | MCS5 | 13.5 | -78 |
| | | MCS6 | 13.5 | -77 |
| | | MCS7 | 13.5 | -76 |
| | | MCS8 | 13.5 | -70 |
| 5 GHz | 802.11ac (VHT40) | MCS0 | 17.5 | -91 |

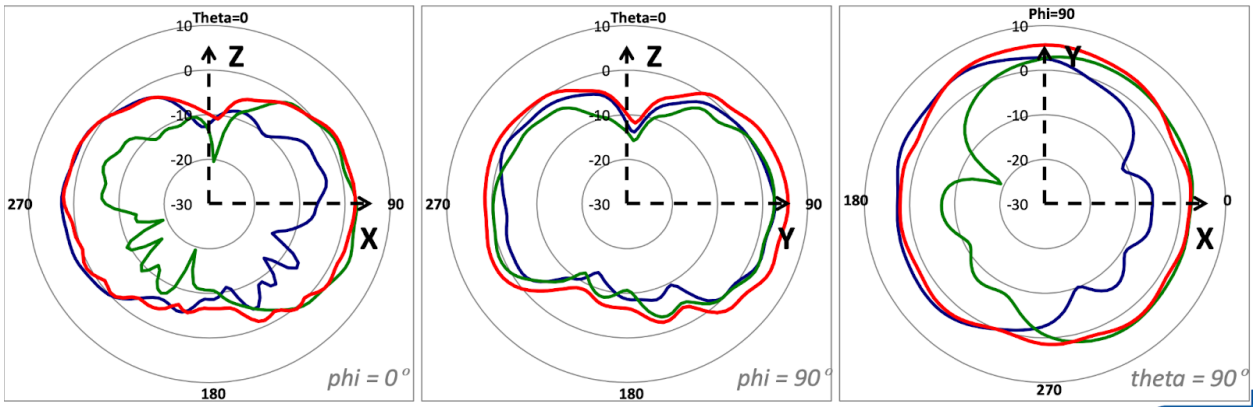
| | | | | |
|---|---|---|---|---|
| | | MCS1 | 17.5 | -88 |
| | | MCS2 | 17.5 | -86 |
| | | MCS3 | 17.5 | -83 |
| | | MCS4 | 17.5 | -79 |
| | | MCS5 | 13.5 | -75 |
| | | MCS6 | 13.5 | -74 |
| | | MCS7 | 13.5 | -73 |
| | | MCS8 | 13.5 | -68 |
| | | MCS9 | 13.5 | -67 |
| 5 GHz | 802.11ac (VHT80) | MCS0 | 17.5 | -88 |
| | | MCS1 | 17.5 | -85 |
| | | MCS2 | 17.5 | -83 |
| | | MCS3 | 17.5 | -80 |
| | | MCS4 | 17.5 | -76 |
| | | MCS5 | 13.5 | -72 |
| | | MCS6 | 13.5 | -71 |
| | | MCS7 | 13.5 | -70 |
| | | MCS8 | 13.5 | -65 |
| | | MCS9 | 13.5 | -64 |

| | | | | |
|---|---|---|---|---|
| 5 GHz | 802.11ax (HE20) | MCS0 | 17.5 | -93 |
| | | MCS1 | 17.5 | -92 |
| | | MCS2 | 17.5 | -88 |
| | | MCS3 | 17.5 | -85 |
| | | MCS4 | 17.5 | -81 |
| | | MCS5 | 13.5 | -77 |
| | | MCS6 | 13.5 | -76 |
| | | MCS7 | 13.5 | -75 |
| | | MCS8 | 13.5 | -70 |
| | | MCS9 | 13.5 | -68 |
| | | MCS10 | 12 | -65 |
| | | MCS11 | 12 | -60 |
| 5 GHz | 802.11ax (HE40) | MCS0 | 17 | -91 |
| | | MCS1 | 17 | -88 |
| | | MCS2 | 17 | -86 |
| | | MCS3 | 17 | -83 |
| | | MCS4 | 17 | -79 |
| | | MCS5 | 13.5 | -75 |
| | | MCS6 | 13.5 | -74 |

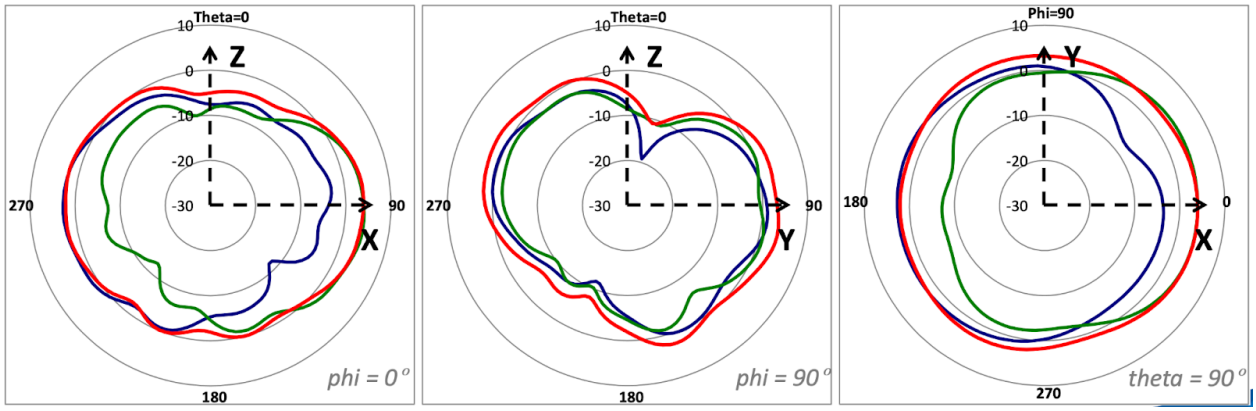
| | | | | |
|---|---|---|---|---|
| | | MCS7 | 13.5 | -73 |
| | | MCS8 | 13.5 | -68 |
| | | MCS9 | 13.5 | -66 |
| | | MCS10 | 12 | -63 |
| | | MCS11 | 12 | -62 |
| | | MCS0 | 17 | -88 |
| | | MCS1 | 17 | -85 |
| | | MCS2 | 17 | -83 |
| 5 GHz | | MCS3 | 17 | -80 |
| | | MCS4 | 17 | -76 |
| | 802.11ax (HE80) | MCS5 | 13.5 | -72 |
| | | MCS6 | 13.5 | -71 |
| | | MCS7 | 13.5 | -70 |
| | | MCS8 | 13.5 | -65 |
| | | MCS9 | 13.5 | -63 |
| | | MCS10 | 12 | -60 |
| | | MCS11 | 12 | -59 |

## Signal Coverage Patterns

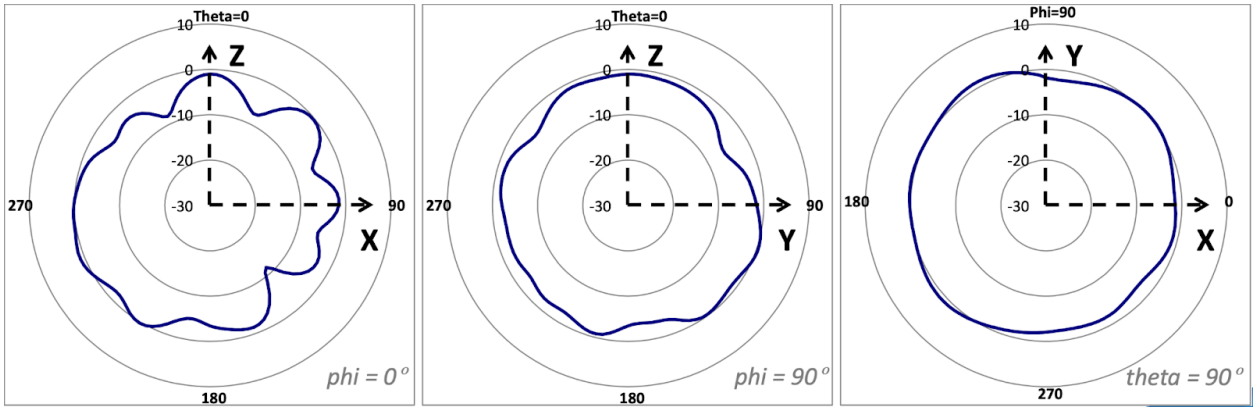
**5 GHz - Wireless**




**2.4 GHz - Wireless**




**BLE**




# Installation Guide

For instructions on how to install and configure MR78 access points please refer to the MR78 Installation Guide.