



## ARUBA MSR2000 OUTDOOR WIRELESS MESH ROUTER

The Aruba MSR2000 outdoor wireless mesh router delivers high-performance networking to outdoor environments where wired connectivity is impractical or unavailable.

Ruggedized and hardened to withstand extreme environmental conditions, the MSR2000 is ideal for deployment in metro areas, retail centers, business parks and transportation hubs.

A multi-radio, multi-frequency architecture and adaptive Layer 3 technology make the MSR2000 unique. Together, they provide unparalleled speed and reliability, low latency, and seamless handoffs for voice, video and other real-time applications across long-distance outdoor wireless mesh networks.

### Flexible, high-performance architecture

The MSR2000 consists of two independent 802.11a/b/g/n radios for flexible outdoor wireless mesh deployments using the 2.4-GHz, 5-GHz and 4.9-GHz U.S. public safety band. Each radio is capable of providing a maximum aggregate transmit power of up to 25dBm.

Each radio may be configured to operate as an access point (AP) or as a point-to-point, point-to-multipoint and full mesh backhaul. This two-radio architecture separates client access and mesh backbone data while optimizing radio resources for both types of traffic to ensure high throughput and low latency.

### Intelligent wireless mesh routing

The MSR2000 leverages Aruba's Adaptive Wireless Routing™ (AWR™) technology, which automatically optimizes traffic routes between multiple wireless mesh routers. AWR creates a truly adaptive mesh infrastructure that adjusts dynamically to traffic levels and RF signal strength to ensure high availability and zero performance degradation across multiple hops.

Aruba's MobileMatrix™, another key Layer 3 technology inherent in the MSR2000, allows clients to move between wireless mesh routers in under 50 milliseconds, maintaining a seamless connection for latency-sensitive applications such as video and voice.

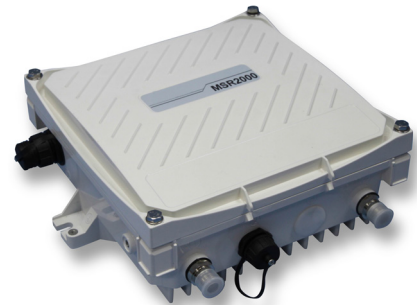
### HD-quality video

The MSR2000 employs Active Video Transport™ (AVT™) traffic shaping and load balancing technology across long-range directional links to deliver HD-quality video from mobile and fixed surveillance cameras, monitors and recording systems.

AVT delivers enhanced video at up to 30 frames per second across the distributed wireless mesh infrastructure using deep packet inspection, MAC protocol optimization, an in-network retransmission protocol, and adaptive video jitter removal.

### Reduced capital and operating costs

The MSR2000 reduces capital and operating costs by simplifying deployment and eliminating the need for cabling in metro and remote outdoor environments. Aruba wireless mesh routers eliminate the high cost of installing copper or fiber optic cabling, as well as monthly fees for leased line, digital subscriber line (DSL) and metro Ethernet services.



### APPLICATION

- Two-radio outdoor wireless mesh router designed for high-performance, latency-sensitive applications

### OPERATING MODE

- Each radio may be configured to operate in the following modes:
  - 802.11a/b/g/n access point for client access
  - 802.11a/b/g/n mesh router for backhaul

### RADIOS

- Two multifunction radios capable of 2.4-GHz, 5-GHz or 4.9-GHz (U.S. public safety) operation
- Radios implement 2x2 MIMO with two spatial streams, providing up to 300 Mbps data rate per radio
- Dual receiver chain maximal ratio combining (MRC) for improved receiver performance
- Maximum aggregate transmit power per radio: up to 25dBm

### RF MANAGEMENT

- RF interference detection and avoidance
- Four BSSIDs, 16 SSIDs
- Flexible baud rate control

### WIRELESS RADIO SPECIFICATIONS

- AP type: outdoor, two radio, dual band plus 4.9-GHz public safety band
- Supported frequency bands (country-specific restrictions apply)
  - 2.400 to 2.483 GHz
  - 4.900 to 5.100 GHz
  - 5.150 to 5.250 GHz
  - 5.250 to 5.350 GHz
  - 5.470 to 5.725 GHz
  - 5.725 to 5.850 GHz
- Available channels: Dependent on configured regulatory domain
- Maximum transmit power: 25 dBm (325 mW) limited by local regulatory requirements

# ARUBA MSR2000 OUTDOOR WIRELESS MESH ROUTER

- Supported radio technologies:
  - 802.11b: Direct-sequence spread-spectrum (DSSS)
  - 802.11a/g/n: Orthogonal frequency division multiplexing (OFDM)
  - 802.11n: 2x2 MIMO with two spatial streams
- Supported modulation types:
  - 802.11b: BPSK, QPSK, CCK
  - 802.11a/g/n: BPSK, QPSK, 16-QAM, 64-QAM
- Association Rates
  - 802.11b: 1, 2, 5.5, 11
  - 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54
  - 802.11n: MCS0 - MCS15 (6.5 Mbps to 300 Mbps)
  - 802.11n high-throughput (HT) support: HT 20/40
  - 802.11n packet aggregation: A-MPDU, A-MSDU

## ANTENNA

- Four N-type interfaces for external antenna support
- Feeder cable may be used for external antenna deployments

## ROUTING FEATURES

- Adaptive Wireless Routing (AWR)
- IPv4/IPv6 dual stacks
- DHCP v4/v6 Server, Relay, Client
- Network Address Translation (NAT)

## ADVANCED FEATURES

- Fast roaming up to 50 milliseconds
- Active Video Transport (AVT) technology performs deep packet inspection, adaptive jitter removal and corrects transmission packet loss
- Quality of service: Wi-Fi Multimedia (WMM), 802.11e, 802.1Q, 802.1p, Differentiated Services (DiffServ)
- Advanced Encryption Standard (AES), WEP, WPA/WPA2
- TKIP (128 bit), PSK, AES (128 bit), TLS and TTLS

## POWER IN

- Power
  - 100-240 VAC 50/60 Hz (MSR2K23EN1 only)
  - 12-48 VDC (MSR2K23EN2 only)
  - 802.3at PoE+ input required (MSR2K23EN0 only)
- Maximum Power consumption: 18W (excludes power consumed by any POE device connected to and powered by the MSR2000 AC and DC versions only)

## POWER OUT

- 802.3af PoE output (15.4W) on Ethernet interface (MSR2K23N1 and MSR2K23N2 only)

## INTERFACES

- One 10/100/1000BASE-T Ethernet interfaces (RJ45)
- Power:
  - 1 x DC power connector (in DC model only)
  - 1 x AC power connector (in AC model only)
- USB console interface
- Four N-type antenna connectors

## MOUNTING

- Mounting kit:
  - Mast mounting
  - Wall mounting
  - Solar shield included

## MECHANICAL

- Dimensions/weight (unit)
  - 260 mm x 240 mm x 105 mm (10.2" x 9.4" x 4.1")
  - 3.25 kg (7 lb)
- Dimensions/weight (shipping)
  - 330 mm x 320 mm x 300 mm (12.9" x 12.6" x 11.8")
  - 7.5 kg (16.6 lb)

## ENVIRONMENTAL

- Operating:
  - Temperature: -30° C to 55° C (-22° F to 131° F)
  - Humidity: 5% to 95% non-condensing
- Storage and transportation temperature range
  - -30° C to 70° C (-22° F to 158° F)
- Weather rating: IP66
- Wind survivability: Up to 165 mph
- Shock and vibration: ETSI 300-19-2-4 spec T41.E class 4M3
- Transportation: ISTA 2A

## REGULATORY

- Safety
  - EN 60950-1
  - IEC60950-1
  - UL 60950-1
  - CAN/CSA-C22.2 No.60950-1
- EMC
  - EN301 48
  - EN55022
  - EN61000
  - FCC Part 15
  - RSS-Gen
- RF
  - CFR47 FCC Part 15
  - RSS-21
  - EN 300 328
  - EN 301 893
- Certification
  - FCC
  - IC
  - CE
  - CB
  - cTUVus
  - RoHS
  - SRRC (China)

## ORDERING INFORMATION

MSR2K23N0-US (US only)/MSR2K23N0-JP (Japan only)/MSR2K23N0-IL (Israel only)/MSR2K23N0 (rest of world)

- Aruba MSR2000 Outdoor Wireless Mesh Router
- Two 802.11 a/b/g/n 320 mW radios (2.4 GHz, 5 GHz, 4.9 GHz)
- 10/100/1000BASE-T Ethernet interface
- Power input via 802.3at (PoE+) Ethernet interface
- One mounting kit with sun shield

MSR2K23N1-US (US only)/MSR2K23N1-JP (Japan only)/MSR2K23N1-IL (Israel only)/MSR2K23N1 (rest of world)

- Aruba MSR2000 Outdoor Wireless Mesh Router
- Two 802.11 a/b/g/n 320 mW radios (2.4 GHz, 5 GHz, 4.9 GHz)
- 100-240 VAC power input, 4.5m power cord included
- 10/100/1000BASE-T Ethernet interface with 802.3af POE power sourcing capability
- One mounting kit with sun shield

MSR2K23N2-US (US only)/MSR2K23N2-JP (Japan only)/MSR2K23N2-IL (Israel only)/MSR2K23N2 (rest of world)

- Aruba MSR2000 Outdoor Wireless Mesh Router
- Two 802.11 a/b/g/n 320 mW radios (2.4 GHz, 5 GHz, 4.9 GHz)
- 12-48 VDC power input, 4.5m power cord included
- 10/100/1000BASE-T Ethernet interface with 802.3af POE power sourcing capability
- One mounting kit with sun shield

## ACCESSORIES

Part number	Description
PD-9001G-AC	Single Port 802 3at PoE Midspan Injector
AP-LAR-1	Aruba Outdoor Antenna Lightning Arrestor - N Type Connector
AINS2KKIT-00	Outdoor Installation Kit
APWRTCL02-US	2m light pole power cord (US only)
ACONGEUSB-00	1.5m USB-DB9 console cable
AETHGEL05-00	5m shielded Ethernet cable with RJ-45 connectors

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## RF PERFORMANCE TABLE

	Max TX power per active TX chain (dBm)	RX Sensitivity (dBm)	Max TX power per active TX chain (dBm)	RX Sensitivity (dBm)
	2.4 GHz		5 GHz	
<b>802.11b</b>				
1 Mbps	20	-96		
2 Mbps	20	-96		
5.5 Mbps	20	-94		
11 Mbps	20	-93		
<b>802.11a/g</b>				
6 Mbps	20	-96	22	-97
9 Mbps	20	-96	22	-96
12 Mbps	20	-96	22	-96
18 Mbps	20	-95	22	-94
24 Mbps	19	-92	22	-88
36 Mbps	18	-89	20	-86
48 Mbps	17	-85	19	-82
54 Mbps	17	-83	18	-80
<b>802.11n HT20</b>				
MCS0	22	-94	21	-97
MCS1	22	-93	20	-94
MCS2	22	-92	19	-91
MCS3	22	-89	18	-87
MCS4	21	-85	17	-86
MCS5	20	-81	16	-81
MCS6	19	-80	15	-79
MCS7	18	-78	15	-77
MCS8	22	-94	21	-97
MCS9	22	-93	20	-94
MCS10	22	-92	19	-91
MCS11	22	-89	18	-87
MCS12	21	-85	17	-86
MCS13	20	-81	16	-81
MCS14	19	-80	15	-79
MCS15	18	-78	15	-77
<b>802.11n HT40</b>				
MCS0	21	-92	19	-92
MCS1	21	-91	19	-90
MCS2	21	-89	18	-88
MCS3	20	-86	17	-85
MCS4	19	-83	16	-83
MCS5	18	-79	15	-79
MCS6	18	-77	14	-77
MCS7	17	-75	14	-73
MCS8	21	-92	19	-92
MCS9	21	-91	19	-90
MCS10	21	-89	18	-88
MCS11	20	-86	17	-85
MCS12	19	-83	16	-83
MCS13	18	-79	15	-79
MCS14	18	-77	14	-77
MCS15	17	-75	14	-73

Maximum capability of the hardware provided. Maximum transmit power will be limited by local regulatory settings.



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