

AWK-3131A-RCC Series

Industrial IEEE 802.11a/b/g/n wireless AP/client



Features and Benefits

- Designed specifically for rail carriage-to-carriage communication
- IEEE 802.11a/b/g/n compliant
- Up to 300 Mbps data rate
- M12 anti-vibration connectors
- MIMO technology increases data throughput and range
- Complies with all EN 50155 mandatory test items¹
- Wide-temperature models available for -40 to 75°C environments
- Supports the Auto Carriage-to-Carriage connection function

Certifications



Introduction

The AWK-3131A-RCC Series industrial 802.11n wireless AP/client is an ideal wireless solution for applications such as onboard passenger infotainment systems and inter-carriage wireless backbone networks because it provides a faster data rate compared to 802.11g devices. The auto carriage connection (ACC) feature facilitates easy deployment of wireless devices and increases the reliability of wireless carriage backbone networks. The AWK-3131A-RCC Series is also optimized for passenger Wi-Fi services and complies with a portion of the EN 50155 specifications covering operating temperature, power input voltage, surge, ESD, and vibration, making the products suitable for a variety of industrial applications. The AWK-3131A-RCC Series can also be powered via the PoE port for easier deployment.

High Data Rate and Bandwidth

- High-speed wireless connectivity with up to 300 Mbps data rate
- MIMO technology to improve the capability of transmitting and receiving multiple data streams
- Increased channel width with channel bonding technology

Designed for Industrial-grade Applications

- Industrial-grade QoS and VLAN for efficient data traffic management
- Integrated DI/DO for on-site monitoring and warnings
- Signal strength LEDs for easy deployment and antenna alignment

Specifications

WLAN Interface

WLAN Standards	802.11a/b/g/n 802.11i Wireless Security
Modulation Type	DSSS OFDM 802.11b: CCK @ 11/5.5 Mbps 802.11b: DQPSK @ 2 Mbps 802.11b: DBPSK @ 1 Mbps 802.11a/g: 64QAM @ 54/58 Mbps 802.11a/g: 16QAM @ 36/24 Mbps 802.11a/g: QPSK @ 18/12 Mbps 802.11a/g: BPSK @ 9/6 Mbps 802.11n: 64QAM @ 300 Mbps to BPSK @ 6.5 Mbps
Frequency Band for US (20 MHz operating channels)	2.412 to 2.462 GHz (11 channels)

1. This product is suitable for rolling stock railway applications, as defined by the EN 50155 standard. For a more detailed statement, click here: www.moxa.com/doc/specs/EN_50155_Compliance.pdf

	5.180 to 5.240 GHz (4 channels) 5.260 to 5.320 GHz (4 channels) ² 5.500 to 5.700 GHz (8 channels) excluding 5.600 to 5.640 GHz ³ 5.745 to 5.825 GHz (5 channels)
Frequency Band for EU (20 MHz operating channels)	2.412 to 2.472 GHz (13 channels) 5.180 to 5.240 GHz (4 channels) 5.260 to 5.320 GHz (4 channels) ² 5.500 to 5.700 GHz (11 channels) ³
Frequency Band for JP (20 MHz operating channels)	2.412 to 2.484 GHz (14 channels) 5.180 to 5.240 GHz (4 channels) 5.260 to 5.320 GHz (4 channels) ² 5.500 to 5.700 GHz (11 channels) ²
Wireless Security	SSID broadcast enable/disable WEP encryption (64-bit and 128-bit) WPA/WPA2-Personal WPA/WPA2-Enterprise (IEEE 802.1X/RADIUS, TKIP, AES)
Transmission Rate	802.11b: 1 to 11 Mbps 802.11a/g: 6 to 54 Mbps 802.11n: 6.5 to 300 Mbps
Transmitter Power for 802.11a	23±1.5 dBm @ 6 to 24 Mbps 21±1.5 dBm @ 36 Mbps 20±1.5 dBm @ 48 Mbps 18±1.5 dBm @ 54 Mbps
Transmitter Power for 802.11n (5 GHz)	23±1.5 dBm @ MCS0 20 MHz 20±1.5 dBm @ MCS1 20 MHz 20±1.5 dBm @ MCS2 20 MHz 20±1.5 dBm @ MCS3 20 MHz 19±1.5 dBm @ MCS4 20 MHz 18±1.5 dBm @ MCS5 20 MHz 18±1.5 dBm @ MCS6 20 MHz 18±1.5 dBm @ MCS7 20 MHz 23±1.5 dBm @ MCS8 20 MHz 20±1.5 dBm @ MCS9 20 MHz 20±1.5 dBm @ MCS10 20 MHz 20±1.5 dBm @ MCS11 20 MHz 19±1.5 dBm @ MCS12 20 MHz 19±1.5 dBm @ MCS13 20 MHz 18±1.5 dBm @ MCS14 20 MHz 18±1.5 dBm @ MCS15 20 MHz 23±1.5 dBm @ MCS0 40 MHz 20±1.5 dBm @ MCS1 40 MHz 20±1.5 dBm @ MCS2 40 MHz 20±1.5 dBm @ MCS3 40 MHz 19±1.5 dBm @ MCS4 40 MHz 18±1.5 dBm @ MCS5 40 MHz 18±1.5 dBm @ MCS6 40 MHz 18±1.5 dBm @ MCS7 40 MHz 23±1.5 dBm @ MCS8 40 MHz 20±1.5 dBm @ MCS9 40 MHz 20±1.5 dBm @ MCS10 40 MHz 20±1.5 dBm @ MCS11 40 MHz 19±1.5 dBm @ MCS12 40 MHz 19±1.5 dBm @ MCS13 40 MHz 18±1.5 dBm @ MCS14 40 MHz 18±1.5 dBm @ MCS15 40 MHz
Transmitter Power for 802.11b	26±1.5 dBm @ 1 Mbps 26±1.5 dBm @ 2 Mbps 26±1.5 dBm @ 5.5 Mbps 25±1.5 dBm @ 11 Mbps
Transmitter Power for 802.11g	23±1.5 dBm @ 6 to 24 Mbps

2. DFS (Dynamic Frequency Selection) channel support: In AP mode, when a radar signal is detected, the device will automatically switch to another channel. However, according to regulations, after switching channels, a 60-second availability check period is required before starting the service.
3. DFS (Dynamic Frequency Selection) channel support: In AP mode, when a radar signal is detected, the device will automatically switch to another channel. However according to regulations, after switching channels, a 60-second availability check period is required before starting the service.

	<p>21±1.5 dBm @ 36 Mbps 19±1.5 dBm @ 48 Mbps 18±1.5 dBm @ 54 Mbps</p>
Transmitter Power for 802.11n (2.4 GHz)	<p>23±1.5 dBm @ MCS0 20 MHz 21±1.5 dBm @ MCS1 20 MHz 21±1.5 dBm @ MCS2 20 MHz 21±1.5 dBm @ MCS3 20 MHz 20±1.5 dBm @ MCS4 20 MHz 19±1.5 dBm @ MCS5 20 MHz 18±1.5 dBm @ MCS6 20 MHz 18±1.5 dBm @ MCS7 20 MHz 23±1.5 dBm @ MCS8 20 MHz 21±1.5 dBm @ MCS9 20 MHz 21±1.5 dBm @ MCS10 20 MHz 21±1.5 dBm @ MCS11 20 MHz 20±1.5 dBm @ MCS12 20 MHz 19±1.5 dBm @ MCS13 20 MHz 18±1.5 dBm @ MCS14 20 MHz 18±1.5 dBm @ MCS15 20 MHz 23±1.5 dBm @ MCS0 40 MHz 20±1.5 dBm @ MCS1 40 MHz 20±1.5 dBm @ MCS2 40 MHz 20±1.5 dBm @ MCS3 40 MHz 19±1.5 dBm @ MCS4 40 MHz 19±1.5 dBm @ MCS5 40 MHz 18±1.5 dBm @ MCS6 40 MHz 17±1.5 dBm @ MCS7 40 MHz 23±1.5 dBm @ MCS8 40 MHz 20±1.5 dBm @ MCS9 40 MHz 20±1.5 dBm @ MCS10 40 MHz 20±1.5 dBm @ MCS11 40 MHz 20±1.5 dBm @ MCS12 40 MHz 19±1.5 dBm @ MCS13 40 MHz 18±1.5 dBm @ MCS14 40 MHz 17±1.5 dBm @ MCS15 40 MHz</p>
Receiver Sensitivity for 802.11a (measured at 5.680 GHz)	<p>Typ. -90 @ 6 Mbps Typ. -88 @ 9 Mbps Typ. -88 @ 12 Mbps Typ. -85 @ 18 Mbps Typ. -81 @ 24 Mbps Typ. -78 @ 36 Mbps Typ. -74 @ 48 Mbps Typ. -74 @ 54 Mbps Note⁴</p>
Receiver Sensitivity for 802.11n (5 GHz; measured at 5.680 GHz)	<p>Typ. -88 dBm @ MCS0 20 MHz Typ. -85 dBm @ MCS1 20 MHz Typ. -82 dBm @ MCS2 20 MHz Typ. -79 dBm @ MCS3 20 MHz Typ. -76 dBm @ MCS4 20 MHz Typ. -71 dBm @ MCS5 20 MHz Typ. -70 dBm @ MCS6 20 MHz Typ. -69 dBm @ MCS7 20 MHz Typ. -95 dBm @ MCS8 20 MHz Typ. -91 dBm @ MCS9 20 MHz Typ. -87 dBm @ MCS10 20 MHz Typ. -80 dBm @ MCS11 20 MHz Typ. -78 dBm @ MCS12 20 MHz Typ. -74 dBm @ MCS13 20 MHz Typ. -72 dBm @ MCS14 20 MHz Typ. -71 dBm @ MCS15 20 MHz Typ. -84 dBm @ MCS0 40 MHz Typ. -81 dBm @ MCS1 40 MHz Typ. -77 dBm @ MCS2 40 MHz Typ. -75 dBm @ MCS3 40 MHz Typ. -71 dBm @ MCS4 40 MHz Typ. -67 dBm @ MCS5 40 MHz Typ. -64 dBm @ MCS6 40 MHz Typ. -63 dBm @ MCS7 40 MHz</p>

4. Due to a limitation in the receiver sensitivity performance for channels 153 and 161, it is recommended to avoid using these channels in your critical applications.

	<p>Typ. -90 dBm @ MCS8 40 MHz Typ. -85 dBm @ MCS9 40 MHz Typ. -82 dBm @ MCS10 40 MHz Typ. -81 dBm @ MCS11 40 MHz Typ. -77 dBm @ MCS12 40 MHz Typ. -73 dBm @ MCS13 40 MHz Typ. -71 dBm @ MCS14 40 MHz Typ. -68 dBm @ MCS15 40 MHz Note⁵</p>
Receiver Sensitivity for 802.11b (measured at 2.437 GHz)	<p>Typ. -93 dBm @ 1 Mbps Typ. -93 dBm @ 2 Mbps Typ. -93 dBm @ 5.5 Mbps Typ. -88 dBm @ 11 Mbps</p>
Receiver Sensitivity for 802.11g (measured at 2.437 GHz)	<p>Typ. -88 dBm @ 6 Mbps Typ. -86 dBm @ 9 Mbps Typ. -85 dBm @ 12 Mbps Typ. -85 dBm @ 18 Mbps Typ. -85 dBm @ 24 Mbps Typ. -82 dBm @ 36 Mbps Typ. -78 dBm @ 48 Mbps Typ. -74 dBm @ 54 Mbps</p>
Receiver Sensitivity for 802.11n (2.4 GHz; measured at 2.437 GHz)	<p>Typ. -89 dBm @ MCS0 20 MHz Typ. -85 dBm @ MCS1 20 MHz Typ. -85 dBm @ MCS2 20 MHz Typ. -82 dBm @ MCS3 20 MHz Typ. -78 dBm @ MCS4 20 MHz Typ. -74 dBm @ MCS5 20 MHz Typ. -72 dBm @ MCS6 20 MHz Typ. -70 dBm @ MCS7 20 MHz Typ. -95 dBm @ MCS8 20 MHz Typ. -90 dBm @ MCS9 20 MHz Typ. -87 dBm @ MCS10 20 MHz Typ. -83 dBm @ MCS11 20 MHz Typ. -80 dBm @ MCS12 20 MHz Typ. -74 dBm @ MCS13 20 MHz Typ. -71 dBm @ MCS14 20 MHz Typ. -69 dBm @ MCS15 20 MHz Typ. -87 dBm @ MCS0 40 MHz Typ. -83 dBm @ MCS1 40 MHz Typ. -83 dBm @ MCS2 40 MHz Typ. -80 dBm @ MCS3 40 MHz Typ. -76 dBm @ MCS4 40 MHz Typ. -73 dBm @ MCS5 40 MHz Typ. -69 dBm @ MCS6 40 MHz Typ. -67 dBm @ MCS7 40 MHz Typ. -93 dBm @ MCS8 40 MHz Typ. -88 dBm @ MCS9 40 MHz Typ. -85 dBm @ MCS10 40 MHz Typ. -82 dBm @ MCS11 40 MHz Typ. -78 dBm @ MCS12 40 MHz Typ. -73 dBm @ MCS13 40 MHz Typ. -69 dBm @ MCS14 40 MHz Typ. -67 dBm @ MCS15 40 MHz</p>
WLAN Operation Mode	Access point, Client, Client-Router, Sniffer
Antenna Connectors	QMA

5. Due to a limitation in the receiver sensitivity performance for channels 153 and 161, it is recommended to avoid using these channels in your critical applications.

Ethernet Interface

PoE Ports (10/100/1000BaseT(X), M12 A-coded 8-pin female connector)	1
Standards	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) IEEE 802.3ab for 1000BaseT IEEE 802.3af for PoE IEEE 802.1Q for VLAN Tagging
10/100/1000BaseT(X) Ports (M12 A-coded 8-pin female connector)	1, M12 A-coded 8-pin female connector, 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, auto MDI/MDI-X connection

Ethernet Software Features

Management	General: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNMP, TCP, UDP, RADIUS, SNMP, DHCP AP-only: ARP, BOOTP, DHCP
Security	RADIUS

Firewall

Filter	MAC/IP Protocol/Port-based
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Serial Interface

Console Port	RS-232 (RJ45-type)
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LED Interface

LED Indicators	PWR1, PWR2, PoE, FAULT, STATE, SIGNAL, Client, WLAN, LAN
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Input/Output Interface

Digital Inputs	2 +13 to +30 V for state 1 +3 to -30 V for state 0 Max. input current: 8 mA
Alarm Contact Channels	Relay output with current carrying capacity of 1 A @ 24 VDC
Buttons	Reset button

Physical Characteristics

Housing	Metal
IP Rating	IP30
Dimensions	52.9 x 151.9 x 127.4 mm (2.08 x 5.98 x 5.02 in)
Weight	850 g (1.87 lb)
Installation	DIN-rail mounting, Wall mounting (with optional kit)
Protection	AWK-3131A-M12-RCC-US-CT-T: PCB conformal coating AWK-3131A-M12-RCC-JP-CT-T: PCB conformal coating AWK-3131A-M12-RCC-EU-CT: PCB conformal coating AWK-3131A-M12-RCC-JP-CT: PCB conformal coating AWK-3131A-M12-RCC-US-CT: PCB conformal coating AWK-3131A-M12-RCC-EU-CT-T: PCB conformal coating

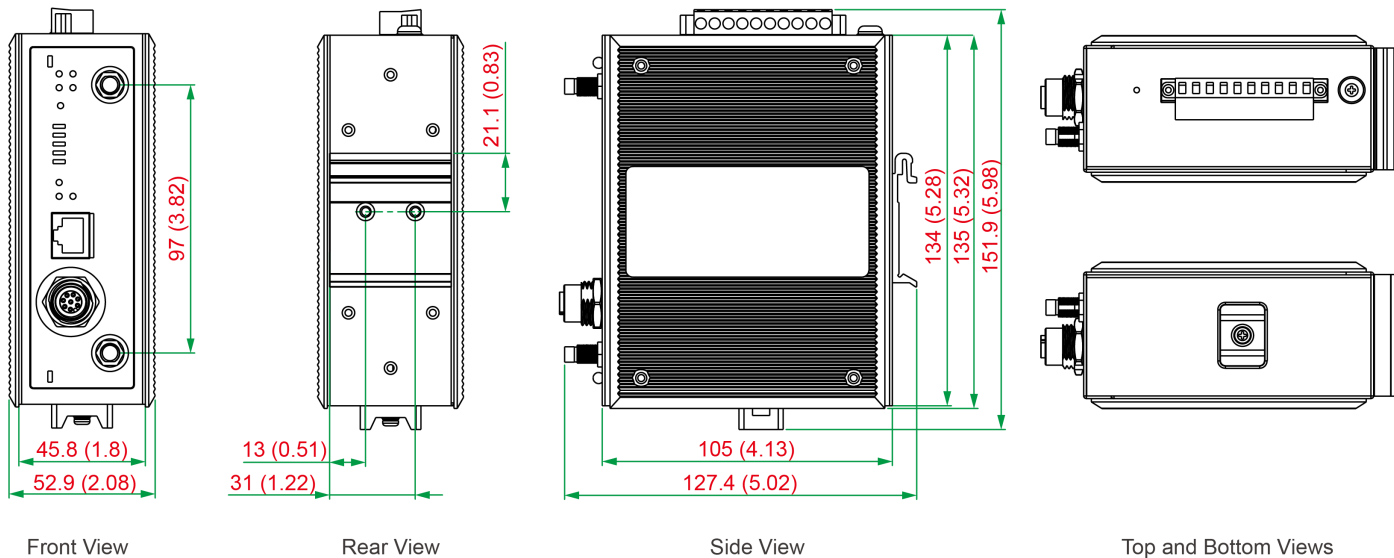
Power Parameters

Input Current	0.67 A @ 12 VDC, 0.17 A @ 48 VDC
Input Voltage	12 to 48 VDC, Redundant dual inputs, 48 VDC Power-over-Ethernet
Power Connector	1 removable 10-contact terminal block(s)

Power Consumption	Maximum 8.03 W
Reverse Polarity Protection	Supported
Environmental Limits	
Operating Temperature	Standard Models: -25 to 60°C (-13 to 140°F) Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature (package included)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)
Standards and Certifications	
EMC	EN 55032/24
EMI	CISPR 32, FCC Part 15B Class B
EMS	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF
Railway	EN 50155, EN 50121-4
Railway Fire Protection	EN 45545-2
Radio	EN 300 328, EN 301 893, MIC, FCC ID SLE-WAPN008, IDA
Safety	UL 60950-1, IEC 60950-1, EN 60950-1 (LVD)
MTBF	
Time	742,649 hrs
Standards	Telcordia SR332
Warranty	
Warranty Period	5 years
Details	See www.moxa.com/warranty
Package Contents	
Device	1 x AWK-3131A-M12-RCC wireless AP/client
Installation Kit	1 x DIN-rail kit 2 x cap, plastic, for RJ45 port 1 x cable holder with screw
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

Unit: mm (inch)



Ordering Information

Model Name	Band	Operating Temperature (-40 to 75°C)	Conformal Coating
AWK-3131A-M12-RCC-US	US	-25 to 60°C	-
AWK-3131A-M12-RCC-EU	EU	-25 to 60°C	-
AWK-3131A-M12-RCC-JP	JP	-25 to 60°C	-
AWK-3131A-M12-RCC-US-T	US	-40 to 75°C	-
AWK-3131A-M12-RCC-EU-T	EU	-40 to 75°C	-
AWK-3131A-M12-RCC-JP-T	JP	-40 to 75°C	-
AWK-3131A-M12-RCC-US-CT	US	-25 to 60°C	✓
AWK-3131A-M12-RCC-EU-CT	EU	-25 to 60°C	✓
AWK-3131A-M12-RCC-JP-CT	JP	-25 to 60°C	✓
AWK-3131A-M12-RCC-US-CT-T	US	-40 to 75°C	✓
AWK-3131A-M12-RCC-EU-CT-T	EU	-40 to 75°C	✓
AWK-3131A-M12-RCC-JP-CT-T	JP	-40 to 75°C	✓

Accessories (sold separately)

Wall-Mounting Kits

WK-51-01

Wall-mounting kit, 2 plates, 6 screws, 51.6 x 67 x 2 mm

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AWK-3131A-RTG Series

Industrial IEEE 802.11a/b/g/n wireless AP/client



Features and Benefits

- IEEE 802.11a/b/g/n compliant
- M12 anti-vibration connectors
- SC optical fiber connection
- QoS (WMM) and VLAN for efficient network traffic
- Controller-based Turbo Roaming (less than 50 ms)¹
- Complies with all EN 50155 mandatory test items²
- Wide-temperature models available for -40 to 75°C environments

Certifications



Introduction

The AWK-3131A-RTG 2-in-1 industrial AP/client devices are designed specifically for train-to-ground communication and can perform reliably even when the trains reach a speed of 120 km/h. The AWK-3131A-RTG complies with a portion of EN 50155 specifications, covering operating temperature, power input voltage, surge, ESD, and vibration, making the AWK-3131A-RTG suitable for a variety of industrial applications. Installation is easy, with either DIN-rail mounting or distribution boxes, and the DIN-rail mounting capability, wide operating temperature range, and IP30 housing with LED indicators make the AWK-3131A-RTG a convenient yet reliable solution for any rolling stock application.

Advanced Security

- 64-bit and 128-bit WEP (Wired Equivalent Privacy)
- Enable/disable SSID broadcasts
- WPA/WPA2 (Wi-Fi Protected Access) and 802.11i support
- IEEE802.1X/RADIUS support
- Powerful filters for access control

Designed for Train-to-Ground Applications

- Client-based Turbo Roaming handover time < 150 ms @ 3 channel with WPA2
- Controller-based Turbo Roaming handover time (available only when used with the WAC-1001 or WAC-2004) < 50 ms @ 3 channels with WPA2
- Multiple roaming parameters for different installation structures and antenna types

Specifications

WLAN Interface

WLAN Standards	802.11a/b/g/n 802.11i Wireless Security
Modulation Type	DSSS OFDM 802.11b: CCK @ 11/5.5 Mbps 802.11b: DQPSK @ 2 Mbps 802.11b: DBPSK @ 1 Mbps 802.11a/g: 64QAM @ 54/48 Mbps 802.11a/g: 16QAM @ 36/24 Mbps 802.11a/g: QPSK @ 18/12 Mbps 802.11a/g: BPSK @ 9/6 Mbps 802.11n: 64QAM @ 300 Mbps to BPSK @ 6.5 Mbps

1. The Turbo Roaming recovery time indicated herein is an average of test results documented, in optimized conditions, across APs configured with interference-free 20-MHz RF channels, WPA2-PSK security, and default Turbo Roaming parameters. The clients are configured with 3-channel roaming at 100 Kbps traffic load. Other conditions may also impact roaming performance. For more information about Turbo Roaming parameter settings, refer to the product manual.
2. This product is suitable for rolling stock railway applications, as defined by the EN 50155 standard. For a more detailed statement, click here: www.moxa.com/doc/specs/EN_50155_Compliance.pdf

Frequency Band for US (20 MHz operating channels)	2.412 to 2.462 GHz (11 channels) 5.180 to 5.240 GHz (4 channels) 5.260 to 5.320 GHz (4 channels) ³ 5.500 to 5.700 GHz (8 channels) excluding 5.600 to 5.640 GHz ⁴ 5.745 to 5.825 GHz (5 channels)
Frequency Band for EU (20 MHz operating channels)	2.412 to 2.472 GHz (13 channels) 5.180 to 5.240 GHz (4 channels) 5.260 to 5.320 GHz (4 channels) ³ 5.500 to 5.700 GHz (11 channels) ⁴
Frequency Band for JP (20 MHz operating channels)	2.412 to 2.484 GHz (14 channels) 5.180 to 5.240 GHz (4 channels) 5.260 to 5.320 GHz (4 channels) ³ 5.500 to 5.700 GHz (11 channels) ³
Wireless Security	SSID broadcast enable/disable WEP encryption (64-bit and 128-bit) WPA/WPA2-Personal WPA/WPA2-Enterprise (IEEE 802.1X/RADIUS, TKIP, AES)
Transmission Rate	802.11b: 1 to 11 Mbps 802.11a/g: 6 to 54 Mbps 802.11n: 6.5 to 300 Mbps
Transmitter Power for 802.11a	23±1.5 dBm @ 6 to 24 Mbps 21±1.5 dBm @ 36 Mbps 20±1.5 dBm @ 48 Mbps 18±1.5 dBm @ 54 Mbps
Transmitter Power for 802.11n (5 GHz)	23±1.5 dBm @ MCS0 20 MHz 20±1.5 dBm @ MCS1 20 MHz 20±1.5 dBm @ MCS2 20 MHz 20±1.5 dBm @ MCS3 20 MHz 19±1.5 dBm @ MCS4 20 MHz 18±1.5 dBm @ MCS5 20 MHz 18±1.5 dBm @ MCS6 20 MHz 18±1.5 dBm @ MCS7 20 MHz 23±1.5 dBm @ MCS8 20 MHz 20±1.5 dBm @ MCS9 20 MHz 20±1.5 dBm @ MCS10 20 MHz 20±1.5 dBm @ MCS11 20 MHz 19±1.5 dBm @ MCS12 20 MHz 19±1.5 dBm @ MCS13 20 MHz 18±1.5 dBm @ MCS14 20 MHz 18±1.5 dBm @ MCS15 20 MHz 23±1.5 dBm @ MCS0 40 MHz 20±1.5 dBm @ MCS1 40 MHz 20±1.5 dBm @ MCS2 40 MHz 20±1.5 dBm @ MCS3 40 MHz 19±1.5 dBm @ MCS4 40 MHz 18±1.5 dBm @ MCS5 40 MHz 18±1.5 dBm @ MCS6 40 MHz 18±1.5 dBm @ MCS7 40 MHz 23±1.5 dBm @ MCS8 40 MHz 20±1.5 dBm @ MCS9 40 MHz 20±1.5 dBm @ MCS10 40 MHz 20±1.5 dBm @ MCS11 40 MHz 19±1.5 dBm @ MCS12 40 MHz 19±1.5 dBm @ MCS13 40 MHz 18±1.5 dBm @ MCS14 40 MHz 18±1.5 dBm @ MCS15 40 MHz
Transmitter Power for 802.11b	26±1.5 dBm @ 1 Mbps 26±1.5 dBm @ 2 Mbps 26±1.5 dBm @ 5.5 Mbps 25±1.5 dBm @ 11 Mbps

3. DFS (Dynamic Frequency Selection) channel support: In AP mode, when a radar signal is detected, the device will automatically switch to another channel. However, according to regulations, after switching channels, a 60-second availability check period is required before starting the service.
4. DFS (Dynamic Frequency Selection) channel support: In AP mode, when a radar signal is detected, the device will automatically switch to another channel. However according to regulations, after switching channels, a 60-second availability check period is required before starting the service.

Transmitter Power for 802.11g	<p>23±1.5 dBm @ 6 to 24 Mbps 21±1.5 dBm @ 36 Mbps 19±1.5 dBm @ 48 Mbps 18±1.5 dBm @ 54 Mbps</p>
Transmitter Power for 802.11n (2.4 GHz)	<p>23±1.5 dBm @ MCS0 20 MHz 21±1.5 dBm @ MCS1 20 MHz 21±1.5 dBm @ MCS2 20 MHz 21±1.5 dBm @ MCS3 20 MHz 20±1.5 dBm @ MCS4 20 MHz 19±1.5 dBm @ MCS5 20 MHz 18±1.5 dBm @ MCS6 20 MHz 18±1.5 dBm @ MCS7 20 MHz 23±1.5 dBm @ MCS8 20 MHz 21±1.5 dBm @ MCS9 20 MHz 21±1.5 dBm @ MCS10 20 MHz 21±1.5 dBm @ MCS11 20 MHz 20±1.5 dBm @ MCS12 20 MHz 19±1.5 dBm @ MCS13 20 MHz 18±1.5 dBm @ MCS14 20 MHz 18±1.5 dBm @ MCS15 20 MHz 23±1.5 dBm @ MCS0 40 MHz 20±1.5 dBm @ MCS1 40 MHz 20±1.5 dBm @ MCS2 40 MHz 20±1.5 dBm @ MCS3 40 MHz 19±1.5 dBm @ MCS4 40 MHz 19±1.5 dBm @ MCS5 40 MHz 18±1.5 dBm @ MCS6 40 MHz 17±1.5 dBm @ MCS7 40 MHz 23±1.5 dBm @ MCS8 40 MHz 20±1.5 dBm @ MCS9 40 MHz 20±1.5 dBm @ MCS10 40 MHz 20±1.5 dBm @ MCS11 40 MHz 20±1.5 dBm @ MCS12 40 MHz 19±1.5 dBm @ MCS13 40 MHz 18±1.5 dBm @ MCS14 40 MHz 17±1.5 dBm @ MCS15 40 MHz</p>
Receiver Sensitivity for 802.11a (measured at 5.680 GHz)	<p>Typ. -90 @ 6 Mbps Typ. -88 @ 9 Mbps Typ. -88 @ 12 Mbps Typ. -85 @ 18 Mbps Typ. -81 @ 24 Mbps Typ. -78 @ 36 Mbps Typ. -74 @ 48 Mbps Typ. -74 @ 54 Mbps Note⁵</p>
Receiver Sensitivity for 802.11n (5 GHz; measured at 5.680 GHz)	<p>Typ. -88 dBm @ MCS0 20 MHz Typ. -85 dBm @ MCS1 20 MHz Typ. -82 dBm @ MCS2 20 MHz Typ. -79 dBm @ MCS3 20 MHz Typ. -76 dBm @ MCS4 20 MHz Typ. -71 dBm @ MCS5 20 MHz Typ. -70 dBm @ MCS6 20 MHz Typ. -69 dBm @ MCS7 20 MHz Typ. -95 dBm @ MCS8 20 MHz Typ. -91 dBm @ MCS9 20 MHz Typ. -87 dBm @ MCS10 20 MHz Typ. -80 dBm @ MCS11 20 MHz Typ. -78 dBm @ MCS12 20 MHz Typ. -74 dBm @ MCS13 20 MHz Typ. -72 dBm @ MCS14 20 MHz Typ. -71 dBm @ MCS15 20 MHz Typ. -84 dBm @ MCS0 40 MHz Typ. -81 dBm @ MCS1 40 MHz Typ. -77 dBm @ MCS2 40 MHz Typ. -75 dBm @ MCS3 40 MHz Typ. -71 dBm @ MCS4 40 MHz Typ. -67 dBm @ MCS5 40 MHz Typ. -64 dBm @ MCS6 40 MHz</p>

5. Due to a limitation in the receiver sensitivity performance for channels 153 and 161, it is recommended to avoid using these channels in your critical applications.

	<p>Typ. -63 dBm @ MCS7 40 MHz Typ. -90 dBm @ MCS8 40 MHz Typ. -85 dBm @ MCS9 40 MHz Typ. -82 dBm @ MCS10 40 MHz Typ. -81 dBm @ MCS11 40 MHz Typ. -77 dBm @ MCS12 40 MHz Typ. -73 dBm @ MCS13 40 MHz Typ. -71 dBm @ MCS14 40 MHz Note⁶ Typ. -68 dBm @ MCS15 40 MHz</p>
Receiver Sensitivity for 802.11b (measured at 2.437 GHz)	<p>Typ. -93 dBm @ 1 Mbps Typ. -93 dBm @ 2 Mbps Typ. -93 dBm @ 5.5 Mbps Typ. -88 dBm @ 11 Mbps</p>
Receiver Sensitivity for 802.11g (measured at 2.437 GHz)	<p>Typ. -88 dBm @ 6 Mbps Typ. -86 dBm @ 9 Mbps Typ. -85 dBm @ 12 Mbps Typ. -85 dBm @ 18 Mbps Typ. -85 dBm @ 24 Mbps Typ. -82 dBm @ 36 Mbps Typ. -78 dBm @ 48 Mbps Typ. -74 dBm @ 54 Mbps</p>
Receiver Sensitivity for 802.11n (2.4 GHz; measured at 2.437 GHz)	<p>Typ. -89 dBm @ MCS0 20 MHz Typ. -85 dBm @ MCS1 20 MHz Typ. -85 dBm @ MCS2 20 MHz Typ. -82 dBm @ MCS3 20 MHz Typ. -78 dBm @ MCS4 20 MHz Typ. -74 dBm @ MCS5 20 MHz Typ. -72 dBm @ MCS6 20 MHz Typ. -70 dBm @ MCS7 20 MHz Typ. -95 dBm @ MCS8 20 MHz Typ. -90 dBm @ MCS9 20 MHz Typ. -87 dBm @ MCS10 20 MHz Typ. -83 dBm @ MCS11 20 MHz Typ. -80 dBm @ MCS12 20 MHz Typ. -74 dBm @ MCS13 20 MHz Typ. -71 dBm @ MCS14 20 MHz Typ. -69 dBm @ MCS15 20 MHz Typ. -87 dBm @ MCS0 40 MHz Typ. -83 dBm @ MCS1 40 MHz Typ. -83 dBm @ MCS2 40 MHz Typ. -80 dBm @ MCS3 40 MHz Typ. -76 dBm @ MCS4 40 MHz Typ. -73 dBm @ MCS5 40 MHz Typ. -69 dBm @ MCS6 40 MHz Typ. -67 dBm @ MCS7 40 MHz Typ. -93 dBm @ MCS8 40 MHz Typ. -88 dBm @ MCS9 40 MHz Typ. -85 dBm @ MCS10 40 MHz Typ. -82 dBm @ MCS11 40 MHz Typ. -78 dBm @ MCS12 40 MHz Typ. -73 dBm @ MCS13 40 MHz Typ. -69 dBm @ MCS14 40 MHz Typ. -67 dBm @ MCS15 40 MHz</p>
WLAN Operation Mode	Access point, Client, Client-Router, Sniffer
Antenna Connectors	QMA
Ethernet Interface	
PoE Ports (10/100BaseT(X), M12 D-coded 4-pin female connector)	1, AWK-3131A-M12-RTG only
Standards	<p>IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) IEEE 802.3af for PoE IEEE 802.1Q for VLAN Tagging</p>

6. Due to a limitation in the receiver sensitivity performance for channels 153 and 161, it is recommended to avoid using these channels in your critical applications.

10/100BaseT(X) Ports (M12 D-coded 4-pin female connector)	1, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection (AWK-3131A-M12-RTG only)	
100BaseFX Ports (single-mode SC connector)	1, AWK-3131A-SSC-RTG only	
Optical Fiber		100BaseFX
	Wavelength	1310 nm
	Max. TX	0 dBm
	Min. TX	-5 dBm
	RX Sensitivity	-34 dBm
	Link Budget	29 dB
	Typical Distance	40 km

Ethernet Software Features

Management	General: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNMP, TCP, UDP, RADIUS, SNMP, PPPoE, DHCP AP-only: ARP, BOOTP, DHCP, STP/RSTP (IEEE 802.1D/w)
Security	RADIUS

Firewall

Filter	MAC/IP Protocol/Port-based
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Serial Interface

Console Port	RS-232 (RJ45-type)
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LED Interface

LED Indicators	PWR1, PWR2, PoE*, FAULT, STATE, SIGNAL, CLIENT, WLAN, LAN (AWK-3131A-M12-RTG only), 100M (AWK-3131A-SSC-RTG only) *PoE is only available for the AWK-3131A-M12-RTG
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Input/Output Interface

Digital Inputs	2 +13 to +30 V for state 1 +3 to -30 V for state 0 Max. input current: 8 mA
Alarm Contact Channels	Relay output with current carrying capacity of 1 A @ 24 VDC
Buttons	Reset button

Physical Characteristics

Housing	Metal
IP Rating	IP30
Dimensions	52.9 x 151.9 x 127.4 mm (2.08 x 5.98 x 5.02 in)
Weight	850 g (1.87 lb)
Installation	DIN-rail mounting, Wall mounting (with optional kit)

Power Parameters

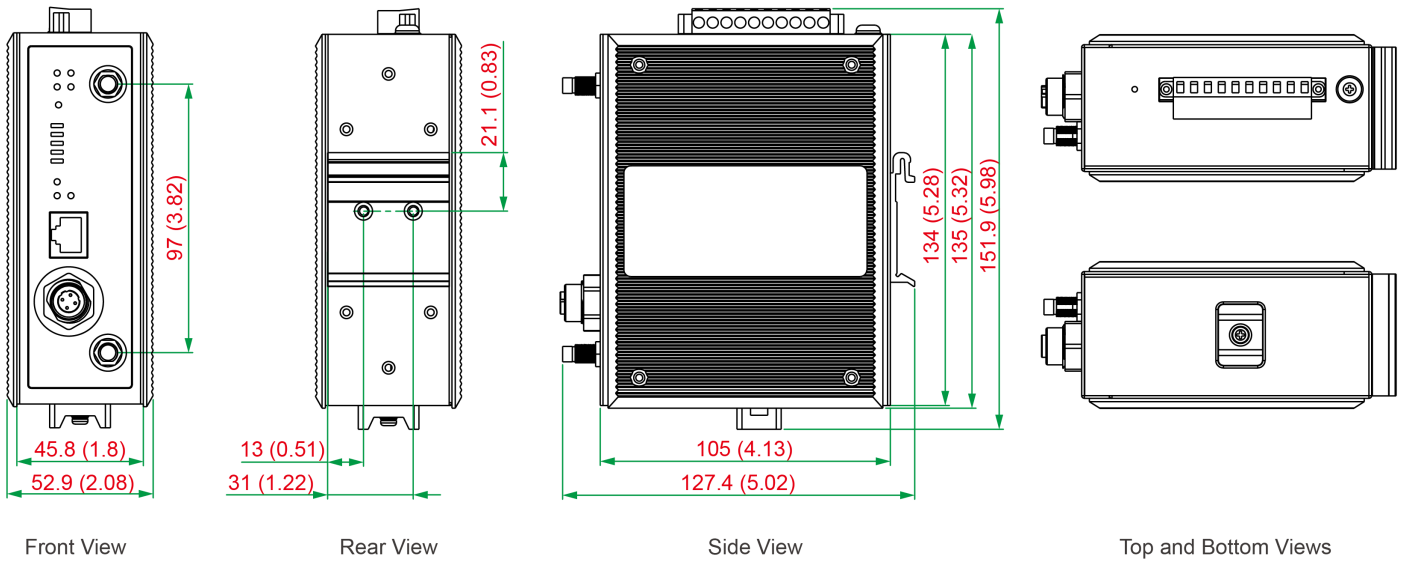
Input Current	AWK-3131A-M12-RTG: 0.85 A @ 12 VDC, 0.22 A @ 48 VDC AWK-3131A-SSC-RTG: 1.0 A @ 12 VDC, 0.27 A @ 48 VDC
Input Voltage	12 to 48 VDC, Redundant dual inputs, 48 VDC Power-over-Ethernet

Power Connector	1 removable 10-contact terminal block(s)
Power Consumption	AWK-3131A-M12-RTG: Maximum 10.5 W AWK-3131A-SSC-RTG: Maximum 13 W
Reverse Polarity Protection	Supported
Environmental Limits	
Operating Temperature	Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature (package included)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)
Standards and Certifications	
EMC	EN 61000-6-2/-6-4
EMI	CISPR 32, FCC Part 15B Class B
EMS	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8
Railway	EN 50155, EN 50121-4
Railway Fire Protection	EN 45545-2
Radio	EN 301 489-1/17, EN 300 328, EN 301 893, MIC, FCC ID SLE-WAPN008, SRRC, NCC, IDA
Safety	UL 60950-1, IEC 60950-1, EN 60950-1 (LVD)
MTBF	
Time	AWK-3131A-M12-RTG: 552,454 hrs AWK-3131A-SSC-RTG: 528,478 hrs
Standards	Telcordia SR332
Warranty	
Warranty Period	5 years
Details	See www.moxa.com/warranty
Package Contents	
Device	1 x AWK-3131A-RTG wireless AP/client
Installation Kit	1 x DIN-rail kit 2 x cap, plastic, for RJ45 port 1 plastic protective cap for fiber port (AWK-3131A-SSC-RTG only) 1 x cable holder with screw
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

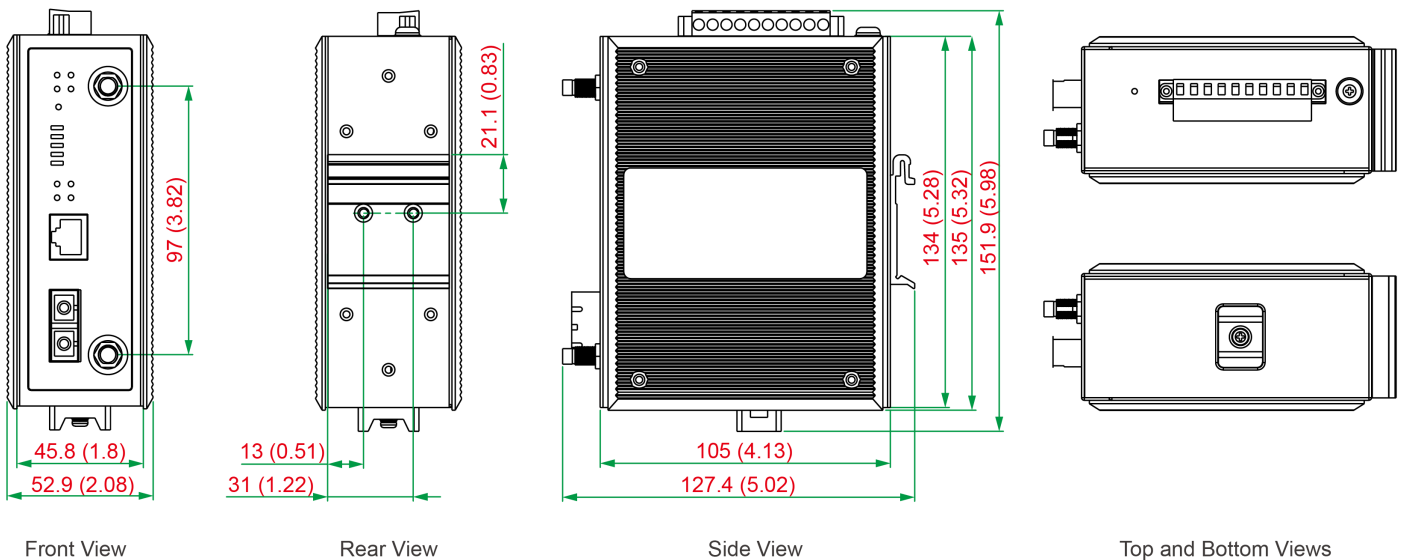
AWK-3131A-M12-RTG Models

Unit: mm (inch)



AWK-3131A-SCC-RTG Models

Unit: mm (inch)



Ordering Information

Model Name	Band	Connector	Conformal Coating
AWK-3131A-M12-RTG-EU-T	EU	M12	-
AWK-3131A-M12-RTG-US-T	US	M12	-
AWK-3131A-M12-RTG-JP-T	JP	M12	-
AWK-3131A-M12-RTG-EU-CT-T	EU	M12	✓
AWK-3131A-M12-RTG-US-CT-T	US	M12	✓
AWK-3131A-M12-RTG-JP-CT-T	JP	M12	✓
AWK-3131A-SSC-RTG-EU-T	EU	Single-mode SC	-
AWK-3131A-SSC-RTG-US-T	US	Single-mode SC	-
AWK-3131A-SSC-RTG-JP-T	JP	Single-mode SC	-

Model Name	Band	Connector	Conformal Coating
AWK-3131A-SSC-RTG-EU-CT-T	EU	Single-mode SC	✓
AWK-3131A-SSC-RTG-US-CT-T	US	Single-mode SC	✓
AWK-3131A-SSC-RTG-JP-CT-T	JP	Single-mode SC	✓

Accessories (sold separately)

Wall-Mounting Kits

WK-51-01	Wall-mounting kit, 2 plates, 6 screws, 51.6 x 67 x 2 mm
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TAP-213 Series

Rail onboard 802.11n IP68 wireless AP/client



Features and Benefits

- IEEE 802.11a/b/g/n compliant
- Can be powered by redundant dual DC power inputs or PoE
- QoS (WMM) and VLAN for efficient network traffic
- Controller-based Turbo Roaming (less than 50 ms)¹
- Complies with all EN 50155 mandatory test items²
- Rugged IP68-rated housing and -40 to 75°C operating temperature
- Wireless network redundancy with AeroLink Protection

Certifications



Introduction

The TAP-213 outdoor wireless AP/client is the ideal ruggedized wireless solution for railway onboard and train-to-ground applications such as CCTV and CBTC communications. The TAP-213's dust-tight, weatherproof design is IP68-rated, allowing you to extend wireless networks to outdoor locations and critical environments. The two redundant DC power inputs increase the reliability of the power supply and the device can also be powered via PoE for easier deployment. The TAP-213 is compliant with the mandatory test items of the EN 50155 standard to ensure suitability for rolling stock applications. With many hardened industrial-grade features, the TAP-213 will provide stable and reliable wireless connectivity, especially for rail onboard environments.

Features for Critical Environments

- IP68-rated metal housing and -40 to 75°C wide operating temperature
- Anti-vibration M12 design with waterproof and dustproof connectors
- PoE and dual DC power inputs
- High-power 400 mW (max.) radio
- Wide range power input from 24 to 110 VDC
- Client-based Turbo Roaming handover time less than 150 ms with 3 channels and WPA2
- Controller-based Turbo Roaming handover time (available only when used with the WAC-1001 or WAC-2004) less than 50 ms with 3 channels and WPA2
- Multiple roaming parameters for different installation structures and antenna types

Specifications

WLAN Interface

Channel Bandwidth	5 MHz, 10 MHz, 20 MHz, 40 MHz
Frequency Band for EU (20 MHz operating channels)	2.412 to 2.472 GHz (13 channels) 5.180 to 5.240 GHz (4 channels) 5.260 to 5.320 GHz (4 channels) 5.500 to 5.700 GHz (11 channels)
Frequency Band for JP (20 MHz operating channels)	2.412 to 2.484 GHz (14 channels) 5.180 to 5.240 GHz (4 channels) 5.260 to 5.320 GHz (4 channels) 5.500 to 5.700 GHz (11 channels)
Frequency Band for US (20 MHz operating channels)	2.412 to 2.462 GHz (11 channels) 5.180 to 5.240 GHz (4 channels)

1. The Turbo Roaming recovery time indicated herein is an average of test results documented, in optimized conditions, across APs configured with interference-free 20-MHz RF channels, WPA2-PSK security, and default Turbo Roaming parameters. The clients are configured with 3-channel roaming at 100 Kbps traffic load. Other conditions may also impact roaming performance. For more information about Turbo Roaming parameter settings, refer to the product manual.
2. This product is suitable for rolling stock railway applications, as defined by the EN 50155 standard. For a more detailed statement, click here: www.moxa.com/doc/specs/EN_50155_Combpliance.pdf

	5.260 to 5.320 GHz (4 channels) ³ 5.500 to 5.700 GHz (8 channels) Excludes 5.600 to 5.640 ³ 5745 to 5825 GHz (5 channels)
Receiver Sensitivity for 802.11a (measured at 5.680 GHz)	Typ. -90 @ 6 Mbps Typ. -88 @ 9 Mbps Typ. -88 @ 12 Mbps Typ. -85 @ 18 Mbps Typ. -81 @ 24 Mbps Typ. -78 @ 36 Mbps Typ. -74 @ 48 Mbps Typ. -74 @ 54 Mbps Note ⁴
Receiver Sensitivity for 802.11n (5 GHz; measured at 5.680 GHz)	Typ. -88 dBm @ MCS0 20 MHz Typ. -85 dBm @ MCS1 20 MHz Typ. -82 dBm @ MCS2 20 MHz Typ. -79 dBm @ MCS3 20 MHz Typ. -76 dBm @ MCS4 20 MHz Typ. -71 dBm @ MCS5 20 MHz Typ. -70 dBm @ MCS6 20 MHz Typ. -69 dBm @ MCS7 20 MHz Typ. -95 dBm @ MCS8 20 MHz Typ. -91 dBm @ MCS9 20 MHz Typ. -87 dBm @ MCS10 20 MHz Typ. -80 dBm @ MCS11 20 MHz Typ. -78 dBm @ MCS12 20 MHz Typ. -74 dBm @ MCS13 20 MHz Typ. -72 dBm @ MCS14 20 MHz Typ. -71 dBm @ MCS15 20 MHz Typ. -84 dBm @ MCS0 40 MHz Typ. -81 dBm @ MCS1 40 MHz Typ. -77 dBm @ MCS2 40 MHz Typ. -75 dBm @ MCS3 40 MHz Typ. -71 dBm @ MCS4 40 MHz Typ. -67 dBm @ MCS5 40 MHz Typ. -64 dBm @ MCS6 40 MHz Typ. -63 dBm @ MCS7 40 MHz Typ. -90 dBm @ MCS8 40 MHz Typ. -85 dBm @ MCS9 40 MHz Typ. -82 dBm @ MCS10 40 MHz Typ. -81 dBm @ MCS11 40 MHz Typ. -77 dBm @ MCS12 40 MHz Typ. -73 dBm @ MCS13 40 MHz Typ. -71 dBm @ MCS14 40 MHz Typ. -68 dBm @ MCS15 40 MHz Note ⁴
Receiver Sensitivity for 802.11b (measured at 2.437 GHz)	Typ. -93 dBm @ 1 Mbps Typ. -93 dBm @ 2 Mbps Typ. -93 dBm @ 5.5 Mbps Typ. -88 dBm @ 11 Mbps
Receiver Sensitivity for 802.11g (measured at 2.437 GHz)	Typ. -90 dBm @ 6 Mbps Typ. -88 dBm @ 9 Mbps Typ. -88 dBm @ 12 Mbps Typ. -85 dBm @ 18 Mbps Typ. -81 dBm @ 24 Mbps Typ. -78 dBm @ 36 Mbps Typ. -74 dBm @ 48 Mbps Typ. -74 dBm @ 54 Mbps
Receiver Sensitivity for 802.11n (2.4 GHz; measured at 2.437 GHz)	Typ. -89 dBm @ MCS0 20 MHz Typ. -85 dBm @ MCS1 20 MHz Typ. -85 dBm @ MCS2 20 MHz Typ. -82 dBm @ MCS3 20 MHz Typ. -78 dBm @ MCS4 20 MHz Typ. -74 dBm @ MCS5 20 MHz Typ. -72 dBm @ MCS6 20 MHz

3. DFS (Dynamic Frequency Selection) channel support: In AP mode, when a radar signal is detected, the device will automatically switch to another channel. However, according to regulations, after switching channels, a 60-second availability check period is required before starting the service.
4. Due to a limitation in the receiver sensitivity performance for channels 153 and 161, it is recommended to avoid using these channels in your critical applications.

	<p>Typ. -70 dBm @ MCS7 20 MHz Typ. -95 dBm @ MCS8 20 MHz Typ. -90 dBm @ MCS9 20 MHz Typ. -87 dBm @ MCS10 20 MHz Typ. -83 dBm @ MCS11 20 MHz Typ. -80 dBm @ MCS12 20 MHz Typ. -74 dBm @ MCS13 20 MHz Typ. -71 dBm @ MCS14 20 MHz Typ. -69 dBm @ MCS15 20 MHz Typ. -87 dBm @ MCS0 40 MHz Typ. -83 dBm @ MCS1 40 MHz Typ. -83 dBm @ MCS2 40 MHz Typ. -80 dBm @ MCS3 40 MHz Typ. -76 dBm @ MCS4 40 MHz Typ. -73 dBm @ MCS5 40 MHz Typ. -69 dBm @ MCS6 40 MHz Typ. -67 dBm @ MCS7 40 MHz Typ. -93 dBm @ MCS8 40 MHz Typ. -88 dBm @ MCS9 40 MHz Typ. -85 dBm @ MCS10 40 MHz Typ. -82 dBm @ MCS11 40 MHz Typ. -78 dBm @ MCS12 40 MHz Typ. -73 dBm @ MCS13 40 MHz Typ. -69 dBm @ MCS14 40 MHz Typ. -67 dBm @ MCS15 40 MHz</p>
Modulation Type	<p>DSSS MIMO-OFDM OFDM</p>
Transmission Rate	<p>802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps 802.11n HT20: 6.5 to 144.4 Mbps (MCS0 to MCS15) 802.11n HT40: 13.5 to 300 Mbps (MCS0 to MCS15)</p>
Transmitter Power for 802.11a	<p>23±1.5 dBm @ 6 Mbps 23±1.5 dBm @ 12 Mbps 23±1.5 dBm @ 24 Mbps 21±1.5 dBm @ 36 Mbps 20±1.5 dBm @ 48 Mbps 18±1.5 dBm @ 54 Mbps</p>
Transmitter Power for 802.11n (5 GHz)	<p>23±1.5 dBm @ MCS0 20 MHz 20±1.5 dBm @ MCS1 20 MHz 20±1.5 dBm @ MCS2 20 MHz 20±1.5 dBm @ MCS3 20 MHz 19±1.5 dBm @ MCS4 20 MHz 18±1.5 dBm @ MCS5 20 MHz 18±1.5 dBm @ MCS6 20 MHz 18±1.5 dBm @ MCS7 20 MHz 23±1.5 dBm @ MCS8 20 MHz 20±1.5 dBm @ MCS9 20 MHz 20±1.5 dBm @ MCS10 20 MHz 20±1.5 dBm @ MCS11 20 MHz 19±1.5 dBm @ MCS12 20 MHz 19±1.5 dBm @ MCS13 20 MHz 18±1.5 dBm @ MCS14 20 MHz 18±1.5 dBm @ MCS15 20 MHz 23±1.5 dBm @ MCS0 40 MHz 20±1.5 dBm @ MCS1 40 MHz 20±1.5 dBm @ MCS2 40 MHz 20±1.5 dBm @ MCS3 40 MHz 19±1.5 dBm @ MCS4 40 MHz 18±1.5 dBm @ MCS5 40 MHz 18±1.5 dBm @ MCS6 40 MHz 18±1.5 dBm @ MCS7 40 MHz 23±1.5 dBm @ MCS8 40 MHz 20±1.5 dBm @ MCS9 40 MHz 20±1.5 dBm @ MCS10 40 MHz 20±1.5 dBm @ MCS11 40 MHz 19±1.5 dBm @ MCS12 40 MHz 19±1.5 dBm @ MCS13 40 MHz 18±1.5 dBm @ MCS14 40 MHz</p>

	18±1.5 dBm @ MCS15 40 MHz
Transmitter Power for 802.11b	26±1.5 dBm @ 1 Mbps 26±1.5 dBm @ 2 Mbps 26±1.5 dBm @ 5.5 Mbps 25±1.5 dBm @ 11 Mbps
Transmitter Power for 802.11g	23±1.5 dBm @ 6 Mbps 23±1.5 dBm @ 12 Mbps 23±1.5 dBm @ 24 Mbps 21±1.5 dBm @ 36 Mbps 20±1.5 dBm @ 48 Mbps 18±1.5 dBm @ 54 Mbps
Transmitter Power for 802.11n (2.4 GHz)	23±1.5 dBm @ MCS0 20 MHz 21±1.5 dBm @ MCS1 20 MHz 21±1.5 dBm @ MCS2 20 MHz 21±1.5 dBm @ MCS3 20 MHz 20±1.5 dBm @ MCS4 20 MHz 19±1.5 dBm @ MCS5 20 MHz 18±1.5 dBm @ MCS6 20 MHz 18±1.5 dBm @ MCS7 20 MHz 23±1.5 dBm @ MCS8 20 MHz 21±1.5 dBm @ MCS9 20 MHz 21±1.5 dBm @ MCS10 20 MHz 21±1.5 dBm @ MCS11 20 MHz 20±1.5 dBm @ MCS12 20 MHz 19±1.5 dBm @ MCS13 20 MHz 18±1.5 dBm @ MCS14 20 MHz 18±1.5 dBm @ MCS15 20 MHz 23±1.5 dBm @ MCS0 40 MHz 20±1.5 dBm @ MCS1 40 MHz 20±1.5 dBm @ MCS2 40 MHz 20±1.5 dBm @ MCS3 40 MHz 19±1.5 dBm @ MCS4 40 MHz 19±1.5 dBm @ MCS5 40 MHz 18±1.5 dBm @ MCS6 40 MHz 17±1.5 dBm @ MCS7 40 MHz 23±1.5 dBm @ MCS8 40 MHz 20±1.5 dBm @ MCS9 40 MHz 20±1.5 dBm @ MCS10 40 MHz 20±1.5 dBm @ MCS11 40 MHz 20±1.5 dBm @ MCS12 40 MHz 19±1.5 dBm @ MCS13 40 MHz 18±1.5 dBm @ MCS14 40 MHz 17±1.5 dBm @ MCS15 40 MHz
Wireless Security	WEP encryption (64-bit and 128-bit) WPA/WPA2-Enterprise (IEEE 802.1X/RADIUS, TKIP, AES) WPA/WPA2-Personal
WLAN Antenna Connector	2 N-type female
WLAN Operation Mode	Access point, Client, Client-Router, Sniffer
WLAN Standards	802.11a/b/g/n 802.11i Wireless Security
Frequency Band	2.4 GHz 5 GHz

Input/Output Interface

Buttons	Reset button
Ethernet Interface	
10/100/1000BaseT(X) Ports (M12 A-coded 8-pin female connector)	1
1000BaseSFP Slots	1

Standards	IEEE 802.1p for Class of Service IEEE 802.1Q for VLAN Tagging IEEE 802.1X for authentication IEEE 802.3 for 10BaseT IEEE 802.3ab for 1000BaseT(X) IEEE 802.3af for PoE IEEE 802.3u for 100BaseT(X)
Total Port Count	2
Highest Speed	1G
Connections	PoE M12 Fiber

Ethernet Software Features

Management	SNMPv1/v2c/v3, DHCP Server/Client, IPv4, LLDP, SMTP, Syslog, TCP/IP, Telnet, TFTP, UDP, Web Console, Wireless Search Utility
Security	HTTPS/SSL, RADIUS, SSH
Time Management	NTP Client, SNTP
Unicast Routing	Static Route

Switch Properties

VLAN ID Range	VID 1 to 4094
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USB Interface

M12 Connector	M12 A-coded 5-pin female (for ABC-02 USB storage)
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Firewall

Filter	IP address, MAC address, Ports
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NAT

Features	Port forwarding
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Serial Interface

Console Port	USB-M12 console (M12 B-coded 5-pin female connector)
Flow Control	RTS/CTS, XON/XOFF
Parity	None, Even, Odd, Space, Mark

Power Parameters

Input Current	0.65 A @ 24 VDC, 0.16 A @ 110 VDC
Input Voltage	24 to 110 VDC, Redundant dual inputs
Power Connector	M12 A-coded 4-pin male connector
Power Consumption	17.6 W (max.)
Reverse Polarity Protection	Supported
Source of Input Power	PoE (IEEE 802.3af)

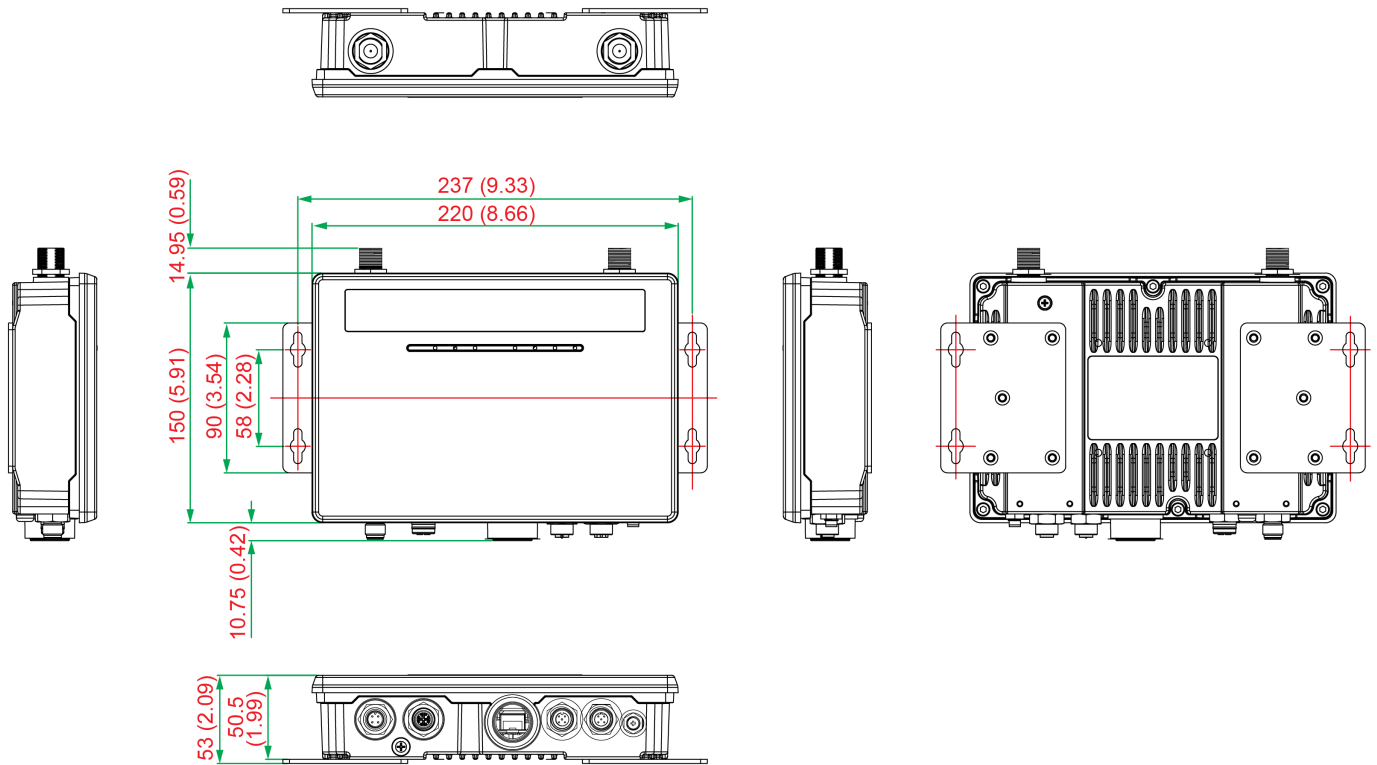
Physical Characteristics

Housing	Metal
IP Rating	IP68

Dimensions (without ears)	220 x 150 x 50.5 mm (8.66 x 5.91 x 1.99 in)
Weight	1,500 g (3.31 lb)
Installation	Wall mounting (standard), DIN-rail mounting (optional), Pole mounting (optional)
Protection	PCB conformal coating
Environmental Limits	
Operating Temperature	-40 to 75°C (-40 to 167°F)
Storage Temperature (package included)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)
Standards and Certifications	
EMC	EN 61000-6-2/-6-4
EMI	CISPR 32, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF
Radio Frequency	EN 300 328, EN 301 489-1/17, EN 301 893, FCC, IC, WPC
Railway	EN 50121-4, EN 50155
Railway Fire Protection	EN 45545-2
Safety	EN 60950-1, UL 60950-1, IEC 60950-1
MTBF	
Time	758,369 hrs
Standards	Telcordia SR332
Warranty	
Warranty Period	5 years
Details	See www.moxa.com/warranty
Package Contents	
Device	1 x TAP-213 Series wireless AP/client
Installation Kit	1 x cap, metal, for ABC-02 USB storage port 1 x cap, metal, for LAN fiber port 1 x cap, metal, for USB console port 1 x cap, plastic, for LAN X-coded port 1 x metal M12 male 4-pin A-coded screw-type crimp circular connector for power 1 x wall-mounting kit
Antenna	2 x ANT-WDB-ANM-0502 2.4/5 GHz antenna
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

Unit: mm (inch)



Ordering Information

Model Name	Band	Wi-Fi Standard	Application	Operating Temp.	Indoor/Outdoor, IP Code	Single/Dual RF
TAP-213-EU-CT-T	EU	802.11a/b/g/n	Railway onboard AP/client	-40 to 75°C	Outdoor, IP68	Single RF
TAP-213-US-CT-T	US	802.11a/b/g/n	Railway onboard AP/client	-40 to 75°C	Outdoor, IP68	Single RF
TAP-213-JP-CT-T	JP	802.11a/b/g/n	Railway onboard AP/client	-40 to 75°C	Outdoor, IP68	Single RF

Accessories (sold separately)

Antennas

ANT-WDB-ANM-0502	2.4/5 GHz, omni-directional antenna, 5/2 dBi, N-type (male)
ANT-WDB-ARM-02	2.4/5 GHz, omni-directional rubber duck antenna, 2 dBi, RP-SMA (male)
ANT-WDB-PNF-1518	2.4/5 GHz, panel antenna, 15/18 dBi, N-type (female)

M12 Connector Caps

A-CAP-M12F-M	Metal cap for M12 female connector
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Wireless AP Connector Cables

A-PLG-WPM30IP67-01	Field-Installation for M30 plug
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Wireless Connector Caps

A-CAP-M30M-MIP67	Metal cap to cover M30 connector
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Wireless Terminating Resistors

A-TRM-50-RM	Termination resistor, 50 ohms, N-type male
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Wireless Antenna Cables

A-CRF-NMNM-LL4-900	N-type (male) to N-type (male), LMR-400 Lite cable, 9 m
A-CRF-NMNM-LL4-600	N-type (male) to N-type (male), LMR-400 Lite cable, 6 m
A-CRF-NMNM-LL4-300	N-type (male) to N-type (male), LMR-400 Lite cable, 3 m

Surge Arrestors

A-SA-NFNF-01	Surge arrestor, N-type (female) to N-type (female)
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Wireless AP Mounting Kits

DK-DC50131	DIN-rail mounting kit
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TAP-323 Series

Railway trackside dual radio 802.11n IP68 wireless AP



Features and Benefits

- 2 dual-band radios, IEEE 802.11a/b/g/n compliant
- Rugged IP68-rated housing and -40 to 75°C operating temperature
- Controller-based Turbo Roaming (less than 50 ms)¹
- 2 fiber SFP slots and 4 PoE ports with M12 LAN connectors
- Complies with all EN 50155 mandatory test items²
- Complies with EN 50121-4
- Wireless network redundancy with AeroLink Protection
- High transmission power for extended reach

Certifications



Introduction

The TAP-323 trackside wireless unit is designed for train-to-ground wireless communication. The TAP-323 is a highly compact and rugged wireless unit that integrates two access points, a managed fiber switch, and a wide-range AC/DC power supply into one box. The IP68 housing allows the unit to withstand harsh weather conditions, and the M12 connectors make the unit shock and vibration resistant. The TAP-323 supports advanced controller-based Turbo Roaming technology for train-to-ground wireless applications such as communication-based train control (CBTC) and CCTV. The unit can supply power to up to 4 PoE devices while providing reliable LAN communication with Moxa's Turbo Chain technology.

Advanced Mobility and Reliability

- Controller-based L3 Turbo Roaming
- Mobile IP support
- 2 dual-band radios: 2.4 GHz and 5 GHz
- Turbo Chain support (100 ms recovery time)
- WPA/WPA2 and 802.11i supported
- IEEE 802.1X/RADIUS supported

Built for Transportation Applications

- Isolated 110 to 220 VDC/VAC power input
- High transmission power, 400 mW (max)
- Supplies power through 4 PoE ports
- 2 fiber SFP ports for backbone installation
- Wide temperature (-40 to 75°C) range and IP68-rated housing

Specifications

WLAN Interface

Channel Bandwidth	5 MHz, 10 MHz, 20 MHz, 40 MHz
Frequency Band	5 GHz 2.4 GHz
Frequency Band for EU (20 MHz operating channels)	2.412 to 2.472 GHz (13 channels) 5.180 to 5.240 GHz (4 channels) 5.260 to 5.320 GHz (4 channels) 5.500 to 5.700 GHz (11 channels)

1. The Turbo Roaming recovery time indicated herein is an average of test results documented, in optimized conditions, across APs configured with interference-free 20-MHz RF channels, WPA2-PSK security, and default Turbo Roaming parameters. The clients are configured with 3-channel roaming at 100 Kbps traffic load. Other conditions may also impact roaming performance. For more information about Turbo Roaming parameter settings, refer to the product manual.
2. This product is suitable for rolling stock railway applications, as defined by the EN 50155 standard. For a more detailed statement, click here: www.moxa.com/doc/specs/EN_50155_Combpliance.pdf

Frequency Band for JP (20 MHz operating channels)	2.412 to 2.484 GHz (14 channels) 5.180 to 5.240 GHz (4 channels) 5.260 to 5.320 GHz (4 channels) 5.500 to 5.700 GHz (11 channels)
Frequency Band for US (20 MHz operating channels)	2.412 to 2.462 GHz (11 channels) 5.180 to 5.240 GHz (4 channels) 5.260 to 5.320 GHz (4 channels) ³ 5.500 to 5.700 GHz (8 channels) Excludes 5.600 to 5.640 ³ 5.745 to 5.825 GHz (5 channels)
Receiver Sensitivity for 802.11a (measured at 5.680 GHz)	Typ. -90 @ 6 Mbps Typ. -88 @ 9 Mbps Typ. -88 @ 12 Mbps Typ. -85 @ 18 Mbps Typ. -81 @ 24 Mbps Typ. -78 @ 36 Mbps Typ. -74 @ 48 Mbps Typ. -74 @ 54 Mbps Note ⁴
Receiver Sensitivity for 802.11n (5 GHz; measured at 5.680 GHz)	Typ. -88 dBm @ MCS0 20 MHz Typ. -85 dBm @ MCS1 20 MHz Typ. -82 dBm @ MCS2 20 MHz Typ. -79 dBm @ MCS3 20 MHz Typ. -76 dBm @ MCS4 20 MHz Typ. -71 dBm @ MCS5 20 MHz Typ. -70 dBm @ MCS6 20 MHz Typ. -69 dBm @ MCS7 20 MHz Typ. -95 dBm @ MCS8 20 MHz Typ. -91 dBm @ MCS9 20 MHz Typ. -87 dBm @ MCS10 20 MHz Typ. -80 dBm @ MCS11 20 MHz Typ. -78 dBm @ MCS12 20 MHz Typ. -74 dBm @ MCS13 20 MHz Typ. -72 dBm @ MCS14 20 MHz Typ. -71 dBm @ MCS15 20 MHz Typ. -84 dBm @ MCS0 40 MHz Typ. -81 dBm @ MCS1 40 MHz Typ. -77 dBm @ MCS2 40 MHz Typ. -75 dBm @ MCS3 40 MHz Typ. -71 dBm @ MCS4 40 MHz Typ. -67 dBm @ MCS5 40 MHz Typ. -64 dBm @ MCS6 40 MHz Typ. -63 dBm @ MCS7 40 MHz Typ. -90 dBm @ MCS8 40 MHz Typ. -85 dBm @ MCS9 40 MHz Typ. -82 dBm @ MCS10 40 MHz Typ. -81 dBm @ MCS11 40 MHz Typ. -77 dBm @ MCS12 40 MHz Typ. -73 dBm @ MCS13 40 MHz Typ. -71 dBm @ MCS14 40 MHz Typ. -68 dBm @ MCS15 40 MHz Note ⁴
Receiver Sensitivity for 802.11b (measured at 2.437 GHz)	Typ. -93 dBm @ 1 Mbps Typ. -93 dBm @ 2 Mbps Typ. -93 dBm @ 5.5 Mbps Typ. -88 dBm @ 11 Mbps
Receiver Sensitivity for 802.11g (measured at 2.437 GHz)	Typ. -88 dBm @ 6 Mbps Typ. -86 dBm @ 9 Mbps Typ. -85 dBm @ 12 Mbps Typ. -85 dBm @ 18 Mbps Typ. -85 dBm @ 24 Mbps Typ. -82 dBm @ 36 Mbps Typ. -78 dBm @ 48 Mbps Typ. -74 dBm @ 54 Mbps

3. DFS (Dynamic Frequency Selection) channel support: In AP mode, when a radar signal is detected, the device will automatically switch to another channel. However, according to regulations, after switching channels, a 60-second availability check period is required before starting the service.
4. Due to a limitation in the receiver sensitivity performance for channels 153 and 161, it is recommended to avoid using these channels in your critical applications.

Receiver Sensitivity for 802.11n (2.4 GHz; measured at 2.437 GHz)	<p>Typ. -89 dBm @ MCS0 20 MHz</p> <p>Typ. -85 dBm @ MCS1 20 MHz</p> <p>Typ. -85 dBm @ MCS2 20 MHz</p> <p>Typ. -82 dBm @ MCS3 20 MHz</p> <p>Typ. -78 dBm @ MCS4 20 MHz</p> <p>Typ. -74 dBm @ MCS5 20 MHz</p> <p>Typ. -72 dBm @ MCS6 20 MHz</p> <p>Typ. -70 dBm @ MCS7 20 MHz</p> <p>Typ. -95 dBm @ MCS8 20 MHz</p> <p>Typ. -90 dBm @ MCS9 20 MHz</p> <p>Typ. -87 dBm @ MCS10 20 MHz</p> <p>Typ. -83 dBm @ MCS11 20 MHz</p> <p>Typ. -80 dBm @ MCS12 20 MHz</p> <p>Typ. -74 dBm @ MCS13 20 MHz</p> <p>Typ. -71 dBm @ MCS14 20 MHz</p> <p>Typ. -69 dBm @ MCS15 20 MHz</p> <p>Typ. -87 dBm @ MCS0 40 MHz</p> <p>Typ. -83 dBm @ MCS1 40 MHz</p> <p>Typ. -83 dBm @ MCS2 40 MHz</p> <p>Typ. -80 dBm @ MCS3 40 MHz</p> <p>Typ. -76 dBm @ MCS4 40 MHz</p> <p>Typ. -73 dBm @ MCS5 40 MHz</p> <p>Typ. -69 dBm @ MCS6 40 MHz</p> <p>Typ. -67 dBm @ MCS7 40 MHz</p> <p>Typ. -93 dBm @ MCS8 40 MHz</p> <p>Typ. -88 dBm @ MCS9 40 MHz</p> <p>Typ. -85 dBm @ MCS10 40 MHz</p> <p>Typ. -82 dBm @ MCS11 40 MHz</p> <p>Typ. -78 dBm @ MCS12 40 MHz</p> <p>Typ. -73 dBm @ MCS13 40 MHz</p> <p>Typ. -69 dBm @ MCS14 40 MHz</p> <p>Typ. -67 dBm @ MCS15 40 MHz</p>
Modulation Type	DSSS OFDM
Transmission Rate	802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps 802.11n HT40: 13.5 to 300 Mbps (MCS0 to MCS15)
Transmitter Power for 802.11a	<p>23±1.5 dBm @ 6 Mbps</p> <p>23±1.5 dBm @ 12 Mbps</p> <p>23±1.5 dBm @ 24 Mbps</p> <p>21±1.5 dBm @ 36 Mbps</p> <p>20±1.5 dBm @ 48 Mbps</p> <p>18±1.5 dBm @ 54 Mbps</p>
Transmitter Power for 802.11n (5 GHz)	<p>23±1.5 dBm @ MCS0 20 MHz</p> <p>20±1.5 dBm @ MCS1 20 MHz</p> <p>20±1.5 dBm @ MCS2 20 MHz</p> <p>20±1.5 dBm @ MCS3 20 MHz</p> <p>19±1.5 dBm @ MCS4 20 MHz</p> <p>18±1.5 dBm @ MCS5 20 MHz</p> <p>18±1.5 dBm @ MCS6 20 MHz</p> <p>18±1.5 dBm @ MCS7 20 MHz</p> <p>23±1.5 dBm @ MCS8 20 MHz</p> <p>20±1.5 dBm @ MCS9 20 MHz</p> <p>20±1.5 dBm @ MCS10 20 MHz</p> <p>20±1.5 dBm @ MCS11 20 MHz</p> <p>19±1.5 dBm @ MCS12 20 MHz</p> <p>19±1.5 dBm @ MCS13 20 MHz</p> <p>18±1.5 dBm @ MCS14 20 MHz</p> <p>18±1.5 dBm @ MCS15 20 MHz</p> <p>23±1.5 dBm @ MCS0 40 MHz</p> <p>20±1.5 dBm @ MCS1 40 MHz</p> <p>20±1.5 dBm @ MCS2 40 MHz</p> <p>20±1.5 dBm @ MCS3 40 MHz</p> <p>19±1.5 dBm @ MCS4 40 MHz</p> <p>18±1.5 dBm @ MCS5 40 MHz</p> <p>18±1.5 dBm @ MCS6 40 MHz</p> <p>18±1.5 dBm @ MCS7 40 MHz</p> <p>23±1.5 dBm @ MCS8 40 MHz</p> <p>20±1.5 dBm @ MCS9 40 MHz</p>

	<p>20±1.5 dBm @ MCS10 40 MHz 20±1.5 dBm @ MCS11 40 MHz 19±1.5 dBm @ MCS12 40 MHz 19±1.5 dBm @ MCS13 40 MHz 18±1.5 dBm @ MCS14 40 MHz 18±1.5 dBm @ MCS15 40 MHz</p>
Transmitter Power for 802.11b	<p>26±1.5 dBm @ 1 Mbps 26±1.5 dBm @ 2 Mbps 26±1.5 dBm @ 5.5 Mbps 25±1.5 dBm @ 11 Mbps</p>
Transmitter Power for 802.11g	<p>23±1.5 dBm @ 6 Mbps 23±1.5 dBm @ 12 Mbps 23±1.5 dBm @ 24 Mbps 21±1.5 dBm @ 36 Mbps 20±1.5 dBm @ 48 Mbps 18±1.5 dBm @ 54 Mbps</p>
Transmitter Power for 802.11n (2.4 GHz)	<p>23±1.5 dBm @ MCS0 20 MHz 21±1.5 dBm @ MCS1 20 MHz 21±1.5 dBm @ MCS2 20 MHz 21±1.5 dBm @ MCS3 20 MHz 20±1.5 dBm @ MCS4 20 MHz 19±1.5 dBm @ MCS5 20 MHz 18±1.5 dBm @ MCS6 20 MHz 18±1.5 dBm @ MCS7 20 MHz 23±1.5 dBm @ MCS8 20 MHz 21±1.5 dBm @ MCS9 20 MHz 21±1.5 dBm @ MCS10 20 MHz 21±1.5 dBm @ MCS11 20 MHz 20±1.5 dBm @ MCS12 20 MHz 19±1.5 dBm @ MCS13 20 MHz 18±1.5 dBm @ MCS14 20 MHz 18±1.5 dBm @ MCS15 20 MHz 23±1.5 dBm @ MCS0 40 MHz 20±1.5 dBm @ MCS1 40 MHz 20±1.5 dBm @ MCS2 40 MHz 20±1.5 dBm @ MCS3 40 MHz 19±1.5 dBm @ MCS4 40 MHz 19±1.5 dBm @ MCS5 40 MHz 18±1.5 dBm @ MCS6 40 MHz 17±1.5 dBm @ MCS7 40 MHz 23±1.5 dBm @ MCS8 40 MHz 20±1.5 dBm @ MCS9 40 MHz 20±1.5 dBm @ MCS10 40 MHz 20±1.5 dBm @ MCS11 40 MHz 20±1.5 dBm @ MCS12 40 MHz 19±1.5 dBm @ MCS13 40 MHz 18±1.5 dBm @ MCS14 40 MHz 17±1.5 dBm @ MCS15 40 MHz</p>
Wireless Security	<p>WEP encryption (64-bit and 128-bit) WPA/WPA2-Enterprise (IEEE 802.1X/RADIUS, TKIP, AES) WPA/WPA2-Personal</p>
WLAN Antenna Connector	5 N-type female
WLAN Operation Mode	Access point
WLAN Standards	<p>802.11a/b/g/n 802.11i Wireless Security</p>
Ethernet Interface	
1000BaseSFP Slots	2
10/100BaseT(X) Ports (M12 D-coded 4-pin female connector)	4
Standards	<p>IEEE 802.1p for Class of Service IEEE 802.1Q for VLAN Tagging</p>

	IEEE 802.3 for 10BaseT IEEE 802.3ab for 1000BaseT(X) IEEE 802.3af for PoE IEEE 802.3u for 100BaseT(X)
Total Port Count	6
Highest Speed	1G
Connections	PoE M12 Fiber

Ethernet Software Features

Management	SNMPv1/v2c/v3, DHCP Server/Client, IPv4, Syslog, TCP/IP, Telnet, TFTP, UDP, Web Console, Wireless Search Utility
Security	HTTPS/SSL, RADIUS, SSH
Time Management	SNTP

Switch Properties

VLAN ID Range	VID 1 to 4094
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USB Interface

M12 Connector	M12 A-coded 5-pin female (for ABC-02 USB storage)
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Firewall

Filter	IP address, MAC address, Ports
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NAT

Features	Port forwarding
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Serial Interface

Console Port	USB-M12 console (M12 B-coded 5-pin female connector)
Parity	None, Even, Odd, Space, Mark

Power Parameters

Input Current	AC input: 110 to 220 VAC, 50 to 60 Hz, 1.1 A (max.) DC input: 110 to 220 VDC, 1.1 A (max.)				
Input Voltage	Redundant dual inputs, 110/220 VAC/VDC (85 to 264 VAC, 88 to 300 VDC)				
Power Connector	6-pin M23 Connector				
Power Consumption	85 W (max.)				
	PSE/Voltage	110 VDC	110 VAC	220 VDC	220 VAC
	0 PSE port in use	17.4 W	16.2 W	17.6 W	17.5 W
	1 PSE port in use	34.15 W	32.6 W	33.8 W	33.55 W
	2 PSE ports in use	50.9 W	49 W	49.9 W	49.6 W
	3 PSE ports in use	67.65 W	65.4 W	66 W	65.65 W
4 PSE ports in use	84.4 W	81.8 W	82.1 W	81.7 W	
Reverse Polarity Protection	Supported				
Source of Input Power	PoE (IEEE 802.3af)				

Overload Protection

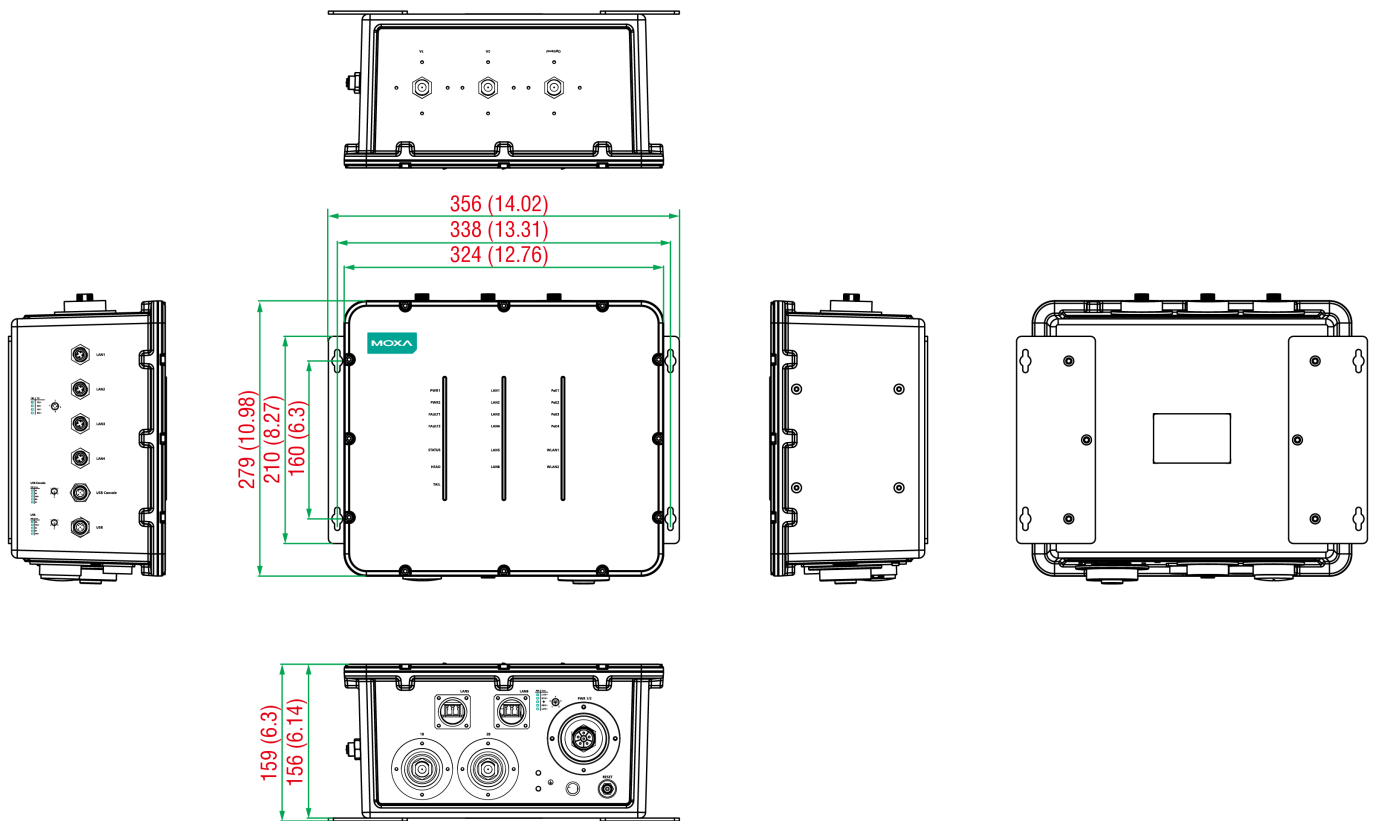
Protection Type	Current
Physical Characteristics	
Housing	Metal
IP Rating	IP68
Dimensions	324 x 279 x 156 mm (12.76 x 10.98 x 6.142 in)
Weight	10,000 g (22.22 lb)
Installation	Wall mounting (standard), DIN-rail mounting (optional), Pole mounting (optional)
Protection	PCB conformal coating
Environmental Limits	
Operating Temperature	-40 to 75°C (-40 to 167°F)
Storage Temperature (package included)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)
Standards and Certifications	
EMC	EN 61000-6-2/-6-4, EN 55032/24
EMI	CISPR 32, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF
Radio Frequency	FCC, IC, WPC, RED
Radio	MIC
Railway	EN 50121-4, EN 50155
Railway Fire Protection	EN 45545-2
Safety	EN 60950-1, UL 60950-1, IEC 60950-1
MTBF	
Time	290,937 hrs
Standards	Telcordia SR332
Warranty	
Warranty Period	5 years
Details	See www.moxa.com/warranty

Package Contents

Device	1 x TAP-323 Series wireless access point
Installation Kit	1 x cap, metal, for ABC-02 USB storage port 1 x cap, metal, for USB console port 1 x metal M23 male 6-pin crimp 1 x plastic M23 dust cover for power 1 x fiber panel mounting kit 1 x wall-mounting kit 3 x antenna glands for top side antenna 4 x cap, metal, for LAN port 5 x metal protective caps for 4 antenna ports and 1 optional antenna port
Documentation	1 x quick installation guide 1 x warranty card

Dimensions

Unit: mm (inch)



Ordering Information

Model Name	Band	Standard	Application	Operating Temp.	Indoor/Outdoor, IP Rating	Single/Dual RF
TAP-323-EU-CT-T	EU	802.11a/b/g/n	Railway trackside wireless access point	-40 to 75°C	Outdoor, IP68	Dual RF
TAP-323-US-CT-T	US	802.11a/b/g/n	Railway trackside wireless access point	-40 to 75°C	Outdoor, IP68	Dual RF
TAP-323-JP-CT-T	JP	802.11a/b/g/n	Railway trackside wireless access point	-40 to 75°C	Outdoor, IP68	Dual RF

Accessories (sold separately)

Communication Modules

SFP-1FELLC-T	SFP module with 1 100Base single-mode with LC connector for 80 km transmission, -40 to 85°C operating temperature
SFP-1GLSXLC-T	SFP module with 1 1000BaseLSX port with LC connector for 500 m transmission, -40 to 85°C operating temperature
SFP-1FEMLC-T	SFP module with 1 100Base multi-mode with LC connector for 4 km transmission, -40 to 85°C operating temperature
SFP-1GLHXLCT	SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, -40 to 85°C operating temperature
SFP-1GSXLCT	SFP module with 1 1000BaseSX port with LC connector for 300/550 m transmission, -40 to 85°C operating temperature
SFP-1GLHLCT	SFP module with 1 1000BaseLH port with LC connector for 30 km transmission, -40 to 85°C operating temperature
SFP-1FESLCT	SFP module with 1 100Base single-mode with LC connector for 40 km transmission, -40 to 85°C operating temperature
SFP-1GLXLCT	SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, -40 to 85°C operating temperature

M12 Connector Caps

A-CAP-M12F-M	Metal cap for M12 female connector
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Connectors

M12D-4P-IP68	M12 D-coded screw-in sensor connector, male, IP68
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Wireless Connector Caps

A-CAP-N-M	Metal cap to cover N-type connector
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Cables

CBL-M12D(MM4P)/RJ45-100 IP67	M12-to-RJ45 cable, IP67-rated, 1 m
CBL-M23(FF6P)/OPEN-BK-100 IP67	M23 to 6-pin power cable, IP67-rated female 6-pin M23 connector, IP67, 1 m

Storage Kits

ABC-02-USB	Configuration backup and restoration tool, firmware upgrade, and log file storage tool for managed Ethernet switches and routers, 0 to 60°C operating temperature
ABC-02-USB-T	Configuration backup and restoration tool, firmware upgrade, and log file storage tool for managed Ethernet switches and routers, -40 to 75°C operating temperature

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