

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)
- Complies with all EN 50155 mandatory test items¹
- 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
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. 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

	5.260 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 802.11b	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 21±1.5 dBm @ 36 Mbps 19±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

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.
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	<p>18±1.5 dBm @ MCS14 40 MHz 17±1.5 dBm @ MCS15 40 MHz</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 18±1.5 dBm @ MCS15 40 MHz</p>
Receiver Sensitivity for 802.11a	<p>-90 dBm @ 6 Mbps -88 dBm @ 9 Mbps -88 dBm @ 12 Mbps -85 dBm @ 18 Mbps -81 dBm @ 24 Mbps -78 dBm @ 36 Mbps -74 dBm @ 48 Mbps -74 dBm @ 54 Mbps</p>
Receiver Sensitivity for 802.11b	<p>-93 dBm @ 1 Mbps -93 dBm @ 2 Mbps -93 dBm @ 5.5 Mbps -88 dBm @ 11 Mbps</p>
Receiver Sensitivity for 802.11g	<p>-88 dBm @ 6 Mbps -86 dBm @ 9 Mbps -85 dBm @ 12 Mbps -85 dBm @ 18 Mbps -85 dBm @ 24 Mbps -82 dBm @ 36 Mbps -78 dBm @ 48 Mbps -74 dBm @ 54 Mbps</p>
Receiver Sensitivity for 802.11n (2.4 GHz)	<p>-89 dBm @ MCS0 20 MHz -85 dBm @ MCS1 20 MHz -85 dBm @ MCS2 20 MHz -82 dBm @ MCS3 20 MHz -78 dBm @ MCS4 20 MHz -74 dBm @ MCS5 20 MHz -72 dBm @ MCS6 20 MHz -70 dBm @ MCS7 20 MHz -95 dBm @ MCS8 20 MHz -90 dBm @ MCS9 20 MHz -87 dBm @ MCS10 20 MHz -83 dBm @ MCS11 20 MHz -80 dBm @ MCS12 20 MHz -74 dBm @ MCS13 20 MHz</p>

	<p>-71 dBm @ MCS14 20 MHz -69 dBm @ MCS15 20 MHz -87 dBm @ MCS0 40 MHz -83 dBm @ MCS1 40 MHz -83 dBm @ MCS2 40 MHz -80 dBm @ MCS3 40 MHz -76 dBm @ MCS4 40 MHz -73 dBm @ MCS5 40 MHz -69 dBm @ MCS6 40 MHz -67 dBm @ MCS7 40 MHz -93 dBm @ MCS8 40 MHz -88 dBm @ MCS9 40 MHz -85 dBm @ MCS10 40 MHz -82 dBm @ MCS11 40 MHz -78 dBm @ MCS12 40 MHz -73 dBm @ MCS13 40 MHz -69 dBm @ MCS14 40 MHz -67 dBm @ MCS15 40 MHz</p>
Receiver Sensitivity for 802.11n (5 GHz)	<p>-88 dBm @ MCS0 20 MHz -85 dBm @ MCS1 20 MHz -82 dBm @ MCS2 20 MHz -79 dBm @ MCS3 20 MHz -76 dBm @ MCS4 20 MHz -71 dBm @ MCS5 20 MHz -70 dBm @ MCS6 20 MHz -69 dBm @ MCS7 20 MHz -95 dBm @ MCS8 20 MHz -91 dBm @ MCS9 20 MHz -87 dBm @ MCS10 20 MHz -80 dBm @ MCS11 20 MHz -78 dBm @ MCS12 20 MHz -74 dBm @ MCS13 20 MHz -72 dBm @ MCS14 20 MHz -71 dBm @ MCS15 20 MHz -84 dBm @ MCS0 40 MHz -81 dBm @ MCS1 40 MHz -77 dBm @ MCS2 40 MHz -75 dBm @ MCS3 40 MHz -71 dBm @ MCS4 40 MHz -67 dBm @ MCS5 40 MHz -64 dBm @ MCS6 40 MHz -63 dBm @ MCS7 40 MHz -90 dBm @ MCS8 40 MHz -85 dBm @ MCS9 40 MHz -82 dBm @ MCS10 40 MHz -81 dBm @ MCS11 40 MHz -77 dBm @ MCS12 40 MHz -73 dBm @ MCS13 40 MHz -71 dBm @ MCS14 40 MHz -68 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	IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) IEEE 802.3af for PoE IEEE 802.1Q for VLAN Tagging
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, SNTP, TCP, UDP, RADIUS, SNMP, PPPoE, DHCP AP-only: ARP, BOOTP, DHCP, STP/RSTP (IEEE 802.1D/w)
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Security	RADIUS
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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
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Alarm Contact Channels	Relay output with current carrying capacity of 1 A @ 24 VDC
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Buttons	Reset button
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Physical Characteristics

Housing	Metal
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IP Rating	IP30
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Dimensions	52.9 x 151.9 x 127.4 mm (2.08 x 5.98 x 5.02 in)
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Weight	850 g (1.87 lb)
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Installation	DIN-rail mounting, Wall mounting (with optional kit)
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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
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Input Voltage	12 to 48 VDC, Redundant dual inputs, 48 VDC Power-over-Ethernet
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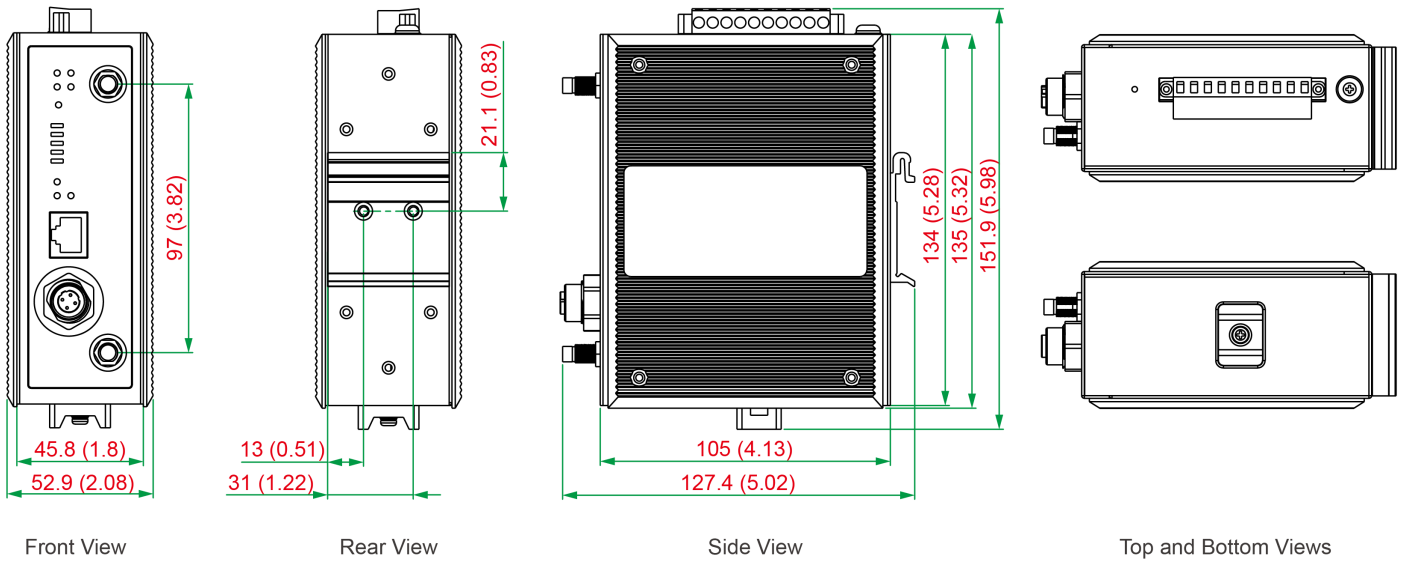
Power Connector	1 removable 10-contact terminal block(s)
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Power Consumption	AWK-3131A-M12-RTG: Maximum 10.5 W AWK-3131A-SSC-RTG: Maximum 13 W
Reverse Polarity Protection	Supported
Environmental Limits	
Operating Temperature	Wide Temp. Models: -40 to 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

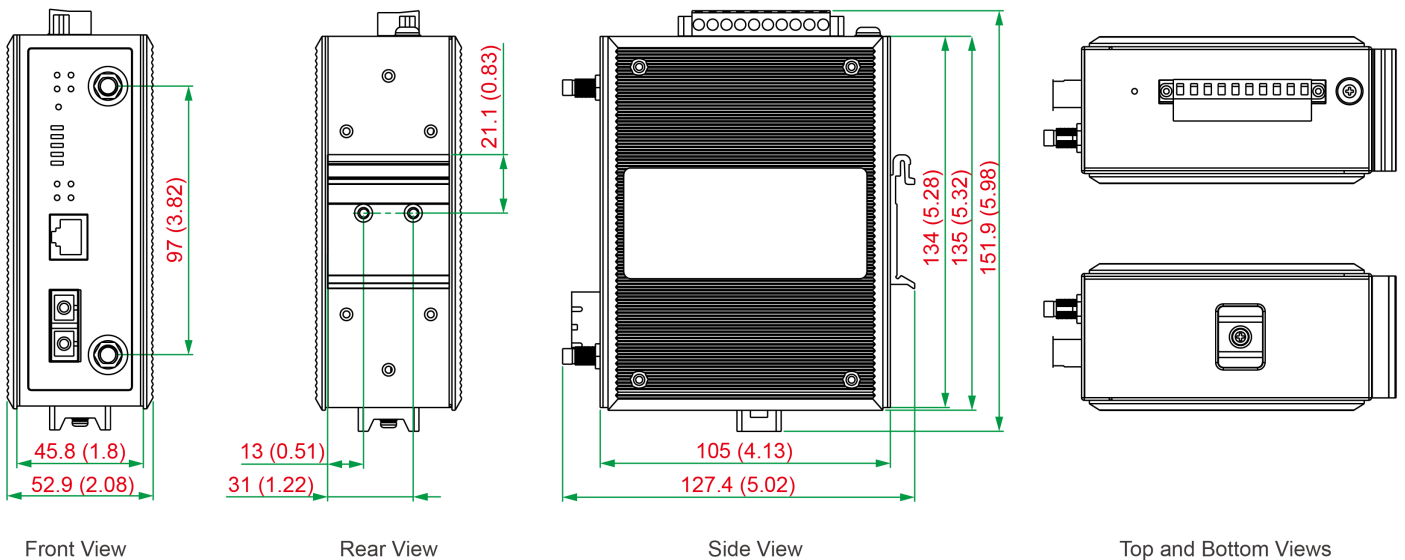
AWK-3131A-M12-RTG Models

Unit: mm (inch)



AWK-3131A-SSC-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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