AWK-3131A-RTG Series

Wi-Fi 4 (802.11n) railway train-to-ground IP30 wireless AP/clients

Features and Benefits

- M12 and SC fiber LAN connectors for onboard and wayside deployments
- DIN-rail design and QMA connectors for more flexible deployment
- Seamless train-to-ground communication with sub-50 ms controller-based Turbo Roaming

Certifications

EN 50155 EN 50121-4

Introduction

The AWK-3131A-RTG Series Wi-Fi 4 (802.11n) railway train-to-ground IP30-rated wireless AP/clients are designed for reliable train-to-ground (T2G) communication, supporting seamless controller-based Turbo Roaming with handover times under 50 ms. Featuring both M12 and SSC models, the AWK-3131A-RTG Series meets different deployment needs, while the DIN-rail design and QMA antenna connectors simplify installation.

Specifications

WLAN Interface

WLAN Standards	2.4 GHz: 802.11b/g/n with 64 QAM support, 20/40 MHz 5 GHz: 802.11a/n with 64 QAM support, 20/40 MHz
Frequency Band for US (20 MHz operating channels)	AWK-3131A-RTG-US models only: 2.412 to 2.462 GHz (11 channels) 5.180 to 5.240 GHz (4 channels) 5.260 to 5.320 GHz (4 channels)[1] 5.500 to 5.700 GHz (8 channels) excluding 5.600 to 5.640 GHz[2] 5.745 to 5.825 GHz (5 channels)
Frequency Band for EU (20 MHz operating channels)	AWK-3131A-RTG-EU models only: 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)[2]
Frequency Band for JP (20 MHz operating channels)	AWK-3131A-RTG-JP models only: 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-Enterprise (IEEE 802.1X/RADIUS, TKIP, AES), WPA/WPA2-Personal
Transmission Rate	802.11b: 1 to 11 Mbps, 802.11a/g: 6 to 54 Mbps, 802.11n: 6.5 to 300 Mbps

1. 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.
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.

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, 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, 18±1.5 dBm @ MCS14 40 MHz, 17±1.5 dBm @ MCS15 40 MHz
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: 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 (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, Note: 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., Typ. -68 dBm @ MCS15 40 MHz
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
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, 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
WLAN Operation Mode	Access point, Client, Client-Router, Sniffer
Antenna Connectors	2 x QMA

Ethernet Interface

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)	AWK-3131A-M12-RTG models: 1 Supports IEEE 802.3af PoE
100BaseFX Ports (single-mode SC connector)	AWK-3131A-SSC-RTG models: 1
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	SNMPv1/v2c/v3, Proxy ARP, ARP, DNS, HTTP, HTTPS, ICMP, TCP/IP, UDP, RADIUS, DHCP, BOOTP, STP/RSTP (IEEE 802.1D/w)
Security	RADIUS
Time Management	SNTP

LED Interface

LED Indicators	All models: PWR1, PWR2, FAULT, STATE, SIGNAL, CLIENT, WLAN AWK-3131A-M12-RTG models only: PoE, LAN AWK-3131A-SSC-RTG models only: 100M

Firewall

Filter	IP protocol, MAC address, Port-based

Serial Interface

Console Port	RS-232 (RJ45-type)

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 models: 0.85 A @ 12 VDC, 0.22 A @ 48 VDC AWK-3131A-SSC-RTG models: 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 models: 10.5 W (max.) AWK-3131A-SSC-RTG models: 13 W (max.)
Reverse Polarity Protection	Supported

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 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
Cybersecurity	EN 18031-1
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 models: 552,454 hrs AWK-3131A-SSC-RTG models: 528,478 hrs
Standards	Telcordia Standard SR-332

Warranty

Warranty Period	5 years
Details	See www.moxa.com/warranty

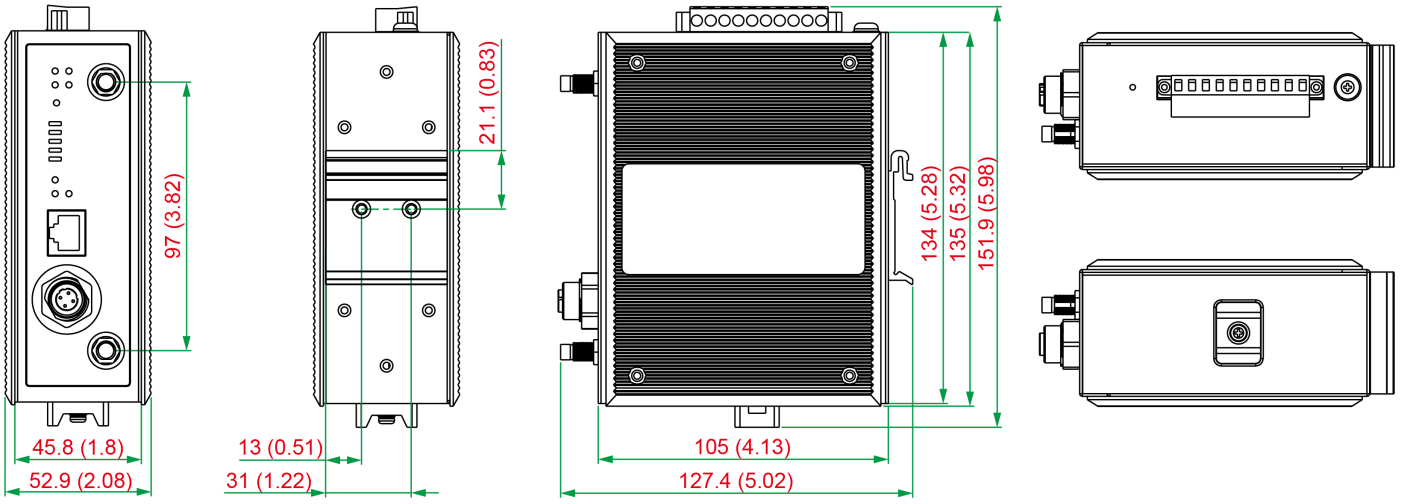
Package Contents

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

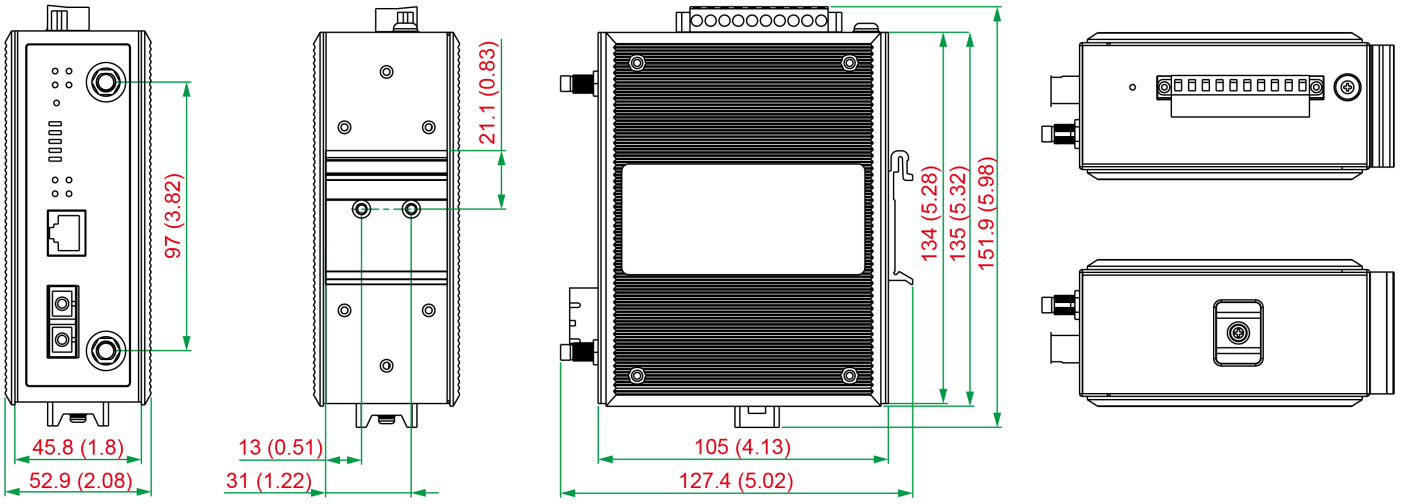
Unit: mm (inch)



Front View | Rear View | Side View | Top and Bottom Views

AWK-3131A-SCC-RTG Models

Unit: mm (inch)



Front View | Rear View | Side View | Top and Bottom Views

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 with 2 plates (51.6 x 67 x 2 mm) and 6 screws