

AWK-3131A-M12-RCC Series

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



- > 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 a portion of EN 50155 specifications
- > -40 to 75°C operating temperature range (T models)
- > Supports Auto Carriage-to-Carriage connection function



Introduction

The AWK-3131A-M12-RCC series industrial 802.11n wireless AP/bridge/client is an ideal wireless solution for applications such as onboard passenger infotainment systems and inter-carriage wireless backbone networks. The AWK-3131A-M12-RCC series provides a faster data rate than the 802.11g model and is ideal for a great variety of wireless configurations and applications. The auto carriage connection (ACC) feature provides simple deployment and increases the reliability of wireless carriage backbone networks. The AWK-3131A-M12-RCC series is also optimized for passenger Wi-Fi services and complies with a portion of 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-M12-RCC series can also be powered via PoE for easier deployment.

Improved Higher 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

Specifications 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

Standards:

IEEE 802.11a/b/g/n for Wireless LAN
 IEEE 802.11i for Wireless Security
 IEEE 802.3 for 10BaseT
 IEEE 802.3u for 100BaseT(X)
 IEEE 802.3ab for 1000BaseT
 IEEE 802.3af for Power-over-Ethernet
 IEEE 802.1D for Spanning Tree Protocol
 IEEE 802.1w for Rapid STP
 IEEE 802.1Q for VLAN

Spread Spectrum and Modulation (typical):

- DSSS with DBPSK, DQPSK, CCK
- OFDM with BPSK, QPSK, 16QAM, 64QAM
- 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 1 Mbps
- 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
- 802.11n: 64QAM @ 300 Mbps to BPSK @ 6.5 Mbps (multiple rates supported)

Operating Channels (central frequency):

US:

2.412 to 2.462 GHz (11 channels)
 5.180 to 5.240 GHz (4 channels)
 5.260 to 5.320 GHz (4 channels)*
 5.500 to 5.700 GHz (8 channels, excluding 5.600 to 5.640 GHz)*
 5.745 to 5.825 GHz (5 channels)

EU:

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)*

JP:

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)*

*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.

Security:

- SSID broadcast enable/disable
- Firewall for MAC/IP/Protocol/Port-based filtering
- 64-bit and 128-bit WEP encryption, WPA/WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP, and AES)

Transmission Rates:

802.11b: 1, 2, 5.5, 11 Mbps

802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps

802.11n: 6.5 to 300 Mbps (multiple rates supported)

TX Transmit Power:

802.11b:

- Typ. 26±1.5 dBm @ 1 Mbps
- Typ. 26±1.5 dBm @ 2 Mbps
- Typ. 26±1.5 dBm @ 5.5 Mbps
- Typ. 25±1.5 dBm @ 11 Mbps

802.11g:

- Typ. 23±1.5 dBm @ 6 to 24 Mbps
- Typ. 21±1.5 dBm @ 36 Mbps
- Typ. 19±1.5 dBm @ 48 Mbps
- Typ. 18±1.5 dBm @ 54 Mbps

802.11n (2.4 GHz):

- Typ. 23±1.5dBm @ MCS0 20 MHz
- Typ. 21±1.5dBm @ MCS1 20 MHz
- Typ. 21±1.5dBm @ MCS2 20 MHz
- Typ. 21±1.5dBm @ MCS3 20 MHz
- Typ. 20±1.5dBm @ MCS4 20 MHz
- Typ. 19±1.5dBm @ MCS5 20 MHz
- Typ. 18±1.5dBm @ MCS6 20 MHz
- Typ. 18±1.5dBm @ MCS7 20 MHz
- Typ. 23±1.5dBm @ MCS8 20 MHz
- Typ. 21±1.5dBm @ MCS9 20 MHz
- Typ. 21±1.5dBm @ MCS10 20 MHz
- Typ. 21±1.5dBm @ MCS11 20 MHz
- Typ. 20±1.5dBm @ MCS12 20 MHz
- Typ. 19±1.5dBm @ MCS13 20 MHz
- Typ. 18±1.5dBm @ MCS14 20 MHz
- Typ. 18±1.5dBm @ MCS15 20 MHz
- Typ. 23±1.5dBm @ MCS0 40 MHz
- Typ. 20±1.5dBm @ MCS1 40 MHz
- Typ. 20±1.5dBm @ MCS2 40 MHz
- Typ. 20±1.5dBm @ MCS3 40 MHz
- Typ. 19±1.5dBm @ MCS4 40 MHz
- Typ. 19±1.5dBm @ MCS5 40 MHz
- Typ. 18±1.5dBm @ MCS6 40 MHz
- Typ. 17±1.5dBm @ MCS7 40 MHz
- Typ. 23±1.5dBm @ MCS8 40 MHz
- Typ. 20±1.5dBm @ MCS9 40 MHz
- Typ. 20±1.5dBm @ MCS10 40 MHz
- Typ. 20±1.5dBm @ MCS11 40 MHz
- Typ. 20±1.5dBm @ MCS12 40 MHz
- Typ. 19±1.5dBm @ MCS13 40 MHz
- Typ. 18±1.5dBm @ MCS14 40 MHz
- Typ. 17±1.5dBm @ MCS15 40 MHz

802.11a:

- Typ. 23±1.5 dBm @ 6 to 24 Mbps
- Typ. 21±1.5 dBm @ 36 Mbps
- Typ. 20±1.5 dBm @ 48 Mbps
- Typ. 18±.5 dBm @ 54 Mbps

802.11n (5 GHz):

- Typ. 23±1.5dBm @ MCS0 20 MHz
- Typ. 20±1.5dBm @ MCS1 20 MHz
- Typ. 20±1.5dBm @ MCS2 20 MHz
- Typ. 20±1.5dBm @ MCS3 20 MHz
- Typ. 19±1.5dBm @ MCS4 20 MHz
- Typ. 18±1.5dBm @ MCS5 20 MHz
- Typ. 18±1.5dBm @ MCS6 20 MHz
- Typ. 18±1.5dBm @ MCS7 20 MHz
- Typ. 23±1.5dBm @ MCS8 20 MHz

- Typ. 20±1.5dBm @ MCS9 20 MHz
- Typ. 20±1.5dBm @ MCS10 20 MHz
- Typ. 20±1.5dBm @ MCS11 20 MHz
- Typ. 19±1.5dBm @ MCS12 20 MHz
- Typ. 19±1.5dBm @ MCS13 20 MHz
- Typ. 18±1.5dBm @ MCS14 20 MHz
- Typ. 18±1.5dBm @ MCS15 20 MHz
- Typ. 23±1.5dBm @ MCS0 40 MHz
- Typ. 20±1.5dBm @ MCS1 40 MHz
- Typ. 20±1.5dBm @ MCS2 40 MHz
- Typ. 20±1.5dBm @ MCS3 40 MHz
- Typ. 19±1.5dBm @ MCS4 40 MHz
- Typ. 18±1.5dBm @ MCS5 40 MHz
- Typ. 18±1.5dBm @ MCS6 40 MHz
- Typ. 18±1.5dBm @ MCS7 40 MHz
- Typ. 23±1.5dBm @ MCS8 40 MHz
- Typ. 20±1.5dBm @ MCS9 40 MHz
- Typ. 20±1.5dBm @ MCS10 40 MHz
- Typ. 20±1.5dBm @ MCS11 40 MHz
- Typ. 19±1.5dBm @ MCS12 40 MHz
- Typ. 19±1.5dBm @ MCS13 40 MHz
- Typ. 18±1.5dBm @ MCS14 40 MHz
- Typ. 18±1.5dBm @ MCS15 40 MHz

RX Sensitivity:

2.4 GHz

802.11b:

- -93 dBm @ 1 Mbps
- -93 dBm @ 2 Mbps
- -93 dBm @ 5.5 Mbps
- -88 dBm @ 11 Mbps

802.11g:

- -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

802.11n (2.4 GHz):

- -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
- -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
- 802.11a:
- -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
- 802.11n (5 GHz):
- -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

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNMP, TCP, UDP, RADIUS, SNMP, DHCP

AP-only Protocols: ARP, BOOTP, DHCP, STP/RSTP (IEEE 802.1D/w)

Interface

M12 Ports: 1, M12 A-coded 8-pin female connector, 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, auto MDI/MDI-X connection

Console Port: RS-232 (RJ45-type)

Reset: Present

LED Indicators: PWR1, PWR2, PoE, FAULT, STATE, signal strength, Client, WLAN, LAN

Alarm Contact (digital output): 1 relay output with current carrying capacity of 1 A @ 24 VDC

Digital Inputs: 2 electrically isolated inputs

- +13 to +30 V for state "1"
- +3 to -30 V for state "0"
- Max. input current: 8 mA

Connector for External Antennas: QMA (female)

Physical Characteristics

Housing: Metal, IP30 protection

Weight: 850 g (1.87 lb)

Dimensions: 52.9 x 151.9 x 127.4 mm (2.08 x 5.98 x 5.02 in)

Installation: DIN-rail mounting (standard), wall mounting (optional)

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: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant)

Input Current: Maximum 8.03 W (12 V / 0.67 A to 48 V / 0.17 A), 25°C

Connector: 10-pin removable terminal block

Reverse Polarity Protection: Present

Standards and Certifications

Safety: EN 60950-1(LVD), UL 60950-1, IEC 60950-1(CB)

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

Radio:

EU: EN 300 328, EN 301 893

US: FCC ID SLE-WAPN008

JP: TELEC

Singapore: IDA

Rail Traffic: EN 50155*, EN 50121-4, EN 45545-2

*Complies with a portion of EN 50155 specifications.

Note: Please check Moxa's website for the most up-to-date certification status.

MTBF (mean time between failures)

Time: 742,649 hrs

Standard: Telcordia SR332

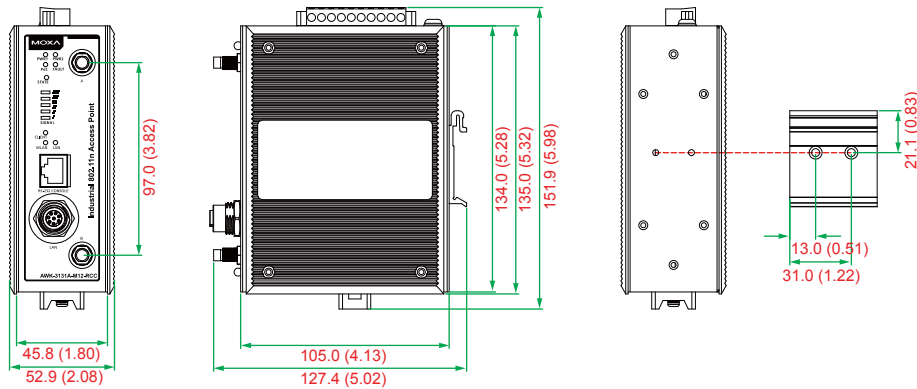
Warranty

Warranty Period: 5 years

Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)



Ordering Information

Model Name	Available Models			Port Interface		Antenna Interface	
	Standard Temperature (-25 to 60°C)	Wide Temperature (-40 to 75°C)	Conformal Coating	M12		RP-SMA	QMA
				10/100/1000BaseT(X)			
AWK-3131A-M12-RCC							
AWK-3131A-M12-RCC-US	✓	–	–	✓		–	✓
AWK-3131A-M12-RCC-EU	✓	–	–	✓		–	✓
AWK-3131A-M12-RCC-JP	✓	–	–	✓		–	✓
AWK-3131A-M12-RCC-US-T	–	✓	–	✓		–	✓
AWK-3131A-M12-RCC-EU-T	–	✓	–	✓		–	✓
AWK-3131A-M12-RCC-JP-T	–	✓	–	✓		–	✓
AWK-3131A-M12-RCC-US-CT	✓	–	✓	✓		–	✓
AWK-3131A-M12-RCC-EU-CT	✓	–	✓	✓		–	✓
AWK-3131A-M12-RCC-JP-CT	✓	–	✓	✓		–	✓
AWK-3131A-M12-RCC-US-CT-T	–	✓	✓	✓		–	✓
AWK-3131A-M12-RCC-EU-CT-T	–	✓	✓	✓		–	✓
AWK-3131A-M12-RCC-JP-CT-T	–	✓	✓	✓		–	✓

Note:

US: USA band

EU: Europe band

JP: Japan band

CT: conformal coating

Optional Accessories (can be purchased separately)

WK-51-01: DIN-rail/wall-mounting kit, 2 plates with 6 screws

Package Checklist

- AWK-3131A-M12-RCC wireless AP/bridge/client
- DIN-rail kit
- 2 plastic RJ45 protective caps for console ports
- Cable holder with 1 screw
- Quick installation guide (printed)
- Warranty card