# AWK-3131-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)

802.11

EN 50121

## Introduction

The AWK-3131-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-3131-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-3131-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-3131-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 @ 11 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)
5.18 to 5.24 GHz (4 channels)
EU:
2.412 to 2.472 GHz (13 channels)
5.18 to 5.24 GHz (4 channels)
JP:
2.412 to 2.472 GHz (13 channels, OFDM)
2.412 to 2.484 GHz (14 channels, DSSS)
5.18 to 5.24 GHz (4 channels for W52)

**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:
1 to 11 Mbps: Typ. 18 dBm (± 1.5 dBm)
802.11g:
6 to 24 Mbps: Typ. 18 dBm (± 1.5 dBm)
36 to 48 Mbps: Typ. 17 dBm (± 1.5 dBm)
54 Mbps: Typ. 15 dBm (± 1.5 dBm)
802.11a:
6 to 24 Mbps: Typ. 17 dBm (± 1.5 dBm)
36 to 48 Mbps: Typ. 16 dBm (± 1.5 dBm)
54 Mbps: Typ. 14 dBm (± 1.5 dBm)
**RX Sensitivity:**
802.11b:
-92 dBm @ 1 Mbps, -90 dBm @ 2 Mbps, -88 dBm @ 5.5 Mbps, -84 dBm @ 11 Mbps
802.11g:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps, -80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
802.11a:
-87 dBm @ 6 Mbps, -86 dBm @ 9 Mbps, -85 dBm @ 12 Mbps, -82 dBm @ 18 Mbps,
-80 dBm @ 24 Mbps, -76 dBm @ 36 Mbps, -72 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
**RX Sensitivity MIMO:**
802.11a/n:
-68 dBm @ MCS15 40 MHz,
-69 dBm @ MCS15 20 MHz,
-70 dBm @ MCS7 40 MHz,
-71 dBm @ MCS7 20 MHz
802.11g/n:
-69 dBm @ MCS15 20 MHz,
-71 dBm @ MCS7 20 MHz
**TX Transmit Power MIMO:**
802.11a/n (20/40 MHz):
MCS15 20 MHz: Typ. 13 dBm (± 1.5 dBm)
802.11g/n (20 MHz):
MCS15 20 MHz: Typ. 14 dBm (± 1.5 dBm)

## Protocol Support

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

## Interface

**Connector for External Antennas:** AWK-3131-M12-RCC: QMA (female)
**M12 Ports:** 1, 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
**Console Port:** RS-232 (RJ45-type)
**LED Indicators:** PWR1, PWR2, PoE, FAULT, STATE, signal strength, 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

## Physical Characteristics

**Housing:** Metal, IP30 protection
**Weight:** 970 g
**Dimensions:** 53.6 x 135 x 105 mm (2.11 x 5.31 x 4.13 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)
*Compliant with EN 50155 on 24 VDC
**Connector:** 10-pin removable terminal block
**Power Consumption:**
Maximum 12.48 watts
12 to 48 VDC, 700 mA (max.)
**Reverse Polarity Protection:** Present

## Standards and Certifications

**Safety:** UL 60950-1, EN 60950-1
**EMC:** EN 301 489-1/17, FCC Part 15 Subpart B, EN 55022/55024
**Radio:** EN 300 328, EN 301 893, FCC ID SLE-WAPN001
**Rail Traffic:** EN 50155*, EN 50121-1/4
Note: Please check Moxa’s website for the most up-to-date certification status.

## Reliability

**MTBF (mean time between failures):** 407,416 hrs

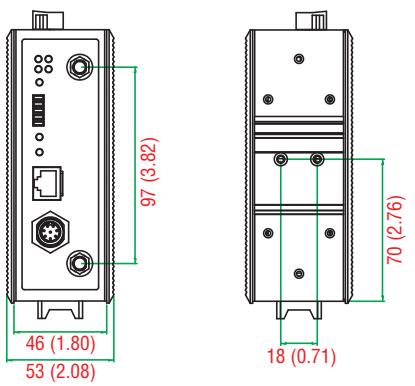
## Warranty

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

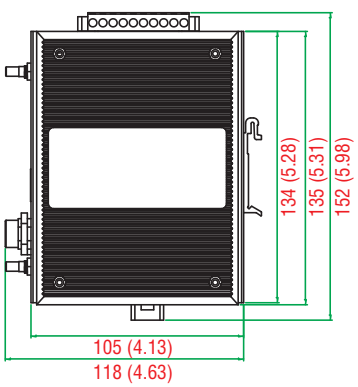
## Dimensions

Unit: mm (inch)

### AWK-3131-M12-RCC




Front and Rear Views




Side View

## Ordering Information

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

Note:
US: USA band
EU: Europe band
JP: Japan band
CT: conformal coating

### Package Checklist

- AWK-3131-RCC wireless AP/bridge/client
- DIN-rail kit
- 2 plastic RJ45 protective caps for console port
- Cable holder with one screw
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card