

AWK-3131

Quick Installation Guide

Moxa AirWorks

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Overview

Moxa's new AWK-3131 3-in-1 industrial wireless access point meets the growing need for faster data transmission speeds and wider coverage by supporting IEEE 802.11n technology with a net data rate of up to 300 Mbps. The AWK-3131 combines two adjacent 20 MHz channels into a single 40 MHz channel to deliver a potent combination of greater reliability and more bandwidth. The two redundant DC power inputs increase the reliability of the power supply, and the AWK-3131 can be powered via PoE to make deployment easier. The AWK-3131 can operate on either the 2.4 or 5 GHz bands and is backward-compatible with existing 802.11a/b/g deployments to future-proof your wireless investments.

Package Checklist

Moxa's AWK-3131 is shipped with the following items. If any of these items is missing or damaged, please contact your customer service representative for assistance.

- AWK-3131
- 2 dual-band omni-directional antennas (2 dBi, RP-SMA, 2.4/5 GHz)
- DIN-rail kit
- 2 plastic RJ45 protective caps
- 1 plastic SFP protective cap
- Cable holder with one screw
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

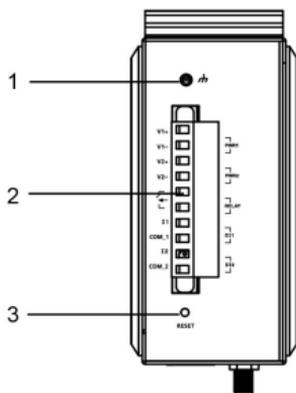
Recommended SFP Accessories

SFP-1G series

- SFP-1GSXLC:
Small form factor pluggable transceiver with 1000BaseSX, LC, 0.5 km, 0 to 60°C.
- SFP-1GSXLC-T:
Small form factor pluggable transceiver with 1000BaseSX, LC, 0.5 km, -20 to 75°C.
- SFP-1GLSXLC:
Small form factor pluggable transceiver with 1000BaseLSX, LC, 2 km, 0 to 60°C.
- SFP-1GLSXLC-T:
Small form factor pluggable transceiver with 1000BaseLSX, LC, 2 km, -40 to 85°C.
- SFP-1GLXLC:
Small form factor pluggable transceiver with 1000BaseLX, LC, 10 km, 0 to 60°C.
- SFP-1GLXLC-T:
Small form factor pluggable transceiver with 1000BaseLX, LC, 10 km, -40 to 85°C.
- SFP-1GLHLC:
Small form factor pluggable transceiver with 1000BaseLH, LC, 30 km, 0 to 60°C.
- SFP-1GLHLC-T:
Small form factor pluggable transceiver with 1000BaseLH, LC, 30 km, -40 to 85°C.
- SFP-1GLHXLC:
Small form factor pluggable transceiver with 1000BaseLHX, LC, 40 km, 0 to 60°C.
- SFP-1GLHXLC-T:
Small form factor pluggable transceiver with 1000BaseLHX, LC, 40 km, -40 to 85°C.
- SFP-1GZXLC:
Small form factor pluggable transceiver with 1000BaseZX, LC, 80 km, 0 to 60°C.
- SFP-1GZXLC-T:
Small form factor pluggable transceiver with 1000BaseZX, LC, 80 km, -40 to 85°C.
- SFP-1GEZXC:
Small form factor pluggable transceiver with 1000BaseEZC, LC, 110 km, 0 to 60°C.
- SFP-1GEZXC-120:
Small form factor pluggable transceiver with 1000BaseEZC, LC, 120 km, 0 to 60°C.

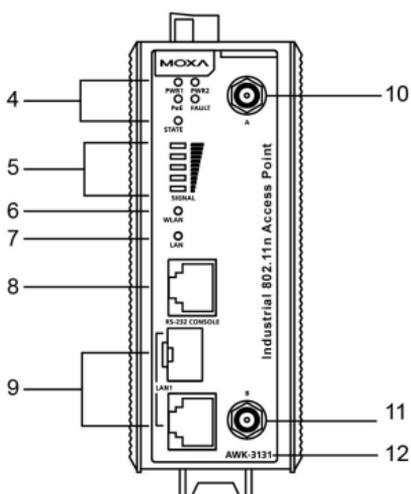
Panel Layout of the AWK-3131

Top Panel View

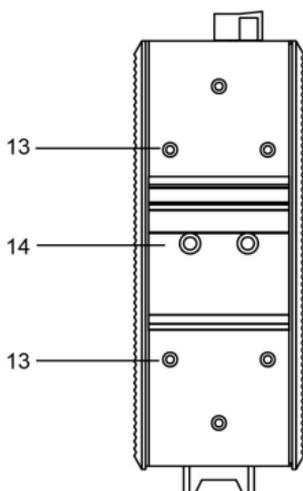


1. Grounding screw (M3)
2. Terminal block for PWR1,PWR2, relay, DI1, and DI2
3. Reset button
4. System LEDs: PWR1, PWR2, PoE, FAULT, and STATE
5. LEDs for signal strength
6. WLAN LED
7. Ethernet or fiber LED
8. RS-232 console port
9. LANs: 10/100/1000 BaseT(X) RJ45 port or 1000Base SFP
10. Main antenna A
11. Main antenna B
12. Model name
13. Screw hole for wall-mounting kit
14. DIN-rail mounting kit

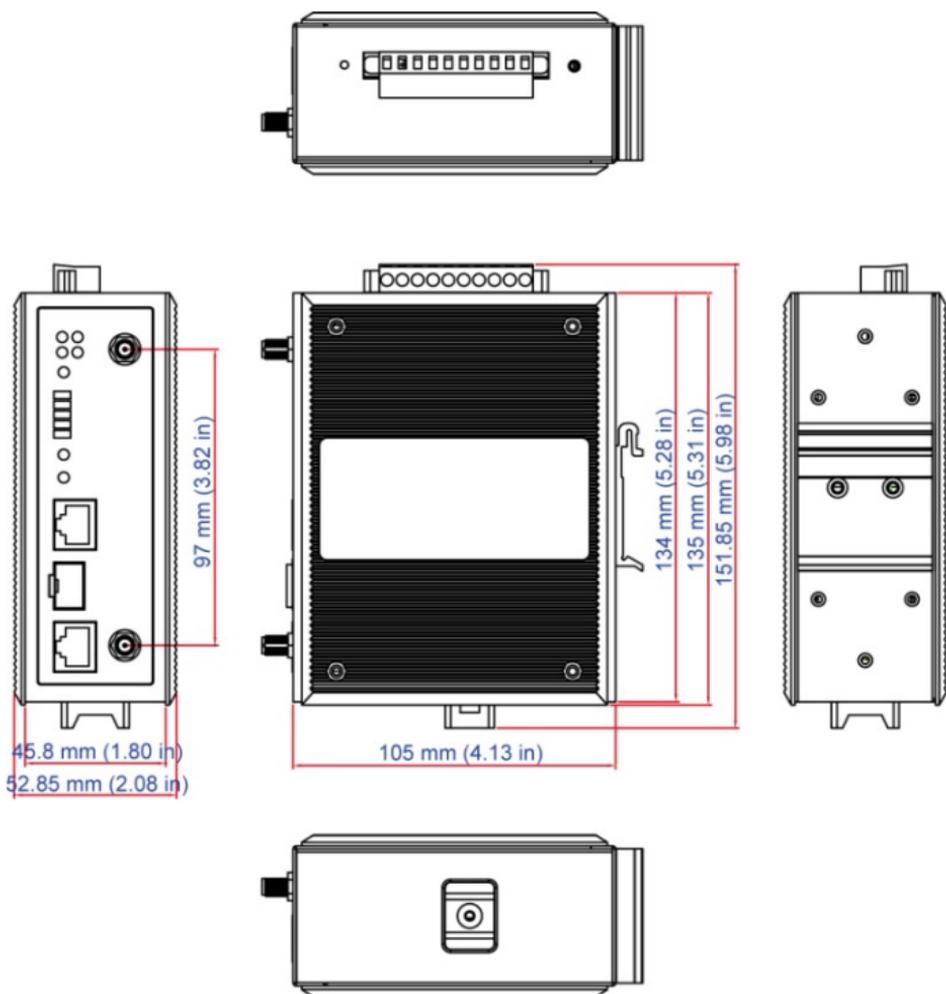
Front Panel View



Rear Panel View



Mounting Dimensions (unit = mm)

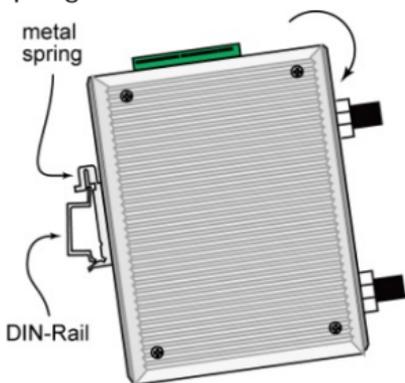


DIN-Rail Mounting

The aluminum DIN-rail attachment plate should be fixed to the back panel of the AWK-3131 when you take it out of the box. If you need to reattach the DIN-rail attachment plate to the AWK-3131, make sure the stiff metal spring is situated towards the top, as shown in the figures below.

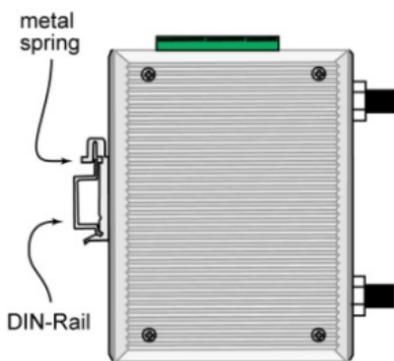
STEP 1:

Insert the top of the DIN rail into the slot just below the stiff metal spring.



STEP 2:

The DIN-rail attachment unit will snap into place as shown below.



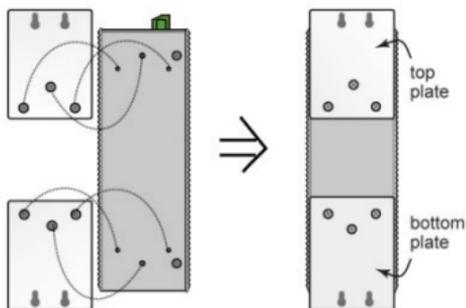
To remove the AWK-3131 from the DIN rail, simply reverse Steps 1 and 2.

Wall Mounting (optional)

For transportation applications that require an EN 50155 certification report, we strongly recommend the purchase of the optional AWK-3131 wall-mounting kit, which has passed EN 50155 testing. This wall-mounting kit is also convenient for other applications that require mounting the AWK-3131 to a wall.

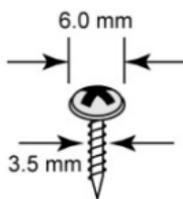
STEP 1:

Remove the aluminum DIN-rail attachment plate from the AWK-3131, and then attach the wall-mounting plates with M3 screws, as shown in the adjacent diagrams.



STEP 2:

Mounting the AWK-3131 to a wall requires 3 screws. Use the AWK-3131 device, with wall-mounting plates attached, as a guide to mark the correct locations of the 3 screws. The heads of the screws should be less than 6.0 mm in diameter, and the shafts should be less than 3.5 mm in diameter, as shown in the figure at the right.

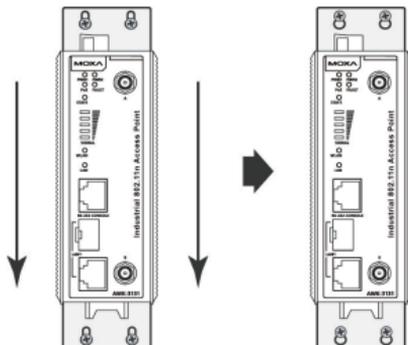


Do not drive the screws in all the way into the wall—leave a space of about 2 mm to allow room for sliding the wall-mounting panel between the wall and the screws.

NOTE Test the screw head and shank size by inserting the screw into one of the keyhole shaped apertures of the wall-mounting plates before attaching the plates to the wall.

STEP 3:

Once the screws are fixed into the wall, insert the four screw heads through the large opening of the keyhole-shaped apertures, and then slide the AWK-3131 downwards, as indicated to the right. Tighten the three screws for added stability.





WARNING

- This equipment is intended to be used in a Restricted Access Location, such as a dedicated computer room. Access can only be gained by SERVICE PERSONS or by USERS who have been instructed about the fact that the metal chassis of the equipment is extremely hot and may cause burns.
- Service persons or users have to pay special attention and take special precaution before handling the equipment.
- Access is to be controlled through the use of a lock and key or a security identity system, controlled by the authority responsible for the location. Only authorized, well-trained professionals are allowed to access the restricted access location.
- **External metal parts are hot!!** Pay special attention or use special protection before handling.

Wiring Requirements



WARNING

Safety First!

Be sure to disconnect the power cord before installing and/or wiring your Moxa AWK-3131.



WARNING

Safety First!

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowed for each wire size.

If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

You should also pay attention to the following items:

- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.

NOTE Do not run signal or communications wiring and power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.

- You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring with similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separate.
- It is strongly advised that you label wiring to all devices in the system for easy identification.



ATTENTION

This product is intended to be supplied by a Listed Power Unit marked "Class 2" or "LPS" and rated O/P: 12 to 48 VDC, 700 mA (max.)



ATTENTION

Make sure the external power adaptor (includes power cords and plug assemblies) provided with the unit is certified and suitable for use in your country.



ATTENTION

Do not use a PoE Injector with the PoE (Power over Ethernet) model. Instead, use an IEEE802.3af or IEEE802.3at compliant PSE (Power Sourcing Equipment).

Grounding the Moxa AWK-3131

Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw to the grounding surface prior to connecting devices.

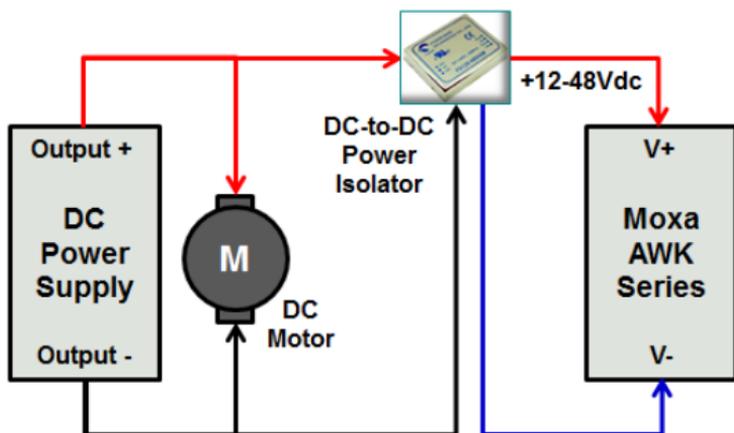


ATTENTION

This product is intended to be mounted to a well-grounded mounting surface, such as a metal panel.

Installations with Unstable Power Inputs

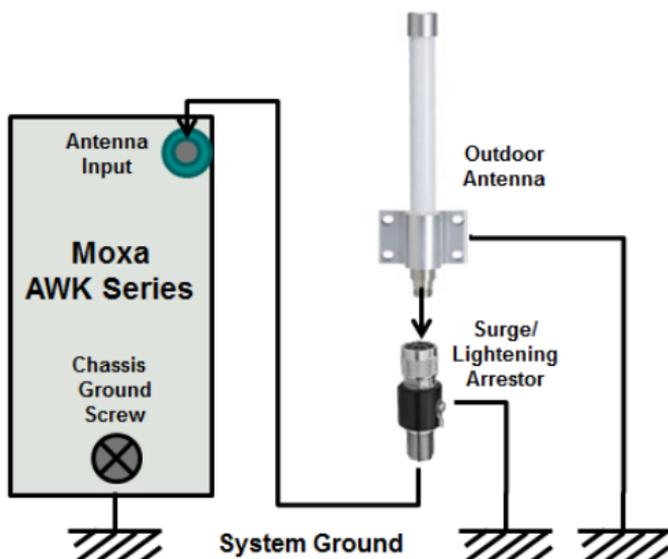
There are cases where the device has to be wired to the same power source as other equipment. In such cases if equipment such as motors that are connected in the circuit draw a large amount of current during operation, the transient voltage drop could potentially cause the AWK to become unstable. Installing a DC/DC power isolator in between the two equipment is recommended to isolate the transient effect and to ensure a stable power input for the AWK.



Installations with Cable Extended Antennas for Outdoor

Applications

If the antenna or the AWK device is installed outdoors or in an open-air setting, proper lightning protection is required to prevent direct lightning strikes on the AWK device. In order to prevent coupling currents from nearby lightning strikes, a lightning arrester should be installed as part of your antenna system. Ground the device, antenna, as well as the arrester properly to provide maximum outdoor protection for the device.

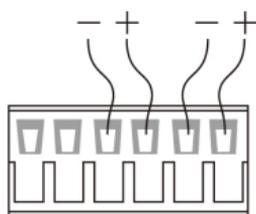


Arrester Accessories

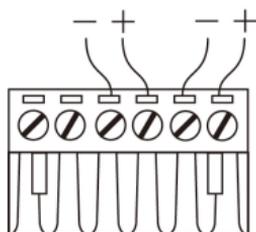
- **SA-NMNF-01:** Surge arrester, N-type (male) to N-type (female)
- **SA-NFNF-01:** Surge arrester, N-type (female) to N-type (female)

Wiring the Redundant Power Inputs

The top two pairs of contacts of the 10-contact terminal block connector on the AWK-3131's top panel are used for the AWK-3131's two DC inputs. Top and front views of the terminal block connector are shown below.



Top View



Front View

STEP 1: Insert the negative/positive DC wires into the V-/V+ terminals.

STEP 2: To keep the DC wires from pulling loose, use a small flat-blade screwdriver to tighten the wire-clamp screws on the front of the terminal block connector.

STEP 3: Insert the plastic terminal block connector prongs into the terminal block receptor, which is located on the AWK-3131's top panel.



ATTENTION

Before connecting the AWK-3131 to the DC power inputs, make sure the DC power source voltage is stable.

Wiring the Relay Contact

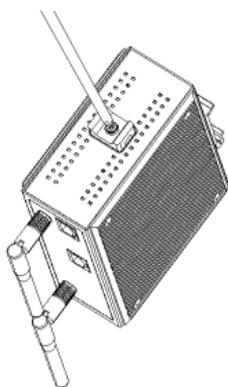
The AWK-3131 has one relay output, which consists of the two contacts of the terminal block on the AWK-3131's top panel. Refer to the previous section for detailed instructions on how to connect the wires to the terminal block connector, and how to attach the terminal block connector to the terminal block receptor. These relay contacts are used to indicate user-configured events. The two wires attached to the Relay contacts form an open circuit when a user-configured event is triggered. If a user-configured event does not occur, the Relay circuit will be closed.

Wiring the Digital Inputs

The AWK-3131 has two sets of digital input—D11 and D12. Each DI comprises two contacts of the 10-pin terminal block connector on the AWK-3131's top panel. You can refer to the "Wiring the Redundant Power Inputs" section for detailed instructions on how to connect the wires to the terminal block connector, and how to attach the terminal block connector to the terminal block receptor.

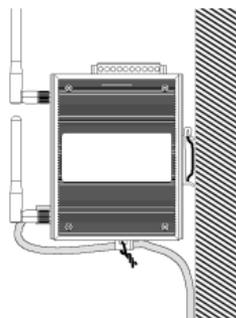
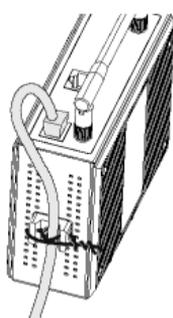
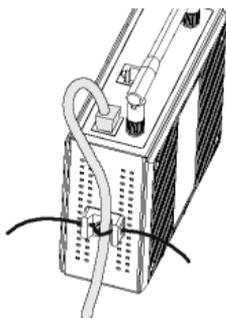
Cable Holder Installation

You can attach the cable holder to the bottom of the AWK-3131. This helps to keep cabling neat and avoid accidents that result from untidy cables.



STEP 1: Screw the cable holder onto the bottom of the AWK-3131.

STEP 2: After mounting the AWK-3131 and plugging in the LAN cable, tighten the cable along the device and wall.



Communication Connections

10/100BaseT(X) Ethernet Port Connection

The 10/100BaseT(X) ports located on the AWK-3131's front panel are used to connect to Ethernet-enabled devices.

Below we show pinouts for both MDI (NIC-type) ports and MDI-X (HUB/Switch-type) ports.

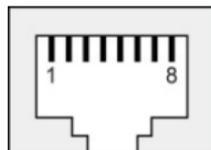
MDI Port Pinouts

| Pin | Signal |
|-----|--------|
| 1 | Tx+ |
| 2 | Tx- |
| 3 | Rx+ |
| 6 | Rx- |

MDI-X Port Pinouts

| Pin | Signal |
|-----|--------|
| 1 | Rx+ |
| 2 | Rx- |
| 3 | Tx+ |
| 6 | Tx- |

8-pin RJ45

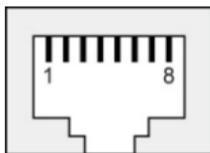


1000BaseT Ethernet Port Connection

1000BaseT data is transmitted on differential TRD+/- signal pairs over copper wires.

MDI/MDI-X Port Pinouts

| Pin | Signal |
|-----|---------|
| 1 | TRD(0)+ |
| 2 | TRD(0)- |
| 3 | TRD(1)+ |
| 4 | TRD(2)+ |
| 5 | TRD(2)- |
| 6 | TRD(1)- |
| 7 | TRD(3)+ |
| 8 | TRD(3)- |

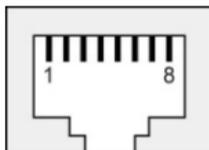


RS-232 Connection

The AWK-3131 has one RS-232 (8-pin RJ45) console port located on the front panel. Use either an RJ45-to-DB9 or RJ45-to-DB25 cable to connect the Moxa AWK-3131's console port to your PC's COM port. You may then use a console terminal program to access the AWK-3131 for console configuration.

Console Pinouts for 10-pin or 8-pin RJ45

| 10-Pin | Description | 8-Pin |
|--------|-------------|-------|
| 1 | - | |
| 2 | DSR | 1 |
| 3 | RTS | 2 |
| 4 | GND | 3 |
| 5 | TxD | 4 |
| 6 | RxD | 5 |
| 7 | DCD | 6 |
| 8 | CTS | 7 |
| 9 | DTR | 8 |
| 10 | - | |



- NOTE**
1. The pin numbers for male DB9 and DB25 connectors, and hole numbers for female DB9 and DB25 connectors are labeled on the connector strip. However, the numbers are typically quite small, so you may need to use a magnifying glass to see the numbers clearly.
 2. The pin numbers for both 8-pin and 10-pin RJ45 connectors (and ports) are typically not labeled on the connector (or port). Refer to the pinout diagram above for details.

ATEX Information



1. Certificate number: DEMKO 14 ATEX 1204X
2. Certification string: Ex nA IIC T4 Gc
3. Standards covered:
EN 60079-0:2012+A11:2013, EN 60079-15:2010
4. These products are to be installed in an ATEX Certified IP54 enclosure and accessible only by the use of a tool.
5. These products are for use in an area of not more than pollution degree 2 in accordance with IEC 60664-1.

LED Indicators

The front panel of the Moxa AWK-3131 contains several LED indicators. The function of each LED is described in the table below.

| LED | Color | State | Description |
|--|-------|---|--|
| Front Panel LED Indicators (System) | | | |
| PWR1 | Green | On | Power is being supplied from power input 1. |
| | | Off | Power is not being supplied from power input 1. |
| PWR2 | Green | On | Power is being supplied from power input 2. |
| | | Off | Power is not being supplied from power input 2. |
| PoE | Amber | On | Power is being supplied via PoE. |
| | | Off | Power is not being supplied via PoE. |
| FAULT | Red | Blinking (slow at 1-second intervals) | Cannot get an IP address from the DHCP server. |
| | | Blinking (fast at 0.5-second intervals) | IP address conflict. |
| | | Off | No error condition exists. |

| LED | Color | State | Description |
|------------------------|---------------|--|--|
| STATE | Green/ Red | Green | System startup is complete and the system is in operation. |
| | | Green (Blinking at 1-second intervals) | The device has been located by the Wireless Search Utility. |
| | | Red | System is booting up. |
| SIGNAL (5 LEDs) | Green | On | Signal level(for client/slave mode only) |
| | | Off | |
| WLAN | Green | On | WLAN function is in client/slave mode and AWK has established a link with an AP. |
| | | Blink | WLAN data communication is run in Client/Slave mode |
| | | Off | WLAN is not in client mode or AWK has not established a link with an AP. |
| | Amber | On | WLAN functions in AP/master mode. |
| | | Blink | WLAN's data communication is run in AP/master mode |
| | | Off | WLAN is not in use or not working properly. |
| LAN | Green | On | LAN port's 1000 Mbps link is active . |
| | | Blink | Data is being transmitted at 1000 Mbps. |
| | | Off | LAN port's 1000 Mbps link is inactive . |
| | Amber | On | LAN port's 10/100 Mbps link is active . |
| | | Blink | Data is being transmitted at 10/100 Mbps. |
| | | Off | LAN port's 10/100 Mbps link is inactive . |

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 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) | <p>US: 2.412 to 2.462 GHz (11 channels) 5.18 to 5.24 GHz (4 channels)</p> <p>EU: 2.412 to 2.472 GHz (13 channels) 5.18 to 5.24 GHz (4 channels)</p> <p>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)</p> |
| Security | <p>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)</p> |
| Transmission Rates | <p>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)</p> |
| TX Transmit Power | <p>802.11b: 1 to 11 Mbps: Typ. 18 dBm (± 1.5 dBm)</p> <p>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)</p> <p>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)</p> |
| RX Sensitivity | <p>802.11b: -92 dBm @ 1 Mbps, -90 dBm @ 2 Mbps, -88 dBm @ 5.5 Mbps, -84 dBm @ 11 Mbps</p> <p>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</p> <p>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</p> |
| TX Transmit Power MIMO (per connector) | <p>802.11a/n (20/40 MHz): MCS15 20 MHz: Typ. 13 dBm (± 1.5 dBm)</p> |

| | |
|---------------------------------|--|
| | 802.11g/n (20 MHz): MCS15 20 MHz: Typ. 14 dBm (± 1.5 dBm) |
| 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 |
| Protocol Support | |
| General Protocols | Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNMP, TCP, UDP, RADIUS, SNMP, PPPoE, DHCP |
| AP-only Protocols | ARP, BOOTP, DHCP, STP/RSTP (IEEE 802.1D/w) |
| Interface | |
| Default Antennas | 2 dual-band omni-directional antennas, 2 dBi, RP-SMA (male) |
| Connector for External Antennas | RP-SMA (female) |
| Console Port | RS-232 (RJ45-type) |
| Reset | Present |
| LED Indicators | PWR1, PWR2, PoE, FAULT, STATE, SIGNAL, WLAN, LAN |
| Alarm Contact(digital output) | 1 relay output with current carrying capacity of 1 A @ 24 VDC |
| Digital Inputs | 2 electrically isolated inputs <ul style="list-style-type: none"> • +13 to +30 V for state "1" • +3 to -30 V for state "0" • Max. input current: 8 mA |
| RJ45 Ports | 1, 10/100/1000BaseT(X), auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection |
| Fiber Ports | 1, 1000BaseSFP slot |
| Physical Characteristics | |
| Housing | Metal, IP30 protection |
| Weight | 970 g (2.09 lb) |
| Dimensions | 54 x 135 x 105 mm (2.1 x 5.3 x 4.1 in) |
| Installation | DIN-rail mounting, wall mounting (with optional kit) |
| 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) |
| Connector | 10-pin removable terminal block |
| Power Consumption | 12 to 48 VDC, 700mA (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, TELEC, FCC ID SLE-WAPN001 |
| Note: Check Moxa's website for the most up-to-date certification status. | |
| Reliability | |
| MTBF | 388,581 hrs. |
| Warranty | |
| Warranty Period | 5 years |
| Details | See www.moxa.com/support/warranty.aspx |



ATTENTION

The AWK-3131 is **NOT** a portable mobile device and should be located at least 20 cm away from the human body. The AWK-3131 is **NOT** designed for the general public. A well-trained technician is required to deploy the AWK-3131 units and safely establish a wireless network.



ATTENTION

Use the antennas correctly: The 2.4 GHz antennas are needed when the AWK-3131 operates in IEEE 802.11b/g/n. The 5 GHz antennas are needed for IEEE802.11a/n. Make sure your antenna installation is within a safety area, which is covered by a lightning protection or surge arrest system.



ATTENTION

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.



ATTENTION

Do not locate the antenna near overhead power lines or other electric light or power circuits, or where it can come into contact with such circuits. When installing the antenna. Take extreme care not to come into contact with such circuits, because they may cause serious injury or death. For proper installation and grounding of the antenna, refer to national and local codes (for example, U.S.: NFPA 70; National Electrical Code, Article 810; Canada: Canadian Electrical Code, Section 54).

NOTE For installation flexibility, either the A antenna or the B antenna may be selected for use. Make sure the antenna connection matches the antenna configured in the AWK-3131 web interface. To protect the connectors and RF module, all radio ports should be terminated by either an antenna or a terminator. We strongly recommend using resistive terminators for terminating the unused antenna ports.



ATTENTION

For EXPLOSION-PROOF applications, the AWK-3131A is designed and certified to meet ATEX and C1D2 requirements. The device should be mounted in a suitable enclosure rated at least IP54 and Pollution Degree 2 as defined in EN 60529 and used within its rated electrical and environmental ratings.