AWK-5222
Quick Installation Guide

Moxa AirWorks

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Overview

The AWK-5222 dual-RF wireless AP/bridge/client provides a flexible and highly reliable solution for your industrial wireless networks.

The AWK-5222 is rated to operate at temperatures ranging from 0 to 60°C for standard models and -40 to 75°C for extended temperature models, and it is rugged enough for industrial applications.

With two independent RF modules, the AWK-5222 supports a greater variety of wireless configurations and applications, and the redundant wireless connections increase the reliability of your entire wireless network.

The AWK-5222's two DC power inputs make the power supply more reliable, and it can also be powered via PoE for easier deployment.

Package Checklist

Moxa's AWK-5222 is shipped with the following items. If any of these items is missing or damaged, please contact your customer service representative for assistance.

- AWK-5222 wireless AP/bridge/client
- DIN-rail kit
- 2 plastic RJ45 protective caps for LAN &
- Console ports
- Cable holder with one screw
- Documentation and software CD
- Quick installation guide (printed)
- Warranty card

Installation and Configuration

Before installing the AWK-5222, make sure that all items in the Package Checklist are in the box. In addition, you will need access to a notebook computer or PC equipped with an Ethernet port. The AWK-5222 has a default IP address that you must use when connecting to the device for the first time.

Step 1: Select the power source

The AWK-5222 can be powered by a DC power input or PoE (Power over Ethernet). The AWK-5222 will use whichever power source you choose.

Step 2: Connect the AWK-5222 to a notebook or PC

Since the AWK-5222 supports MDI/MDI-X auto-sensing, you can use either a straight-through cable or crossover cable to connect the AWK-5222 to a computer. If the LED indicator on the AWK-5222's LAN port lights up, it means the connection is established.

Step 3: Set up the computer's IP address

Set an IP address on the same subnet as the AWK-5222. Since the AWK-5222's default IP address is 192.168.127.253, and the subnet mask is 255.255.255.0, you should set the IP address of the computer to 192.168.127.xxx and subnet mask to 255.255.255.0.

Step 4: Use the web-based manager to configure AWK-5222

Open your computer's web browser and then type http://192.168.127.253 in the address field to access the homepage of the web-based management. Before the homepage opens, you will need to enter the user name and password. For first-time configuration, enter the default user name and password and then click on the **Login** button:

User name: **admin**
Password: **root**

ATTENTION

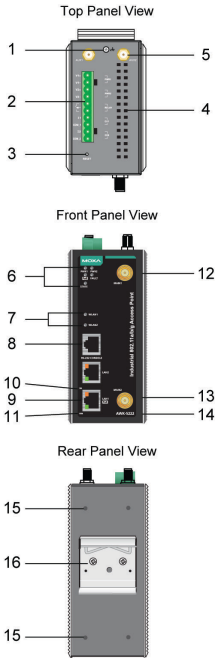
For security reasons, we strongly recommend changing the password. To do so, select **Maintenance → Password**, and then follow the on-screen instructions.

Step 5: Select the operation mode for the AWK-5222

By default, the AWK-5222's operation mode is set to Wireless Redundancy. You can change the setting in **Wireless Settings → Operation mode** if you would like to use the Wireless Bridge or AP-Client mode.

NOTE To make the change effective, you must click **Save Configuration** to save the change or **Restart → Save** and **Restart** button to apply all changes).

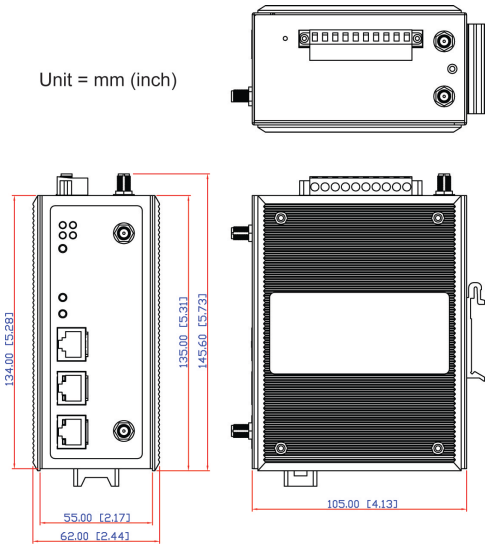
Panel Layout of the AWK-5222



1. Grounding screw
2. Terminal block for PWR1, PWR2, relay, DI1, and DI2
3. Reset button
4. Heat dissipation orifices
5. AUX1 and AUX2 antenna ports
6. System LEDs: PWR1, PWR2, PoE, FAULT, and STATE LEDs
7. WLAN LEDs: WLAN 1 and WLAN2 LEDs
8. RS-232 console port
9. 10/100BaseT(X) RJ45 Port : LAN1 and LAN2
10. 10M LED
11. 100M LED
12. MAIN 1 antenna port
13. MAIN 2 antenna port
14. Model name
15. Screw hole for wall-mounting kit
16. DIN-rail mounting kit

Mounting Dimensions

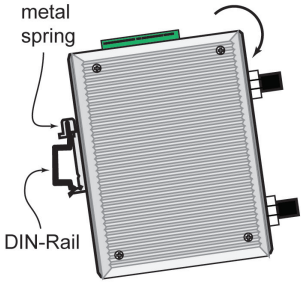
Unit = mm (inch)



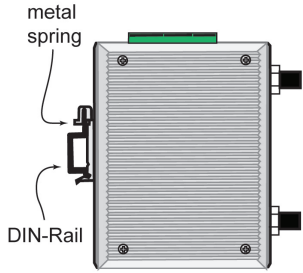
DIN-Rail Mounting

The aluminum DIN-rail attachment plate should be fixed to the back panel of the AWK-5222 when you take it out of the box. If you need to reattach the DIN-rail attachment plate to the AWK-5222, 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.

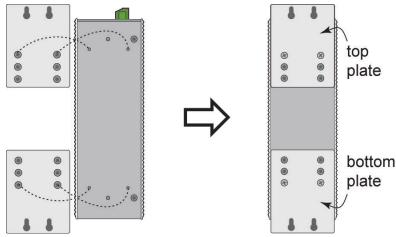


To remove the AWK-5222 from the DIN rail, simply reverse Steps 1 and 2.

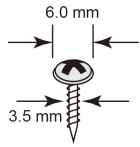
Wall Mounting (optional)

For transportation applications that require an EN50155 certification report, you should purchase the optional wall mount for the AWK-5222, since the wall mount has passed EN50155 testing. The wall mount is also convenient for other applications that require mounting the AWK-5222 to a wall.

STEP 1:
Remove the aluminum DIN-rail attachment plate from the AWK-5222, and then attach the wall-mounting plates with **M3** screws, as shown in the adjacent diagrams.



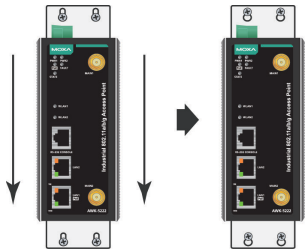
STEP 2:
Mounting the AWK-5222 to a wall requires 4 screws. Use the AWK-5222 device, with wall-mounting plates attached, as a guide to mark the correct locations of the 4 screws. The heads of the screws should be less than 6.0 mm in diameter, and the shafts should be less than 3.5 mm in diameter, as shown 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 screws 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-5222 downwards, as indicated to the right. Tighten the four screws for added stability.



Wiring Requirements

WARNING

Safety First!
Be sure to disconnect the power cord before installing and/or wiring your Moxa AWK-5222.

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 when necessary.

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, 800 mA (max.)

ATTENTION

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

Grounding the Moxa AWK-5222

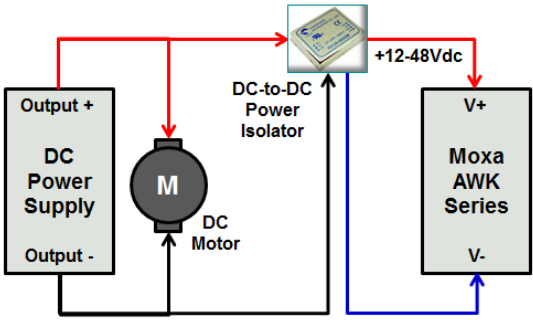
Grounding and wire routing help limit the effects of noise due to electromagnetic interference (EMI). Run the ground connection from the ground screw to the grounding surface prior to connecting devices.

ATTENTION

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

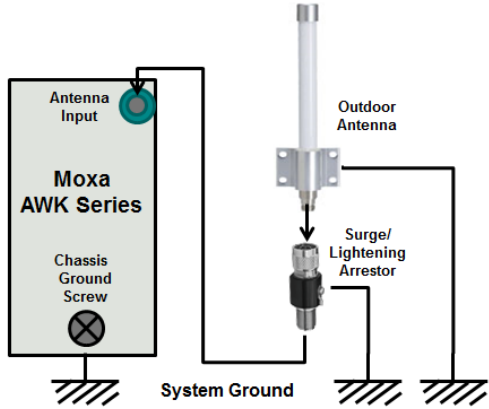
Installations with Unstable Power Inputs

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.

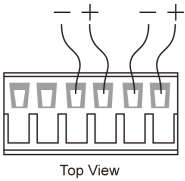


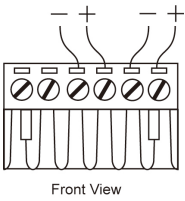
Arrester Accessories

- **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-5222's top panel are used for the AWK-5222's two DC inputs. Top and front views of the terminal block connector is shown here.





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-5222's top panel.

ATTENTION

Before connecting the AWK-5222 to the DC power inputs, make sure the DC power source voltage is stable.

Wiring the Relay Contact

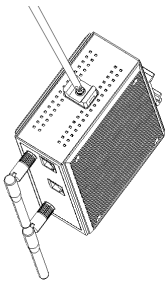
The AWK-5222 has one relay output, which consists of the two contacts of the terminal block on the AWK-5222's top panel. Refer to the previous section for detailed instructions on how to connect the wires to the terminal block connector, and how to attach the terminal block connector to the terminal 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-5222 has two sets of digital input—DI1 and DI2. Each DI comprises two contacts of the 10-pin terminal block connector on the AWK-5222'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.

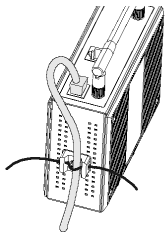
Cable Holder Installation (Optional)

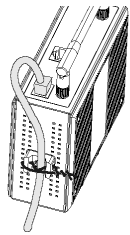
You can attach the cable holder to the bottom of the AWK-5222. This helps to keep cabling neat and avoid accidents that result from untidy cables.

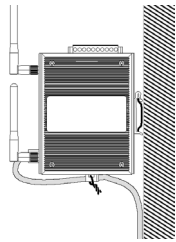


STEP 1: Screw the cable holder onto the bottom of the AWK-5222.

STEP 2: After mounting the AWK-5222 and plugging in the LAN cable, tighten the cable along the device and wall.







Communication Connections

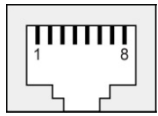
10/100BaseT(X) Ethernet Port Connection

The 10/100BaseT(X) ports located on the AWK-5222's front panel are used to connect to Ethernet-enabled devices.

The pinouts for both MDI (NIC-type) ports and MDI-X (HUB/Switch-type) ports are given below:

MDI Port Pinouts **MDI-X Port Pinouts** **8-pin RJ45**

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

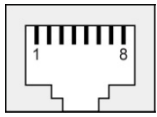


RS-232 Connection

The AWK-5222 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-5222's console port to your PC's COM port. You may then use a console terminal program to access the AWK-5222 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 DB9 and DB25 male connectors, and hole numbers for DB9 and DB25 female 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 the 8-pin and 10-pin RJ45 connectors (and ports) are typically not labeled on the connectors (or ports). Refer to the pinout diagram above for details.

LED Indicators

The front panel of the Moxa AWK-5222 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.
		Off	No error condition exists.
STATE	Green/Red	Green	System startup is complete and the system is in operation.
		Green (Blinking at 1-second intervals)	The AWK has been located by the Wireless Search Utility
		Red	System is booting up.
WLAN1	Green/Amber	Green On	WLAN1 function is in **client** mode.
		Blinking Green	WLAN1's data communication is running in **client** mode.
		Amber On	WLAN1 function is in **AP/bridge** mode.
		Blinking Amber	WLAN1's data communication is running in **AP/bridge** mode.
		Off	WLAN1 is not in use.
WLAN2	Green/Amber	Green On	WLAN2 function is in **client** mode.
		Blinking Green	WLAN2's data communication is running in **client** mode.
		Amber On	WLAN2 function is in **AP/bridge** mode.
		Blinking Amber	WLAN2's data communication is running in **AP/bridge** mode.
		Off	WLAN2 is not in use.
TP Port (LAN1, LAN2) LED Indicators (Port Interface)			
10M	Yellow	On	TP port's 10 Mbps link is active.
		Blinking	Data is being transmitted at 10 Mbps
		Off	TP port's 10 Mbps link is inactive.
100M	Green	On	TP port's 100 Mbps link is active.
		Blinking	Data is being transmitted at 100 Mbps
		Off	TP port's 100 Mbps link is inactive.

Specifications

WLAN	
Standards	IEEE 802.11a/g/b for Wireless LAN IEEE 802.11i for Wireless Security IEEE 802.3 for 10BaseT(X) IEEE 802.3u for 100BaseT(X) 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	DSSS with DBPSK, DQPSK, CCK OFDM with BPSK, QPSK, 16QAM, 64QAM 64QAM @ 54 Mbps, 16QAM @ 24/36 Mbps, QPSK @ 12/18 Mbps, CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBSK@ 1 Mbps • 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
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
TX Transmit Power	802.11b: Typ. 23±1.5 dBm @ 1 to 11 Mbps 802.11g: Typ. 20±1.5 dBm @ 6 to 24 Mbps, Typ. 19±1.5 dBm @ 36 Mbps, Typ. 18±1.5 dBm @ 48 Mbps, Typ. 17±1.5 dBm @ 54 Mbps 802.11a: Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 16±1.5 dBm @ 36 to 48 Mbps, Typ. 15±1.5 dBm @ 54 Mbps
RX Sensitivity	802.11b: -97 dBm @ 1 Mbps, -94 dBm @ 2 Mbps, -92 dBm @ 5.5 Mbps, -90 dBm @ 11 Mbps

	802.11g: -93 dBm @ 6 Mbps, -91 dBm @ 9 Mbps, -90 dBm @ 12 Mbps, -88 dBm @ 18 Mbps, -84 dBm @ 24 Mbps, -80 dBm @ 36 Mbps, -76 dBm @ 48 Mbps, -74 dBm @ 54 Mbps 802.11a: -90 dBm @ 6 Mbps, -89 dBm @ 9 Mbps, -89 dBm @ 12 Mbps, -85 dBm @ 18 Mbps, -83 dBm @ 24 Mbps, -79 dBm @ 36 Mbps, -75 dBm @ 48 Mbps, -74 dBm @ 54 Mbps
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	
Default Antennas	2 dual-band, omni-directional antennas, 2 dBi, RP-SMA (male)
Connector for External Antennas	RP-SMA (female)
RJ45 Ports	2, 10/100BaseT(X), auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Console Port	RS-232 (RJ45-type)
Reset	Present
LED Indicators	PWR1, PWR2, PoE, FAULT, STATE, WLAN1, WLAN2, 10M, 100M
Alarm Contact (digital output)	1 relay output with current carrying capacity of 1A @24VDC
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	1100 g (2.43 lb)
Dimensions	62 x 135 x 105 mm (2.4 x 5.3 x 4.1 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 85ºC (-40 to 185ºF)
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, 800 mA (max.)
Reverse Polarity Protection	Present
Standards and Certifications*	
Safety	UL60950-1, EN60950-1
EMC	EN301 489-1/-17, FCC Part 15 Subpart B, EN 55022/55024, IEC 61000-6-2/4
Radio	EN 300 328, EN 301 893, FCC ID SLE-WAPA003
*Please check Moxa's website for the most up-to-date certification status.	
Reliability	
MTBF	291,367 hrs
Warranty	
Warranty Period	5 years
Details	See www.moxa.com/warranty

ATTENTION

The AWK-5222 is **NOT** a portable mobile device and should be located at least 20 cm away from the human body.
The AWK-5222 is **NOT** designed for the general public. A well-trained technician is required to deploy the AWK-3191 units and safely establish a wireless network.

ATTENTION

Use the antennas correctly!!
Two dual-band 2.4 GHz/5 GHz antennas are included with the product. Either antenna can be installed in MAIN1 and MAIN2 antenna ports. If you want to use a single band antenna, use 2.4 GHz antennas for IEEE 802.11b/g mode and 5 GHz antennas for IEEE 802.11a mode. In order to improve the quality of the signal received by the main antennas, you may connect additional antennas at the AUX1 and AUX2 ports.