

# **AirWorks AWK-5232-M12-RCC**

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## **Quick Installation Guide**

**First Edition, October 2014**



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**P/N: 1802052320030**

## Overview

The AWK-5232-M12-RCC dual-RF wireless AP/Bridge/Client 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-5232-M12-RCC 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-5232-M12-RCC supports a greater variety of wireless configurations and applications, and the redundant wireless connections increase the reliability of your entire wireless network.

The AWK-5232-M12-RCC'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-5232-M12-RCC is shipped with the following items. If any of these items is missing or damaged, please contact your customer service representative for assistance.

- 1 AWK-5232-M12-RCC
- 1 Quick Installation Guide
- 1 Software CD
- 1 Moxa Product Warranty Booklet
- 1 Cable Holder with a Screw
- 2 Protective Caps

## Installation and Configuration

Before installing the AWK-5232-M12-RCC, 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-5232-M12-RCC 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-5232-M12-RCC can be powered by a DC power input or PoE+ (Power over Ethernet Plus, 802.3at). The AWK-5232-M12-RCC will use whichever power source you choose.

### Step 2: Connect the AWK-5232-M12-RCC to a notebook or PC

Since the AWK-5232-M12-RCC supports MDI/MDI-X auto-sensing, you can use either a straight-through cable or crossover cable to connect the AWK-5232-M12-RCC to a computer. If the LED indicator on the AWK-5232-M12-RCC'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-5232-M12-RCC. Since the AWK-5232-M12-RCC'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-5232-M12-RCC

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 username and password. For first-time configuration, enter the default username and password and then click on the **Login** button:

Username: **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-5232-M12-RCC

By default, the AWK-5232-M12-RCC'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 first click Save Configuration to save the change and then click Restart (Save and Restart button to apply all changes).

#### Step 6: Test communications

We will describe two test methods. Use the first method if you are using only one AWK-5232-M12-RCC, and use the second method if you are using two or more AWK-5232-M12-RCCs.

#### Testing method for one AWK-5232-M12-RCC

If you are only using one AWK-5232-M12-RCC, you will need a second notebook computer (B) equipped with a WLAN card. Configure the WLAN card to connect to the AWK-5232-M12-RCC (the default SSID is **MOXA\_1**) and change the IP address of notebook B so that it is on the same subnet as the first notebook (A), which is connected to the AWK-5232-M12-RCC.

After configuring the WLAN card, establish a wireless connection with the AWK-5232-M12-RCC and open a DOS window on notebook B. At the prompt, type

**ping** *IP address of notebook A*

and then press the **Enter** key. A "Reply from IP address ..." response means the communication was successful. A "Request timed out." response means the communication failed. In this case, recheck the configuration to make sure the connections are correct.

#### Testing method for two or more AWK-5232-M12-RCCs

If you have two or more AWK-5232-M12-RCCs, you will need a second notebook computer (B) equipped with an Ethernet port. Use the default settings for the first AWK-5232-M12-RCC connected to notebook A, and change the second or third AWK-5232-M12-RCC connected to notebook B

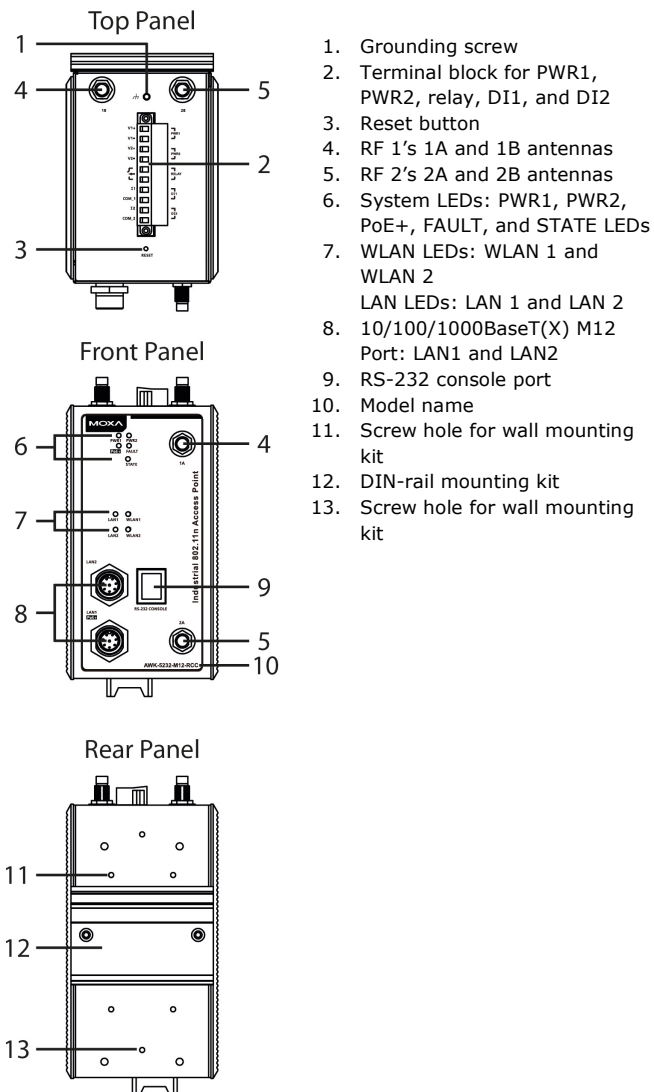
to Client mode and then configure the notebooks and AWK-5232-M12-RCCs properly.

After setting up the testing environment, open a DOS window on notebook B. At the prompt, type

**ping** IP address of notebook A

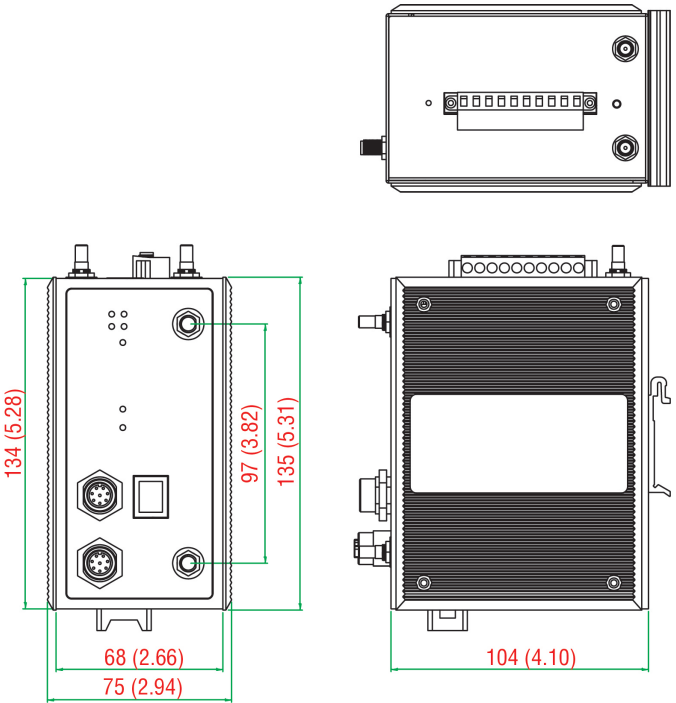
and then press **Enter** key. A "Reply from IP address ..." response means the communication was successful. A "Request timed out." response means the communication failed. In this case, recheck the configuration to make sure the connections are correct.

## Panel Layout of the AWK-5232-M12-RCC



1. Grounding screw
2. Terminal block for PWR1, PWR2, relay, DI1, and DI2
3. Reset button
4. RF 1's 1A and 1B antennas
5. RF 2's 2A and 2B antennas
6. System LEDs: PWR1, PWR2, PoE+, FAULT, and STATE LEDs
7. WLAN LEDs: WLAN 1 and WLAN 2  
LAN LEDs: LAN 1 and LAN 2
8. 10/100/1000BaseT(X) M12 Port: LAN1 and LAN2
9. RS-232 console port
10. Model name
11. Screw hole for wall mounting kit
12. DIN-rail mounting kit
13. Screw hole for wall mounting kit

## Mounting Dimensions (unit = mm)



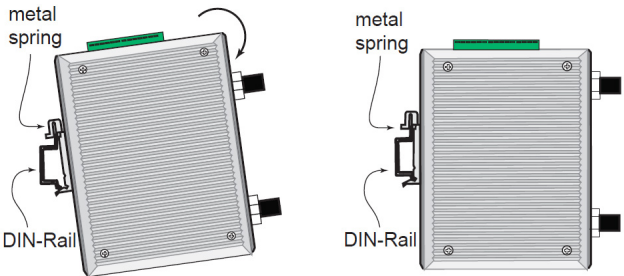
## DIN-Rail Mounting

The aluminum DIN-Rail attachment plate should be fixed to the back panel of the AWK-5232-M12-RCC when you take it out of the box. If you need to reattach the DIN-Rail attachment plate to the AWK-5232-M12-RCC, 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 The DIN-Rail attachment unit will slot just below the stiff metal spring. snap into place as shown below.

### STEP 2:



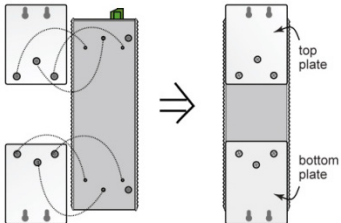
To remove the AWK-5232-M12-RCC from the DIN-Rail, simply reverse Steps 1 and 2.

## Wall Mounting (optional)

For transportation applications that require an EN50155 certification report, you should purchase the optional wall mount for the AWK-5232-M12-RCC, since the wall mount has passed EN50155 testing. The wall mount is also convenient for other applications that require mounting the AWK-5232-M12-RCC to a wall.

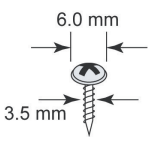
### STEP 1:

Remove the aluminum DIN-Rail attachment plate from the AWK-5232-M12-RCC, and then attach the wall mount plates with M3 screws, as shown in the adjacent diagrams.



### STEP 2:

Mounting the AWK-5232-M12-RCC to a wall requires 4 screws. Use the AWK-5232-M12-RCC device, with wall mount 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.

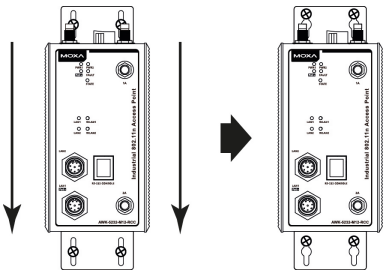


Do not screw the screws in all the way—leave a space of about 2 mm to allow room for sliding the wall mount panel between the wall and the screws.

**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 it is screwed into 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-5232-M12-RCC 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-5232-M12-RCC.



## 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, max 1.5A, 25°C.



## 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.

## Grounding the Moxa AWK-5232-M12-RCC

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.

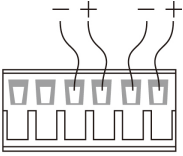


## ATTENTION

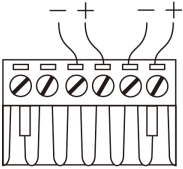
This product is intended to be mounted to a well-grounded mounting surface, such as a metal panel.

## Wiring the Redundant Power Inputs

The top two pairs of contacts of the 10-contact terminal block connector on the AWK-5232-M12-RCC's top panel are used for the AWK-5232-M12-RCC's two DC inputs. Top and front views of the terminal block connector is shown here.



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-5232-M12-RCC's top panel.



### ATTENTION

Before connecting the AWK-5232-M12-RCC to the DC power inputs, make sure the DC power source voltage is stable.

## Wiring the Relay Contact

The AWK-5232-M12-RCC has one relay output, which consists of the two contacts of the terminal block on the AWK-5232-M12-RCC'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.

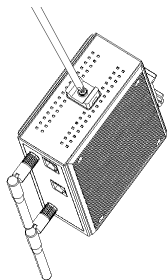
## Wiring the Digital Inputs

The AWK-5232-M12-RCC has two sets of digital input—DI1 and DI2. Each DI comprises two contacts of the 10-pin terminal block connector on the AWK-5232-M12-RCC'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.



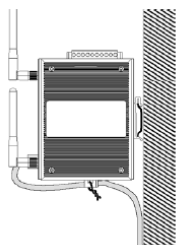
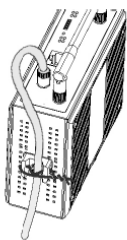
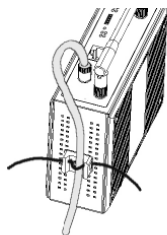
## Cable Holder Installation (Optional)

You can attach the cable holder to the bottom of the AWK-5232-M12-RCC. 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-5232-M12-RCC.

**STEP 2:** After mounting the AWK-5232-M12-RCC and plugging in the LAN cable, tighten the cable along the device and wall.

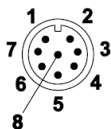


## 10/100/1000BaseT(X) Ethernet Port Connection

All AWK-5232-M12-RCCs have a 10/100/1000BaseT(X) Ethernet port (8-pin shielded M12 connector with D coding). The 10/100/1000TX port located on the AWK-5232-M12-RCC front panel is used to connect to Ethernet-enabled devices. Most users configure this port for Auto MDI/MDI-X mode, in which case the port's pinouts are adjusted automatically depending on the type of Ethernet cable used (straight-through or cross-over), and the type of device (NIC-type or HUB/Switch-type) connected to the port.

### Pinouts for the 10/100/1000BaseT(X) M12 (8-pin) Port

PIN	Con.
1	TRD3+
2	TRD4+
3	TRD4-
4	TRD1-
5	TRD2+
6	TRD1+
7	TRD3-
8	TRD2-

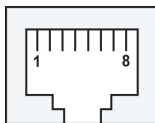


## RS-232 Connection

The AWK-5232-M12-RCC 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-5232-M12-RCC's console port to your PC's COM port. You may then use a console terminal program to access the AWK-5232-M12-RCC 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	-	-



## LED Indicators

The front panel unit contains several LED indicators as shown below.

LED	Color	State	Description
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	Cannot get an IP address from the DHCP server (interval: 1 sec)
		Off	There is no error condition.
STATE	Green/Red	Green	Software Ready.
		Blinking Green	The AWK has been located by AWK Search Utility (interval: 1sec)
		Red	Booting or Error condition.
WLAN1	Green/Amber	Green On	WLAN1 functions in Client mode.
		Blinking Green	WLAN1's data communication is running in Client/Slave mode.
		Amber On	WLAN1 functions in AP/Bridge mode.
		Blinking Amber	WLAN1's data communication is running in AP/Master mode.
		Off	WLAN1 is not in use.

LED	Color	State	Description
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.
LAN 1	Amber	On	LAN port's 10/100 Mbps link is active.
		Blinking	Data is being transmitted at 10/100 Mbps
		Off	LAN port's 10/100 Mbps link is inactive.
	Green	On	LAN port's 1000 Mbps link is active.
		Blinking	Data is being transmitted at 1000 Mbps
		Off	LAN port's 1000 Mbps link is inactive.
LAN 2	Amber	On	LAN port's 10/100 Mbps link is active.
		Blinking	Data is being transmitted at 10/100 Mbps
		Off	LAN port's 10/100 Mbps link is inactive.
	Green	On	LAN port's 1000 Mbps link is active.
		Blinking	Data is being transmitted at 1000 Mbps
		Off	LAN port's 1000 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 100BaseTX IEEE 802.3ab for 1000BaseT IEEE 802.3at for Power-over-Ethernet Plus IEEE 802.1D for Spanning Tree Protocol IEEE 802.1w for Rapid STP IEEE 802.1Q VLAN
Spread Spectrum and Modulation (typical)	<ul style="list-style-type: none"> <li>• DSSS with DBPSK, DQPSK, CCK</li> <li>• OFDM with BPSK, QPSK, 16QAM, 64QAM</li> <li>• 2 x 2 (MIMO) with two spatial streams</li> <li>• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 11 Mbps</li> <li>• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps</li> <li>• 802.11n: 64QAM @ 300 Mbps to BPSK @ 6.5 Mbps (multiple rates supported)</li> </ul>

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	<ul style="list-style-type: none"> <li>• SSID broadcast enable/disable</li> <li>• Firewall for MAC/IP/Protocol/Port-based filtering</li> <li>• 64-bit and 128-bit WEP encryption, WPA/WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES)</li> </ul>
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 ( $\pm 1.5$ dBm) 802.11g: 6 to 24 Mbps: Typ. 18 dBm ( $\pm 1.5$ dBm) 36 to 48 Mbps: Typ. 17 dBm ( $\pm 1.5$ dBm) 54 Mbps: Typ. 15 dBm ( $\pm 1.5$ dBm) 802.11a: 6 to 24 Mbps: Typ. 17 dBm ( $\pm 1.5$ dBm) 36 to 48 Mbps: Typ. 16 dBm ( $\pm 1.5$ dBm) 54 Mbps: Typ. 14 dBm ( $\pm 1.5$ dBm)
TX Transmit Power MIMO	802.11a/n (20/40 MHz): MCS15 20 MHz: Typ. 13 dBm ( $\pm 1.5$ dBm) MCS15 40 MHz: Typ. 12 dBm ( $\pm 1.5$ dBm) 802.11g/n (20/40 MHz): MCS15 20 MHz: Typ. 14 dBm ( $\pm 1.5$ dBm) We do not support channel bonding under 2.4 GHz
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, -70 dBm @ MCS7 40 MHz, -69 dBm @ MCS15 20 MHz, -71 dBm @ MCS7 20 MHz 802.11g/n:

	-69 dBm @ MCS15 20 MHz, -71 dBm @ MCS7 20 MHz <b>We do not support channel bonding under 2.4 GHz</b>
<b>Protocol Support</b>	
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)
<b>Interface</b>	
Connector for External Antennas	QMA
LAN Ports	2, 10/100/1000BaseT(X), auto negotiation speed (M12-type)
Console Port	1, RS-232 (RJ45-type)
LED Indicators	PWR1, PWR2, PoE+, FAULT, STATE, WLAN1, WLAN2, LAN1, LAN2
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"> <li>• +13 to +30 V for state "1"</li> <li>• +3 to -30 V for state "0"</li> <li>• Max. input current: 8 mA</li> </ul>
<b>Physical Characteristics</b>	
Housing	Metal, IP30 protection
Weight	1.2 kg
Dimensions	74.55 x 135 x 105 mm (2.94 x 5.31 x 4.13 in)
Installation	DIN-rail mounting (standard), wall mounting (optional)
<b>Environmental Limits</b>	
Operating Temperature	Standard Models: 0 to 60°C (32 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)
<b>Power Requirements</b>	
Input Voltage	12 to 48 VDC, redundant dual DC power inputs or 48 VDC Power-over-Ethernet Plus (IEEE 802.3at compliant)
Connector	10-pin removable terminal block
Power Consumption	12 to 48 VDC, 1.5 A
Reverse Polarity Protection	Present
<b>Standards and Certifications</b>	
Safety	UL 60950-1, EN 60950-1
EMC	EN 301 489-1/17, FCC Part 15 Subpart B, EN 55022/55024, IEC 61000-6-2/4
Radio	EN 300 328, EN 301 893
Rail Traffic	EN 50155, EN 50121-1/4
<b>Note: Please check Moxa's website for the most up-to-date certification status.</b>	
<b>Warranty</b>	
Warranty Period	5 years
Details	See <a href="http://www.moxa.com/warranty">www.moxa.com/warranty</a>



## **ATTENTION**

The AWK-5232-M12-RCC is **NOT** a portable mobile device and should be located at least 20 cm away from the human body. The AWK-5232-M12-RCC is **NOT** designed for the general public. To deploy AWK-5232-M12-RCCs and establish a wireless network safely, a well-trained technician is required for installation.

### **Technical Support Contact Information** **[www.moxa.com/support](http://www.moxa.com/support)**

#### Moxa Americas:

Toll-free: 1-888-669-2872

Tel: 1-714-528-6777

Fax: 1-714-528-6778

#### Moxa China (Shanghai office):

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