TAP-323 Series
Quick Installation Guide

Moxa Tough AP

Version 2.1, January 2021

Technical Support Contact Information
www.moxa.com/support

P/N: 1802003230012

Overview

The compact and rugged TAP-323 trackside wireless unit is designed for train-to-ground wireless communication. The TAP-323 integrates two access points, a managed fiber switch, and a wide-range AC/DC power supply into a single box. The IP68 housing and shock- and vibration-proof M12 connectors allow it to withstand harsh environmental conditions. In addition, the TAP-323 supports Moxa's advanced controller-based Turbo Roaming technology for train-to-ground applications, such as Communication-Based Train Control (CBTC) and Closed-Circuit Television (CCTV). The TAP-323 can supply power to up to 4 PoE devices while providing reliable LAN communication with Moxa's Turbo Chain technology.

Package Checklist

- 1 TAP-323
- 1 wall-mounting kit, including 2 plates
- 1 fiber-panel mounting kit
- 6 metal protective caps for Ethernet ports LAN-1 to LAN-4, the USB console port, and the ABC-02 USB storage port*.
- 5 metal protective caps for 4 antenna ports and 1 optional antenna port
- 3 antenna glands for the top side antennas
- 1 metal M23 male 6-pin crimp connector for the power supply
- 1 plastic M23 dust cover to protect the power supply connector
- Quick installation guide (printed)
- Warranty card

If any of these items is missing or damaged, contact your customer service representative for assistance.

NOTE *The ABC-02 and SFP modules are not included and can be purchased separately.

For a list of recommended optional accessories, refer to the TAP-323 datasheet, available at:
http://www.moxa.com/product/TAP-323.htm

Installation and Configuration

Take the following steps to configure your TAP-323. Refer to the section Panel Layout of the TAP-323 below to see where the various ports are located on the product.

Step 1: Select a power source

Connect the TAP-323 to either a 110 to 220 VDC or 110 to 220 VAC power source. See the section *Connecting the Power Inputs* below for detailed instructions.

Step 2: Connect the TAP-323 to a computer

Use either a straight-through or crossover Ethernet cable to connect the TAP-323 to a computer. When the connection between the TAP-323 and the computer is established, the LED indicator on the TAP-323's LAN port will light up. See the section 10/100BaseT(X) Ethernet Ports below for detailed instructions.

Step 3: Set up the computer's IP address

The computer's IP address must be on the same subnet as the TAP-323. Since the TAP-323's default IP address is 192.168.127.253, and the subnet mask is 255.255.255.0, set the computer's IP address to 192.168.127.252 (for example), and subnet mask to 255.255.255.0.

Step 4: Use the web-based manager to configure the TAP-323

Open your computer's web browser and type **http://192.168.127.253** in the address field to access the homepage of the web-based manager. Enter the User name and Password to open the TAP-323 homepage. If you are configuring the TAP-323 for the first time, enter the following default User name and Password and then click the **Login** button:

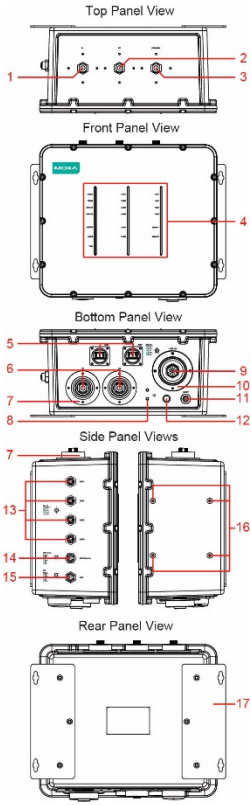
User name: **admin**
Password: **moxa**

ATTENTION

For security reasons, be sure to change the password after first access. To change the password, select **Maintenance → Password** and then follow the on-screen instructions.

NOTE You must either click the **Save Configuration** or the **Restart** button for the configuration changes to take effect.

Panel Layout of the TAP-323

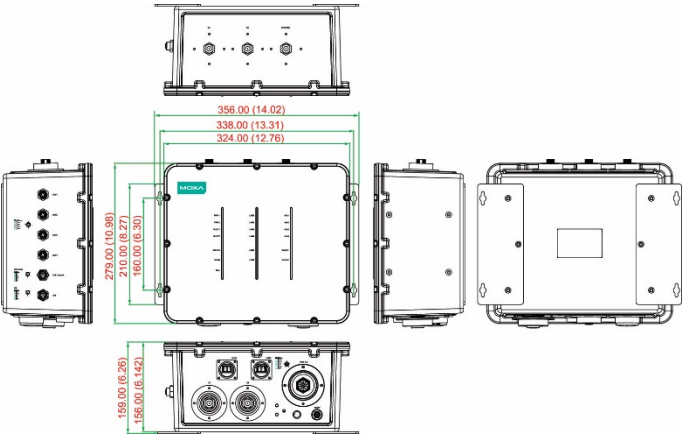


1. **1A**: N-type antenna port
2. **2A**: N-type antenna port
3. **Optional**: N-type antenna port (reserved for future use)
4. **PWR1**, **PWR2**, **FAULT1**, **FAULT2**, **STATUS**, **HEAD**, **TAIL**, **LAN1-LAN6**, **PoE1-PoE4**, **WLAN1**, **WLAN2**: LEDs
5. **LAN5**, **LAN6**: 100/1000BaseSFP fiber sockets
6. **1B**, **2B**: N-type antenna ports
7. PG29 gasket
8. Grounding screw
9. **PWR 1/2**: M23 6-pin connector
10. PG36 gasket
11. **RESET**: Reset button
12. Waterproof vent
13. **LAN1**, **LAN2**, **LAN3**, **LAN4**: 10/100BaseT(X) 4-pin female M12 D-coded connectors
14. **USB Console**: 5-pin female B-coded connector (CLI mode)
15. **USB**: 5-pin female B-coded connector for the ABC-02-USB storage dongle (can be purchased separately)
16. Mounting holes for a fiber panel bracket
17. Wall-mounting kit

ATTENTION

- DO NOT open or remove the waterproof vent (item 12 in the above figure). Removing the seal will void the product warranty.
- Ports that are not being used should be covered tightly with the appropriate protective caps.

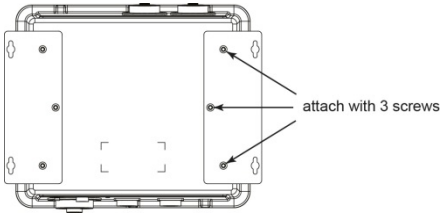
Dimensions, unit = mm (inch)



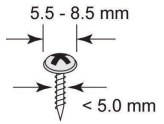
Wall Mounting

Take the following steps to mount the TAP-323 to a wall.

STEP 1: Use M4 screws to attach the wall-mounting kit to the TAP-323's housing.



STEP 2: Four screws are required to mount the TAP-323 on the wall. Hold the TAP-323 device, with wall-mounting kit attached, to the wall, and then use a pencil to mark the locations of the 4 screws. The heads of the screws should be between **5.5 mm** and **8.5 mm** in diameter, and the shafts should not be more than 5.0 mm in diameter, as shown in the figure.

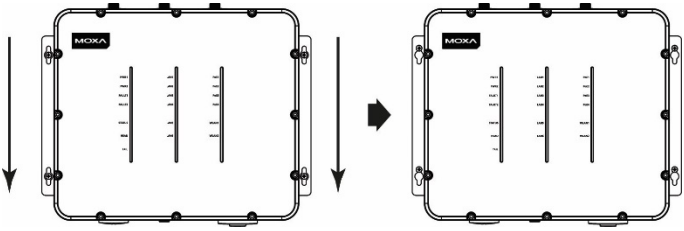


Leave a space of about 2 mm between the bottom side of the screw head and the wall to allow room for sliding the wall-mounting kit between the wall and the screws.

ATTENTION

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, position the TAP-323 in front of the four screws so that the screw heads can protrude through the keyhole-shaped apertures. Push the TAP-323 unit flush with the wall, and then slide the unit downwards, as indicated below. You may 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 TAP-323.

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes dictating the maximum current allowable for each wire size. If the current goes above the maximum ratings, the wiring could overheat, causing serious damage to your equipment.

Read and Follow These Guidelines:

- 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 crossing point.

  NOTE: Do not run signal or communications wiring and power wiring through 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 that shares similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separated.
- For future reference, you should label the wiring used for all of your devices.

Grounding the Moxa TAP-323

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 to the TAP-323 unit.

The TAP-323 should be well-grounded to ensure safe operation. We recommend using at least one grounding hole. When using two grounding holes, the stud hole spacing should be 16 mm (0.63 inch); each TAP-323 comes with two M5 grounding screws attached to the unit's housing.

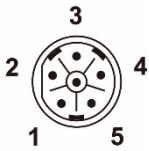
ATTENTION

This product is intended to be mounted to a well-grounded mounting surface, such as a metal panel. The potential difference between the two ground potentials must be zero. If the potential difference is NOT zero, the product could be permanently damaged.

Connecting the Power Inputs

The TAP-323 must be connected to an IEC 60950-compliant limited power source. For both DC and AC power, the M23 connector on the bottom panel is used for the TAP-323's two power inputs (for redundancy). The M23 connector is protected by a size PG36 gasket, which is used to attach a cable gland on top of the power cable. The pin assignments are shown below:

PIN	Con.
1	L1/V+
2	N1/V−
3	⏚
4	N2/V−
5	L2/V+



Pin	Description	Usage
1	PWR1 Live / DC+	Connect "PWR1 Live / DC+" to the positive (+) terminal when using a DC power source.
2	PWR1 Neutral / DC-	Connect "PWR1 Neutral / DC-" to the negative (-) terminal when using a DC power source.
3	Chassis Ground	Connect the "Chassis Ground" to the safety ground terminal for DC inputs.
4	PWR2 Neutral / DC-	Connect "PWR2 Neutral / DC-" to the negative (-) terminal when using a DC power source.
5	PWR2 Live / DC+	Connect "PWR2 Live / DC+" to the positive (+) terminal when using a DC power source.

The TAP-323 should be connected to a 110/220 VDC or VAC power source. We recommend installing a power insulation device between the TAP-323 and the power source to avoid damage from power surges.

The TAP-323 power system supports two independent power sources (i.e., separate neutral lines) to provide redundancy. If you are using a single power source, connect the power source to the L1/N1 terminals; in this case, do not use the L2/N2 pins on the TAP-323's power input port.

WARNING

Use a qualified digital multi-meter (e.g., a Fluke 87V or equivalent) to measure and ensure that the AC voltages between each of the 2 wires from the power supply source are within 90 to 220 VAC rms before connecting and applying the power source to the TAP-323's V1 (pins L1/N1) and V2 (pins L2/N2) input terminals. See the following diagram for details:

You should use a power meter to measure the AC voltage difference between each pair of the five power cable wires to ensure that the voltage difference between each pair of wires is less than 220 VAC RMS. You will need to measure the voltage difference between 10 pairs of wires, as listed below:
[1, 2], [1, 3], [1, 4], [1, 5],
[2, 3], [2, 4], [2, 5],
[3, 4], [3, 5],
[4, 5]

Communication Connections

10/100BaseT(X) Ethernet Ports

The TAP-323 has four 10/100BaseT(X) Ethernet ports (LAN1/LAN2/LAN3/LAN4) on the side panel for connecting Ethernet-enabled devices. The ports use 4-pin female M12 D-coded connectors. Most users configure these ports 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.

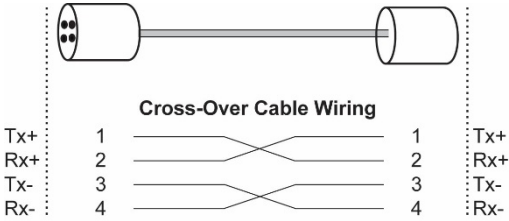
10/100BaseT(X) Port Pinouts

PIN	TX
1	TD+
2	RD+
3	TD−
4	RD−

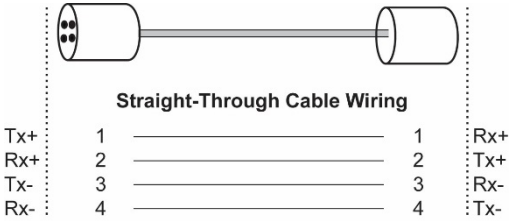
Housing: Shield

NOTE 10/100BaseT(X) ports that are not in use should be covered with A-CAP-M12F-M metal caps. The TAP-323 comes with four metal caps. One cap should be attached to each of the four ports when the unit is removed from the box.

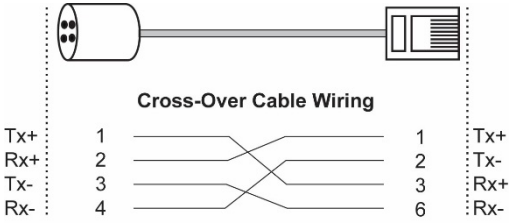
M12 (4-pin, M) to M12 (4-pin, M) Cross-Over Cable Wiring



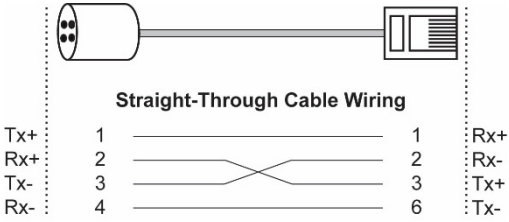
M12 (4-pin, M) to M12 (4-pin, M) Straight-Through Cable Wiring



M12 (4-pin, M) to RJ45 (8-pin) Cross-Over Cable Wiring



M12 (4-pin, M) to RJ45 (8-pin) Straight-Through Cable Wiring



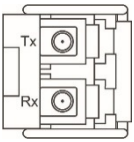
NOTE Avoid connecting to non-auto-polarity devices.

100/1000BaseSFP Fiber Ports

The TAP-323 has two 100/1000BaseSFP ports (LAN5/LAN6) on the bottom panel for installing SFP modules (the SFP modules must be purchased separately). To operate properly, a fiber transceiver must be used with each SFP module. Unlike electrical signals, optical signals do not require a circuit to transmit data. To transmit full-duplex optical signals between two devices (e.g., device 1 and device 2), you need to run two optical lines between the devices. One optical line is used to transmit data from device 1 to device 2, and the other optical line is used to transmit data from device 2 to device 1.

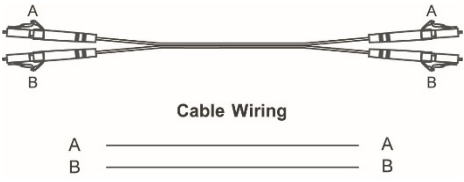
Connect the Tx (transmit) port of device 1 to the Rx (receive) port of device 2, and the Rx port of device 1 to the Tx port of device 2. If you are using your own cable, we suggest labeling the two sides of the fiber optic cable with the same letter (A-A and B-B, as shown in the example below, or A1-A2 and B1-B2).

LC-Port Pinouts



NOTE: 100/1000BaseSFP ports that are not in use should be covered with an IP68-rated plastic cap.

LC-Port to LC-Port Cable Wiring



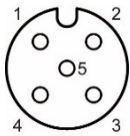
NOTE
- To better protect your LAN5 and LAN6 ports, we suggest using XCO connectors.
- If you would like to swap out an SFP module, power off the TAP-323 before removing the old module and inserting the new module.

USB Storage Connection

The TAP-323 has one USB storage port (5-pin female M12 A-coded) on the front panel. Use the Moxa ABC-02-USB-T automatic backup configurator (can be purchased separately) to connect to the TAP-323's USB storage port for configuration backup, firmware upgrade, or system log file backup.

USB Storage Port Pinouts

Pin No.	Description
1	DN
2	VBUS
3	NC
4	DP
5	GND



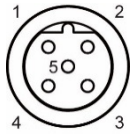
NOTE When the USB storage port is not in use, cover it with an A-CAP-M12F-M metal protective cap. The cap is included with the TAP-323 unit, and should already be installed when you remove the unit from the box.

USB Console Connection

The TAP-323 has one USB console port (5-pin female M12 B-coded) located on the front panel. Use a B-coded USB-to-5-pin M12 male cable to connect the TAP-323's console port to your PC's COM port. You can then use a program to access the console configuration on the TAP-323.

USB Console Port Pinouts

Pin No.	Description
1	DP
2	NC
3	GND
4	DN
5	NC



NOTE When the USB console port is not in use, cover it with an A-CAP-M12F-M metal protective cap. The cap is included with the TAP-323 unit, and should already be installed when you remove the unit from the box.

Antenna Connection

The TAP-323 has three N-type RF connectors on the top panel and two N-type RF connectors on the bottom panel. The connectors on the top panel are labeled **1A**, **2A**, and **Optional**, and the connectors on the bottom panel are labeled **1B** and **2B**.

NOTE Antenna connectors that are not in use should be covered with A-CAP-M12F-M metal protective caps. The caps are included with the TAP-323 unit, and should already be installed when you remove the unit from the box.

LED Indicators

The front panel of the TAP-323 contains several LED indicators. The function of each LED is described in the table below.

LED	Color	State	Description
PWR1	Green	On	Power is being supplied (from power input 1)
		Off	Power is **not** being supplied
PWR2	Green	On	Power is being supplied (from power input 2)
		Off	Power is **not** being supplied
FAULT1	Red	On	System is booting up
		Blinking (slow at 1-sec intervals)	Cannot get an IP address from the DHCP server
		Blinking (fast at 0.5-sec intervals)	IP address conflict
		Off	Normal status **Note:** The FAULT2 LED is reserved for future use.

LED	Color	State	Description
STATUS	Green	On	System startup is complete and the system is in operation
		Blinking (slow at 1-sec intervals)	The AWK Search Utility has located the AWK device
	Red	On	System is booting up
HEAD	Green	On	The TAP unit is configured as the HEAD TAP unit of a Turbo Chain
		Blinking	The TAP unit's head port link is disconnected
		Off	The TAP unit is not configured as the HEAD TAP unit of a Turbo Chain
TAIL	Green	On	The TAP unit is configured as a TAIL TAP unit of a Turbo Chain
		Blinking	The TAP TAIL unit's port link is disconnected or in blocking state
		Off	The TAP unit is not configured as the TAIL TAP unit of a Turbo Chain
WLAN1	Green	On	The WLAN is in **Slave** mode
		Blinking	The WLAN is transmitting data in **Slave** mode
		Off	The WLAN is not in use or is not working properly
	Amber	On	The WLAN is in **AP/Master** mode
		Blinking	The WLAN is transmitting data in **AP/Master** mode
		Off	The WLAN is not in use or is not working properly
WLAN2	Green	On	The WLAN is in **Slave** mode
		Blinking	The WLAN is transmitting data in **Slave** mode
		Off	The WLAN is not in use or is not working properly
	Amber	On	The WLAN is functioning in **AP/Bridge/Master** mode
		Blinking	The WLAN is transmitting data in **AP/Bridge/Master** mode
		Off	WLAN is not in use or is not working properly
LAN 1-4	Amber	On	The LAN port's 10/100 Mbps link is active
		Blinking	Data is being transmitted at 10/100 Mbps
		Off	The LAN port's 10/100 Mbps link is inactive
LAN 5-6	Green	On	The LAN port's 1000 Mbps link is active
		Blinking	Data is being transmitted at 1000 Mbps
		Off	The LAN port's 1000 Mbps link is inactive
	Amber	On	The LAN port's 100 Mbps link is **active**
		Blinking	Data is being transmitted at 100 Mbps

LED	Color	State	Description
		Off	The LAN port's 100 Mbps link is **inactive**
PoE 1-4	Amber	On	The PSE port is supplying power to a powered device
		Off	The PSE port is not supplying power

Specifications

WLAN	
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 802.1p for Class of Service 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; excludes 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 on a channel, 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 on the new channel. Note: Special frequency bands (up to 6.0 GHz) are available for customization.	

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)
Transmitter 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±1.5 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
Receiver Sensitivity	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
NOTE: Due to a limitation in the receiver sensitivity performance for channels 153 and 161, it is recommended to avoid using these channels in your critical applications.	

	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
NOTE: Due to a limitation in the receiver sensitivity performance for channels 153 and 161, it is recommended to avoid using these channels in your critical applications.	
Protocol Support	
General Protocols	Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP v1/v2/v3, PPPoE, DHCP, STP/RSTP
Interface	
Connector for External Antennas	N-type (female)
Fast Ethernet ports	4, side cabling, M12 D-coded 4-pin female connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection, 802.1af PoE power budget
USB Console	5-pin female M12 B-coded connector for USB console
USB Storage Port	5-pin female M12 A-coded connector for connecting the Moxa ABC-02-USB dongle (can be purchased separately)
Fiber Ports	2, 100/1000Base SFP slot (SFP modules can be purchased separately; see Moxa's website for details)

LED Indicators	PWR1, PWR2, PoE1-4, FAULT1, FAULT2, STATUS, HEAD, TAIL, LAN1-6, WLAN1, WLAN2
Physical Characteristics	
Housing	Metal, IP68 protection
Weight	10 kg (22.22 lb)
Dimensions	324 x 279 x 156 mm (12.76 x 10.98 x 6.142 in)
Installation	Wall mounting
Environmental Limits	
Operating Temp.	-40 to 75°C (-40 to 167°F)
Storage Temp.	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5% to 95% (non-condensing)
Power Requirements	
Input Voltage	110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)
Input Current	AC input: 110 to 220 VAC, 50 to 60 Hz, 1.1 A (max.) DC input: 110 to 220 VDC, 1.1 A (max.)
Connector	M23

Power Consumption: Maximum 85 watts (with PSE ports fully loaded)

PSE/Voltage	110 VDC	110 VAC	220 VDC	220 VAC
0 PSE ports in use	17.4 W	16.2 W	17.6 W	17.5 W
1 PSE port in use	34.2 W	32.6 W	33.8 W	33.6 W
2 PSE ports in use	50.9 W	49 W	49.9 W	49.6 W
3 PSE ports in use	67.7 W	65.4 W	66 W	65.7 W
4 PSE ports in use	84.4 W	81.8 W	82.1 W	81.7 W

Reverse Polarity Protection	Present
Overload Current Protection	Present
Standards and Certifications	
Safety	UL 60950-1, IEC 60950-1(CB), LVD EN 60950-1
EMC	EN 61000-6-2/6-4; EN 55032/55024
EMI	CISPR 22, FCC Part 15B Class A
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	EN 301 489-1/17, EN 300 328, EN 301 893, TELEC, DFS, FCC, IC, WPC
Rail Traffic	EN 50155 (mandatory compliance*), EN 50121-4
Fire and Smoke	EN 45545-2

*This product is suitable for rolling stock railway applications, as defined by the EN 50155 standard. For a more detailed statement, click here: www.moxa.com/doc/specs/EN_50155_Compliance.pdf

MTBF (mean time between failures)	
Time	290,937 hrs
Standard	Telcordia SR332
Warranty	
Warranty Period	5 years
Details	See www.moxa.com/warranty

ATTENTION

The TAP-323 is NOT a portable mobile device and should be located at least 20 cm away from the human body.
The TAP-323 is NOT designed for the general public. To ensure that your TAP-323 wireless network is safe and configured properly, consult a well-trained technician to assist with the installation process.

ATTENTION

Use the appropriate antennas for your wireless setup: Use 2.4 GHz antennas when the TAP-323 is configured for IEEE 802.11b/g/n. Use 5 GHz antennas when the TAP-323 is configured for IEEE802.11a. Make sure that your antennas are located in an area with a lightning and surge protection system installed.

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.
2. This device must accept any interference received, including interference that may cause undesired operation.

WARNING

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 doing so 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).