

# **TAP-213 Series Quick Installation Guide**

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**Moxa Tough AP**

**Version 4.0, July 2021**

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



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**P/N: 1802002130012**



## Overview

The TAP-213 outdoor wireless AP/client is the ideal ruggedized wireless solution for railway onboard and train-to-ground applications such as CCTV and CBTC communications. It can provide speeds of up to 300 Mbps with IEEE 802.11n technology. The TAP-213's dust-tight/weatherproof design is IP68-rated, and it can operate at temperatures ranging from -40 to 75°C, allowing you to extend wireless networks to outdoor locations and critical environments.

## Package Checklist

The TAP-213 is shipped with the following items:

- 1 TAP-213
- 1 wall-mounting kit, which includes 2 plates
- 1 plastic protective cap for LAN-1 X-coded port
- 3 metal protective caps for LAN-2 fiber port, USB console port and ABC-02 USB storage port
- 1 metal M12 male 4-pin A-coded screw-type crimp circular connector for power
- 2 antennas which support both 2.4 GHz /5 GHz
- Quick installation guide (printed)
- Product warranty statement

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

**NOTE** For a list of recommended optional accessories, refer to the TAP-213 datasheet available at:  
<http://www.moxa.com/product/TAP-213.htm>

## Installation and Configuration

Before installing the TAP-213, make sure that all items in the package checklist are included in the box. In addition, you will need access to a notebook computer or PC equipped with an Ethernet port. The TAP-213 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 TAP-213 can be powered by a DC power input or PoE (Power-over-Ethernet).

### Step 2: Connect the TAP-213 to a notebook or PC

Since the TAP-213 is provided with the MDI/MDI-X auto-sensing capability, you can use either a straight-through cable or crossover cable to connect it to a computer. When the connection between the TAP-213 and the computer is established, the LED indicator on the TAP-213's LAN port lights up.

### Step 3: Set up the computer’s IP address

Set an IP address for the computer so that it is on the same subnet as that of the TAP-213. Since the TAP-213’s default IP address is 192.168.127.253, and the subnet mask is 255.255.255.0, set the IP address of the computer in the 192.168.127.xxx IP range and subnet mask to 255.255.255.0.

### Step 4: Use the web-based manager to configure the TAP-213

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 **Username** and **Password** to open the TAP-213 homepage. If you are configuring the TAP-213 for the first time, enter the following default Username and Password and click on the **Login** button:

Username:    **admin**  
Password:    **moxa**



#### ATTENTION

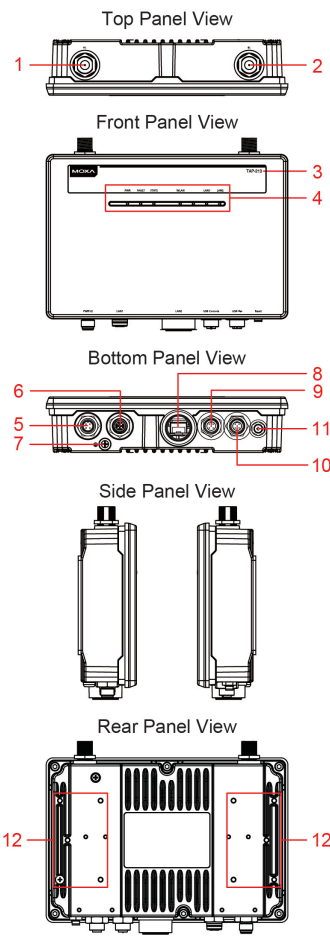
For security reasons, we strongly recommend changing the password after first access. To change the password, select **Maintenance → Password** and follow the on-screen instructions.

### Step 5: Select the operation mode for the TAP-213

By default, the operation mode of the TAP-213 is set to **AP**. You can change this setting to Client mode on the **Wireless Settings → Basic Wireless Settings** page.

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

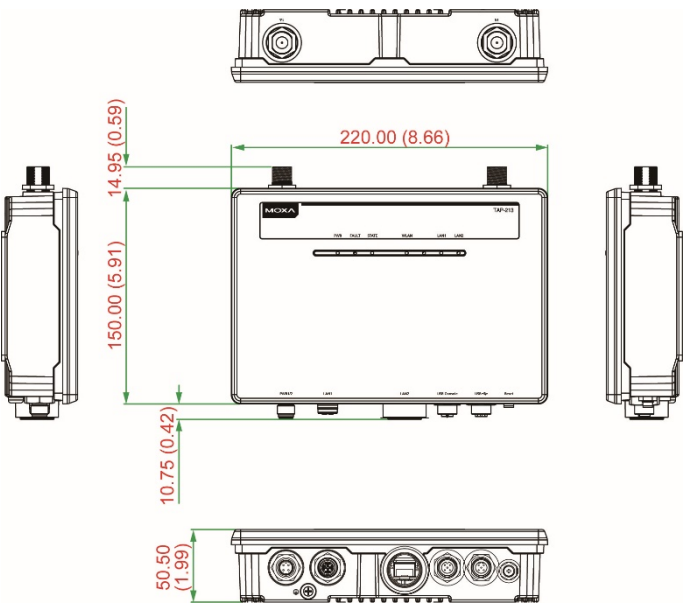
# Panel Layout of the TAP-213



- 1A N-type antenna port
- 1B N-type antenna port
- Model name
- LEDs for PWR, FAULT, STATE, WLAN, LAN1, and LAN2
- 4-pin male M12 A-coded connector for PWR-1 and PWR-2
- 10/100/1000BaseT(X) 8-pin M12 X-coded female connector for LAN1
- Grounding screw
- 100/1000Base fiber SFP socket for LAN2
- 5-pin female M12 B-coded connector for USB console
- 5-pin female M12 A-coded connector for ABC-02-USB
- Reset button
- Wall-mounting holes

# Mounting Dimensions

Unit: mm (inch)

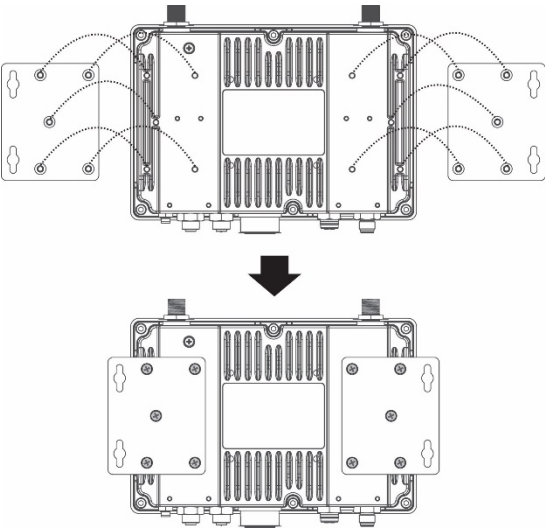


## Wall Mounting

In most applications, wall mounting the TAP-213 is the most commonly used method, which makes installation easier as illustrated below:

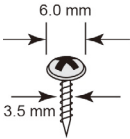
**STEP 1:**

Attach the wall-mounting plates with M4 screws.



**STEP 2:**

Mounting the TAP-213 to a wall requires 4 screws. Use the TAP-213 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 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.

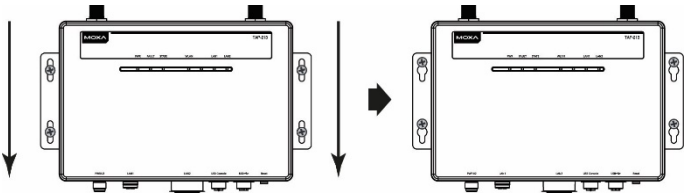


Do not drive the screws in all the way—leave a space of about 2 mm to allow room for sliding the wall-mount panel between the wall and the screws.

**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 driving the screws into the wall.

**STEP 3:**

Once the screws are driven into the wall, insert the four screw heads through the large opening of the keyhole-shaped apertures in the wall-mount plates, and then slide the TAP-213 downwards, as indicated to the right. Tighten the four screws for added stability.

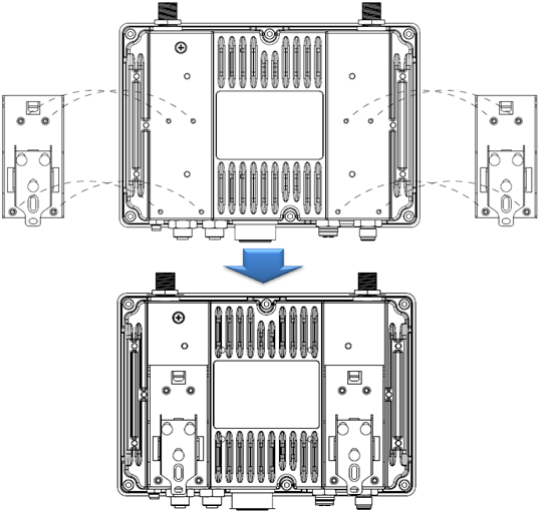


**DIN-Rail Mounting (Optional)**

The DIN-rail mounting method is used in industrial or railway application. You will require a DIN-rail attachment plate, which is an optional accessory, to mount the TAP-213 to a DIN rail. When you attach the DIN-rail attachment plate to the TAP-213, make sure that the stiff metal spring is situated towards the top as shown in the following instructions:

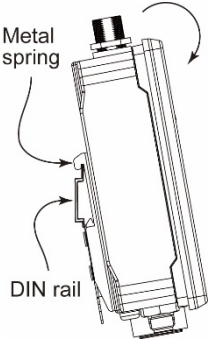
**STEP 1:**

Attached the DIN-rail mounting plates to the TAP-213 using M3 screws.



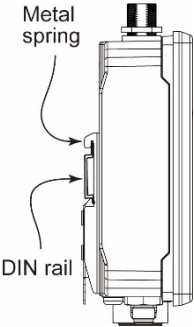
**STEP 2:**

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



**STEP 3:**

The DIN-rail attachment unit will snap into place as shown in the figure below:



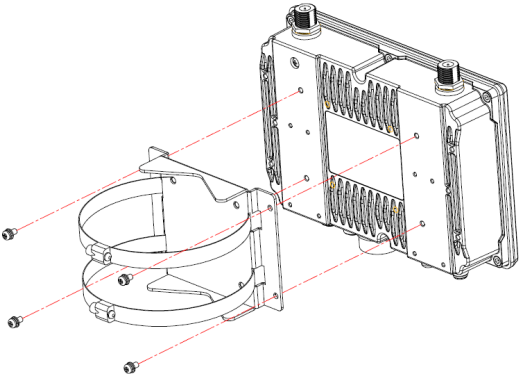
To remove the TAP-213 from the DIN rail, simply reverse Steps 2 and 3.

# Pole Mounting (Optional)

You might find it more convenient to mount the TAP-213 on a pole for some applications, as illustrated below. The edges of the iron rings that are part of the pole-mounting kit are sharp. We suggest that you wear gloves to protect your hands during the installation process.

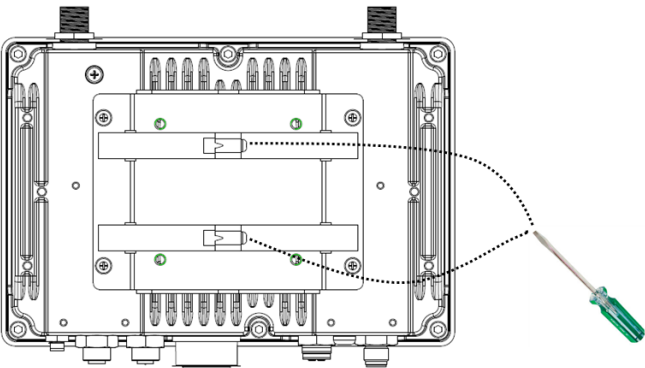
## STEP 1:

Attach the pole-mounting kit to the TAP-213 using M4 screws.



## STEP 2:

Install the TAP-213 on a pole and use a flathead screwdriver to fasten the screws on the rings of the pole-mounting kit to secure it to the pole.





## WARNING

- This equipment is intended to be used in a Restricted Access Location, such as a dedicated computer room where 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.
- Access to the equipment should be controlled through the use of a lock and key or a security identification system, controlled by the authority responsible for the location. Only authorized, well-trained professionals should be allowed to access the restricted access location.
- Service persons or users must pay special attention and take special precautions before handling this equipment.

### **External Metal Parts are Hot!**

- Use adequate protection before handling this device.

## Wiring Requirements



## WARNING

### **Safety First!**

Be sure to disconnect the power cord before installing and/or wiring your TAP-213.



## WARNING

### **Safety First!**

Calculate the maximum possible current in each power wire and common wire. Observe all electrical codes that dictate 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: 24 to 110 VDC, 15 W (max.)

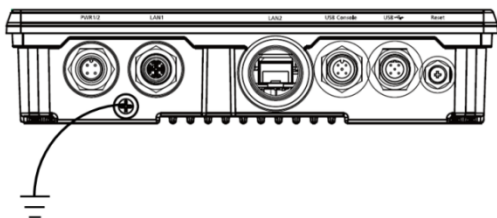


## ATTENTION

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 TAP-213

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

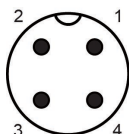
This product is intended to be mounted to a well-grounded mounting surface, such as a metal panel.

## Connecting the Power Supplies

The TAP-213 Tough AP series supports two types of power supplies—PWR1 and PWR2. The 4-pin male M12 A-coded connector on the TAP-213 front panel is used for the dual power inputs. You can use the metal M12 male 4-pin A-coded screw-type crimp circular connector with pins for power connection included with the product or purchase the M12 power cable (optional) CBL-M12(FF4P)/Open-BK-100-IP68 for lab use/tests.

### Pinouts for the power input (4-pin male M12 A-coded) port:

| Pin No. | Power Input |
|---------|-------------|
| 1       | V1+         |
| 2       | V2+         |
| 3       | V1-         |
| 4       | V2-         |





## ATTENTION

Before connecting the TAP-213 to the DC power inputs, make sure the DC power source voltage is stable.

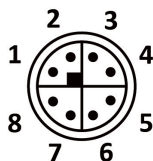
## Communication Connections

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

The TAP-213 has a 10/100/1000BaseT(X) Ethernet port (LAN1 8-pin shielded M12 X-coded connector). The 10/100/1000TX port located on the 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 female X-coded) port

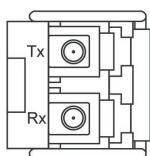
| Pin No. | GbE Conn. | FE Conn. | PoE Inputs       |
|---------|-----------|----------|------------------|
| 1       | DA+       | TD+      | +A, PoE Positive |
| 2       | DA-       | TD-      | -A, PoE Positive |
| 3       | DB+       | RD+      | +B, PoE Negative |
| 4       | DB-       | RD-      | -B, PoE Negative |
| 5       | DD+       | -        | +D, PoE Negative |
| 6       | DD-       | -        | -D, PoE Negative |
| 7       | DC-       | -        | -C, PoE Positive |
| 8       | DC+       | -        | +C, PoE Positive |



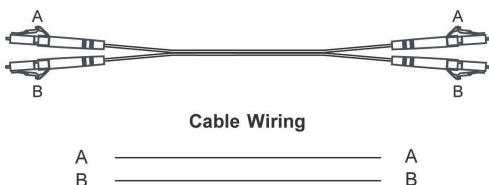
### 100/1000Base Fiber Port Connection

The TAP-213 has a 100/1000Base socket, which you can use to connect SFP modules. You must use a fiber transceiver with the SFP module for the module to work properly. The concept behind the fiber port and cable is that, unlike electric signals, optical signals do not require a circuit in order to transmit data. Suppose you want to connect two devices, device 1 and device 2, one of the optical lines 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, for full-duplex transmission. Remember to 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 a line with the same letter (A-A and B -B, as shown in the example below), or A1-A2 and B1-B2).

#### LC-Port Pinouts



#### LC-Port to LC-Port Cable Wiring



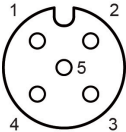
**NOTE** When using a fiber optic small-form pluggable (SFP) module, ensure it is a IEC 60825-1 certified and Class 1 Laser Product.

### USB Storage Connection

The TAP-213 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 to connect to the TAP'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         |

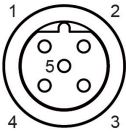


### USB Console Connection

The TAP-213 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-213's console port to your PC's COM port. You may then use a console terminal program to access the TAP-213 for console configuration.

#### USB Console Port Pinouts

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



### LED Indicators

The front panel of the TAP-213 contains several LED indicators. The function of each LED is described in the table below:

| LED   | Color | State                                   | Description                                   |
|-------|-------|-----------------------------------------|-----------------------------------------------|
| PWR   | Green | On                                      | Power is on                                   |
|       |       | Off                                     | Power is <b>not</b> being supplied            |
| FAULT | Red   | On                                      | System is booting up                          |
|       |       | 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 exist                      |

| LED                                            | Color | State                                | Description                                                                               |
|------------------------------------------------|-------|--------------------------------------|-------------------------------------------------------------------------------------------|
| STATE                                          | Green | On                                   | System startup is complete and the system is in operation                                 |
|                                                |       | Blinking (fast at 0.5-sec intervals) | AeroLink Protection is enabled and is currently in "Backup" state                         |
|                                                |       | Blinking (slow at 1-sec intervals)   | Device has been located by Wireless Utility                                               |
|                                                | Red   | On                                   | System is booting up                                                                      |
| WLAN                                           | Green | On                                   | WLAN is functioning in <b>client/client-router</b> mode                                   |
|                                                |       | Blinking                             | WLAN is transmitting data in <b>client/client-router</b> mode                             |
|                                                |       | Off                                  | WLAN is not in <b>client/ client-router</b> mode or has not established a link with an AP |
|                                                | Amber | On                                   | WLAN is in <b>AP</b> mode                                                                 |
|                                                |       | Blinking                             | WLAN is transmitting data in <b>AP</b> mode                                               |
|                                                |       | Off                                  | WLAN is not in use or is not working properly                                             |
| LAN1<br>(10/100/<br>1000<br>Ethernet<br>port)  | Green | On                                   | LAN port's 1000 Mbps link is <b>active</b>                                                |
|                                                |       | Blinking                             | Data is being transmitted at 1000 Mbps                                                    |
|                                                |       | Off                                  | LAN port's 1000 Mbps link is <b>inactive</b>                                              |
|                                                | Amber | On                                   | LAN port's 10/100 Mbps link is <b>active</b>                                              |
|                                                |       | Blinking                             | Data is being transmitted at 10/100 Mbps                                                  |
|                                                |       | Off                                  | LAN port's 10/100 Mbps link is <b>inactive.</b>                                           |
| LAN2<br>(100/1000<br>fiber<br>optical<br>port) | Green | On                                   | LAN port's 1000 Mbps link is <b>active</b>                                                |
|                                                |       | Blinking                             | Data is being transmitted at 1000 Mbps                                                    |
|                                                |       | Off                                  | LAN port's 1000 Mbps link is <b>inactive</b>                                              |
|                                                | Amber | On                                   | LAN port's 100 Mbps link is <b>active</b>                                                 |
|                                                |       | Blinking                             | Data is being transmitted at 100 Mbps                                                     |
|                                                |       | Off                                  | LAN port's 100 Mbps link is <b>inactive</b>                                               |

**NOTE** The WLAN 2 LED is reserved for future use.

# Specifications

| WLAN Interface                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standards                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | IEEE 802.11a/b/g/n for Wireless LAN<br>IEEE 802.11i for Wireless Security<br>IEEE 802.3 for 10BaseT<br>IEEE 802.3u for 100BaseT(X)<br>IEEE 802.3ab for 1000BaseT<br>IEEE 802.3at for Power-over-Ethernet<br>IEEE 802.1p for Class of Service<br>IEEE 802.1Q for 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>802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 1 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)                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <ul style="list-style-type: none"> <li>US:               <ul style="list-style-type: none"> <li>2.412 to 2.462 GHz (11 channels)</li> <li>5.180 to 5.240 GHz (4 channels)</li> <li>5.260 to 5.320 GHz (4 channels)*</li> <li>5.500 to 5.700 GHz (8 channels; excludes 5.600 to 5.640 GHz)*</li> <li>5.745 to 5.825 GHz (5 channels)</li> </ul> </li> <li>EU:               <ul style="list-style-type: none"> <li>2.412 to 2.472 GHz (13 channels)</li> <li>5.180 to 5.240 GHz (4 channels)</li> <li>5.260 to 5.320 GHz (4 channels)*</li> <li>5.500 to 5.700 GHz (11 channels)*</li> </ul> </li> <li>JP:               <ul style="list-style-type: none"> <li>2.412 to 2.484 GHz (14 channels, DSSS)</li> <li>5.180 to 5.240 GHz (4 channels)</li> <li>5.260 to 5.320 GHz (4 channels)*</li> <li>5.500 to 5.700 GHz (11 channels)*</li> </ul> </li> </ul> |
| <p>*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.</p> <p>*Moxa Turbo Roaming Technology does not work with DFS channels.</p> <p>*Special frequency bands (up to 6.0 GHz) are available by customization.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>802.11b: 1, 2, 5.5, 11 Mbps</li> <li>802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps</li> <li>802.11n: 6.5 to 300 Mbps (multiple rates supported)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| Transmitter Power | <p>802.11b:</p> <ul style="list-style-type: none"> <li>• Typ. <math>26 \pm 1.5</math> dBm @ 1 Mbps</li> <li>• Typ. <math>26 \pm 1.5</math> dBm @ 2 Mbps</li> <li>• Typ. <math>26 \pm 1.5</math> dBm @ 5.5 Mbps</li> <li>• Typ. <math>25 \pm 1.5</math> dBm @ 11 Mbps</li> </ul> <p>802.11g:</p> <ul style="list-style-type: none"> <li>• Typ. <math>23 \pm 1.5</math> dBm @ 6 to 24 Mbps</li> <li>• Typ. <math>21 \pm 1.5</math> dBm @ 36 Mbps</li> <li>• Typ. <math>19 \pm 1.5</math> dBm @ 48 Mbps</li> <li>• Typ. <math>18 \pm 1.5</math> dBm @ 54 Mbps</li> </ul> <p>802.11n (2.4 GHz):</p> <ul style="list-style-type: none"> <li>• Typ. <math>23 \pm 1.5</math> dBm @ MCS0 20 MHz</li> <li>• Typ. <math>21 \pm 1.5</math> dBm @ MCS1 20 MHz</li> <li>• Typ. <math>21 \pm 1.5</math> dBm @ MCS2 20 MHz</li> <li>• Typ. <math>21 \pm 1.5</math> dBm @ MCS3 20 MHz</li> <li>• Typ. <math>20 \pm 1.5</math> dBm @ MCS4 20 MHz</li> <li>• Typ. <math>19 \pm 1.5</math> dBm @ MCS5 20 MHz</li> <li>• Typ. <math>18 \pm 1.5</math> dBm @ MCS6 20 MHz</li> <li>• Typ. <math>18 \pm 1.5</math> dBm @ MCS7 20 MHz</li> <li>• Typ. <math>23 \pm 1.5</math> dBm @ MCS8 20 MHz</li> <li>• Typ. <math>21 \pm 1.5</math> dBm @ MCS9 20 MHz</li> <li>• Typ. <math>21 \pm 1.5</math> dBm @ MCS10 20 MHz</li> <li>• Typ. <math>21 \pm 1.5</math> dBm @ MCS11 20 MHz</li> <li>• Typ. <math>20 \pm 1.5</math> dBm @ MCS12 20 MHz</li> <li>• Typ. <math>19 \pm 1.5</math> dBm @ MCS13 20 MHz</li> <li>• Typ. <math>18 \pm 1.5</math> dBm @ MCS14 20 MHz</li> <li>• Typ. <math>18 \pm 1.5</math> dBm @ MCS15 20 MHz</li> <li>• Typ. <math>23 \pm 1.5</math> dBm @ MCS0 40 MHz</li> <li>• Typ. <math>20 \pm 1.5</math> dBm @ MCS1 40 MHz</li> <li>• Typ. <math>20 \pm 1.5</math> dBm @ MCS2 40 MHz</li> <li>• Typ. <math>20 \pm 1.5</math> dBm @ MCS3 40 MHz</li> <li>• Typ. <math>20 \pm 1.5</math> dBm @ MCS4 40 MHz</li> <li>• Typ. <math>19 \pm 1.5</math> dBm @ MCS5 40 MHz</li> <li>• Typ. <math>18 \pm 1.5</math> dBm @ MCS6 40 MHz</li> <li>• Typ. <math>17 \pm 1.5</math> dBm @ MCS7 40 MHz</li> <li>• Typ. <math>23 \pm 1.5</math> dBm @ MCS8 40 MHz</li> <li>• Typ. <math>20 \pm 1.5</math> dBm @ MCS9 40 MHz</li> <li>• Typ. <math>20 \pm 1.5</math> dBm @ MCS10 40 MHz</li> <li>• Typ. <math>20 \pm 1.5</math> dBm @ MCS11 40 MHz</li> <li>• Typ. <math>20 \pm 1.5</math> dBm @ MCS12 40 MHz</li> <li>• Typ. <math>19 \pm 1.5</math> dBm @ MCS13 40 MHz</li> <li>• Typ. <math>18 \pm 1.5</math> dBm @ MCS14 40 MHz</li> <li>• Typ. <math>17 \pm 1.5</math> dBm @ MCS15 40 MHz</li> </ul> <p>802.11a:</p> <ul style="list-style-type: none"> <li>• Typ. <math>23 \pm 1.5</math> dBm @ 6 to 24 Mbps</li> <li>• Typ. <math>21 \pm 1.5</math> dBm @ 36 Mbps</li> <li>• Typ. <math>20 \pm 1.5</math> dBm @ 48 Mbps</li> <li>• Typ. <math>18 \pm 1.5</math> dBm @ 54 Mbps</li> </ul> |
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|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | <p>802.11n (5 GHz):</p> <ul style="list-style-type: none"> <li>• Typ.23±1.5 dBm @ MCS0 20 MHz</li> <li>• Typ.20±1.5 dBm @ MCS1 20 MHz</li> <li>• Typ.20±1.5 dBm @ MCS2 20 MHz</li> <li>• Typ.20±1.5 dBm @ MCS3 20 MHz</li> <li>• Typ.19±1.5 dBm @ MCS4 20 MHz</li> <li>• Typ.18±1.5 dBm @ MCS5 20 MHz</li> <li>• Typ.18±1.5 dBm @ MCS6 20 MHz</li> <li>• Typ.18±1.5 dBm @ MCS7 20 MHz</li> <li>• Typ.23±1.5 dBm @ MCS8 20 MHz</li> <li>• Typ.20±1.5 dBm @ MCS9 20 MHz</li> <li>• Typ.20±1.5 dBm @ MCS10 20 MHz</li> <li>• Typ.20±1.5 dBm @ MCS11 20 MHz</li> <li>• Typ.19±1.5 dBm @ MCS12 20 MHz</li> <li>• Typ.19±1.5 dBm @ MCS13 20 MHz</li> <li>• Typ.18±1.5 dBm @ MCS14 20 MHz</li> <li>• Typ.18±1.5 dBm @ MCS15 20 MHz</li> <li>• Typ.23±1.5 dBm @ MCS0 40 MHz</li> <li>• Typ.20±1.5 dBm @ MCS1 40 MHz</li> <li>• Typ.20±1.5 dBm @ MCS2 40 MHz</li> <li>• Typ.20±1.5 dBm @ MCS3 40 MHz</li> <li>• Typ.19±1.5 dBm @ MCS4 40 MHz</li> <li>• Typ.18±1.5 dBm @ MCS5 40 MHz</li> <li>• Typ.18±1.5 dBm @ MCS6 40 MHz</li> <li>• Typ.18±1.5 dBm @ MCS7 40 MHz</li> <li>• Typ.23±1.5 dBm @ MCS8 40 MHz</li> <li>• Typ.20±1.5 dBm @ MCS9 40 MHz</li> <li>• Typ.20±1.5 dBm @ MCS10 40 MHz</li> <li>• Typ.20±1.5 dBm @ MCS11 40 MHz</li> <li>• Typ.19±1.5 dBm @ MCS12 40 MHz</li> <li>• Typ.19±1.5 dBm @ MCS13 40 MHz</li> <li>• Typ.18±1.5 dBm @ MCS14 40 MHz</li> <li>• Typ.18±1.5 dBm @ MCS15 20 MHz</li> </ul> |
| Receiver Sensitivity | <p>802.11b:</p> <ul style="list-style-type: none"> <li>• -93 dBm @ 1 Mbps</li> <li>• -93 dBm @ 2 Mbps</li> <li>• -93 dBm @ 5.5 Mbps</li> <li>• -88 dBm @ 11 Mbps</li> </ul> <p>802.11g:</p> <ul style="list-style-type: none"> <li>• -88 dBm @ 6 Mbps</li> <li>• -86 dBm @ 9 Mbps</li> <li>• -85 dBm @ 12 Mbps</li> <li>• -85 dBm @ 18 Mbps</li> <li>• -85 dBm @ 24 Mbps</li> <li>• -82 dBm @ 36 Mbps</li> <li>• -78 dBm @ 48 Mbps</li> <li>• -74 dBm @ 54 Mbps</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

802.11n (2.4 GHz):

- -89 dBm @ MCS0 20 MHz
- -85 dBm @ MCS1 20 MHz
- -85 dBm @ MCS2 20 MHz
- -80 dBm @ MCS3 20 MHz
- -76 dBm @ MCS4 20 MHz
- -73 dBm @ MCS5 20 MHz
- -69 dBm @ MCS6 20 MHz
- -70 dBm @ MCS7 20 MHz
- -93 dBm @ MCS8 20 MHz
- -88 dBm @ MCS9 20 MHz
- -85 dBm @ MCS10 20 MHz
- -82 dBm @ MCS11 20 MHz
- -78 dBm @ MCS12 20 MHz
- -73 dBm @ MCS13 20 MHz
- -69 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

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|                                 | 802.11n (5 GHz): <ul style="list-style-type: none"> <li>• -88 dBm @ MCS0 20 MHz</li> <li>• -85 dBm @ MCS1 20 MHz</li> <li>• -82 dBm @ MCS2 20 MHz</li> <li>• -79 dBm @ MCS3 20 MHz</li> <li>• -76 dBm @ MCS4 20 MHz</li> <li>• -71 dBm @ MCS5 20 MHz</li> <li>• -70 dBm @ MCS6 20 MHz</li> <li>• -69 dBm @ MCS7 20 MHz</li> <li>• -95 dBm @ MCS8 20 MHz</li> <li>• -91 dBm @ MCS9 20 MHz</li> <li>• -87 dBm @ MCS10 20 MHz</li> <li>• -80 dBm @ MCS11 20 MHz</li> <li>• -78 dBm @ MCS12 20 MHz</li> <li>• -74 dBm @ MCS13 20 MHz</li> <li>• -72 dBm @ MCS14 20 MHz</li> <li>• -71 dBm @ MCS15 20 MHz</li> <li>• -84 dBm @ MCS0 40 MHz</li> <li>• -81 dBm @ MCS1 40 MHz</li> <li>• -77 dBm @ MCS2 40 MHz</li> <li>• -75 dBm @ MCS3 40 MHz</li> <li>• -71 dBm @ MCS4 40 MHz</li> <li>• -67 dBm @ MCS5 40 MHz</li> <li>• -64 dBm @ MCS6 40 MHz</li> <li>• -63 dBm @ MCS7 40 MHz</li> <li>• -90 dBm @ MCS8 40 MHz</li> <li>• -85 dBm @ MCS9 40 MHz</li> <li>• -82 dBm @ MCS10 40 MHz</li> <li>• -81 dBm @ MCS11 40 MHz</li> <li>• -77 dBm @ MCS12 40 MHz</li> <li>• -73 dBm @ MCS13 40 MHz</li> <li>• -71 dBm @ MCS14 40 MHz</li> <li>• -68 dBm @ MCS15 40 MHz</li> </ul> |
| <b>Protocol Support</b>         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| General Protocols               | Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, DHCP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| AP-only Protocols               | ARP, BOOTP, DHCP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Interface</b>                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Connector for External Antennas | N-type (female)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Fiber Ports                     | 1, 100/1000Base SFP slot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| LAN Ports                       | 1, M12-type, 8-pin female X-coded, 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| USB Storage Port                | 5-pin female M12 A-coded connector for ABC-02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| USB Console Port                | 5-pin female M12 B-coded connector for USB console                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Reset                           | Present                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| LED Indicators                  | PWR, FAULT, STATE, WLAN, LAN 1, LAN 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Physical Characteristics</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Housing                         | Metal, IP68 protection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Weight                          | 1.5 kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Dimensions                      | 220 x 150 x 50.5 mm (8.66 x 5.90 x 1.99 in)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

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| Installation                                                                                                                                                                                                                                                            | Wall mounting (standard), DIN-rail mounting (optional), pole mounting (optional)                                                                                                                                                      |
| <b>Environmental Limits</b>                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                       |
| Operating Temperature                                                                                                                                                                                                                                                   | -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                                                                                                                                                                                                                                                           | 24 to 110 VDC, dual DC power inputs or 48 VDC Power-over-Ethernet (IEEE 802.3at compliant)                                                                                                                                            |
| Input Current                                                                                                                                                                                                                                                           | 0.65 A @ 24 VDC; 0.16 A @ 110 VDC                                                                                                                                                                                                     |
| Power Consumption                                                                                                                                                                                                                                                       | 17.6 W (max.)                                                                                                                                                                                                                         |
| Connector                                                                                                                                                                                                                                                               | 4-pin male M12 A-coded connector                                                                                                                                                                                                      |
| Reverse Polarity Protection                                                                                                                                                                                                                                             | Present                                                                                                                                                                                                                               |
| <b>Standards and Certifications</b>                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                       |
| Safety                                                                                                                                                                                                                                                                  | UL 60950-1, IEC 62368-1(CB), LVD EN 62368-1                                                                                                                                                                                           |
| EMC                                                                                                                                                                                                                                                                     | EN 61000-6-2/6-4                                                                                                                                                                                                                      |
| EMI                                                                                                                                                                                                                                                                     | CISPR 22, FCC Part 15B Class B                                                                                                                                                                                                        |
| EMS                                                                                                                                                                                                                                                                     | IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV<br>IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m<br>IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV<br>IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV<br>IEC 61000-4-6 CS: 10 V<br>IEC 61000-4-8 |
| Radio                                                                                                                                                                                                                                                                   | EN 301 489-1/17, EN 300 328, EN 301 893, TELECOM, DFS, FCC, IC                                                                                                                                                                        |
| Rail Traffic                                                                                                                                                                                                                                                            | EN 50155*, 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:<br><a href="http://www.moxa.com/doc/specs/EN_50155_Compliance.pdf">www.moxa.com/doc/specs/EN_50155_Compliance.pdf</a> |                                                                                                                                                                                                                                       |
| <b>MTBF (mean time between failures)</b>                                                                                                                                                                                                                                |                                                                                                                                                                                                                                       |
| Time                                                                                                                                                                                                                                                                    | 758,369 hrs.                                                                                                                                                                                                                          |
| <b>Warranty</b>                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                       |
| Warranty Period                                                                                                                                                                                                                                                         | 5 years                                                                                                                                                                                                                               |
| Details                                                                                                                                                                                                                                                                 | See <a href="http://www.moxa.com/warranty">www.moxa.com/warranty</a>                                                                                                                                                                  |



## ATTENTION

The TAP-213 is **NOT** a portable mobile device and should be located at least 20 cm away from the human body.

The TAP-213 is **NOT** designed for the general public. To establish a wireless network safely using the TAP-213, a well-trained technician should be consulted for installation.



## **ATTENTION**

Use the antennas correctly: The 2.4 GHz antennas are needed when the TAP-213 operates in IEEE 802.11b/g/n. The 5 GHz antennas are needed for IEEE 802.11a. Make sure your antenna installation is within a safe area, which is covered by a lightning protection or surge arrest system.