TAP-6226
Quick Installation Guide

Moxa Tough AP

First Edition, November 2014

P/N: 1802062260010

Overview

The TAP-6226 trackside wireless unit is designed for board-to-ground wireless communication. It is a highly compact and rugged wireless unit that integrates two access points, a managed fiber switch, and a wide-range AC/DC power supply, all in one box. The IP68 housing allows the unit to withstand the harshest of weather and the unit is shock and vibration proof with M12 connectors. The TAP-6226 supports advanced controller-based Turbo Roaming technology for applications such as Communication-Based Train Control (CBTC). The unit can also supply power for up to 4 PoE devices while providing reliable LAN communication with Moxa's Turbo Chain technology.

WARNING, ATTENTION, NOTE

WARNING

Death or personal injury may occur if you do not follow the precautions indicated in a WARNING statement.

ATTENTION

Damage to this product or your property may result if you do not follow the precautions indicated in an ATTENTION statement.

NOTE *Indicates important information related to this product.*

Package Checklist

Moxa's TAP-6226 is shipped with the following items. If any of these items is missing or damaged, please contact your customer service representative for assistance.

- TAP-6226 with protective caps for LAN/fiber/console ports
- 2 omni-directional antennas (5 dBi, N-type male, 2.4 GHz)
- Accessory pack, including wall-mounting kit and fiber panel mounting kit
- Software and documentation CD
- Quick installation guide
- Warranty card

NOTE The items above come with the standard version TAP-6226 The package contents may vary for customized versions.

Recommended SFP Modules

NOTE Can be purchased separately.

SFP-1FE Series

- **SFP-1FELLC-T:** SFP module, 100Base single-mode with LC connector for 80 km transmission, -40 to 85°C operating temperature
- **SFP-1FEMLC-T:** SFP module, 100Base multi-mode with LC connector for 4 km transmission, -40 to 85°C operating temperature
- **SFP-1FESLC-T:** SFP module, 100Base single-mode with LC connector for 40 km transmission, -40 to 85°C operating temperature

Installation

Before installing the TAP-6226, make sure that all items in the Package Checklist are in the box. In addition, you will need access to a notebook computer or PC equipped with an Ethernet port. The TAP-6226 has a default IP address, user name, and password that you must use when resetting or connecting to your TAP-6226 device.

Default IP address: **192.168.127.253**
User name: **admin**
Password: **root**

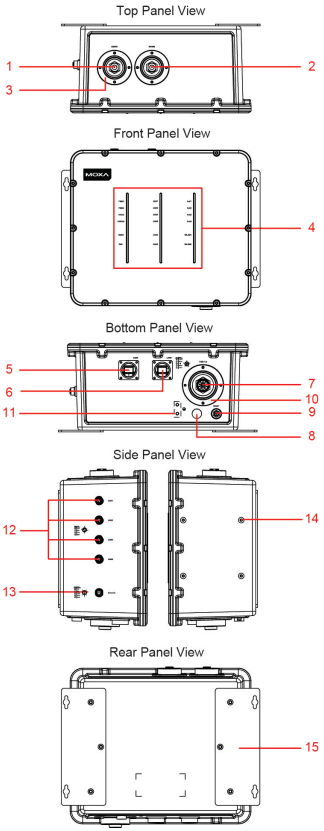
Read **Chapter 2: Getting Started** in the TAP-6226 User's Manual for more details about installation and configuration.

ATTENTION

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

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

Panel Layout of the TAP-6226

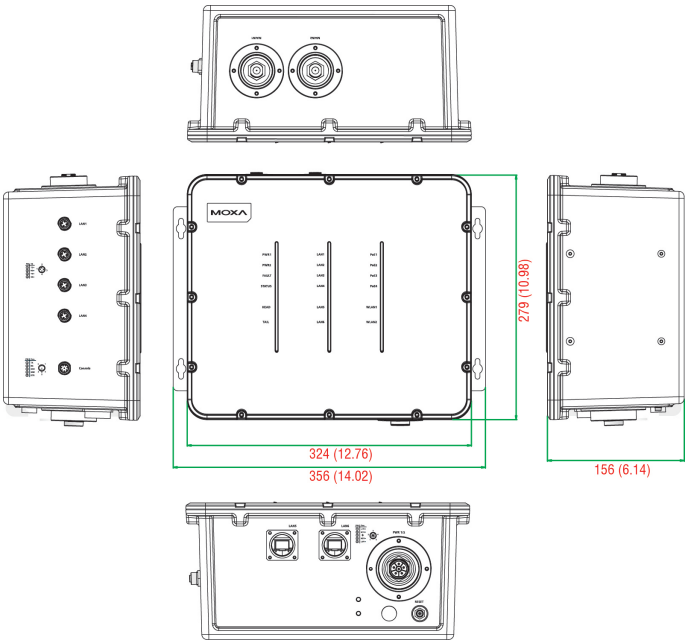


1. MAIN 1 N-type antenna port
2. MAIN 2 N-type antenna port
3. PG29 gasket
4. LEDs for: PWR1, PWR2, FAULT, STATUS, MSTR/HEAD, CPLR/TAIL, LAN1-6, PoE1-4, WLAN1-2.
5. Fiber SFP port: LAN5
6. Fiber SFP port: LAN6
7. M23 5-pin connector for PWR1, PWR2.
8. Waterproof vent
9. Reset button
10. PG36 gasket
11. Grounding screw
12. 10/100BaseT(X) M12 port: LAN1, LAN2, LAN3, LAN4.
13. M12 5-pin console port
14. Mounting hole for fiber panel bracket
15. Wall mount kit

ATTENTION

DO NOT open or remove the waterproof vent (item 8 in the above figure). Removing the seal will void the warranty.
Ports that are not being used should be covered tightly by the appropriate caps.

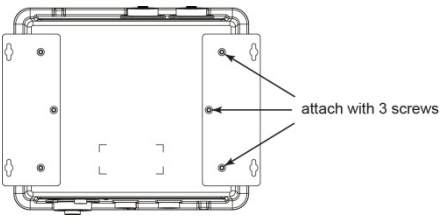
Dimensions (unit = mm)



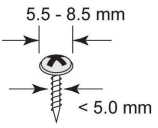
Wall Mounting

In most applications, wall mount provides an easier installation. You will find it quite easy to mount the TAP-6226 on the wall, as illustrated below.

STEP 1: Attach the wall-mounting kit with **M4** screws, as shown in the diagram below.



STEP 2: Mounting the TAP-6226 on the wall requires 4 screws. Use the TAP-6226 device, with wall-mounting kit attached, as a guide to mark the correct 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.



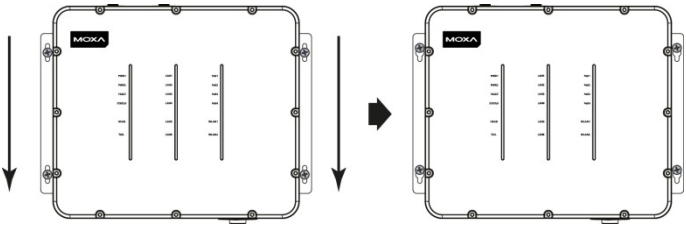
Do not screw the screws all the way in to the wall—leave a space of about 2 mm to allow room to slide the wall-mounting kit between the wall and the screws.

ATTENTION

Test the screw head and shank size by inserting the screw into one of the keyhole shaped apertures of the wall mounting plates before it is screwed into the wall.

STEP 3:

Once the screws are fixed into the wall, insert the four screw heads through the large opening of the keyhole-shaped apertures, and then slide the TAP-6226 downwards, as indicated below. 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-6226.

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.

You should also pay attention to the following items:

- Use separate paths to route wiring for power and devices. If power wiring and device wiring paths must cross, make sure the wires are perpendicular at the intersection point.
  NOTE: Do not run signal or communications wiring and power wiring in the same wire conduit. To avoid interference, wires with different signal characteristics should be routed separately.
- You can use the type of signal transmitted through a wire to determine which wires should be kept separate. The rule of thumb is that wiring with similar electrical characteristics can be bundled together.
- Keep input wiring and output wiring separate.
- It is strongly advised that you label wiring to all devices in the system when necessary.

Grounding the Moxa TAP-6226

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. There must be no potential difference between two ground potentials; otherwise, there is a risk that the device could be destroyed.

Wiring the Redundant Power Inputs

The TAP-6226 must be connected to an IEC 60950 compliant limited power source. When the TAP-6226 is powered by AC power, the M23 connector on the bottom panel is used for the TAP-6226's two redundant inputs. 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 assignment is shown below:

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

Communication Connections

10/100BaseT(X) Ethernet Port Connection

All TAP-6226 units have a 10/100BaseT(X) Ethernet port (4-pin shielded M12 connector with D coding). The 10/100TX port located on the TAP-6226's 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 10/100BaseT(X) Port

PIN	TX
1	TD+
2	RD+
3	TD−
4	RD−

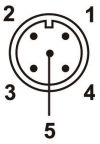
Housing: Shield

RS-232 Connection

The TAP-6226 has one RS-232 (5-pin M12) console port located on the bottom panel. Use either an M12-to-DB9 or M12-to-DB25 cable to connect the TAP-6226's console port to your PC's COM port. You may then use a console terminal program to access the TAP-6226 for console configuration.

Console Pinouts for 5-pin M12 Connectors

PIN	Con.
1	TX
2	RX
3	DSR
4	GND
5	DTR



LED Indicators

The front panel of the TAP-6226 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
FAULT	Red	On	Relay is event-triggered
		Blinking (slow)	Cannot get an IP address from the DHCP server (interval: 1 sec)
		Blinking (fast)	IP address conflict (interval: 0.5 sec)
		Off	Normal status
STATE	Green/ Red	Green	Software ready
		Green, blinking	The AWK Search Utility has located the AWK. (interval: 1sec)
		Red	Booting or error condition
HEAD	Green	On	TAP is set as HEAD TAP in Turbo Chain
		Blinking	TAP head port link is broken
		Off	TAP is not set as HEAD TAP in Turbo Chain
TAIL	Green	On	TAP is set as TAIL TAP in Turbo Chain
		Blinking	TAP TAIL port link is broken or in blocking state
		Off	TAP is not set as TAIL TAP in Turbo Chain

LED	Color	State	Description
WLAN1	Green/ Amber	Green On	WLAN is in **Client/Slave** mode
		Green, blinking	WLAN is transmitting data in **Client/Slave** mode
		Amber On	WLAN is in **AP/Bridge/Master** mode
		Amber, blinking	WLAN is transmitting data in **AP/Bridge/Master** mode
		Off	WLAN is not in use or is not working properly
WLAN2	Green/ Amber	Green On	WLAN is in **Client/Slave** mode
		Green, blinking	WLAN is transmitting data in **Client/Slave** mode
		Amber On	WLAN is functioning in **AP/Bridge/Master** mode
		Amber, blinking	WLAN is transmitting data in **AP/Bridge/Master** mode
		Off	WLAN is not in use or is not working properly
LAN1-6	Yellow/ Green	Yellow, on	LAN port's 10 Mbps link is active
		Yellow, blinking	Data is being transmitted at 10 Mbps
		Yellow, off	LAN port's 10 Mbps link is inactive
		Green, on	LAN port's 100 Mbps link is active
		Green, blinking	Data is being transmitted at 100 Mbps
		Green, off	LAN port's 100 Mbps link is inactive
PoE1-4	Green	On	PSE port is supplying power to PD
		Off	PSE port is not supplying power

Specifications

WLAN	
Standards	IEEE 802.11a/b/g for Wireless LAN IEEE 802.11i for Wireless Security IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseTX 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 @ 11 Mbps • 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps

Operating Channels (Central Frequency)	US: 2.412 to 2.462 GHz (802.11abg, 11 channels) 5.18 to 5.24 GHz (802.11a, 4 channels) 5.26 to 5.825 GHz (optional) EU: 2.412 to 2.472 GHz (802.11abg, 13 channels) 5.18 to 5.24 GHz (802.11a, 4 channels) 5.26 to 5.825 GHz (optional) *Special frequency bands (such as 5.9 GHz) is 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
TX Transmit Power	802.11b: Typ. 26±1.5 dBm @ 1 to 11 Mbps 802.11g: Typ. 26±1.5 dBm @ 6 to 24 Mbps, Typ. 25±1.5 dBm @ 36 Mbps, Typ. 24±1.5 dBm @ 48 Mbps, Typ. 23±1.5 dBm @ 54 Mbps 802.11a: Typ. 26±1.5 dBm @ 6 to Mbps, Typ. 25±1.5 dBm @ 36Mbps, Typ. 24±1.5 dBm @ 48 Mbps, Typ. 23±1.5 dBm @ 54 Mbps
RX Sensitivity	802.11b: -97 dBm @ 1 Mbps, -94 dBm @ 2 Mbps, -92 dBm @ 5.5 Mbps, -90 dBm @ 11 Mbps 802.11g: -93 dBm @ 6 Mbps, -91 dBm @ 9 Mbps, -90 dBm @ 12 Mbps, -88 dBm @ 18 Mbps, -84 dBm @ 24 Mbps, -80 dBm @ 36 Mbps, -76 dBm @ 48 Mbps, -74 dBm @ 54 Mbps 802.11a: -90 dBm @ 6 Mbps, -89 dBm @ 9 Mbps, -89 dBm @ 12 Mbps, -85 dBm @ 18 Mbps, -83 dBm @ 24 Mbps, -79 dBm @ 36 Mbps, -75 dBm @ 48 Mbps, -74 dBm @ 54 Mbps
Protocol Support	
General Protocols	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
Console Port	M12 A-coded 5-pin male connector
Fiber Ports	2, 100BaseSFP slot

Fiber Module	100Base multi-mode 1300 nm wavelength with LC connector for 4 km transmission (50/125 µm or 62.5/125 µm 800 MHz-km @ 1300 nm wavelength)
LED Indicators	PWR1, PWR2, PoE1-4, FAULT, STATE, HEAD, TAIL, LAN1-6, WLAN1, WLAN2
Physical Characteristics	
Housing	Metal, IP68 protection
Weight	10 kg
Dimensions	322 x 282 x 159 mm
Installation	Wall mounting
Environmental Limits	
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)
Power Requirements	
Input Voltage	110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)
Connector	M23
Power Consumption	AC input: 110 to 220 VAC, 50 to 60 Hz, 0.68 A (max.) DC input: 110 to 220 VDC, 0.68 A (max.) Maximum 74.8 watts
Reverse Polarity Protection	Present
Overload Current Protection	Present
Standards and Certifications	
Safety	UL 60950-1, EN 60950-1
EMC	EN 301 489-1/17; FCC Part 15, Subpart B; EN 55022/55024
Radio	EN 300 328, EN 301 893
Rail Traffic	EN 50155*, EN 50121-1/4
*Complies with a portion of EN 50155 specifications. Please contact Moxa or a Moxa distributor for details.	
Reliability	
MTBF (mean time between failures)	TAP-6226-TC: 382,735 hrs
Warranty	
Warranty	5 years
Details	See www.moxa.com/warranty

ATTENTION

The TAP-6226 is NOT a portable mobile device and should be located at least 20 cm away from the human body.
The TAP-6226 is NOT designed for the general public. A well-trained technician is required to safely deploy the TAP-6226s and establish a wireless network.

ATTENTION

Use the appropriate antennas for your wireless setup: Use 2.4 GHz antennas when the TAP-6226 is configured for IEEE 802.11b/g. Use 5 GHz antennas when the TAP-6226 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, and
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 they may cause serious injury or death. For proper installation and grounding of the antenna, refer to national and local codes (for example, U.S.: NFPA 70, National Electrical Code, Article 810, Canada: Canadian Electrical Code, Section 54).

Technical Support Contact Information
www.moxa.com/support

Moxa Americas:
Toll-free: 1-888-669-2872
Tel: 1-714-528-6777
Fax: 1-714-528-6778

Moxa China (Shanghai office):
Toll-free: 800-820-5036
Tel: +86-21-5258-9955
Fax: +86-21-5258-5505

Moxa Europe:
Tel: +49-89-3 70 03 99-0
Fax: +49-89-3 70 03 99-99

Moxa Asia-Pacific:
Tel: +886-2-8919-1230
Fax: +886-2-8919-1231