

# TAP-323シリーズ

## 鉄道沿線用デュアル無線 802.11n IP68ワイヤレスAP



### 機能と特長

- 2つのデュアルバンド無線、IEEE 802.11a/b/g/n準拠
- 堅牢なIP68保護等級の筐体、および -40~75°C動作温度
- コントローラベースTurbo Roaming (50ミリ秒未満)<sup>1</sup>
- 2つのファイバSFPスロットと4つのPoEポート (M12 LANコネクタ付き)
- EN 50155全必須検査項目に準拠<sup>2</sup>
- EN 50121-4に準拠
- AeroLink保護によるワイヤレスネットワークの冗長性
- 高い送信電力によりリーチを延長

### 認証



### 製品紹介

TAP-323沿線無線ユニットは列車-地上間のワイヤレス通信用に設計されています。TAP-323は非常にコンパクトで堅牢なワイヤレス装置で、2つのアクセスポイント、マネージドファイバスイッチ、さらに広範なAC/DC電源が、1つの筐体に格納されています。IP68筐体により、ユニットは過酷な気象条件に耐えることができ、M12コネクタにより、ユニットは耐衝撃性と耐振動性を備えています。TAP-323は、通信ベースの列車制御 (CBTC) やCCTVなどの列車-地上間のワイヤレスアプリケーション向けの高度なコントローラベースTurbo Roaming技術をサポートしています。このユニットは、MoxaのTurbo Chain技術を使用して信頼性の高いLAN通信を提供しながら、最大4つのPoEデバイスに電力を供給することができます。

### 高度なモビリティと信頼性

- コントローラベースL3 Turbo Roaming
- モバイルIPサポート
- 2つのデュアルバンド無線：2.4 GHz/5 GHz
- Turbo Chain対応 (リカバリ時間は100ミリ秒)
- WPA/WPA2および802.11iに対応
- IEEE 802.1X/RADIUSに対応

### 輸送アプリケーション向け設計

- 絶縁設計された110~220 VDC/VAC電源入力
- 高い送信電力、最大 400 mW
- 4つのPoEポートを介して電力を供給
- バックボーン接続用の2つのファイバSFPポート
- 広い温度 (-40~75°C) 範囲およびIP68保護等級の防水・防塵ハウジング

### 仕様

#### WLAN Interface

Channel Bandwidth	20 MHz, 40 MHz
Frequency Band	5 GHz 2.4 GHz

1. Turbo Roaming Recovery Timeは、干渉のない20 MHz RFチャンネル、WPA2-PSKセキュリティ、およびデフォルトのTurbo Roamingパラメータで設定されたAPに全体にわたり、最適化された条件で記録されたテスト結果の平均です。クライアントは、100 Kbpsのトラフィック負荷で3チャンネルローミングが設定されています。他の条件もまた、ローミング性能に影響を及ぼす可能性があります。Turbo Roamingパラメータ設定の詳細については、製品マニュアルを参照してください。
2. 本製品は、EN 50155規格で定められた鉄道車両アプリケーションに適しています。詳細については、こちらをクリックしてください：[www.moxa.com/doc/specs/EN\\_50155\\_Compliance.pdf](http://www.moxa.com/doc/specs/EN_50155_Compliance.pdf)

Frequency Band for EU (20 MHz operating channels)	2.412 to 2.472 GHz (13 channels) 5.180 to 5.240 GHz (4 channels) 5.260 to 5.320 GHz (4 channels) 5.500 to 5.700 GHz (11 channels)
Frequency Band for JP (20 MHz operating channels)	2.412 to 2.484 GHz (14 channels) 5.180 to 5.240 GHz (4 channels) 5.260 to 5.320 GHz (4 channels) 5.500 to 5.700 GHz (11 channels)
Frequency Band for US (20 MHz operating channels)	2.412 to 2.462 GHz (11 channels) 5.180 to 5.240 GHz (4 channels) 5.260 to 5.320 GHz (4 channels) <sup>3</sup> 5.500 to 5.700 GHz (8 channels) Excludes 5.600 to 5.640 <sup>3</sup> 5.745 to 5.825 GHz (5 channels)
Receiver Sensitivity for 802.11a (measured at 5.680 GHz)	Typ. -90 @ 6 Mbps Typ. -88 @ 9 Mbps Typ. -88 @ 12 Mbps Typ. -85 @ 18 Mbps Typ. -81 @ 24 Mbps Typ. -78 @ 36 Mbps Typ. -74 @ 48 Mbps Typ. -74 @ 54 Mbps Note: Due to a limitation in the receiver sensitivity performance for channels 153 and 161, it is recommended to avoid using these channels in your critical applications.
Receiver Sensitivity for 802.11n (5 GHz; measured at 5.680 GHz)	Typ. -88 dBm @ MCS0 20 MHz Typ. -85 dBm @ MCS1 20 MHz Typ. -82 dBm @ MCS2 20 MHz Typ. -79 dBm @ MCS3 20 MHz Typ. -76 dBm @ MCS4 20 MHz Typ. -71 dBm @ MCS5 20 MHz Typ. -70 dBm @ MCS6 20 MHz Typ. -69 dBm @ MCS7 20 MHz Typ. -95 dBm @ MCS8 20 MHz Typ. -91 dBm @ MCS9 20 MHz Typ. -87 dBm @ MCS10 20 MHz Typ. -80 dBm @ MCS11 20 MHz Typ. -78 dBm @ MCS12 20 MHz Typ. -74 dBm @ MCS13 20 MHz Typ. -72 dBm @ MCS14 20 MHz Typ. -71 dBm @ MCS15 20 MHz Typ. -84 dBm @ MCS0 40 MHz Typ. -81 dBm @ MCS1 40 MHz Typ. -77 dBm @ MCS2 40 MHz Typ. -75 dBm @ MCS3 40 MHz Typ. -71 dBm @ MCS4 40 MHz Typ. -67 dBm @ MCS5 40 MHz Typ. -64 dBm @ MCS6 40 MHz Typ. -63 dBm @ MCS7 40 MHz Typ. -90 dBm @ MCS8 40 MHz Typ. -85 dBm @ MCS9 40 MHz Typ. -82 dBm @ MCS10 40 MHz Typ. -81 dBm @ MCS11 40 MHz Typ. -77 dBm @ MCS12 40 MHz Typ. -73 dBm @ MCS13 40 MHz Typ. -71 dBm @ MCS14 40 MHz Typ. -68 dBm @ MCS15 40 MHz Note: Due to a limitation in the receiver sensitivity performance for channels 153 and 161, it is recommended to avoid using these channels in your critical applications.
Receiver Sensitivity for 802.11b (measured at 2.437 GHz)	Typ. -93 dBm @ 1 Mbps Typ. -93 dBm @ 2 Mbps Typ. -93 dBm @ 5.5 Mbps Typ. -88 dBm @ 11 Mbps
Receiver Sensitivity for 802.11g (measured at 2.437 GHz)	Typ. -88 dBm @ 6 Mbps Typ. -86 dBm @ 9 Mbps Typ. -85 dBm @ 12 Mbps

3. DFS (Dynamic Frequency Selection) channel support: In AP mode, when a radar signal is detected, the device will automatically switch to another channel.ただし、規定により、チャンネル切り替え後はサービス開始前に 60 秒間の可用性チェック期間が必要となります。

	<p>Typ. -85 dBm @ 18 Mbps  Typ. -85 dBm @ 24 Mbps  Typ. -82 dBm @ 36 Mbps  Typ. -78 dBm @ 48 Mbps  Typ. -74 dBm @ 54 Mbps</p>
Receiver Sensitivity for 802.11n (2.4 GHz; measured at 2.437 GHz)	<p>Typ. -89 dBm @ MCS0 20 MHz  Typ. -85 dBm @ MCS1 20 MHz  Typ. -85 dBm @ MCS2 20 MHz  Typ. -82 dBm @ MCS3 20 MHz  Typ. -78 dBm @ MCS4 20 MHz  Typ. -74 dBm @ MCS5 20 MHz  Typ. -72 dBm @ MCS6 20 MHz  Typ. -70 dBm @ MCS7 20 MHz  Typ. -95 dBm @ MCS8 20 MHz  Typ. -90 dBm @ MCS9 20 MHz  Typ. -87 dBm @ MCS10 20 MHz  Typ. -83 dBm @ MCS11 20 MHz  Typ. -80 dBm @ MCS12 20 MHz  Typ. -74 dBm @ MCS13 20 MHz  Typ. -71 dBm @ MCS14 20 MHz  Typ. -69 dBm @ MCS15 20 MHz  Typ. -87 dBm @ MCS0 40 MHz  Typ. -83 dBm @ MCS1 40 MHz  Typ. -83 dBm @ MCS2 40 MHz  Typ. -80 dBm @ MCS3 40 MHz  Typ. -76 dBm @ MCS4 40 MHz  Typ. -73 dBm @ MCS5 40 MHz  Typ. -69 dBm @ MCS6 40 MHz  Typ. -67 dBm @ MCS7 40 MHz  Typ. -93 dBm @ MCS8 40 MHz  Typ. -88 dBm @ MCS9 40 MHz  Typ. -85 dBm @ MCS10 40 MHz  Typ. -82 dBm @ MCS11 40 MHz  Typ. -78 dBm @ MCS12 40 MHz  Typ. -73 dBm @ MCS13 40 MHz  Typ. -69 dBm @ MCS14 40 MHz  Typ. -67 dBm @ MCS15 40 MHz</p>
Modulation Type	DSSS OFDM
Transmission Rate	802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps 802.11n HT40: 13.5 to 300 Mbps (MCS0 to MCS15)
Transmitter Power for 802.11a	<p>23±1.5 dBm @ 6 Mbps  23±1.5 dBm @ 12 Mbps  23±1.5 dBm @ 24 Mbps  21±1.5 dBm @ 36 Mbps  20±1.5 dBm @ 48 Mbps  18±1.5 dBm @ 54 Mbps</p>
Transmitter Power for 802.11n (5 GHz)	<p>23±1.5 dBm @ MCS0 20 MHz  20±1.5 dBm @ MCS1 20 MHz  20±1.5 dBm @ MCS2 20 MHz  20±1.5 dBm @ MCS3 20 MHz  19±1.5 dBm @ MCS4 20 MHz  18±1.5 dBm @ MCS5 20 MHz  18±1.5 dBm @ MCS6 20 MHz  18±1.5 dBm @ MCS7 20 MHz  23±1.5 dBm @ MCS8 20 MHz  20±1.5 dBm @ MCS9 20 MHz  20±1.5 dBm @ MCS10 20 MHz  20±1.5 dBm @ MCS11 20 MHz  19±1.5 dBm @ MCS12 20 MHz  19±1.5 dBm @ MCS13 20 MHz  18±1.5 dBm @ MCS14 20 MHz  18±1.5 dBm @ MCS15 20 MHz  23±1.5 dBm @ MCS0 40 MHz  20±1.5 dBm @ MCS1 40 MHz  20±1.5 dBm @ MCS2 40 MHz  20±1.5 dBm @ MCS3 40 MHz</p>

	<p>19±1.5 dBm @ MCS4 40 MHz  18±1.5 dBm @ MCS5 40 MHz  18±1.5 dBm @ MCS6 40 MHz  18±1.5 dBm @ MCS7 40 MHz  23±1.5 dBm @ MCS8 40 MHz  20±1.5 dBm @ MCS9 40 MHz  20±1.5 dBm @ MCS10 40 MHz  20±1.5 dBm @ MCS11 40 MHz  19±1.5 dBm @ MCS12 40 MHz  19±1.5 dBm @ MCS13 40 MHz  18±1.5 dBm @ MCS14 40 MHz  18±1.5 dBm @ MCS15 40 MHz</p>
Transmitter Power for 802.11b	<p>26±1.5 dBm @ 1 Mbps  26±1.5 dBm @ 2 Mbps  26±1.5 dBm @ 5.5 Mbps  25±1.5 dBm @ 11 Mbps</p>
Transmitter Power for 802.11g	<p>23±1.5 dBm @ 6 Mbps  23±1.5 dBm @ 12 Mbps  23±1.5 dBm @ 24 Mbps  21±1.5 dBm @ 36 Mbps  20±1.5 dBm @ 48 Mbps  18±1.5 dBm @ 54 Mbps</p>
Transmitter Power for 802.11n (2.4 GHz)	<p>23±1.5 dBm @ MCS0 20 MHz  21±1.5 dBm @ MCS1 20 MHz  21±1.5 dBm @ MCS2 20 MHz  21±1.5 dBm @ MCS3 20 MHz  20±1.5 dBm @ MCS4 20 MHz  19±1.5 dBm @ MCS5 20 MHz  18±1.5 dBm @ MCS6 20 MHz  18±1.5 dBm @ MCS7 20 MHz  23±1.5 dBm @ MCS8 20 MHz  21±1.5 dBm @ MCS9 20 MHz  21±1.5 dBm @ MCS10 20 MHz  21±1.5 dBm @ MCS11 20 MHz  20±1.5 dBm @ MCS12 20 MHz  19±1.5 dBm @ MCS13 20 MHz  18±1.5 dBm @ MCS14 20 MHz  18±1.5 dBm @ MCS15 20 MHz  23±1.5 dBm @ MCS0 40 MHz  20±1.5 dBm @ MCS1 40 MHz  20±1.5 dBm @ MCS2 40 MHz  20±1.5 dBm @ MCS3 40 MHz  19±1.5 dBm @ MCS4 40 MHz  19±1.5 dBm @ MCS5 40 MHz  18±1.5 dBm @ MCS6 40 MHz  17±1.5 dBm @ MCS7 40 MHz  23±1.5 dBm @ MCS8 40 MHz  20±1.5 dBm @ MCS9 40 MHz  20±1.5 dBm @ MCS10 40 MHz  20±1.5 dBm @ MCS11 40 MHz  20±1.5 dBm @ MCS12 40 MHz  19±1.5 dBm @ MCS13 40 MHz  18±1.5 dBm @ MCS14 40 MHz  17±1.5 dBm @ MCS15 40 MHz</p>
Wireless Security	<p>WEP encryption (64-bit and 128-bit)  WPA/WPA2-Enterprise (IEEE 802.1X/RADIUS, TKIP, AES)  WPA/WPA2-Personal</p>
WLAN Antenna Connector	5 N-type female
WLAN Operation Mode	Access point
WLAN Standards	<p>802.11a/b/g/n  802.11i Wireless Security</p>

## Ethernet Interface

1000BaseSFP Slots	2
10/100BaseT(X) Ports (M12 D-coded 4-pin female connector)	4
Standards	IEEE 802.1p for Class of Service IEEE 802.1Q for VLAN Tagging IEEE 802.3 for 10BaseT IEEE 802.3ab for 1000BaseT(X) IEEE 802.3af for PoE IEEE 802.3u for 100BaseT(X)
Total Port Count	6
Highest Speed	1G
Connections	PoE M12 Fiber

## Ethernet Software Features

Management	SNMPv1/v2c/v3, DHCP Server/Client, IPv4, Syslog, TCP/IP, Telnet, TFTP, UDP, Web Console, Wireless Search Utility
Security	HTTPS/SSL, RADIUS, SSH
Time Management	SNTP

## Switch Properties

VLAN ID Range	VID 1 to 4094
---------------	---------------

## USB Interface

M12 Connector	M12 A-coded 5-pin female (for ABC-02 USB storage)
---------------	---

## Firewall

Filter	IP address, MAC address, Ports
--------	--------------------------------

## NAT

Features	Port forwarding
----------	-----------------

## Serial Interface

Console Port	USB-M12 console (M12 B-coded 5-pin female connector)
Parity	None, Even, Odd, Space, Mark

## Power Parameters

Input Current	AC input: 110 to 220 VAC, 50 to 60 Hz, 1.1 A (max.) DC input: 110 to 220 VDC, 1.1 A (max.)																				
Input Voltage	Redundant dual inputs, 110/220 VAC/VDC (85 to 264 VAC, 88 to 300 VDC)																				
Power Connector	6-pin M23 Connector																				
Power Consumption	85 W (max.) <table><thead><tr><th>PSE/Voltage</th><th>110 VDC</th><th>110 VAC</th><th>220 VDC</th><th>220 VAC</th></tr></thead><tbody><tr><td>0 PSE port in use</td><td>17.4 W</td><td>16.2 W</td><td>17.6 W</td><td>17.5 W</td></tr><tr><td>1 PSE port in use</td><td>34.15 W</td><td>32.6 W</td><td>33.8 W</td><td>33.55 W</td></tr><tr><td>2 PSE ports in use</td><td>50.9 W</td><td>49 W</td><td>49.9 W</td><td>49.6 W</td></tr></tbody></table>	PSE/Voltage	110 VDC	110 VAC	220 VDC	220 VAC	0 PSE port in use	17.4 W	16.2 W	17.6 W	17.5 W	1 PSE port in use	34.15 W	32.6 W	33.8 W	33.55 W	2 PSE ports in use	50.9 W	49 W	49.9 W	49.6 W
PSE/Voltage	110 VDC	110 VAC	220 VDC	220 VAC																	
0 PSE port in use	17.4 W	16.2 W	17.6 W	17.5 W																	
1 PSE port in use	34.15 W	32.6 W	33.8 W	33.55 W																	
2 PSE ports in use	50.9 W	49 W	49.9 W	49.6 W																	

	PSE/Voltage	110 VDC	110 VAC	220 VDC	220 VAC
	3 PSE ports in use	67.65 W	65.4 W	66 W	65.65 W
	4 PSE ports in use	84.4 W	81.8 W	82.1 W	81.7 W
Reverse Polarity Protection	Supported				
Source of Input Power	PoE (IEEE 802.3af)				
<b>Overload Protection</b>					
Protection Type	Current				
<b>Physical Characteristics</b>					
Housing	Metal				
IP Rating	IP68				
Dimensions	324 x 279 x 156 mm (12.76 x 10.98 x 6.142 in)				
Weight	10,000 g (22.22 lb)				
Installation	Wall mounting (standard), DIN-rail mounting (optional)				
Protection	PCB conformal coating				
<b>Environmental Limits</b>					
Operating Temperature	-40 to 75°C (-40 to 167°F)				
Storage Temperature (package included)	-40 to 85°C (-40 to 185°F)				
Ambient Relative Humidity	5 to 95% (non-condensing)				
<b>Standards and Certifications</b>					
EMC	EN 61000-6-2/-6-4, EN 55032/24				
EMI	CISPR 32, FCC Part 15B Class A				
EMS	IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF				
Radio Frequency	FCC, IC, WPC, RED				
Radio	MIC				
Railway	EN 50121-4, EN 50155				
Railway Fire Protection	EN 45545-2				
Safety	EN 60950-1, UL 60950-1, IEC 60950-1				
<b>MTBF</b>					
Time	290,937 hrs				
Standards	Telcordia SR332				

## Warranty

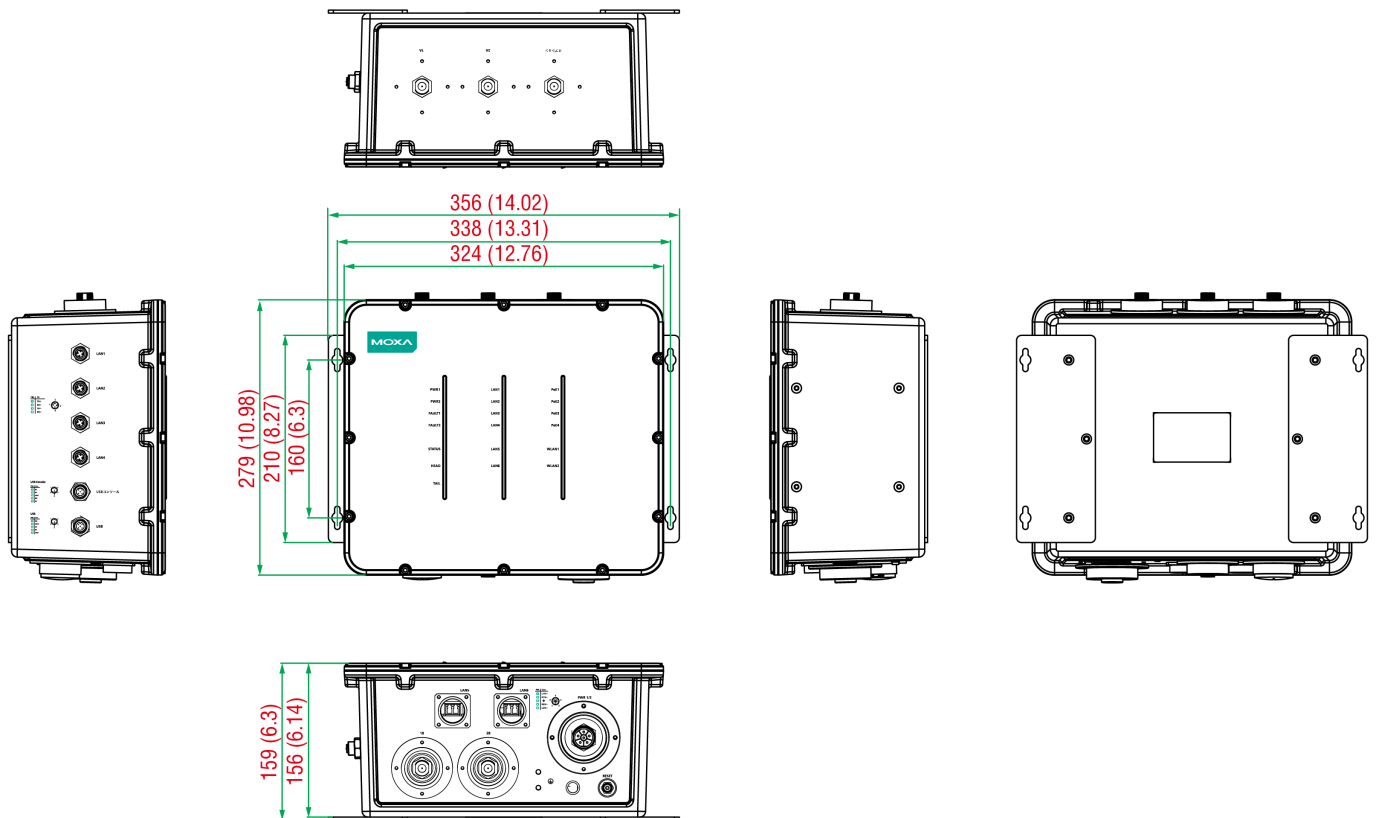
Warranty Period	5 years
Details	See <a href="http://www.moxa.com/jp/warranty">www.moxa.com/jp/warranty</a>

## Package Contents

Device	1 x TAP-323 Series wireless access point
Installation Kit	1 x cap, metal, for ABC-02 USB storage port 1 x cap, metal, for USB console port 1 x metal M23 male 6-pin crimp 1 x plastic M23 dust cover for power 1 x fiber panel mounting kit 1 x wall-mounting kit 3 x antenna glands for top side antenna 4 x cap, metal, for LAN port 5 x metal protective caps for 4 antenna ports and 1 optional antenna port
Documentation	1 x quick installation guide 1 x warranty card

## 寸法

単位: mm (インチ)



## 注文情報

Model Name	Band	Standard	Application	Operating Temp.	Indoor/Outdoor, IP Rating	Single/Dual RF
TAP-323-EU-CT-T	EU	802.11a/b/g/n	Railway trackside wireless access point	-40 to 75°C	Outdoor, IP68	Dual RF
TAP-323-US-CT-T	US	802.11a/b/g/n	Railway trackside wireless access point	-40 to 75°C	Outdoor, IP68	Dual RF
TAP-323-JP-CT-T	JP	802.11a/b/g/n	Railway trackside wireless access point	-40 to 75°C	Outdoor, IP68	Dual RF

## アクセサリ（別売）

### Communication Modules

SFP-1FELLC-T	SFP module with 1 100Base single-mode with LC connector for 80 km transmission, -40 to 85°C operating temperature
SFP-1GLSXLCT-T	SFP module with 1 1000BaseLSX port with LC connector for 1km/2km transmission, -40 to 85°C operating temperature
SFP-1FEMLC-T	SFP module with 1 100Base multi-mode, LC connector for 2/4 km transmission, -40 to 85°C operating temperature
SFP-1GLHXLC-T	SFP module with 1 1000BaseLHX port with LC connector for 40 km transmission, -40 to 85°C operating temperature
SFP-1GSXLC-T	SFP module with 1 1000BaseSX port with LC connector for 300m/550m transmission, -40 to 85°C operating temperature
SFP-1GLHLCT-T	SFP module with 1 1000BaseLH port with LC connector for 30 km transmission, -40 to 85°C operating temperature
SFP-1FESLC-T	SFP module with 1 100Base single-mode with LC connector for 40 km transmission, -40 to 85°C operating temperature
SFP-1GLXLC-T	SFP module with 1 1000BaseLX port with LC connector for 10 km transmission, -40 to 85°C operating temperature

### M12 Connector Caps

A-CAP-M12F-M	Metal cap for M12 female connector
--------------	------------------------------------

### Connectors

M12D-4P-IP68	M12 D-coded screw-in sensor connector, male, IP68
--------------	---

### Cables

CBL-M12D(MM4P)/RJ45-100 IP67	M12-to-RJ45 cable, IP67-rated, 1 m
CBL-M23(FF6P)/OPEN-BK-100 IP67	M23 to 6-pin power cable, IP67-rated female 6-pin M23 connector, IP67, 1 m

### Storage Kits

ABC-02-USB	Configuration backup and restoration tool, firmware upgrade, and log file storage tool for managed Ethernet switches and routers, 0 to 60°C operating temperature
ABC-02-USB-T	Configuration backup and restoration tool, firmware upgrade, and log file storage tool for managed Ethernet switches and routers, -40 to 75°C operating temperature

© Moxa Inc. All rights reserved. 2022年3月4日更新。

Moxa Inc.の明白な許可を画面で取得しない限り、本書およびその一部の複製や使用はいかなる方法やいかなる場合でも許可されません。製品の仕様は予告なく変更されることがあります。最新の製品情報については当社のWebサイトをご覧ください。