

TAP-323 系列

鐵路軌旁雙無線電 802.11n IP68 無線 AP



特色與優點

- 2 個雙頻無線電，符合 IEEE 802.11a/b/g/n 規範
- IP68 等級堅固外殼，支援 -40 至 75°C 的操作溫度
- 基於控制器的 Turbo Roaming (小於 50 毫秒)¹
- 2 個光纖 SFP 插槽和 4 個 PoE 連接埠 (M12 LAN 連接器)
- 符合所有 EN 50155 規範強制性測試項目²
- 符合 EN 50121-4 標準
- 無線網路冗餘加上 AeroLink 保護
- 高傳輸功率提供更長的覆蓋範圍

認證



簡介

TAP-323 鐵路軌旁無線裝置專為列車對地無線通訊而設計。TAP-323 是一款極度小巧又堅固耐用的無線設備，將兩個存取點、一個網管光纖交換機，和一個寬壓版的 AC/DC 電源供應器整合在一台設備上。IP68 等級的外殼可以讓設備承受嚴苛的天氣狀態，M12 接頭讓設備可以抗衝擊和震動。TAP-323 支援進階的基於控制器的 Turbo Roaming 快速漫遊技術，使用在列車對地的無線應用，像是通訊式的列車控制系統 (CBTC) 和 CCTV。此設備最多可供電給 4 個 PoE 設備，同時透過 Moxa Turbo Chain 的技術，提供可靠的 LAN 通訊。

進階移動性與可靠性

- 控制端 L3 Turbo Roaming 快速漫遊
- 支援行動 IP
- 2 組雙頻無線電：2.4 GHz 及 5 GHz
- 支援 Turbo Chain (100 毫秒恢復時間)
- 支援 WPA/WPA2 及 802.11i
- 支援 IEEE 802.1X/RADIUS

專為交通運輸應用設計

- 110 至 220 VDC/VAC 隔離式電源輸入
- 高傳輸功率 400 mW (最大值)
- 透過 4 個 PoE 連接埠供電
- 2 個支援骨幹安裝的光纖 SFP 連接埠
- 支援寬溫 (-40 至 75°C) 和 IP68 等級外殼

規格

WLAN Interface

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

1. 此處所指的 Turbo Roaming 快速漫遊恢復原時間是在最佳狀態下，配置無干擾 20 MHz RF 頻道、WPA2-PSK 安全性和預設的 Turbo Roaming 快速漫遊參數，所得到的測試結果平均值。用戶端設定為在 100 Kbps 流量負載下 3 個頻道漫遊。其他情況也有可能影響漫遊的效能。若想了解更多關於 Turbo Roaming 快速漫遊的參數設定，請參閱產品手冊。

2. 此產品適用於符合 EN 50155 標準所定義的所有軌道車輛應用。若需更詳細的說明，請參照：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) ³ 5.500 to 5.700 GHz (8 channels) Excludes 5.600 to 5.640 ³ 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. 支援 DFS (動態頻率選擇) 頻道：在 AP 模式下，當設備偵測到一個雷達信號，會自動切換到另一個頻道。然而，根據規定，當頻道切換後，若要重啟服務，需要 60 秒的可用性檢查期。

	<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
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USB Interface

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

Filter	IP address, MAC address, Ports
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NAT

Features	Port forwarding
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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)				
Overload Protection					
Protection Type	Current				
Physical Characteristics					
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				
Environmental Limits					
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)				
Standards and Certifications					
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				
MTBF					
Time	290,937 hrs				
Standards	Telcordia SR332				

Warranty

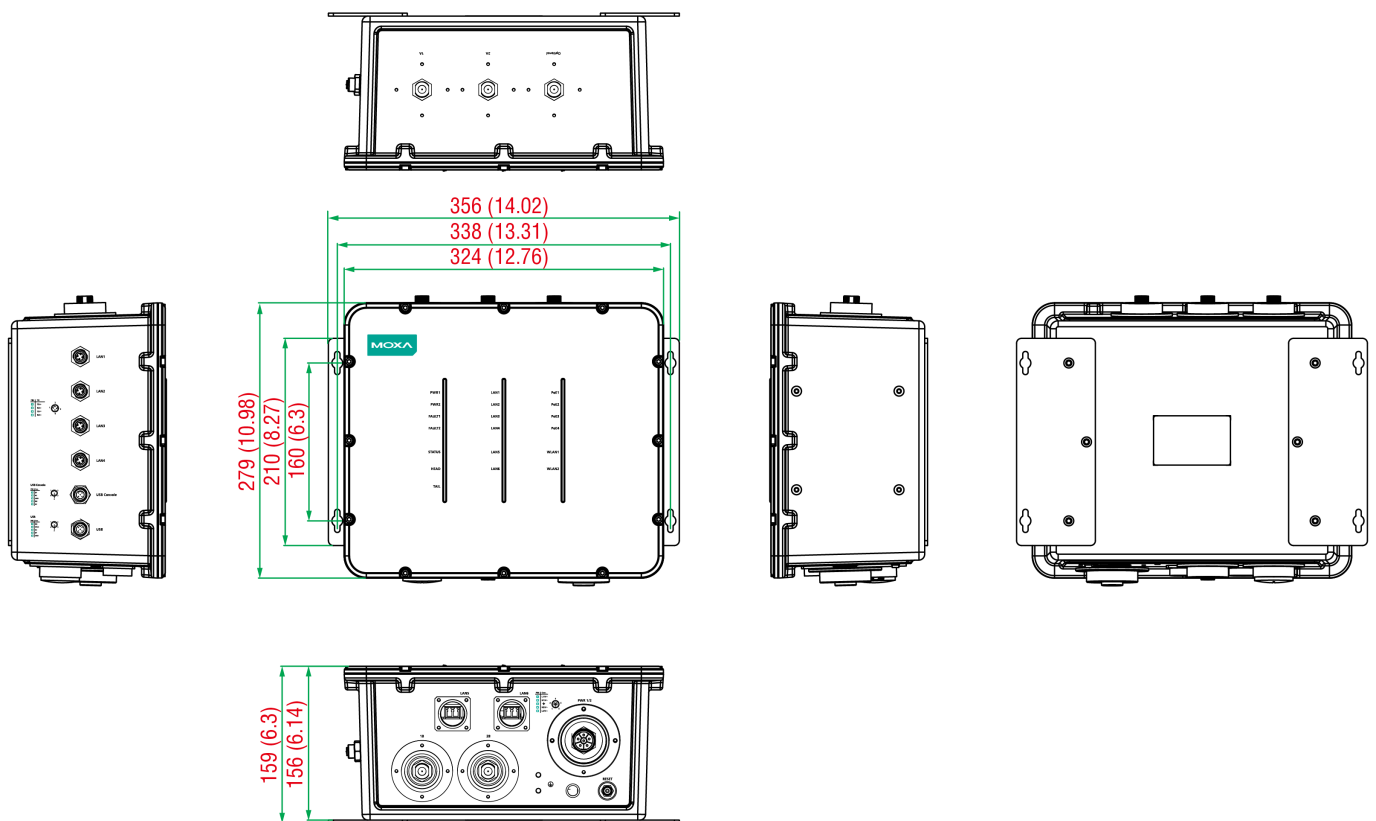
Warranty Period	5 years
Details	See www.moxa.com/tw/warranty

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

尺寸

單位：公釐 (英吋)



訂購資訊

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

配件 (選購)

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-1GLSXLC-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-1GLHXLCT	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	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
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Connectors

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

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