# AWK-3131A-RTG 系列

軌道車載室內單一無線電，802.11n AP/client，IP30

### 特色與優點

- 符合 IEEE 802.11a/b/g/n 規範
- M12 防震連接器
- SC 光纖連接
- QoS（WMM）和 VLAN 提供有效率的網路傳輸
- 基於控制器的 Turbo Roaming（小於 50 毫秒）[1]
- 符合所有 EN 50155 規範強制性測試項目[2]
- 提供寬溫度型號，適合 -40 至 75°C 的作業環境

### 認證

EN 50155 EN 50121-4

## 簡介

AWK-3131A-RTG 二合一工業 Ap/client 裝置專為列車對地通訊所設計，即使列車時速高達 120 公里依然能夠可靠運作。AWK-3131A-RTG 部分 EN 50155 規範部分項目，涵蓋操作溫度、電源輸入電壓、突波、ESD 和震動，使得 AWK-3131A-RTG 適用於多種的工業應用。 安裝簡易，可利用 DIN 軌道安裝或置於配電箱中，其 DIN 軌道安裝功能、寬操作溫度範圍、具備 LED 指示燈的 IP30 機箱，使得 AWK-3131A-RTG 成為軌道應用最簡便且可靠的解決方案。

### 進階安全性

- 64 位元和 128 位元 WEP（Wired Equivalent Privacy，有線等效加密）
- 啟用/停用 SSID 廣播
- WPA/WPA2（Wi-Fi 存取保護）和支援802.11i
- 支援 IEEE802.1X/RADIUS
- 針對存取控制提供強力的篩選機制

### 專為車對地應用所設計

- 若為用戶端，Turbo Roaming 快速漫遊在 3 個頻道及 WPA2 時，切換時間 < 150 毫秒
- 若為控制端，Turbo Roaming 快速漫遊（僅限於和 WAC-1001 或 WAC-2004 並用時支援）在 3 個頻道及 WPA2 時，切換時間 < 50 毫秒
- 多種漫遊參數，適用於不同的安裝架構和天線類型

## 規格

**WLAN Interface**

| | |
|---|---|
| WLAN Standards | 802.11a/b/g/n<br>802.11i Wireless Security |
| Modulation Type | DSSS<br>OFDM<br>802.11b: CCK @ 11/5.5 Mbps<br>802.11b: DQPSK @ 2 Mbps<br>802.11b: DBPSK @ 1 Mbps<br>802.11a/g: 64QAM @ 54/48 Mbps<br>802.11a/g: 16QAM @ 36/24 Mbps<br>802.11a/g: QPSK @ 18/12 Mbps |

1. 此處所指的 Turbo Roaming 快速漫遊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。其他情況也有可能會影響漫遊的效能。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

| | |
|---|---|
| | 802.11a/g: BPSK @ 9/6 Mbps<br>802.11n: 64QAM @ 300 Mbps to BPSK @ 6.5 Mbps |
| Frequency Band for US (20 MHz operating channels) | 2.412 to 2.462 GHz (11 channels)<br>5.180 to 5.240 GHz (4 channels)<br>5.260 to 5.320 GHz (4 channels)[3]<br>5.500 to 5.700 GHz (8 channels) excluding 5.600 to 5.640 GHz[3]<br>5.745 to 5.825 GHz (5 channels) |
| Frequency Band for EU (20 MHz operating channels) | 2.412 to 2.472 GHz (13 channels)<br>5.180 to 5.240 GHz (4 channels)<br>5.260 to 5.320 GHz (4 channels)[3]<br>5.500 to 5.700 GHz (11 channels)[3] |
| Frequency Band for JP (20 MHz operating channels) | 2.412 to 2.484 GHz (14 channels)<br>5.180 to 5.240 GHz (4 channels)<br>5.260 to 5.320 GHz (4 channels)[3]<br>5.500 to 5.700 GHz (11 channels)[3] |
| Wireless Security | SSID broadcast enable/disable<br>WEP encryption (64-bit and 128-bit)<br>WPA/WPA2-Personal<br>WPA/WPA2-Enterprise (IEEE 802.1X/RADIUS, TKIP, AES) |
| Transmission Rate | 802.11b: 1 to 11 Mbps<br>802.11a/g: 6 to 54 Mbps<br>802.11n: 6.5 to 300 Mbps |
| Transmitter Power for 802.11a | 23±1.5 dBm @ 6 to 24 Mbps<br>21±1.5 dBm @ 36 Mbps<br>20±1.5 dBm @ 48 Mbps<br>18±1.5 dBm @ 54 Mbps |
| Transmitter Power for 802.11n (5 GHz) | 23±1.5 dBm @ MCS0 20 MHz<br>20±1.5 dBm @ MCS1 20 MHz<br>20±1.5 dBm @ MCS2 20 MHz<br>20±1.5 dBm @ MCS3 20 MHz<br>19±1.5 dBm @ MCS4 20 MHz<br>18±1.5 dBm @ MCS5 20 MHz<br>18±1.5 dBm @ MCS6 20 MHz<br>18±1.5 dBm @ MCS7 20 MHz<br>23±1.5 dBm @ MCS8 20 MHz<br>20±1.5 dBm @ MCS9 20 MHz<br>20±1.5 dBm @ MCS10 20 MHz<br>20±1.5 dBm @ MCS11 20 MHz<br>19±1.5 dBm @ MCS12 20 MHz<br>19±1.5 dBm @ MCS13 20 MHz<br>18±1.5 dBm @ MCS14 20 MHz<br>18±1.5 dBm @ MCS15 20 MHz<br>23±1.5 dBm @ MCS0 40 MHz<br>20±1.5 dBm @ MCS1 40 MHz<br>20±1.5 dBm @ MCS2 40 MHz<br>20±1.5 dBm @ MCS3 40 MHz<br>19±1.5 dBm @ MCS4 40 MHz<br>18±1.5 dBm @ MCS5 40 MHz<br>18±1.5 dBm @ MCS6 40 MHz<br>18±1.5 dBm @ MCS7 40 MHz<br>23±1.5 dBm @ MCS8 40 MHz<br>20±1.5 dBm @ MCS9 40 MHz<br>20±1.5 dBm @ MCS10 40 MHz<br>20±1.5 dBm @ MCS11 40 MHz<br>19±1.5 dBm @ MCS12 40 MHz<br>19±1.5 dBm @ MCS13 40 MHz<br>18±1.5 dBm @ MCS14 40 MHz<br>18±1.5 dBm @ MCS15 40 MHz |
| Transmitter Power for 802.11b | 26±1.5 dBm @ 1 Mbps<br>26±1.5 dBm @ 2 Mbps<br>26±1.5 dBm @ 5.5 Mbps<br>25±1.5 dBm @ 11 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。

| | |
|---|---|
| Transmitter Power for 802.11g | 23±1.5 dBm @ 6 to 24 Mbps<br>21±1.5 dBm @ 36 Mbps<br>19±1.5 dBm @ 48 Mbps<br>18±1.5 dBm @ 54 Mbps |
| Transmitter Power for 802.11n (2.4 GHz) | 23±1.5 dBm @ MCS0 20 MHz<br>21±1.5 dBm @ MCS1 20 MHz<br>21±1.5 dBm @ MCS2 20 MHz<br>21±1.5 dBm @ MCS3 20 MHz<br>20±1.5 dBm @ MCS4 20 MHz<br>19±1.5 dBm @ MCS5 20 MHz<br>18±1.5 dBm @ MCS6 20 MHz<br>18±1.5 dBm @ MCS7 20 MHz<br>23±1.5 dBm @ MCS8 20 MHz<br>21±1.5 dBm @ MCS9 20 MHz<br>21±1.5 dBm @ MCS10 20 MHz<br>21±1.5 dBm @ MCS11 20 MHz<br>20±1.5 dBm @ MCS12 20 MHz<br>19±1.5 dBm @ MCS13 20 MHz<br>18±1.5 dBm @ MCS14 20 MHz<br>18±1.5 dBm @ MCS15 20 MHz<br>23±1.5 dBm @ MCS0 40 MHz<br>20±1.5 dBm @ MCS1 40 MHz<br>20±1.5 dBm @ MCS2 40 MHz<br>20±1.5 dBm @ MCS3 40 MHz<br>19±1.5 dBm @ MCS4 40 MHz<br>19±1.5 dBm @ MCS5 40 MHz<br>18±1.5 dBm @ MCS6 40 MHz<br>17±1.5 dBm @ MCS7 40 MHz<br>23±1.5 dBm @ MCS8 40 MHz<br>20±1.5 dBm @ MCS9 40 MHz<br>20±1.5 dBm @ MCS10 40 MHz<br>20±1.5 dBm @ MCS11 40 MHz<br>20±1.5 dBm @ MCS12 40 MHz<br>19±1.5 dBm @ MCS13 40 MHz<br>18±1.5 dBm @ MCS14 40 MHz<br>17±1.5 dBm @ MCS15 40 MHz |
| Receiver Sensitivity for 802.11a (measured at 5.680 GHz) | Typ. -90 @ 6 Mbps<br>Typ. -88 @ 9 Mbps<br>Typ. -88 @ 12 Mbps<br>Typ. -85 @ 18 Mbps<br>Typ. -81 @ 24 Mbps<br>Typ. -78 @ 36 Mbps<br>Typ. -74 @ 48 Mbps<br>Typ. -74 @ 54 Mbps<br>Note[4] |
| Receiver Sensitivity for 802.11n (5 GHz; measured at 5.680 GHz) | Typ. -88 dBm @ MCS0 20 MHz<br>Typ. -85 dBm @ MCS1 20 MHz<br>Typ. -82 dBm @ MCS2 20 MHz<br>Typ. -79 dBm @ MCS3 20 MHz<br>Typ. -76 dBm @ MCS4 20 MHz<br>Typ. -71 dBm @ MCS5 20 MHz<br>Typ. -70 dBm @ MCS6 20 MHz<br>Typ. -69 dBm @ MCS7 20 MHz<br>Typ. -95 dBm @ MCS8 20 MHz<br>Typ. -91 dBm @ MCS9 20 MHz<br>Typ. -87 dBm @ MCS10 20 MHz<br>Typ. -80 dBm @ MCS11 20 MHz<br>Typ. -78 dBm @ MCS12 20 MHz<br>Typ. -74 dBm @ MCS13 20 MHz<br>Typ. -72 dBm @ MCS14 20 MHz<br>Typ. -71 dBm @ MCS15 20 MHz<br>Typ. -84 dBm @ MCS0 40 MHz<br>Typ. -81 dBm @ MCS1 40 MHz<br>Typ. -77 dBm @ MCS2 40 MHz<br>Typ. -75 dBm @ MCS3 40 MHz<br>Typ. -71 dBm @ MCS4 40 MHz<br>Typ. -67 dBm @ MCS5 40 MHz<br>Typ. -64 dBm @ MCS6 40 MHz |

4. 頻道 153 和 161 因為在接收靈敏度上有限制，建議在關鍵應用下，盡量避免使用這些頻道。

| | |
|---|---|
| | Typ. -63 dBm @ MCS7 40 MHz<br>Typ. -90 dBm @ MCS8 40 MHz<br>Typ. -85 dBm @ MCS9 40 MHz<br>Typ. -82 dBm @ MCS10 40 MHz<br>Typ. -81 dBm @ MCS11 40 MHz<br>Typ. -77 dBm @ MCS12 40 MHz<br>Typ. -73 dBm @ MCS13 40 MHz<br>Typ. -71 dBm @ MCS14 40 MHz<br>Note[5]<br>Typ. -68 dBm @ MCS15 40 MHz |
| Receiver Sensitivity for 802.11b (measured at 2.437 GHz) | Typ. -93 dBm @ 1 Mbps<br>Typ. -93 dBm @ 2 Mbps<br>Typ. -93 dBm @ 5.5 Mbps<br>Typ. -88 dBm @ 11 Mbps |
| Receiver Sensitivity for 802.11g (measured at 2.437 GHz) | Typ. -88 dBm @ 6 Mbps<br>Typ. -86 dBm @ 9 Mbps<br>Typ. -85 dBm @ 12 Mbps<br>Typ. -85 dBm @ 18 Mbps<br>Typ. -85 dBm @ 24 Mbps<br>Typ. -82 dBm @ 36 Mbps<br>Typ. -78 dBm @ 48 Mbps<br>Typ. -74 dBm @ 54 Mbps |
| Receiver Sensitivity for 802.11n (2.4 GHz; measured at 2.437 GHz) | Typ. -89 dBm @ MCS0 20 MHz<br>Typ. -85 dBm @ MCS1 20 MHz<br>Typ. -85 dBm @ MCS2 20 MHz<br>Typ. -82 dBm @ MCS3 20 MHz<br>Typ. -78 dBm @ MCS4 20 MHz<br>Typ. -74 dBm @ MCS5 20 MHz<br>Typ. -72 dBm @ MCS6 20 MHz<br>Typ. -70 dBm @ MCS7 20 MHz<br>Typ. -95 dBm @ MCS8 20 MHz<br>Typ. -90 dBm @ MCS9 20 MHz<br>Typ. -87 dBm @ MCS10 20 MHz<br>Typ. -83 dBm @ MCS11 20 MHz<br>Typ. -80 dBm @ MCS12 20 MHz<br>Typ. -74 dBm @ MCS13 20 MHz<br>Typ. -71 dBm @ MCS14 20 MHz<br>Typ. -69 dBm @ MCS15 20 MHz<br>Typ. -87 dBm @ MCS0 40 MHz<br>Typ. -83 dBm @ MCS1 40 MHz<br>Typ. -83 dBm @ MCS2 40 MHz<br>Typ. -80 dBm @ MCS3 40 MHz<br>Typ. -76 dBm @ MCS4 40 MHz<br>Typ. -73 dBm @ MCS5 40 MHz<br>Typ. -69 dBm @ MCS6 40 MHz<br>Typ. -67 dBm @ MCS7 40 MHz<br>Typ. -93 dBm @ MCS8 40 MHz<br>Typ. -88 dBm @ MCS9 40 MHz<br>Typ. -85 dBm @ MCS10 40 MHz<br>Typ. -82 dBm @ MCS11 40 MHz<br>Typ. -78 dBm @ MCS12 40 MHz<br>Typ. -73 dBm @ MCS13 40 MHz<br>Typ. -69 dBm @ MCS14 40 MHz<br>Typ. -67 dBm @ MCS15 40 MHz |
| WLAN Operation Mode | Access point, Client, Client-Router, Sniffer |
| Antenna Connectors | QMA |

### Ethernet Interface

| | |
|---|---|
| PoE Ports (10/100BaseT(X), M12 D-coded 4-pin female connector) | 1, AWK-3131A-M12-RTG only |
| Standards | IEEE 802.3 for 10BaseT<br>IEEE 802.3u for 100BaseT(X)<br>IEEE 802.3af for PoE<br>IEEE 802.1Q for VLAN Tagging |

5. 頻道 153 和 161 因為在接收靈敏度上有限制，建議在關鍵應用下，盡量避免使用這些頻道。

| | |
|---|---|
| 10/100BaseT(X) Ports (M12 D-coded 4-pin female connector) | 1, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection (AWK-3131A-M12-RTG only) |
| 100BaseFX Ports (single-mode SC connector) | 1, AWK-3131A-SSC-RTG only |
| Optical Fiber | |

| | 100BaseFX |
|---|---|
| Wavelength | 1310 nm |
| Max. TX | 0 dBm |
| Min. TX | -5 dBm |
| RX Sensitivity | -34 dBm |
| Link Budget | 29 dB |
| Typical Distance | 40 km |

### Ethernet Software Features

| | |
|---|---|
| Management | General: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, PPPoE, DHCP<br>AP-only: ARP, BOOTP, DHCP, STP/RSTP (IEEE 802.1D/w) |
| Security | RADIUS |

### Firewall

| | |
|---|---|
| Filter | MAC/IP Protocol/Port-based |

### Serial Interface

| | |
|---|---|
| Console Port | RS-232 (RJ45-type) |

### LED Interface

| | |
|---|---|
| LED Indicators | PWR1, PWR2, PoE*, FAULT, STATE, SIGNAL, CLIENT, WLAN, LAN (AWK-3131A-M12-RTG only),100M (AWK-3131A-SSC-RTG only)<br>*PoE is only available for the AWK-3131A-M12-RTG |

### Input/Output Interface

| | |
|---|---|
| Digital Inputs | 2<br>+13 to +30 V for state 1<br>+3 to -30 V for state 0<br>Max. input current: 8 mA |
| Alarm Contact Channels | Relay output with current carrying capacity of 1 A @ 24 VDC |
| Buttons | Reset button |

### Physical Characteristics

| | |
|---|---|
| Housing | Metal |
| IP Rating | IP30 |
| Dimensions | 52.9 x 151.9 x 127.4 mm (2.08 x 5.98 x 5.02 in) |
| Weight | 850 g (1.87 lb) |
| Installation | DIN-rail mounting, Wall mounting (with optional kit) |

### Power Parameters

| | |
|---|---|
| Input Current | AWK-3131A-M12-RTG: 0.85 A @ 12 VDC, 0.22 A @ 48 VDC<br>AWK-3131A-SSC-RTG: 1.0 A @ 12 VDC, 0.27 A @ 48 VDC |
| Input Voltage | 12 to 48 VDC, Redundant dual inputs, 48 VDC Power-over-Ethernet |

| | |
|---|---|
| Power Connector | 1 removable 10-contact terminal block(s) |
| Power Consumption | AWK-3131A-M12-RTG: Maximum 10.5 W<br>AWK-3131A-SSC-RTG: Maximum 13 W |
| Reverse Polarity Protection | Supported |

### Environmental Limits

| | |
|---|---|
| Operating Temperature | Wide Temp. Models: -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 |
| EMI | CISPR 32, FCC Part 15B Class B |
| EMS | IEC 61000-4-2 ESD: Contact: 8 kV; Air: 15 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 |
| Railway | EN 50155, EN 50121-4 |
| Railway Fire Protection | EN 45545-2 |
| Radio | EN 301 489-1/17, EN 300 328, EN 301 893, MIC, FCC ID SLE-WAPN008, SRRC, NCC, IDA |
| Safety | UL 60950-1, IEC 60950-1, EN 60950-1 (LVD) |

### MTBF

| | |
|---|---|
| Time | AWK-3131A-M12-RTG: 552,454 hrs<br>AWK-3131A-SSC-RTG: 528,478 hrs |
| Standards | Telcordia SR332 |

### Warranty

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

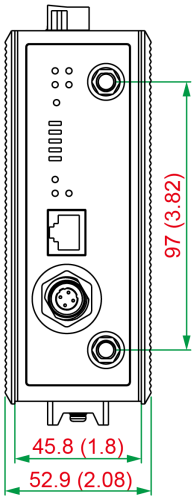
### Package Contents

| | |
|---|---|
| Device | 1 x AWK-3131A-RTG wireless AP/client |
| Installation Kit | 1 x DIN-rail kit<br>2 x cap, plastic, for RJ45 port<br>1 plastic protective cap for fiber port (AWK-3131A-SSC-RTG only)<br>1 x cable holder with screw |
| Documentation | 1 x quick installation guide<br>1 x warranty card |

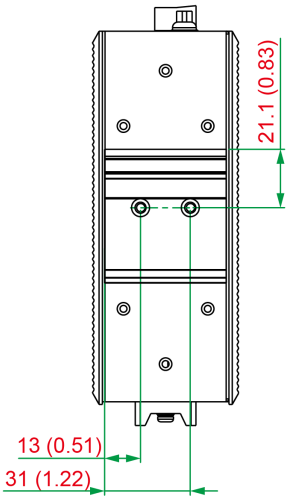
# 尺寸

### AWK-3131A-M12-RTG 型號

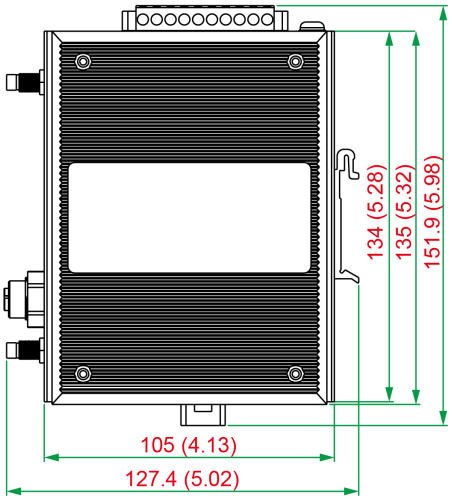
Unit: mm (inch)



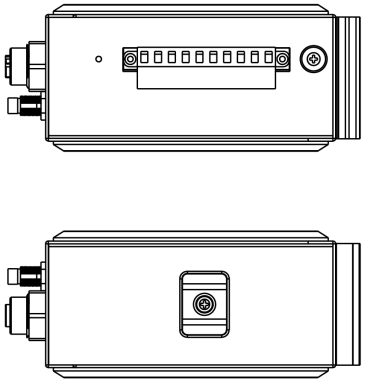

Front View




Rear View



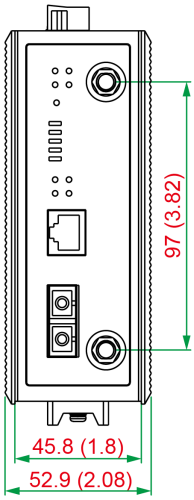

Side View



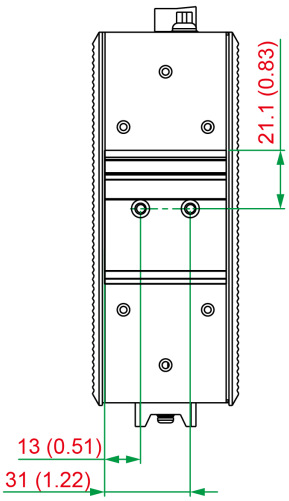
Top and Bottom Views

### AWK-3131A-SCC-RTG 型號

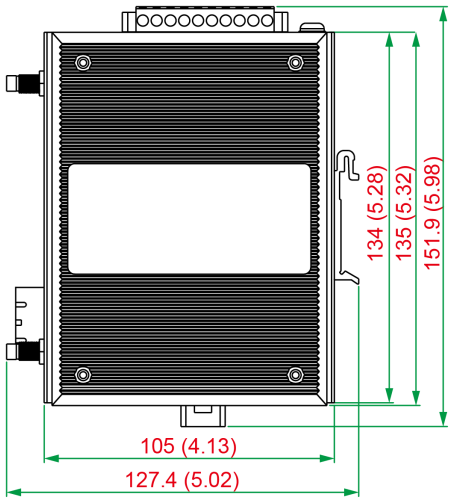
Unit: mm (inch)



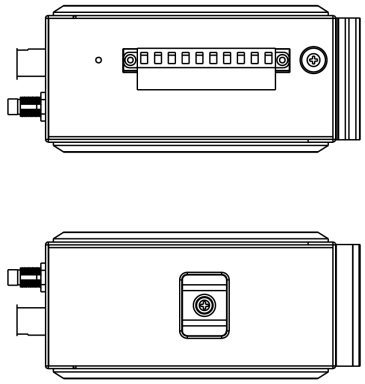

Front View




Rear View




Side View



Top and Bottom Views

# 訂購資訊

| Model Name | Band | Connector | Conformal Coating |
|---|---|---|---|
| AWK-3131A-M12-RTG-EU-T | EU | M12 | – |
| AWK-3131A-M12-RTG-US-T | US | M12 | – |
| AWK-3131A-M12-RTG-JP-T | JP | M12 | – |
| AWK-3131A-M12-RTG-EU-CT-T | EU | M12 | P |
| AWK-3131A-M12-RTG-US-CT-T | US | M12 | P |
| AWK-3131A-M12-RTG-JP-CT-T | JP | M12 | P |
| AWK-3131A-SSC-RTG-EU-T | EU | Single-mode SC | – |
| AWK-3131A-SSC-RTG-US-T | US | Single-mode SC | – |

| Model Name | Band | Connector | Conformal Coating |
|---|---|---|---|
| AWK-3131A-SSC-RTG-JP-T | JP | Single-mode SC | – |
| AWK-3131A-SSC-RTG-EU-CT-T | EU | Single-mode SC | P |
| AWK-3131A-SSC-RTG-US-CT-T | US | Single-mode SC | P |
| AWK-3131A-SSC-RTG-JP-CT-T | JP | Single-mode SC | P |

## 配件（選購）

### Wall-Mounting Kits

| | |
|---|---|
| WK-51-01 | Wall mounting kit with 2 plates (51.6 x 67 x 2 mm) and 6 screws |