



AP329

Datasheet

Aiming to create better and safer working environments and life experiences through the products we deliver.



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Cellular Router and 24V Boost PoE Switch in One LTE/Wi-Fi PoE Routing Switch for BUS/Vehicle

AP329

Industrial 8 PoE+ with 1G WAN and Dual Radio LTE/Wi-Fi Routing Switch for BUS/Vehicle

The Innovative LTE routing switch AP329 combines functionalities of LTE/Wi-Fi router and 8-Port 8~32VDC Power boost PoE+ switch for Smart Bus applications. It can also be used in roadside cabinets or other industrial applications for high-speed Wi-Fi & multi-port Ethernet ports to LTE routing. The modular design allows project customizations of enable/disable POE ports, LTE/Wi-Fi. The embedded MQTT and RESTful API enables public cloud integration such as AWS or Azure. The private cloud platform ATMS can also be setup for instant and secured access to track location and video surveillance over cloud.



High speed 4G LTE & Wi-Fi Network

- LTE Cat.4, 2x2 MIMO, 150M downlink and 50M uplink
- LTE Cat.6 with 2CA, 2T2R MIMO provides 300M downlink and 50M uplink
- 4G/3G/2G full cellular network compatibility
- Support GPS for location services
- IEEE 802.11ac compliant & backward compatible with 802.11a/b/g/n
- Selectable 5G/2.4G Wi-Fi for local coverage, up to 866Mbps bandwidth

Multiple Ethernet ports

- Supports 8x Fast Ethernet PoE+ ports, provides 100M wire-speed switching
- Supports 1x Gigabit Ethernet WAN port for uplink or NVR
- LAN Switch port to LTE or WAN port routing
- WAN to LTE Redundant

Rugged Design for Bus, Wayside Surveillance, ITS Application

- Railway EMC: EN50121-4 compliance
- IEC61000-6-2/IEC61000-6-4 heavy industrial EMC
- Vehicle: E-mark compliance
- Radio RED for CE Marking
- Emission: FCC part 15 B Class A
- Effective heat dissipation design for operating in -40~75°C environments

Extreme PoE Capability

- Provides 8-port IEEE 802.3af/at compliance PoE+, up to 30W per port
- 12/24V to 54VDC Booster PoE
- Up to 120W PoE power budget
- Complete PoE management including per-port Power Budget Control, PoE Scheduling and PoE Status

Enhanced Cyber Security for Critical Application

- Firewall for traffic classification, port forwarding
- Support NAT, DMZ for LAN protection
- Support OpenVPN, IPsec, L2TP for secure connection
- Support HTTPs/SSH secure login

Cloud Management Service

- Support Amazon AWS & Microsoft Azure cloud service
- Support proprietary ATMS cloud service
- Interactive monitoring dashboard and map shows the status, signal strength, location etc.

Management Features

- Various configuration paths, including WebGUI, CLI, SNMP, LAN Utility (AIAS), and NMS (ANMS)
- Support AIAS Utility, Remote configuration software utility
- Redundancy: WAN to LTE redundancy, wireless auto-offload
- Diagnostic tool includes Radio LED, Ping, TFTP, SNMP Trap, E-mail Alert and System Log
- LTE watchdog, auto-reconnect cellular connection
- OPCuA by request

Ordering Information

| Model Name | Description |
|----------------------------|--|
| AP329-LTE | Industrial Wireless IIoT Secure Routing Gateway,1xGbE WAN+8xFE LAN, 1xUSB, 2xSIM, WLAN, LTE-E, GPS, FDD B1/3/5/7/8/20, TDD B38/40/41, 8-32VDC, -40°C~75°C, IP30 |
| AP329-WLAN | Industrial Wireless IIoT Secure Routing Gateway,1xGbE WAN+8xFE LAN, 1xUSB, WLAN 802.11ac/n, 8-32VDC, -40°C~75°C, IP30 |
| AP329-WLAN-LTE | Industrial Wireless IIoT Secure Routing Gateway,1xGbE WAN+8xFE LAN, 1xUSB, 2xSIM, 1xeSIM, WLAN 802.11ac/n, LTE-E, GPS, FDD B1/3/5/7/8/20, TDD B38/40/41, 8-32VDC, -40°C~75°C, IP30 |
| AP329A-LTE | Industrial Wireless IIoT Secure Routing Gateway,1xGbE WAN+8xFE LAN, 3xDI,1xDO, 1xUSB, 2xSIM, WLAN, LTE-E, GPS, FDD B1/3/5/7/8/20, TDD B38/40/41, 8-32VDC, -40°C~75°C, IP30 |
| AP329A-WLAN | Industrial Wireless IIoT Secure Routing Gateway,1xGbE WAN+8xFE LAN, 3xDI,1xDO, 1xUSB, WLAN 802.11ac/n, 8-32VDC, -40°C~75°C, IP30 |
| AP329A-WLAN-LTE | Industrial Wireless IIoT Secure Routing Gateway,1xGbE WAN+8xFE LAN, 3xDI,1xDO, 1xUSB, 2xSIM, 1xeSIM, WLAN 802.11ac/n, LTE-E, GPS, FDD B1/3/5/7/8/20, TDD B38/40/41, 8-32VDC, -40°C~75°C, IP30 |
| AP329-PoE-LTE | Industrial wireless IIoT secure routing POE gateway,1xGbE WAN+8xFE LAN, 1xUSB, 2xSIM, WLAN, LTE-E, GPS, FDD B1/3/5/7/8/20, TDD B38/40/41, 8-32VDC, -40°C~75°C, IP30 |
| AP329-PoE-WLAN | Industrial wireless IIoT secure routing POE gateway1xGbE WAN+8xFE LAN, 1xUSB, WLAN 802.11ac/n, 8-32VDC, -40°C~75°C, IP30 |
| AP329-PoE-WLAN-LTE | Industrial wireless IIoT secure routing POE gateway,1xGbE WAN+8xFE LAN, 1xUSB, 2xSIM, 1xeSIM, WLAN 802.11ac/n, LTE-E, GPS, FDD B1/3/5/7/8/20, TDD B38/40/41, 8-32VDC, -40°C~75°C, IP30 |
| AP329A-PoE-LTE | Industrial wireless IIoT secure routing POE gateway,1xGbE WAN+8xFE LAN, 1xUSB, 2xSIM, 1xeSIM, WLAN 802.11ac/n, LTE-E, GPS, FDD B1/3/5/7/8/20, TDD B38/40/41, 8-32VDC, -40°C~75°C, IP30 |
| AP329A-PoE-WLAN | Industrial wireless IIoT secure routing POE gateway, 1xGbE WAN+8xFE LAN, 3xDI,1xDO, 1xUSB, WLAN 802.11ac/n, 8-32VDC, -40°C~75°C, IP30 |
| AP329A-PoE-WLAN-LTE | Industrial wireless IIoT secure routing POE gateway, 1xGbE WAN+8xFE LAN, 3xDI,1xDO, 1xUSB, 2xSIM, 1xeSIM, WLAN 802.11ac/n, LTE-E, GPS, FDD B1/3/5/7/8/20, TDD B38/40/41, 8-32VDC, -40°C~75°C, IP30 |

| Technology | |
|------------------------------------|---|
| Standard | 3GPP Release 11 Long Term Evolution (LTE), fallback 3GPP Release 7,8,9 for HSPA/UMTS IEEE 802.11ac wireless local area network (WLAN), Backward support 802.11a/b/g/n Wireless LAN IEEE 802.3 10Base-TX Ethernet IEEE 802.3u 100Base-TX Fast Ethernet IEEE 802.3ab 1000Base-T Gigabit Ethernet Copper IEEE 802.3af/at Power-over-Ethernet IEEE 802.1Q for VLAN |
| Interface | |
| Ethernet Port | LAN: 8 x 10/100Base-TX RJ45, Auto Negotiation, Auto MDI/MDI-X, IEEE 802.3af/at PoE/PoE+ WAN: 1 x 100/1000Base-T RJ45, Auto Negotiation, Auto MDI/MDI-X |
| System LED | 1 x DO: Red On 1 x Power: Green On 1 x SYS: Ready: Green On, Firmware Updating: Green Blinking 1 x WAN: Link: Green On, Activity: Green Blinking 1 x 1000M: WAN port speed, 1000M: Green On, Not 1000M: Off AP329: 3 x Radio (Ra, Rb, Rc): Reserved AP329-WLAN: 3 x Radio (Ra, Rb, Rc): Radio status Ra: Reserved Rb: Reserved Rc: AP mode: Green On, Station mode connected: Green Blinking, Station mode/radio disable: Off AP329-2xWLAN: 3 x Radio (Ra, Rb, Rc): Radio status Ra: Reserved Rb: AP mode: Green On, Station mode connected: Green Blinking, Station mode/radio disable: Off Rc: AP mode: Green On, Station mode connected: Green Blinking, Station mode/radio disable: Off AP329-LTE: 3 x Radio (Ra, Rb, Rc): Radio status Ra: SIM detected: Green On, SIM not inserted: Off Rb: 4G connection: Green On, 2/3G connection: Green blinking, Disconnected: Off Rc: Reserved AP329-WLAN+LTE: 3 x Radio (Ra, Rb, Rc): Radio status Ra: SIM detected: Green On, SIM not inserted: Off Rb: 4G connection: Green On, 2/3G connection: Green blinking, Disconnected: Off Rc: AP mode: Green On, Station mode connected: Green Blinking, Station mode/radio disable: Off |
| Ethernet Port LED | Link: Green On, Activity: Green Blinking, PoE power feeding: Amber on, PoE power not feeding: Off |
| USB | 1 x USB for Configuration/Firmware Update |
| Reset | System Reset(2~6 Seconds) / Default Settings Reset(over 7 Seconds) |
| SMA Connector | Up to 5x RP-SMA Female, check product interface for installation (Page2) |
| SIM Socket | AP329-LTE/AP329-WLAN+LTE: 2x Nano SIM tray with redundancy |
| Power Input, Digital Output | 4-Pin Removable Terminal Block Connector 2 Pin for Power Input 2 Pin for DO (Relay Alarm) DO: Dry Relay Output with 0.5A/24V DC |
| Optional Expansion Board | RS232/422/485, Digital Input/Digital Output, MicroSD card for field application |
| Cellular Properties (LTE Cat. 4) | |
| Standard | GSM/GPRS/EDGE 3GPP Release 6 UMTS/HSPA 3GPP Release 8 LTE 3GPP Release 11 |
| Data Rate | GPRS: DL: max. 85.6 kbps, UL: max. 85.6 kbps EDGE: DL: max. 236.8 kbps, UL: max. 236.8 kbps HSPA: DL: max. 42 Mbps, UL: max. 5.76 Mbps LTE-FDD Cat.4: DL: max. 150 Mbps, UL: max. 50 Mbps, 2x2 DL MIMO LTE-TDD Cat.4: DL: max. 130 Mbps, UL: max. 35 Mbps, 2x2 DL MIMO |
| Band Information: LTE-E | LTE: FDD B1/B3/B5/B7/B8/B20 (2100/1800/850/2600/900/800MHz) LTE: TDD B38/B40/B41 (2600/2300/2500MHz) WCDMA: FDD B1/B5/B8 (2100/850/900MHz) GSM: B3/B8 (1800/900MHz) |

| | | | | | | | | |
|--|--|------------------|-----------------|-----------------|---|------------------|-----------------|-----------------|
| Band Information: LTE-AU | LTE: FDD B1/B2/B3/B4/B5/B7/B8/B28 (2100/1900/1800/1700/850/2600/900/700MHz) LTE: TDD B40 (2300MHz) WCDMA: FDD B1/B2/B5/B8 (2100/1900/850/900MHz) GSM: B2/B3/B5/B8 (1900/1800/850/900MHz) | | | | | | | |
| Band Information: LTE-U | FDD LTE: B2/B4/B12 (1900/1700/700MHz) WCDMA: B2/B4/B5 (1900/1700/850MHz) | | | | | | | |
| Band Information: LTE-CN | LTE FDD: B1/B3/B5/B8 (2100/1800/850/900MHz) LTE TDD: B38/B39/B40/B41 (2600/1900/2300/2500MHz) TD-SCDMA: B34/B39 (2000/1900MHz) WCDMA: B1/B8 (2100/900MHz) CDMA: BCO GSM: 900/1800MHz | | | | | | | |
| Band Information: LTE-V (Verizon Certified) | FDD LTE: B4/B13 (1700/700MHz) | | | | | | | |
| Cellular Properties (LTE Cat. 6) | | | | | | | | |
| Standard | UMTS/HSPA 3GPP Release 8 LTE 3GPP Release 12 (LTE Cat.6) | | | | | | | |
| Data Rate | TD-SCDMA: DL Max 4.2Mbps, UL: Max 2.2Mbps HSPA: DL: Max. 42 Mbps, UL: Max. 5.76 Mbps WCDMA: DL: Max 384Kbps, UL: Max 384Kbps LTE-FDD: DL: Max. 300 Mbps, UL: Max. 50 Mbps, 2x2 DL MIMO LTE-TDD: DL: Max. 226 Mbps, UL: Max. 28 Mbps, 2x2 DL MIMO | | | | | | | |
| Band Information: LTE-E | LTE-FDD: B1/B3/B5/B7/B8/B20/B28/B32 (2100/1800/850/2600/900/800/700/1500MHz) LTE-TDD: B38/B40/B41 (2600/2300/2500MHz) WCDMA: B1/B3/B5/B8 (2100/1800/850/900MHz) | | | | | | | |
| Band Information: LTE-U | LTE-FDD: B2/B4/B5/B7/B12/B13/B17/B25/B26/B29/B30/B66 (1900/1700/700/2600/700/700/1900/850/700/2300/1700MHz)) LTE-TDD: B41 (2500MHz) WCDMA: B2/B4/B5 (1900/1700/850MHz) | | | | | | | |
| Band Information: LTE-AP | LTE-FDD: B1/B3/B5/B7/B8/B18/B19/B21/B26 (2100/1800/850/2600/900/850/850/1500/850MHz) LTE-TDD: B38/B39/B40/B41 (2600/1900/2300/2500MHz) WCDMA: B1/B5/B6/B8/B9/B19 (2100/850/UMTS only/900/1800/850MHz) TD-SCDMA: B39 (1900MHz) | | | | | | | |
| Wi-Fi Properties | | | | | | | | |
| Standard | IEEE 802.11ac/a/b/g/n (2T2R) 802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM) | | | | | | | |
| Data Rate | 802.11ac: MCS0 ~ 9, max. 866Mbps 802.11b: 11Mbps / 802.11a/g: 54Mbps / 802.11n: MCS0 ~ 15, max. 300Mbps | | | | | | | |
| Frequency | IISM Band, 2.412GHz ~ 2.472GHz, 5.180MHz ~ 5.825MHz(Band 1,4) | | | | | | | |
| MIMO | 2T2R, 2xAntennas (Optional Accessory) | | | | | | | |
| RSSI | ≤20db, compliant with CE request | | | | | | | |
| Output Power & Receive Sensitivity | Operating Frequency: 2.412~2.472GHz | | | | Operating Frequency: 5.180G~5.825GHz Max. MIMO: 2T2R | | | |
| | Standard | Bandwidth | TX (dBm) | RX (dBm) | Standard | Bandwidth | TX (dBm) | RX (dBm) |
| | 802.11b | 1Mbps | 20 | -95 | 802.11a | 6Mbps | 20 | -94 |
| | | 11Mbps | 20 | -90 | | 54Mbps | 15 | -80 |
| | 802.11g | 6Mbps | 21 | -94 | 802.11an/ac HT20 | MCS0 | 19 | -93 |
| | | 54Mbps | 18 | -80 | | MCS8 | 13 | -71 |
| | 802.11n HT20 | MCS0 | 21 | -93 | 802.11an/ac HT40 | MCS0 | 18 | -90 |
| | | MCS7 | 16 | -76 | | MCS9 | 13 | -66 |
| | 802.11n HT40 | MCS0 | 20 | -92 | 802.11an/ac HT80 | MCS0 | 18 | -88 |
| | | MCS7 | 16 | -73 | | MCS9 | 13 | -65 |

| GPS Properties | |
|---|---|
| GNSS | GPS/GLONASS/BeiDou/Galileo |
| Performance | Cold start: 18s, Warm start: 2.2s, Hot start: 1.8s |
| Sensitivity | Cold start: -146dBm, Reacquisition: -157dBm, Tracking: -157dBm |
| Accuracy | <1.5M |
| GNSS Frequency | GPS/Galileo: 1575.42±1.023 MHz GLONASS: 1597.5~1605.8 MHz BeiDou: 1561.098±2.046 MHz |
| Antenna (Optional Accessory- A-GPS-27-RSM-3M) | Frequency range: 1561~1615MHz Polarization: RHCP or linear VSWR: <2 (Typ.) Passive antenna gain: >0dBi |
| Software | |
| Management Interface | CGI WebGUI, Command Line Interface (CLI), Telnet, SNMP |
| User Management | Radius client, TACACS+, Multi-User Authentication |
| Time Management | SNTP, Cellular Time |
| IoT | AWS Agent, Azure Agent, ThingsMaster Agent |
| Network Management | 802.1Q VLAN, IPv4/IPv6, DDNS, SNMP v1/v2c/v3/Trap, MIB II, Entity MIB, MIBs, DHCP server/client, DHCP relay*, TFTP, System Log, ARP response over 802.2 LLC SNAP, Proxy ARP, DNS (client/proxy) |
| Traffic Management | NAT Routing, Traffic shaping, 1:1 NAT, NAPT(SNAT/DNAT) |
| Routing | RIPv2*, Static Route |
| Security | Firewall, DMZ, Port Forwarding, HTTPs, SSH. First login password management |
| Redundancy Protocol | WAN/LTE Redundancy, VRRP |
| VPN | IPsec, OpenVPN, L2TP, GRE |
| Cellular Configuration | Radio on/off, 4G LTE/3G HSPA Configuration, SIM Security, Connection Status, Cellular to Eth-WAN Redundancy, GPS positioning |
| WLAN Configuration | WLAN Basic Settings: Radio on/off, 2.4G 11n/5G 11ac Band and Frequency selection, SSID/Multi-SSID configuration, SSID broadcast, Cellular to WLAN Auto Offload and advanced WLAN settings, 802.1X |
| Utility | AIAS, ANMS, Ping, Traceroute |
| Power Requirement | |
| Input Voltage | Model with PoE: 12/24VDC (8~32VDC with booster to 54V) min. 8V low-peak auxiliary voltage Model without PoE: 12/24VDC (8~32VDC) |
| Reverse Polarity Protect | Yes |
| Input Current | AR329P: 5.67A@24VDC, 10.76A@8VDC/60W\ |
| Power Consumption | Max. 4.8W@24VDC full traffic without PD loading, suggest to reserve 15% tolerance |
| PoE | |
| Power forwarding mode | Alternative A |
| PoE Power Budget | System: Max. 120W@70°C/12VDC, Max.60W@70°C/8VDC Per Port: Max. 30W |
| PoE Standard | IEEE 802.3af/at |
| Management | PoE Enable/Disable, System/Port Power Budget Control, PD Alive Check, PoE Scheduling, PoE Status |
| Mechanical | |
| Installation | Wall mount |
| Enclosure Material | Steel Metal with Aluminum |
| Dimension | Model with PoE: 200x 55 x 126 (W x H x D) / without Mounting Clip Model without PoE: 200x 51 x 126 (W x H x D) / without Mounting Clip |
| Ingress Protection | IP30 |
| Weight | ~1350g without package |

| Environmental | |
|---|---|
| Operating Temperature & Humidity | -40°C~75°C , 5%~95% Non- Condensing |
| Storage Temperature | -40°C~85°C |
| MTBF | >200,000 hours |
| Warranty | 5 years |
| Approval | |
| Safety | EN60950-1 Compliance |
| EMC | EN61000-6-2/EN61000-6-4 |
| EMI | CISPR 22, FCC part 15B Class A |
| Radio | RED Compliance Safety: EN 62368-1 EN 50385/EN62311 MPE assessment EN 301 489-1/17/19/52, EN 55032/55024 EN 300 328/EN 301 893 EN 301 908-1 FCC Part 15B |
| Railway | EN50121-4 Compliance |



Function interface

| | AP329-LTE | AP329-WLAN | AP329-2xWLAN | AP329-WLAN+LTE |
|-------|-----------|------------|--------------|----------------|
| ANT 1 | LTE-Main | Wi-Fi 1 | Wi-Fi 1 | LTE-Main |
| ANT 2 | LTE-Aux | Wi-Fi 2 | Wi-Fi 2 | LTE-Aux |
| ANT 3 | GPS | - | - | GPS |
| ANT 4 | - | - | Wi-Fi 1 | Wi-Fi 1 |
| ANT 5 | - | - | Wi-Fi 2 | Wi-Fi 2 |

Outstanding Heat Sink

- Industrial Fin-Type Design

System LED

- 1 x DO
- 1 x Power
- 1 x System Status
- 3 x Radio status
- 1 x Ethernet Port (Port 9)
- 1 x Speed (Port 9)



Gigabit Ethernet WAN

- 1-port 100/1000M RJ45

SMA Antenna Socket

- Up to 5 SMA

Integrated Power Connector

- 1 x 4-pin terminal block
- 2 pin booster power input
- 2 pin DO
- Easy installation

PoE Power Feeding

- 8-port 10/100M PoE RJ45
- IEEE 802.3af/at

USB Extension Port

- USB for Configuration/Firmware update
- External Storage



Installation dimensions

Unit: $\frac{\text{inch} \pm 0.040}{[\text{mm}] \pm 1.00}$

