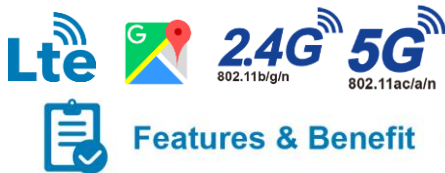


Cellular Router and 24V Boost PoE Switch in One LTE/WiFi PoE Routing Switch for BUS/Vehicle

WR329P Series

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

The Innovative LTE routing switch WR329P series combines functionalities of LTE/WiFi 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/WiFi. The embedded MQTT and RESTful API enables public cloud integration such as AWS or Azure. The private cloud platform ThingsMaster can also be setup for instant and secured access to track location and video surveillance over cloud.



PoE+ Emark



Features & Benefit

High Throughput Wireless Performance

- LTE Cat.4, 2x2 MIMO, 150M downlink and 50M uplink
- 4G/3G/2G full cellular network compatibility
 - LTE-E: FDD B1/3/5/7/8/20; TDD B38/40/41
 - LTE-AU: FDD B1/B2/B3/B4/B5/B7/B8/B28; TDD B40
 - LTE-CN: FDD B1/3/5//8; TDD B38/39/40/41
 - LTE-U: FDD B2/B4/B12
- 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 for secure connection
- Support HTTPs/SSH secure login

Cloud Management over ThingsMaster

- Interactive monitoring dashboard and map shows the status, signal strength, and location of all WR series deployed
- Supports over-the-air batch device registration, configuration and firmware update
- Set alerts on critical events to prevent downtime (i.e signal strength is too low or temperature is too high)

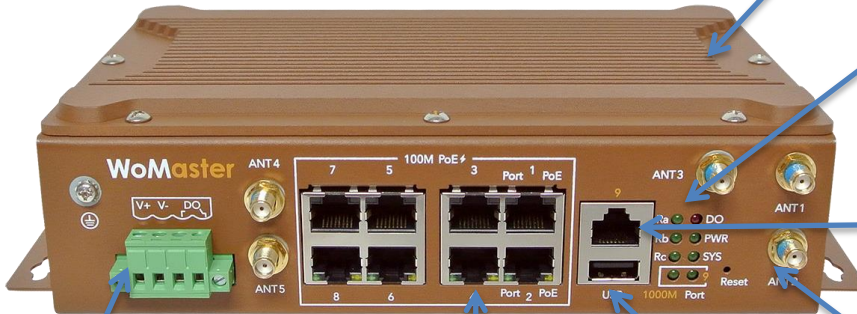
Management Features

- Various configuration paths, including WebGUI, CLI, SNMP, LAN Utility (ViewMaster), and NMS (NetMaster)
- Support ViewMaster 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



Interfaces

	WA329 2xWLAN	WR329/329P- WLAN+LTE	WR329/329P- 2xLTE
ANT 1	Wi-Fi 1	LTE-Main	LTE-Main
ANT 2	Wi-Fi 2	LTE-Aux	LTE-Aux
ANT 3	-	GPS	GPS
ANT 4	Wi-Fi 1	Wi-Fi 1	LTE-Main
ANT 5	Wi-Fi 2	Wi-Fi 2	LTE-Aux



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

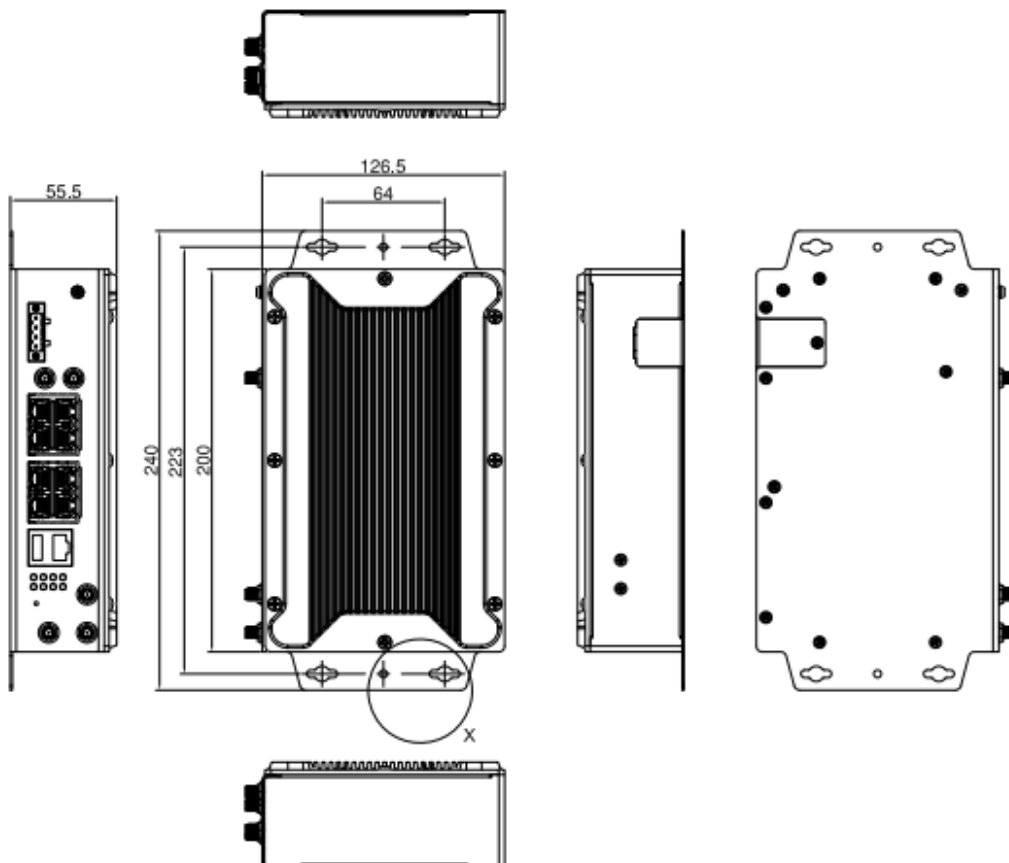
USB Extension Port

- USB for Configuration/Firmware update
- External Storage



Dimensions

(mm)



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
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 WR309/WR309P: 3 x Radio (Ra, Rb, Rc): Reserved WR329-WLAN+LTE/WR329P-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 WR329-2xLTE/WR329P-2xLTE: 3 x Radio (Ra, Rb, Rc): Radio status Ra: SIM1 and 2 detected: Green On, SIM1 or 2 detected: Green Blinking, SIM 1 and 2 not inserted: Off Rb: LTE1: 4G connection: Green On, 2/3G connection: Green blinking, Disconnected: Off Rc: LTE2: 4G connection: Green On, 2/3G connection: Green blinking, Disconnected: 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, 4 for Wi-Fi/ LTE, 1x GPS
SIM Socket	WR329-WLAN+LTE/WR329P-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, by request
Cellular Properties	
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-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: BC0 GSM: 900/1800MHz

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
RSSI	≤ 20db, compliant with CE request

Output Power & Receive Sensitivity

Operating Frequency: 2.412~2.472GHz

Standard	Bandwidth	TX (dBm)	RX (dBm)
802.11b	1Mbps	20	-95
	11Mbps	20	-90
802.11g	6Mbps	21	-94
	54Mbps	18	-80
802.11n HT20	MCS0	21	-93
	MCS7	16	-76
802.11n HT40	MCS0	20	-92
	MCS7	16	-73

Operating Frequency: 5.180G~5.825GHz
Max. MIMO: 2T2R

Standard	Bandwidth	TX (dBm)	RX (dBm)
802.11a	6Mbps	20	-94
	54Mbps	15	-80
802.11an/ac HT20	MCS0	19	-93
	MCS8	13	-71
802.11an/ac HT40	MCS0	18	-90
	MCS9	13	-66
802.11an/ac HT80	MCS0	18	-88
	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	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
Network Time Management	SNTP, Cellular Time
Network Management	IPv4/IPv6, DDNS, SNMP v1/v2c/v3/Trap, MIBs, DHCP server/client, TFTP, System Log
Traffic Management	NAT Routing, Traffic shaping
Security	Firewall, DMZ, Port Forwarding, HTTPs, SSH
Redundancy Protocol	WAN/LTE Redundancy
VPN	IPsec, OpenVPN
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
Power Requirement	
Input Voltage	WR309P/WR329P: 12/24VDC (8~32VDC with booster to 54V) min. 8V low-peak auxiliary voltage WR309/WR329: 12/24VDC (8~32VDC)
Reverse Polarity Protect	Yes
Input Current	WR309P/WR329P: 5.67A@24VDC, 10.76A@8VDC/60W WR309/WR329: 0.2A@24VDC
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	WR309P/WR329P series: 200x 55 x 126 (W x H x D) / without Mounting Clip WR309/WR329 series: 200x 51 x 126 (W x H x D) / without Mounting Clip
Ingress Protection	IP31
Weight	≈ 1.4Kg (TBD)
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

Model Name	Description
WR309	Industrial 8+1G port Routing Switch
WR309P	Industrial 8+1G port PoE Routing Switch
WA329	Industrial 8+1G port Wireless AP/Client, Dual 802.11ac/n WLAN
WA329P	Industrial 8+1G port PoE Wireless AP/Client, Dual 802.11ac/n WLAN
WR329-WLAN+LTE-E	Industrial 8+1G port Cellular Ethernet Routing Switch, 802.11ac/n WLAN, LTE-E, 2SIM, GPS, FDD B1/3/5/7/8/20, TDD B38/40/41
WR329-WLAN+LTE-CN	Industrial 8+1G port Cellular Ethernet Routing Switch, 802.11ac/n WLAN, LTE-CN, 2SIM, GPS, FDD B1/B3/B5/B8, TDD B38/B39/B40/B41
WR329-WLAN+LTE-U	Industrial 8+1G port Cellular Ethernet Routing Switch, 802.11ac/n WLAN, LTE-U, 2SIM, GPS, FDD B2/4/12, B2/B4/B5@WCDMA
WR329P-WLAN+LTE-E	Industrial 8+1G port Cellular PoE Routing Switch, 802.11ac/n WLAN, LTE-E, 2SIM, GPS, FDD B1/3/5/7/8/20, TDD B38/40/41
WR329P-WLAN+LTE-CN	Industrial 8+1G port Cellular PoE Routing Switch, 802.11ac/n WLAN, LTE-CN, 2SIM, GPS, FDD B1/B3/B5/B8, TDD B38/B39/B40/B41
WR329P-WLAN+LTE-U	Industrial 8+1G port Cellular PoE Routing Switch, 802.11ac/n WLAN, LTE-U, 2SIM, GPS, FDD B2/4/12, B2/B4/B5@WCDMA
*WR329-2xLTE-E	Industrial 8+1G port Cellular Ethernet Routing Switch, LTE-E, FDD B1/3/5/7/8/20, TDD B38/40/41
*WR329-2xLTE-CN	Industrial 8+1G port Cellular Ethernet Routing Switch, LTE-CN, FDD B1/B3/B5/B8, TDD B38/B39/B40/B41
*WR329-2xLTE-U	Industrial 8+1G port Cellular Ethernet Routing Switch, LTE-U, FDD B2/4/12, B2/B4/B5@WCDMA
*WR329P-2xLTE-E	Industrial 8+1G port Cellular PoE Routing Switch, LTE-E, FDD B1/3/5/7/8/20, TDD B38/40/41
*WR329P-2xLTE-CN	Industrial 8+1G port Cellular PoE Routing Switch, LTE-CN, FDD B1/B3/B5/B8, TDD B38/B39/B40/B41
*WR329P-2xLTE-U	Industrial 8+1G port Cellular PoE Routing Switch, LTE-U, FDD B2/4/12, B2/B4/B5@WCDMA
Package List	
1 x Product Unit	
1 x 4-pin Removable Terminal Block Connector	
1 x Quick Installation Guide	

*By request

Model Name	Radio 1	Radio 2	Eth-WAN	Eth-LAN	USB	SIM	eSIM (Optional)	GPS	Power Input	Dimension (W x H x D)
WR309	--	--	1xGbE	8xFE	1	0	--	--	8-32V	200x 51 x 126
WR309P	--	--	1xGbE	8xFE PoE	1	0	--	--	8-32V	200x 55 x 126
WA329	802.11ac	802.11ac	1xGbE	8xFE	1	0	--	--	8-32V	200x 51 x 126
WA329P	802.11ac	802.11ac	1xGbE	8xFE PoE	1	0	--	--	8-32V	200x 55 x 126
WR329-WLAN+LTE	802.11ac	LTE	1xGbE	8xFE	1	2	1	Yes	8-32V	200x 51 x 126
WR329P-WLAN+LTE	802.11ac	LTE	1xGbE	8xFE PoE	1	2	1	Yes	8-32V	200x 55 x 126
*WR329-2xLTE	LTE	LTE	1xGbE	8xFE	1	2	1	Yes	8-32V	200x 51 x 126
*WR329P-2xLTE	LTE	LTE	1xGbE	8xFE PoE	1	2	1	Yes	8-32V	200x 55 x 126

*By request