

## 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 and Intelligent LTE routing switch WR329P series is designed to combine functionalities of LTE/WiFi router and 8-Port power boost PoE+ switch for Smart Bus applications. It can also be used in roadside cabinets or other industrial applications for ultra-resilient high-speed Wi-Fi & multi-port Ethernet ports to LTE routing. The flexible modular design allows project customizations of enable/disable POE ports, LTE/WiFi, or add serial /IO ports. Wide Temperature and Ruggedized design allows convenient deployment in existing infrastructure under the harsh conditions.



### 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
- 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

#### 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

#### Management Features

- Various configuration paths, including WebGUI, CLI and SNMP
- Support ViewMaster Utility, Remote configuration software utility and NetMaster NMS System
- Redundancy: Supports WAN to LET redundancy, wireless auto-offload
- LLDP topology discovery
- Diagnostic tool includes Radio LED, Ping, TFTP, SNMP Trap, E-mail Alert and System Log
- LTE watchdog, auto-reconnect cellular connection
- OPCuA, Cloud monitoring by request

#### Rugged Design for Bus, Wayside Surveillance, ITS Application

- Railway EMC: EN50121-4 compliance
- IEC61000-6-2/IEC61000-6-4 heavy industrial EMC
- ITS/Traffic Control: NEMA-TS2 compliance
- 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

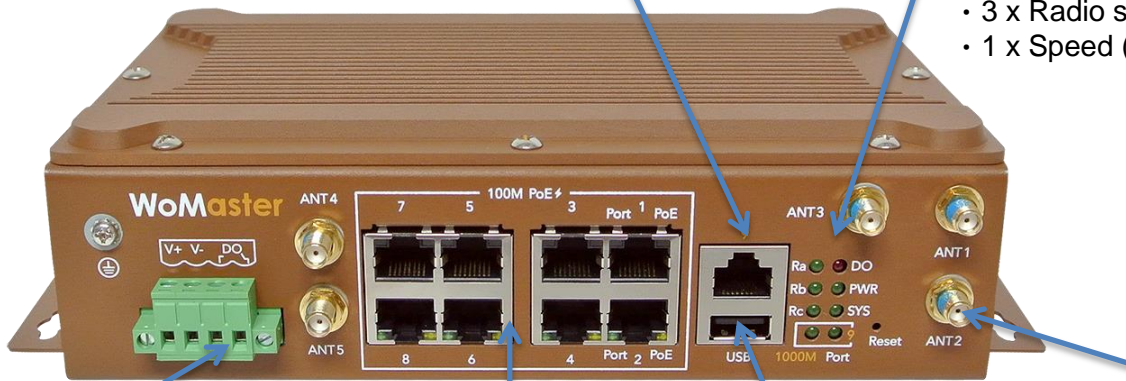


## Interfaces

**Gigabit Ethernet WAN**  
 • 1-port 100/1000M RJ45

### System LED

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



### 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

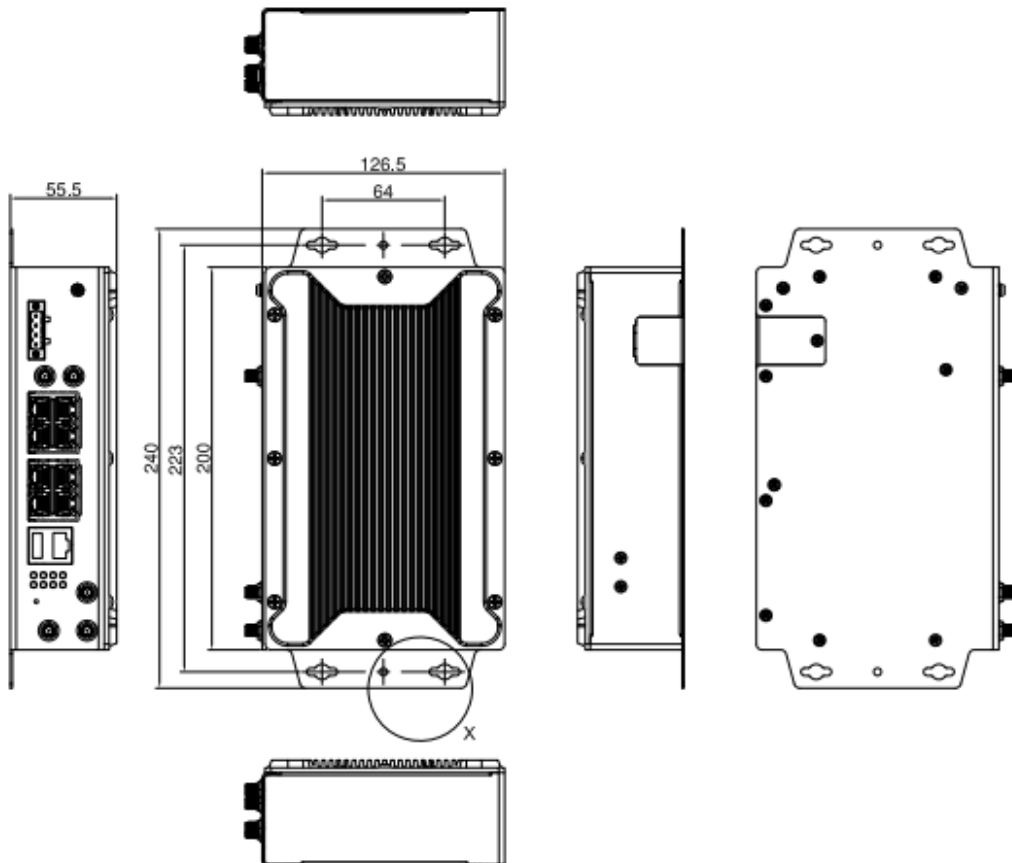
### USB Extension Port

- USB for Configuration/Firmware update
- External Storage



## Dimensions

(mm)



Technology	
<b>Standard</b>	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 802.11n/g/a/b 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	
<b>Ethernet Port</b>	LAN: 8 x 10/100Base-TX RJ45, Auto Negotiation, IEEE 802.3af/at PoE/PoE+ WAN: 1 x 100/1000Base-T RJ45, Auto Negotiation
<b>System LED</b>	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 <b>WR309/WR309P:</b> 3 x Radio (Ra, Rb, Rc): Reserved <b>WR329-WLAN+LTE/WR329P-WLAN+LTE:</b> 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 <b>WR329-2xLTE/WR329P-2xLTE:</b> 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
<b>Ethernet Port LED</b>	Link: Green On, Activity: Green Blinking, PoE power feeding: Amber on, PoE power not feeding: Off
<b>Reset</b>	System Reset(2~6 Seconds) / Default Settings Reset(over 7 Seconds)
<b>SMA Connector</b>	Up to 5: 4 x RP-SMA Female, 4 for Wi-Fi/ LTE, 1x GPS
<b>SIM Socket</b>	<b>WR329-WLAN+LTE/WR329P-WLAN+LTE:</b> 2x Nano SIM tray with redundancy <b>WR329-2xLTE/WR329P-2xLTE:</b> 2x Nano SIM tray: use 1 for each LTE module *Optional 1x ESIM redundancy for 1 LTE module
<b>Power Input, Digital Output</b>	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
<b>Optional Expansion Board</b>	RS232/422/485, Digital Input/Digital Output, MicroSD card for field application, by request

## Cellular Properties

<b>Standard</b>	GSM/GPRS/EDGE 3GPP Release 6 UMTS/HSPA 3GPP Release 8 LTE 3GPP Release 11
<b>Data Rate</b>	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
<b>Band Information: LTE-E</b>	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)
<b>Band Information: LTE-U</b>	FDD LTE: B2/B4/B12 (1900/1700/700MHz) WCDMA: B2/B4/B5 (1900/1700/850MHz)
<b>Band Information: LTE-CN</b>	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

<b>Standard</b>	IEEE 802.11ac/a/b/g/n (2T2R) 802.11ac: OFDM (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM)
<b>Data Rate</b>	802.11ac: MCS0 ~ 9, max. 866Mbps 802.11b: 11Mbps / 802.11a/g: 54Mbps / 802.11n: MCS0 ~ 15, max. 300Mbps
<b>Frequency</b>	IISM Band, 2.412GHz ~ 2.472GHz, 5.180MHz ~ 5.825MHz(Band 1,4)
<b>MIMO</b>	2T2R, 2xAntennas
<b>RSSI</b>	≤ 20db, compliant with CE request

<b>Output Power &amp; Receive Sensitivity</b>	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	
<b>GNSS</b>	GPS/GLONASS/BeiDou/Galileo
<b>Performance</b>	Cold start: 18s, Warm start: 2.2s, Hot start: 1.8s
<b>Sensitivity</b>	Cold start: -146dBm, Reacquisition: -157dBm, Tracking: -157dBm
<b>Accuracy</b>	<1.5M
<b>GNSS Frequency</b>	GPS/Galileo: 1575.42±1.023 MHz GLONASS: 1597.5~1605.8 MHz BeiDou: 1561.098±2.046 MHz
<b>Antenna</b>	Frequency range: 1561~1615MHz Polarization: RHCP or linear VSWR: <2 (Typ.) Passive antenna gain: >0dBi
Software	
<b>Management Interface</b>	CGI WebGUI, Command Line Interface (CLI), Telnet, SNMP
<b>Network Time Management</b>	SNTP, Cellular Time
<b>Network Management</b>	IPv4/IPv6, DDNS, SNMP v1/v2c/v3/Trap, MIBs, LLDP, DHCP server/client, TFTP, System Log
<b>Traffic Management</b>	NAT Routing, Traffic Control
<b>Security</b>	Firewall, DMZ, Port Forwarding, HTTPs, SSH
<b>Redundancy Protocol</b>	WAN/LTE Redundancy
<b>VPN</b>	IPsec, OpenVPN
<b>Cellular Configuration</b>	Radio on/off, 4G LTE/3G HSPA Configuration, SIM Security, Connection Status, Cellular to Eth-WAN Redundancy, GPS positioning
<b>WLAN Configuration</b>	WLAN Basic Settings: Radio on/off, 2.4G 11n/5G 11ac Band and Frequency selection, SSID/Multi-SSID configuration, SSID broadcast, VLAN ID, WLAN to LAN Link fault pass-through, Cellular to WLAN Auto Offload and advanced WLAN settings, 802.1X
Power Requirement	
<b>Input Voltage</b>	<b>WR329P:</b> 12/24VDC (8~32VDC with booster to 54V) min. 8V low-peak auxiliary voltage <b>WR329:</b> 12/24VDC (8~32VDC)
<b>Reverse Polarity Protect</b>	Yes
<b>Input Current</b>	<b>WR329P:</b> 5.5A@24VDC, 11A@12VDC, <15A@8VDC <b>WR329:</b> 0.5A@24VDC
<b>Power Consumption</b>	Max. 12W@24VDC full traffic without PD loading, suggest to reserve 15% tolerance
PoE	
<b>Power forwarding mode</b>	Alternative A
<b>PoE Power Budget</b>	System: Max. 120W@70°C/24VDC, Max.60W@70°C/8VDC Per Port: Max. 30W
<b>PoE Standard</b>	IEEE 802.3af/at
<b>Management</b>	PoE Enable/Disable, System/Port Power Budget Control, PD Alive Check, PoE Scheduling, PoE Status
Mechanical	
<b>Installation</b>	Wall mount
<b>Enclosure Material</b>	Steel Metal with Aluminum
<b>Dimension</b>	<b>WR329P series:</b> 200x 55 x 126 (W x H x D) / without Mounting Clip <b>WR329 series:</b> 200x 51 x 126 (W x H x D) / without Mounting Clip
<b>Ingress Protection</b>	IP31
<b>Weight</b>	≈ 1.4Kg (TBD)

## Environmental

<b>Operating Temperature &amp; Humidity</b>	-40°C~75°C , 5%~95% Non- Condensing
<b>Storage Temperature</b>	-40°C~85°C
<b>MTBF</b>	>200,000 hours
<b>Warranty</b>	5 years

## Approval

<b>Safety</b>	EN60950-1 Compliance
<b>EMC</b>	EN61000-6-2/EN61000-6-4
<b>EMI</b>	CISPR 22, FCC part 15B Class A
<b>Radio</b>	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
<b>Traffic Control</b>	NEMA-TS2 Compliance
<b>Railway</b>	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, 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, 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, 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, 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, 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, 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
<b>Package List</b>	
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
WR309	--	--	1xGbE	8xFE	1	0	--	--	8-32V
WR309P	--	--	1xGbE	8xFE PoE	1	0	--	--	8-32V
WA329	802.11ac	802.11ac	1xGbE	8xFE	1	0	--	--	8-32V
WA329P	802.11ac	802.11ac	1xGbE	8xFE PoE	1	0	--	--	8-32V
WR329-WLAN+LTE	802.11ac	LTE	1xGbE	8xFE	1	2 Redundant	1	Yes	8-32V
WR329P-WLAN+LTE	802.11ac	LTE	1xGbE	8xFE PoE	1	2 Redundant	1	Yes	8-32V
WR329-2xLTE	LTE	LTE	1xGbE	8xFE	1	2 Concurrent	1	Yes	8-32V
WR329P-2xLTE	LTE	LTE	1xGbE	8xFE PoE	1	2 Concurrent	1	Yes	8-32V