

# Secured and Rugged WLAN Router for IIoT WR312G-WLAN Series

## Industrial Secure Router

The innovative Industrial Secure Router WR312G Series is designed for IIoT applications using WLAN networks. Dual RS232/422/485 ports with Modbus support brings sensor and meter data to cloud wirelessly. The WR312G router supports WLAN auto offload to guarantee continuous connections. To safeguard cybersecurity, security features such as Firewall, OpenVPN, GRE tunnel are supported. The embedded MQTTS, CoAP and RESTful API enables instant public cloud integration such as AWS or Azure. The private cloud platform ThingsMaster and ThingsMaster OTA can also be set up for an instant and secured access to receive data or manage devices remotely.



### Features & Benefits

#### High speed Wi-Fi Network

- 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

#### Serial Communication & High Throughput Data Switching

- Dual serial ports with RS232/422/485 full functions for serial over Wi-Fi/Ethernet data switching
- 2-port Gigabit Ethernet supports routing and bridging mode
- Close to wire-speed NAT routing performance
- Hardware NAT for CPU utilization saving

#### Dynamic Routing with Redundancy Protection

- RIPv1&v2, OSPFv1&v2 for intra-domain routing within an autonomous system
- Efficient unicast/multicast\* static routing
- VRRP guarantees sustainable routing in a single point of failure

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

- EN50121-4 railway trackside EMC certificate design for Industrial IoT, ITS applications
- Operating in -40~75°C environments
- CE Marking
- IEC61000-6-2/IEC61000-6-4 heavy industrial EMC compliance

#### Enhanced Cyber Security & Redundancy

- Firewall for inbound/outbound traffic
- OpenVPN (server/client), and IPSec support AES256 for secure remote connection
- L2TP with PPP, PAP, CHAP (LCP, IPCP)
- GRE tunnel; HTTPs/SSH secure login
- TACACS+ multi-user authentication
- RSTP spanning tree protocol

#### Industrial IoT LAN & Cloud Management

- Embedded Amazon AWS & Microsoft Azure cloud service
- Various configuration paths, including CGI WebGUI, CLI, SNMP and RMON\*
- 1:1 NAT, port forwarding and NAPT for local traffic protection; ARP response over 802.2 LLC SNAP
- Support SNMPv3 and entity-MIB (RFC4133), MIB II (RFC1213); NTP v3 time management

**NetMaster:** Network Management System with VLAN visualization\* and ERPS\* Ring

**ViewMaster:** Configuration Management

**ThingMaster:** Interactive monitoring dashboard to collect data from field devices

**ThingMaster OTA:** Realtime map showing the status, signal strength, location of the remote devices, over-the air batch device registration, configuration and firmware upgrade\*, alerts on critical events to prevent downtime

- Support MQTTS/CoAP protocol, ready to use AWS/Azure and Private Cloud Agent for cloud management
- LLDP\* for topology control, auto-topology drawing
- USB for easy field configuration and firmware update
- Diagnostic tool includes Ping, TFTP, SNMP Trap, E-mail Alert and System Log

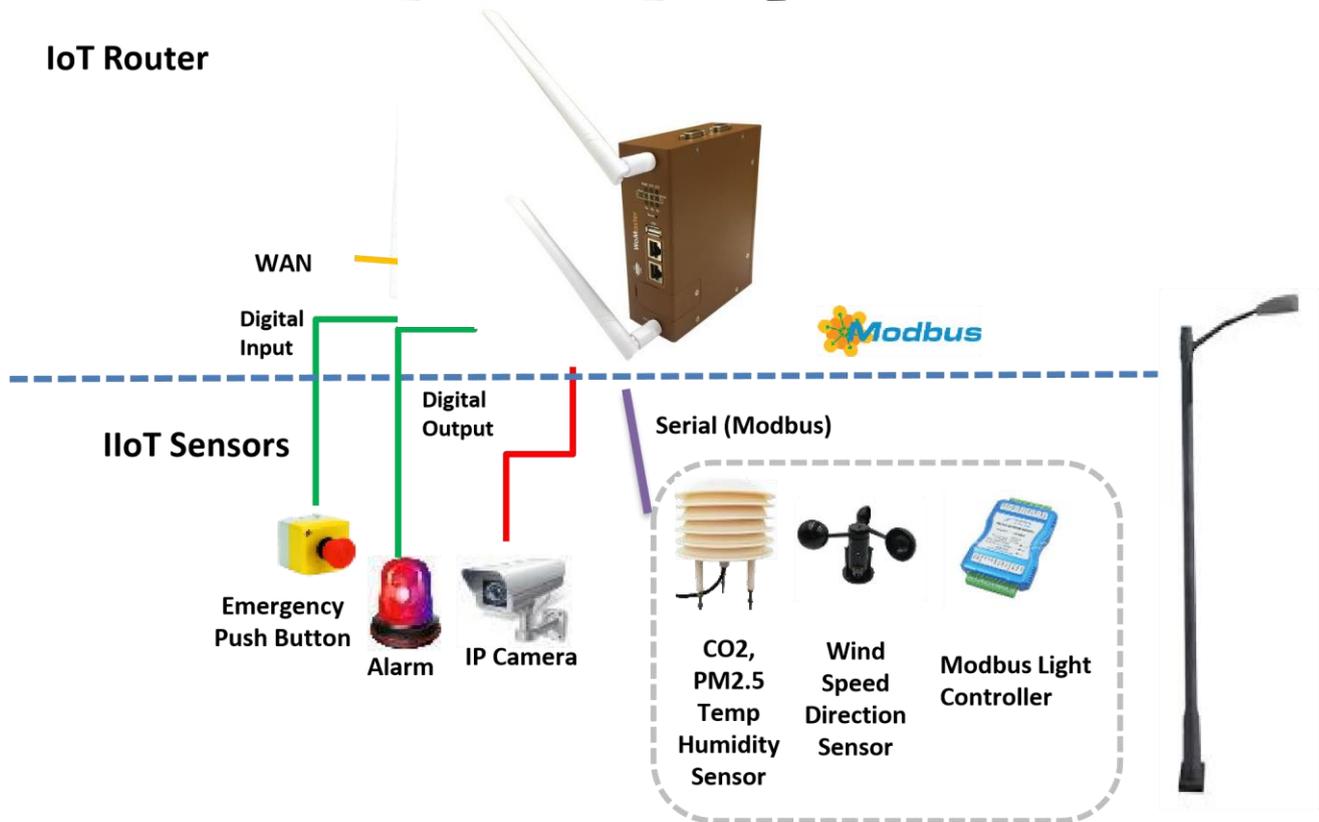


## Features & Benefits

### ✓ Ready Total Solution for IoT



### IoT Router



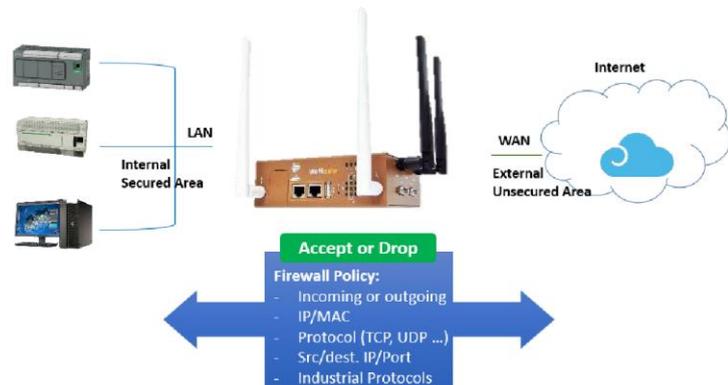
### ✓ Secured Remote Access by VPN

WR322 can act as a VPN server for data encryption and dynamic remote access. Multiple VPN protocols are supported such as OpenVPN, DMVPN, and L2TP. The channels between multiple networks, ex. private/public/hybrid networks are fully secured and with authentication features.



### ✓ Cyber Security Guard

The stateful firewall can monitor the status of connection at all time. Multiple industrial fieldbus protocols, ex. Modbus TCP\*, EtherNet/IP\* are also supported for factory automation applications.



## Secure IoT Modbus Tags

Tag-based data acquisition with MQTT/CoAP support

MQTT client acting as publisher and subscriber

The latest TLS encryption and X.509 authentication

Selectable serial port and data type. Sensor alive check and display sensor value.



### Modbus Logging

Modbus Logging  Enable

Name:  // Tag Name

Serial:

Slave ID:

PLC Address:

Function:  // Slave Address

Data Type:

// Data Address, Register Address

### Modbus RTU Slave Tag List

Select	Name	Serial	Slave ID	Address	Function Code	Data Type	Edit	Alive	Value
<input type="checkbox"/>	PM1	1	4	1	03	int16	<input type="button" value="Edit"/>	Yes	10
<input type="checkbox"/>	PM2_5	1	4	2	03	uint16	<input type="button" value="Edit"/>	Yes	13
<input type="checkbox"/>	PM10	1	4	3	03	uint16	<input type="button" value="Edit"/>	Yes	13
<input type="checkbox"/>	CO2	1	1	562	03	uint16	<input type="button" value="Edit"/>	Yes	1107
<input type="checkbox"/>	Temperature	1	1	564	03	int16	<input type="button" value="Edit"/>	Yes	255
<input type="checkbox"/>	Humidity	1	1	566	03	int16	<input type="button" value="Edit"/>	Yes	629
<input type="checkbox"/>	Temperature_f	1	1	1	03	float	<input type="button" value="Edit"/>	Yes	25.480820

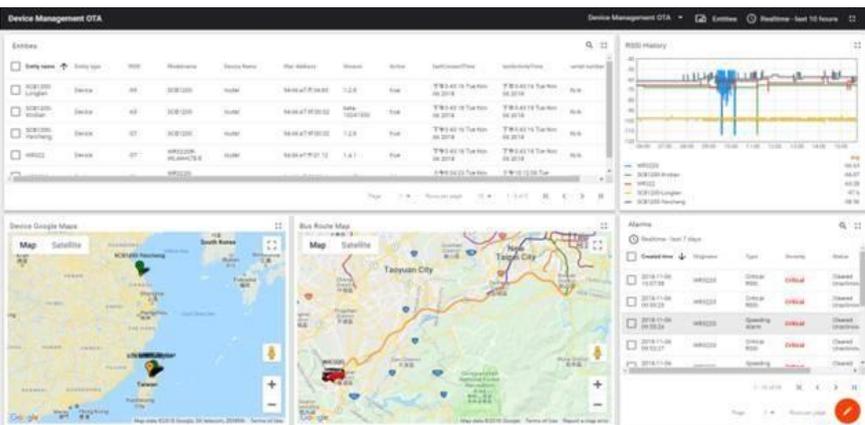
## Secured Multi-sites Management

N to N VPN

Latest TLS encryption and X.509 authentication

## ThingsMaster OTA (device management over the air)

The OTA agent embedded in WR322 upgrades device management over the air, anywhere you are and any time you want over your mobile devices. ThingsMaster OTA is a secured local OTA software that can be installed in a private or public server or even QNAP NAS (network attached storage). With OTA, all device information such as location, warning event can be shown in real time. The maintenance such as configuration reload, or device reboot can also be run by group.



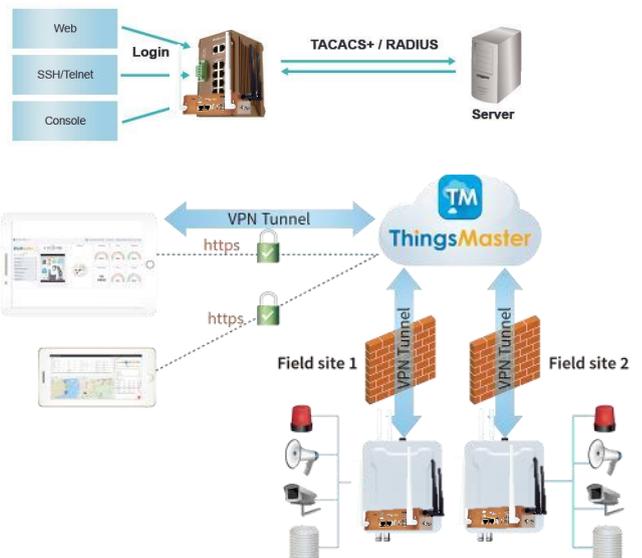
## Built-in Microsoft Azure and Amazon AWS agent



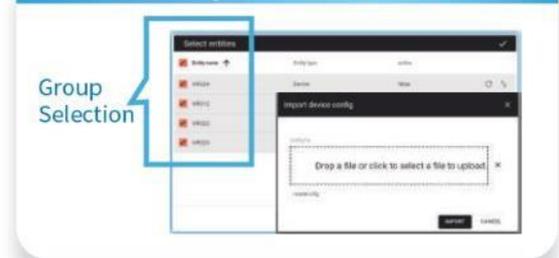
## Multi-Level User Passwords

Different centralized authentication servers are supported such as RADIUS and TACACS+. Using a central authentication server simplifies account administration, when you have more than one switches in the network.

Authentication Chain is also supported. An authentication chain is an ordered list of authentication methods to handle more advanced authentication scenarios. For example, you can create an authentication chain which first contacts a RADIUS server, and then looks in a local database if the RADIUS server does not respond.



## Batch Configuration and Reboot OTA





## Interfaces

### System LED

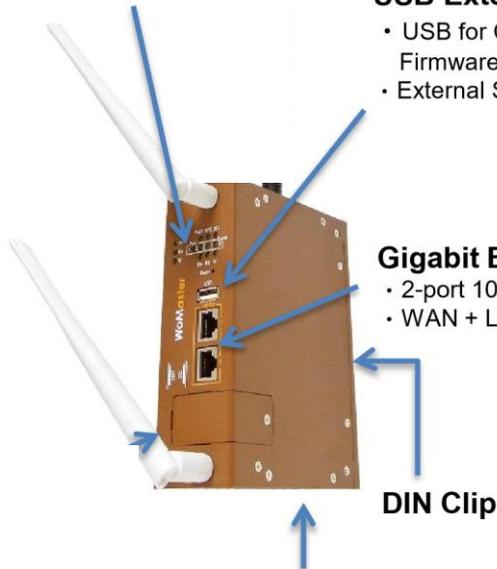
- 1 x Power
- 1 x System Status
- 1 x DO
- 2 x Ethernet Port
- 1 or 2 x Serial Port ( By Model)

### USB Extension Port

- USB for Configuration/  
Firmware update
- External Storage

### Gigabit Ethernet

- 2-port 10/100/1000M RJ45
- WAN + LAN configurable



### Integrated Power Connector

- 1 x 6-pin terminal block
- 4 pin for redundant power
- 2 pin DO

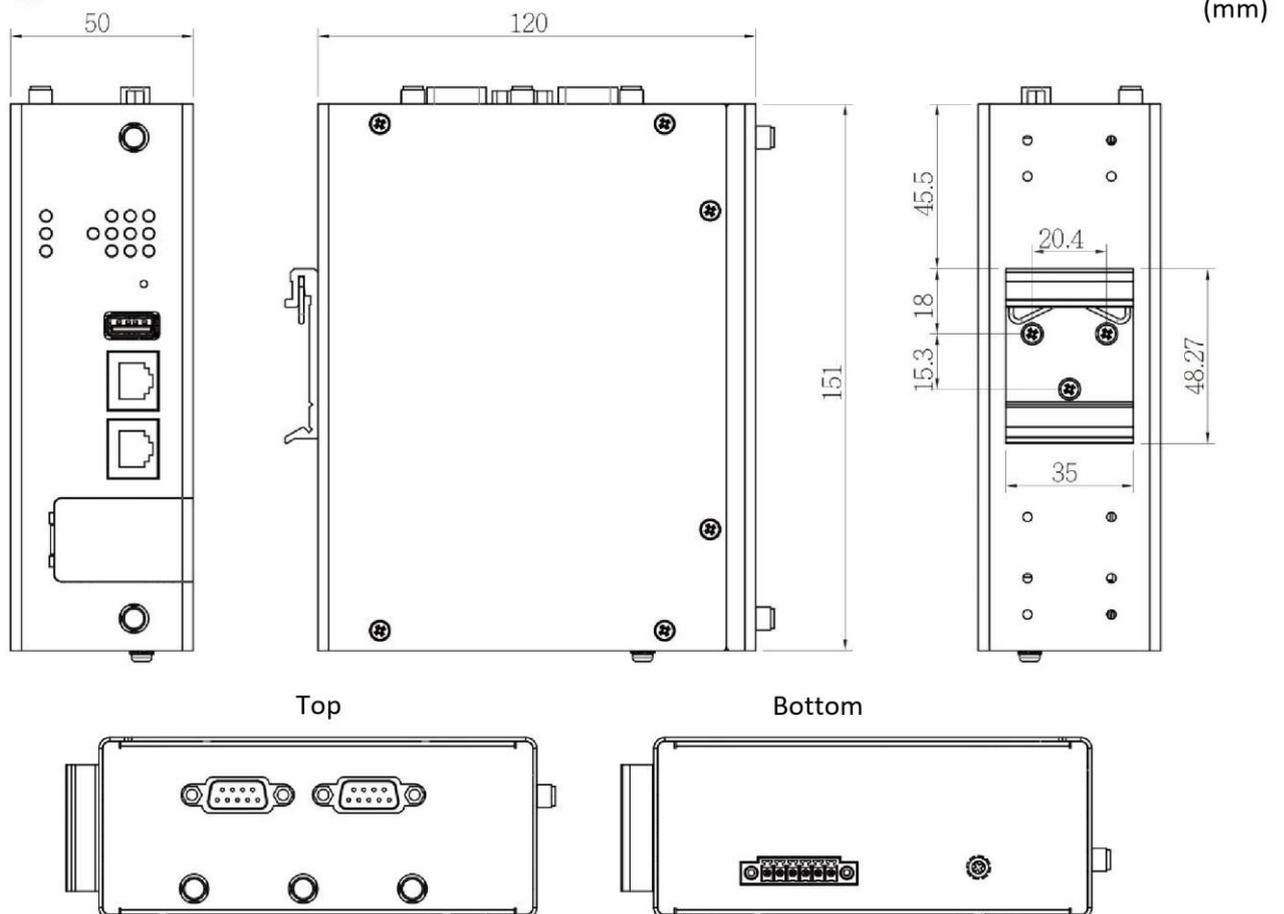


### Serial Communication

- RS232/422/485 Full functions
- DB9 female



## Dimensions



## Ordering Information

Model Name	
WR312G-WLAN	Industrial Secure Wireless AP, 2GbE+2COM, USB, SD, 802.11ac/n WLAN
Package List	
	1 x Product Unit
	1 x 6-pin Removable Terminal Connector
	2 x Wi-Fi Antenna, White
	1 x Attached Din Clip
	1 x Quick Installation Guide

## Specifications

Technology	
Standard	IEEE 802.11ac wireless local area network (WLAN), Backward support 802.11n/g/a/b Wireless LAN
	IEEE 802.3 10Base-T Ethernet
	IEEE 802.3u 100Base-TX Fast Ethernet
	IEEE 802.3ab 1000Base-T Gigabit Ethernet copper
	IEEE 802.1D-2004 Rapid Spanning Tree Protocol (RSTP)
	IEEE 802.1Q for VLAN

Interface	
Ethernet Port	2 x 10/100/1000MBase-T RJ45, Auto Negotiation, Auto-MDI/MDIX
System LED	1 x PWR: Green On 1 x SYS: Ready: Green On, Firmware Updating: Green Blinking 1 x DO: Red On 2 x Ethernet Ports: Link: Green On, Activity: Green Blinking 2 x Serial Ports (Serial 1/2, by model): Activity: Green Blinking 6 x Radio (Ra, Rb, Rc, Rd, Re, Rf): Radio status Ra: AP mode: Green On, Station mode connected: Green Blinking, Station mode/radio disable: Off Rb/Rc: Reserved Rd: Reserved Re: Reserved Rf: Base Station connected: Green On for 2 sec period, Base station disconnected: Green Off for 2 sec period
USB	1 x USB for Configuration/Firmware Update
Reset	System Reset(2~6 Seconds) / Default Settings Reset (over 7 Seconds)
SMA Socket	Up to 5 xRP-SMA Female Wi-Fi 2T2R: ANT1 for Wi-Fi1, ANT2 for Wi-Fi2, ANT3/4/5 Reserved
Micro SD	(Only for <b>E Series</b> ) 1 x for field diagnostic data logging
Serial	Up to 2 x RS232/422/485, DB9
Power Input, Digital Output	6-Pin Removable Terminal Block Connector 4 Pin for Redundant Power 2 Pin for DO (Relay Alarm) DO: Dry Relay Output with 1A /24V DC

Wi-Fi Properties	
Standard	IEEE 802.11ac/a/b/g/n, 2T2R MIMO 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 Check detail TX/RX information in User Manual
Frequency	ISM Band, 2.412GHz~2.472GHz, 5.180MHz~5.825MHz(Band 1,4)
RSSI	≤20db, compliant with CE request

Software	
Network Protocols	TCP/IP, UDP, DHCP, Telnet, DNS, SNMP, HTTP, HTTPS, SMTP,NTP,ARP, ICMP,DDNS
Management Interface	CGI WebGUI, Command Line Interface (CLI), IPv4/IPv6*, Telnet, SNMP v1/v2c/v3, DDNS, DHCP server/client, DHCP Relay, TFTP, System Log, SMTP, ARP response over 802.2 LLC SNAP, Proxy ARP, DNS (client/proxy), PPPOE*
Filter	IEEE802.1Q VLAN
User Management	Radius client, TACACS+, local database
Serial communication	TCP Server/TCP Client/UDP mode, TCP Alive check, Force TX Delimiter.Timeout/interval/length, Long Distance Termination
Time Management	NTP, SNTP
IoT	AWS Agent, Azure Agent, ThingMaster Agent
Network Management	IPv4, SNMP v1/v2c/v3/Trap, MIB II, Entity MIB, DHCP server/client, DHCP relay*, TFTP, ARP response over 802.2 LLC SNAP, Proxy ARP, DNS (client/proxy)
Traffic Management	Flow Control*, Traffic shaping
<b>WAN / Routing / NAT/ Firewall / VPN</b>	Routing: RIPv2, OSPFv2, VRRPv2 NAT: 1-1 NAT, NATP(SNAT/DNAT), Port Forwarding, DMZ Firewall: Stateful Inspection firewall, IP/Port Filter VPN: IPSec, OpenVPN (Multipoint VPN), L2TP, GRE, PPTP, MGRE*
Security	IEEE 802.1X/RADIUS, TLS v1.2, HTTPS/SSH, First login password management WLAN AP Security: Share Key, WPA/WPA2-PSK(Pre-Shared Key), WPA/WPA2 Enterprise Encryption: 64/128-bit WEP(Wired Equivalent Privacy), TKIP(WPA-PSK), AES(WPA2-PSK), MAC Filter
Advanced Security	TACACS+, Multi-user authentication
Redundancy Protocol	Rapid Spanning Tree Protocol (RSTP)
<b>IIoT Industrial Protocol</b>	Modbus RTU, MQTT, RESTful API
<b>Private Cloud</b>	ThingsMaster, ThingsMaster OTA
<b>Public Cloud</b>	AWS Agent, Azure Agent
<b>Location</b>	Google map, Baidu map
MIB	MIB-II, Entity MIB, WoMaster Private MIB
Utility	ViewMaster, NetMaster, Ping, Traceroute, IP SLA*
<b>Serial communication</b>	TCP Server/TCP Client/UDP mode, TCP Alive check, Force TX Delimiter/Timeout/interval/length, Long Distance Termination
WLAN Configuration	WLAN Basic Settings: Radio on/off, AP/client mode, 2.4G 11n/5G 11ac Band and Frequency selection, SSID/Multi-SSID configuration, SSID broadcast, VLAN ID, WLAN to LAN Link fault pass-through*, Advanced WLAN settings, 802.1X

Power Requirement	
Input Voltage	24V(12~48VDC)
Reverse Polarity Protect	Yes
Input Current	0.26A@24V
Power Consumption	Max 6.24W@24VDC full traffic, suggest to reserve 15% tolerance
Mechanical	
Installation	DIN Rail
Enclosure Material	Steel Metal with Aluminum
Dimension	50(W) x 151(H) x 120(D) mm / without DIN Rail Clip
Ingress Protection	IP30
Weight	≈660g 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 EN62368-1:2014/AC:2017 Compliance IEC 60255-27:2013 Compliance
EMC	EN61000-6-2/EN61000-6-4 Compliance
EMI	CISPR 22, FCC part 15B Class A Compliance
EMS	EN61000-4-2 ESD, EN61000-4-3 RS, EN61000-4-4 EFT, EN61000-4-5, EN61000-4-6 CS, EN61000-4-8 Magnetic Field, EN61000-4-12/16/17/18/29
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
Environmental	EN60870-2-2:1998 Compliance IEC 60068-2-21: 2006 Compliance