Huawei AR502 Series IoT Gateway

HUAWEI TECHNOLOGIES CO.,LTD.
Huawei Industrial Base
Bantian Longgang
Shenzhen 518129,P.R.China
Tel: +86 755 28780808

www.huawei.com

July, 2017

HUAWEI TECHNOLOGIES CO., LTD.

HUAWEI

Product Overview

The AR502 series IoT gateway is designed for industrial environments and supports communication in harsh environments such as extreme temperature, high humidity, and electromagnetic interference.The built-in industrial-grade LTE module supports high bandwidth, low-latency wireless access, and various local interfaces (RS485/RS422, RS232, Gigabit Ethernet and ZigBee) for connecting serial interface devices,Ethernet devices.The AR502 applies to multiple IoT fields, such as smart grid and smart transportation.

The AR502 Series comes in five models: AR502EG-L, AR502EGW-L, AR502EGRz-L and AR502CG-L and AR502EG-L-PD.

 AR502EG-L	• Fixed interfaces: 2 x GE RJ45, 1 x RS485/422, 1 x RS232, and 6 x digital input/output (DI/DO) , 1 x USB2.0 • LTE: LTE FDD • Operating temperature: –25°C to +70°C • Dimensions (W x D x H): 150 mm x 100 mm x 44 mm • Power supplies: DC: 8 V to 36 V
 AR502EGW-L	• Fixed interfaces: 2 x GE RJ45, 1 x RS485/422, 1 x RS232, and 6 x digital input/output (DI/DO), 1 x USB2.0 • LTE: LTE FDD • WLAN: 802.11b/g/n • Operating temperature: –25°C to +70°C • Dimensions (W x D x H): 150 mm x 100 mm x 44 mm • Power supplies: DC: 8 V to 36 V
 AR502EGRz-L	• Fixed interfaces: 2 x GE RJ45, 1 x RS485/422, 1 x RS232, 1 x DI, 1 x DO, 1 x USB2.0 • LTE: LTE FDD • ZigBee: 2.4GHz • Operating temperature: –25°C to +70°C • Dimensions (W x D x H): 150 mm x 100 mm x 44 mm • Power supplies: DC: 8 V to 36 V
 AR502CG-L	• Fixed interfaces: 2 x GE RJ45, 1 x RS232, 1 x DI, 1 x DO, 1 x USB2.0 • LTE: LTE FDD • Operating temperature: –25°C to +70°C • Dimensions (W x D x H): 150 mm x 100 mm x 44 mm • Power supplies: DC: 8 V to 36 V
 AR502EG-L-PD	• Fixed interfaces: 1 x GE RJ45, 1 x RS232 • LTE: LTE FDD, LTE TDD • Operating temperature: –40° C to +55° C • Dimensions (W x D x H): 230mm x 230 mm x 105 mm • Power supplies: PoE power supply, In compliance with IEEE 802.3af/at

Product Highlighting

High Speed and Flexibility

- Supports LTE FDD and is compatible with WCDMA/GPRS/GSM.
- Integrates GE, RS232, RS485/RS422 ZigBee and Wi-Fi interfaces.
- Integrates up to six DI/DO interfaces and allows flexible configurations.

High Security and Reliability

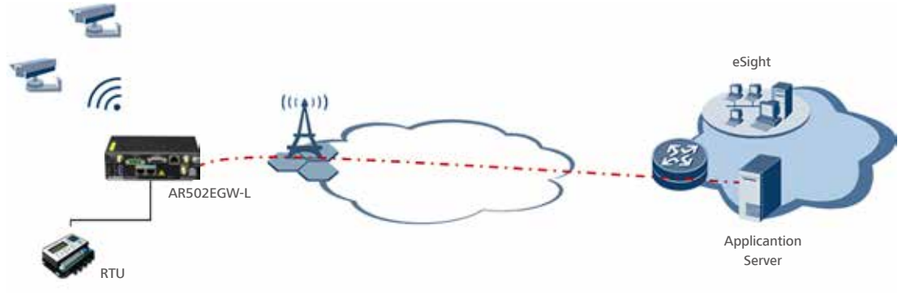
- Dual SIM cards allow services to be rapidly switched.
- Double antennas strengthen wireless signals.
- Integrated IPSec VPN ensures the security of critical data.

Intelligent Service Deployment and Convenient O&M

- Supports USB-based deployment and plug-and-play, greatly improving the service deployment efficiency.
- Compact ruggedized form factor, easy to deploy
- Supports unified management of remote devices and uses NQA to monitor links in real time, improving O&M.

Typical Application

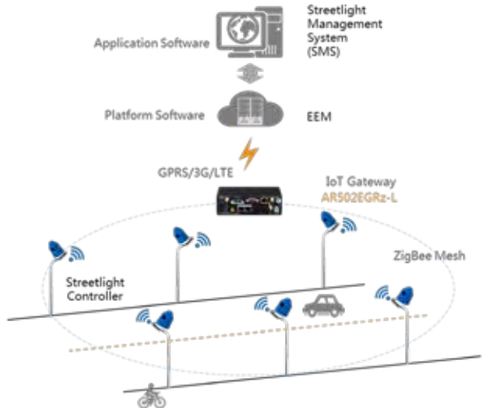
Connected Oilfield



For oil companies, ensuring efficient communications across large open spaces is vital. LTE is an ideal technology for effective communications across oilfields, offering long-distance, low-latency wireless coverage and high bandwidth for data transmission.

The AR502E integrates serial interface to collect data from oil wells and auxiliary facilities, and Wi-Fi or Ethernet interface to connect the surveillance cameras. And then the data and video are sent to monitor center through LTE network.

Connected City Lighting



Huawei's Connected City Lighting Solution connects street lights to the IoT, and enables cities to enhance the control and performance of every street light.

The street lights form a mesh network based on RF in the neighborhood area network (NAN). The mesh network is aggregated at the gateway that can access wide area network (WAN).

AR502EGRz-L integrates ZigBee module, supports ZigBee mesh network, and provides high-performance LTE communication, satisfies the communication requirement between the street lights and remote monitor system.

AR502 Series IoT Gateway

Product Specifications

Table 1: AR502E Technical Specifications

Specifications	AR502EG-L	AR502EGW-L	AR502EGRz-L	AR502EG-L-PD
Hardware Specifications				
Box	Metal			Plastic
Processor	Powerful 700Mhz ARM Dual-Core Cortex A9			
DRAM (DDR3)	256 MB/512 MB*		512 MB	512 MB
Flash memory	512 MB		512 MB	512 MB
Operating System	Wind River LINUX 6.0			
4G/LTE	FDD LTE: Band 1, Band 2, Band 3, Band 4, Band 5, Band 7, Band 8, Band 20, all bands with diversity UL 50 Mbit/s; DL 150 Mbit/s			LTE FDD: Band 1/3/7/8/20/28 LTE TDD: Band 38 CA: B3+B20, B7+B20, B3+B8, B3+B28, B7+B28, B3+B3, B7+B7, B1+B3, B3+B7, B1+B8, B3+B38
3G	WCDMA/HSDPA/HSUPA/HSPA+: Band 1, Band 2, Band 5, Band 8, all bands with diversity UL 5.76 Mbit/s; DL 42 Mbit/s			WCDMA/HSPA+: Band 1/8
GSM	GSM/GPRS/EDGE: 850/900/1,800/1,900 MHz EDGE throughput up to 236 kbps			GSM/GPRS/EDGE: 900/1800(MHz)
SIM card	Dual SIM card support Lockable SIM card holder Supports micro-SIM format(3FF)			
Serial	1 x RS232 (DB9 female connector, isolated) 1 x RS485/422 (5-pin terminal block connector, isolated)		1 x RS232 (RJ45 connector, non-isolated) 1 x RS485/422 （5PIN terminal block connector, isolated)	1 x RS232 (RJ45)
Configure button	Switch function between service and management for RS232 port when press button for no longer than 5s Restore to default configuration when press button for no less than 5s			-
Ethernet	2 10/100/1000M base-T			1 10/100/1000M base-T
WLAN	-	802.11b/g/n	-	-
ZigBee	-	-	2.4GHz	-
DI/DO	6 x DI/DO (RJ45 Connector) LVTTL voltage level, the mode of DI/DO is configurable		1 x DI （terminal block, detect dry contact open or close, 9.6 to 60V input) 1 x DO (terminal block, support Normal Open and Normal Closed)	-
USB	1 x USB 2.0			

Specifications	AR502EG-L	AR502EGW-L	AR502EGRz-L	AR502EG-L-PD
Antenna	2 external antennas for Main and Div			Built-in
LED indicators	PWR x 1 RUN x 1 ALM x 1 RSSI x 3 2G x 1 3G x 1 SIM x 2			-
Power supply	DC: 8 V to 36 V			PoE power supply: In compliance with 802.3af/at
Maximum power consumption	8 W			10 W
Dimensions (W x D x H)	150mm x 100mm x 44 mm			230 mm x 230 mm x 105
Weight	0.85 kg	0.85 kg	0.85kg	2.8Kg
Operating temperature	–25°C to +70°C			-40° C to +55° C
Storage temperature	–40°C to +85°C			
Relative humidity	5% RH to 95% RH (non-condensing)			
IP protection Rating	IP30			IP65
Installation mode	Wall mounted (Mounting brackets is included by default) DIN-Rail mounted (DIN mounting kit is optional)			Wall mounted (Mounting brackets is included by default) or pole mounted
EMC	ETSI EN 300 386 V1.6.1(2012-09) EN 55022:2010 CLASS A EN 55024:2010 CISPR22:2010 CISPR24:2010 EN 301 489-1 V1.9.2(2011-09) EN 301 489-17 V2.2.1(2012-09) IEC61850-3 (2013) IEEE1613 (2009) EN61000-4-2:2009 EN61000-4-3:2006 + A1:2008 + A2:2010 EN61000-4-4:2012 EN61000-4-5:2014 EN61000-4-6:2014 EN61000-4-8:2010 EN61000-4-10:1993 + A1:2001 EN61000-4-11:2004 EN61000-4-16:1998 + A1:2004 + A2:2011 EN61000-4-17:2002 EN61000-4-18:2007 + A1:2010 EN61000-4-29:2000			
Safety	IEC60950-1:2005(Second Edition) + A 1:2009 + A 2 :2013			

Specifications	AR502EG-L	AR502EGW-L	AR502EGRz-L	AR502EG-L-PD
Certifications	CE(Europe) RoHS(Europe) WEEE(Europe) REACH(Europe)	CE(Europe) RoHS(Europe) WEEE(Europe) REACH(Europe) RCM(Australia)	CE(Europe) RoHS(Europe) WEEE(Europe) REACH(Europe)	CE(Europe) RoHS(Europe) WEEE(Europe) REACH(Europe)
Software Specifications				
Basic features	TCP, UDP, ICMP, IPv4, IPv6 PPP protocols: PPP, PAP, IPCP, CHAP, and BCP DHCP server/client/relay, DNS client/proxy/relay, Dynamic DNS NAT			
WLAN	-	WLAN radio management, WLAN VAP management WLAN user management WLAN anti-attack WLAN QoS WLAN Security	-	-
LAN	IEEE 802.1P, IEEE 802.1Q, IEEE 802.3 VLAN management, MAC address management STP, etc.			
Unicast routing	Routing policy, static route RIP, BGP RIPng, BGP4+			
VPN	GRE tunnel IPSec tunnel L2TP Client VPN			
QoS	Traffic classification based on the Layer-2 header, Layer-3 information, Layer-4 information, and 802.1p priority Traffic policing (CAR) Traffic shaping Queue scheduling of PQ, WRR, DRR, PQ+WRR, and PQ+DRR Congestion avoidance, such as WRED and tail drop			
Security	AAA authentication, RADIUS authentication, HWTACACS authentication 802.1X/MAC/MAC bypass authentication Certificate authentication and PKI management Firewall, Packet filtering, and firewall log Anti-DoS attack, TCP SYN Flood attack defense, UDP Flood attack defense, broadcast storm suppression, heavy traffic attack defense Provides CPU protection Ping and Tracert functions			
Edge Computing	Open platform in the edge of the network			
WAN failover/fall back	Interface Backup : Business continuity guarantee for wired networks via instantaneous failover/failback to/from 4G/3G/2G networks Intelligent delay mechanism for controlling failover/failback procedure			

Specifications	AR502EG-L	AR502EGW-L	AR502EGRz-L	AR502EG-L-PD
Configuration and maintenance	Web-GUI (HTTPS) CLI, Telnet, and SSH (v1/v2) terminals SNMPv1/v2c/v3 including cellular specific MIB, config and firmware download FTP and TFTP Boot ROM upgrades and remote upgrades User operation logs NQA monitor System status monitor NTP client support for network time sync of device’ s system clock			
Firmware management	Firmware upgrade locally via LAN or remotely over-the-air (HTTPS, SNMP) Multiple firmware image storage on device and dynamic install			
Event Alert	SYSLOG Trap and Alarm by SNMP			

*Model with 256MB and model with 512 MB DRAM have different part number.

Table 2: AR502C Technical Specifications

Specifications	AR502CG-L
Hardware Specifications	
Box	Plastics
Processor	Powerful 700Mhz ARM Dual-Core Cortex A9
DRAM (DDR3)	256 MB
Flash memory	512 MB
Operating System	Wind River LINUX 6.0
4G/LTE	FDD LTE: Band 1, Band 2, Band 3, Band 4, Band 5, Band 7, Band 8, Band 20, all bands with diversity UL 50 Mbit/s; DL 150 Mbit/s
3G	WCDMA/HSDPA/HSUPA/HSPA+: Band 1, Band 2, Band 5, Band 8, all bands with diversity UL 5.76 Mbit/s; DL 42 Mbit/s
GSM	GSM/GPRS/EDGE: 850/900/1,800/1,900 MHz EDGE throughput up to 236 kbps
SIM card	One SIM card support Lockable tray reader with push-button-to-release Supports mini-SIM format (2FF)
Serial	1 x RS232 (RJ45 connector, non-isolated)
Configure button	Switch function between service and management for RS232 port when press button for no longer than 5s Restore to default configuration when press button for no less than 5s
Ethernet	2 x 10/100/1000M base-T
WLAN	-
DI/DO	1 alarm inputs to detect dry contact open or close, 9.6 to 60V input, State “0” / “1” can be configured 1 relay output with current carrying capacity of 1 A @ 60 VDC, normally open/closed
USB	1 x USB 2.0

Specifications	AR502CG-L
Antenna	2 internal antennas • 2 x Internal antennas for Main and Div 1 external antenna(Optional) • 1 x SMA connector for 3G/4G (1x Main) • Replace internal main Antenna when external antenna is installed
LED indicators	PWR x 1 RUN/ALM x 1 RSSI x 3 2G x 1 3G x 1 SIM x 1
Power supply	DC: 8 V to 36 V
Maximum power consumption	8W
Dimensions (W x D x H)	150 mm x 100 mm x 44 mm
Weight	0.38kg
Operating temperature	–25° C to +70° C
Storage temperature	–40° C to +85° C
Relative humidity	5% RH to 95% RH (non-condensing)
IP protection Rating	IP30
Installation mode	Wall mounted (Mounting brackets is included by default) DIN-Rail mounted(Supported by default) horizontally
EMC	ETSI EN 300 386 V1.6.1(2012-09) EN 55022:2010 CLASS A EN 55024:2010 CISPR22:2010 CISPR24:2010 EN 301 489-1 V1.9.2(2011-09) EN 301 489-17 V2.2.1(2012-09) EN61000-4-2:2009 EN61000-4-3:2006 + A1:2008 + A2:2010 EN61000-4-4:2012 EN61000-4-5:2014 EN61000-4-6:2014 EN61000-4-8:2010 EN61000-4-10:1993 + A1:2001 EN61000-4-11:2004 EN61000-4-16:1998 + A1:2004 + A2:2011 EN61000-4-17:2002 EN61000-4-18:2007 + A1:2010 EN61000-4-29:2000

	2G LED	3G LED
2G mode	✓	-
3G mode	-	✓
4G/LTE mode	✓	✓

Specifications	AR502CG-L
Safety	IEC60950-1:2005(Second Edition) + A 1:2009 + A 2 :2013
Certifications	CE(Europe) CB(International) RoHS(Europe) WEEE(Europe) REACH(Europe) GCF(Europe) RCM(Australia)
Software Specifications	
Basic features	TCP, UDP, ICMP, IPv4, IPv6 PPP protocols: PPP, PAP, IPCP, CHAP, and BCP DHCP server/client/relay, DNS client/proxy/relay, Dynamic DNS NAT
LAN	IEEE 802.1P, IEEE 802.1Q, IEEE 802.3 VLAN management, MAC address management STP, etc.
Unicast routing	Routing policy, static route RIP, BGP RIPng, BGP4+
VPN	GRE tunnel IPSec tunnel L2TP Client VPN
QoS	Traffic classification based on the Layer-2 header, Layer-3 information, Layer-4 information, and 802.1p priority Traffic policing (CAR) Traffic shaping Queue scheduling of PQ, WRR, DRR, PQ+WRR, and PQ+DRR Congestion avoidance, such as WRED and tail drop
Security	AAA authentication, RADIUS authentication, HWTACACS authentication 802.1X/MAC/MAC bypass authentication Certificate authentication and PKI management Firewall, Packet filtering, and firewall log Anti-DoS attack, TCP SYN Flood attack defense, UDP Flood attack defense, broadcast storm suppression, heavy traffic attack defense Provides CPU protection Ping and Tracert functions
WAN failover/fall back	Interface Backup : Business continuity guarantee for wired networks via instantaneous failover/failback to/from 4G/3G/2G networks Intelligent delay mechanism for controlling failover/failback procedure

Specifications	AR502CG-L
Configuration and maintenance	Web-GUI (HTTPS) CLI, Telnet, and SSH (v1/v2) terminals SNMPv1/v2c/v3 including cellular specific MIB, config and firmware download FTP and TFTP Boot ROM upgrades and remote upgrades User operation logs NQA monitor System status monitor NTP client support for network time sync of device’ s system clock
Firmware management	Firmware upgrade locally via LAN or remotely over-the-air (HTTPS, SNMP) Multiple firmware image storage on device and dynamic install
Event Alert	SYSLOG Trap and Alarm by SNMP

AR502 Configuration

Before choosing an AR502, determine the device model and auxiliary materials.

Device

Select the device model according to the port type and service requirements.

Power Supply

Select the power supply according to environment requirements.

Antenna

Determine the type and quantity ofthe antennas according the communication type and environments requirement.

Installation Materials

Select the DIN mounting base according to installation mode.

Ordering Information

Model	Ordering Information
Device	
AR502EG-L	AR502EG-L, 1*RS485/RS422 , 1*RS232 ,6*DI/DO, 2*GE (10/100/1000M RJ45) , LTE (dual SIM), 1*USB2.0,8-36VDC
AR502EG-L-PD	AR502EG-L-PD,1*GE,LTE(support CAT6),POE PD,IP65
AR502EGW-L	AR502EGW-L, 1*RS485/RS422 , 1*RS232 ,6*DI/DO,802.11bgn, 2*GE (10/100/1000M RJ45) , LTE (dual SIM), 1*USB2.0,8-36VDC
AR502EGRz-L	AR502EGRz-L, 1*RS485/RS422 , 1*RS232 , 1*DI , 1*DO , Zigbee , 2*GE (10/100/1000M RJ45) , LTE (dual SIM), 1*USB2.0 , 8-36VDC
AR502CG-L	AR502CG-L ,1*RS232 ,1*DI/1*DO, 2*GE (10/100/1000M RJ45) , LTE 1*USB2.0,8-36VDC
Power Supply	
PAC-60WB	60W AC Power Module(No Fan)
PAC-24W	24W Power Adapter
Antennas	
ASMAM0008	Isotropic Antenna, 698MHz~960MHz/1420MHz~2690MHz,2.1dBi(max)(698-960/2110-2170MHz)/4.6dBi(max)(1710-1990/2500-2690MHz),vertical,Omni,5W,SMA-J
ASMAM0002	Isotropic Antenna,3m,698MHz-960MHz/1710MHz-2690MHz,SMA-J
ASMAM0007	Omni-directional Antenna,698MHz-960MHz/1710MHz-2700MHz,1.5dBi/2.5dBi,Isotropic,20W,N50SF
ASMAM0003	Isotropic Antenna,2400-2500/5150-5850MHz,>2.15dBi/3dBi,Vertical,Omni,5W-0r-RP-SMA-J
TQJ-2400-11-T2	Omnidirectional Antenna,2400-2500MHz,11dBi,vertical,100W,2r,N Female
Installation Materials	
DINRAIL002	mounting base

For more information, visit http://e.huawei.com/en or contact your local Huawei sales office.