**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.


**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 DIO/DI interfaces and allows flexible configurations.

**Typical Application**

**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.

**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.

**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.

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**Product Highlighting**

- Fixed interfaces: 2 x GE RJ45, 1 x RS485/422, 1 x RS232, and 6 x digital input/output (DIO/DI), 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**

- Fixed interfaces: 2 x GE RJ45, 1 x RS485/422, 1 x RS232, and 6 x digital input/output (DIO/DI), 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, 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

**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
- 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: 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 802.3at

**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 802.3at
# AR502E Technical Specifications

## Hardware Specifications

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Box</td>
<td>Metal</td>
<td>Plastic</td>
<td>Plastic</td>
<td>Plastic</td>
</tr>
<tr>
<td>Processor</td>
<td>Powerful 700Mhz ARM Dual-Core Cortex A9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DRAM (DDR3)</td>
<td>256 MB/512 MB*</td>
<td>512 MB</td>
<td>512 MB</td>
<td>512 MB</td>
</tr>
<tr>
<td>Flash memory</td>
<td>512 MB</td>
<td>512 MB</td>
<td>512 MB</td>
<td>512 MB</td>
</tr>
<tr>
<td>Operating System</td>
<td>Wind River LINUX 6.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 4G/LTE                 | FDD LTE: Band 1, Band 2, Band 3, Band 4, Band 5, Band 7, Band 8, Band 20, all bands with diversity  
FDD LTE: Band 13/19/28  
LTE TDD: Band 38  
CA: B3+B20, B7+B20, B3+B28, B7+B28, B7+B7, B1+B3, B3+B7, B1+B8, B3+B38 |
| 3G                     | WCDMA/HSDPA/HSPA+/HS+ Band 1, Band 2, Band 5, Band 8, all bands with diversity  
WCDMA/HSPA+ Band 1/3/7/8/20/28 |
| GSM                    | EDGE throughput up to 236 kbps  
EDGE throughput up to 236 kbps  
WCDMA/HSPA+ Band 1/3/7/8/20/28 |
| 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 (RS4)  
1 x RS485 (RS4)  
1 x RS232 (RS4) |
| 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  
1 x 10/100/1000M base-T |
| WLAN                   | -  
802.11 b/g/n  
- |
| 2G/3G                  | -  
2.4GHz  
- |
| Power-over-Ethernet (PoE) | - |
| 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             | 150mm x 100mm x 44 mm  
230 mm x 230 mm x 105 |
| Weight                 | 0.85 kg  
0.85 kg  
2.8 kg |
| 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  
IP55 |
| 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 (2012-09)  
EN 55022:2010 CLASS A  
EN 55024:2010  
CISPR2:2010  
CISPR24:2010  
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  
EN61000-4-17:2002  
EN61000-4-18:2007 + A1:2010  
EN61000-4-29:2000 |
### Specifications

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Certifications</strong></td>
<td>CE(Europe)</td>
<td>CE(Europe)</td>
<td>CE(Europe)</td>
<td>CE(Europe)</td>
</tr>
<tr>
<td></td>
<td>RoHS(Europe)</td>
<td>RoHS(Europe)</td>
<td>RoHS(Europe)</td>
<td>RoHS(Europe)</td>
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<tr>
<td></td>
<td>WEEE(Europe)</td>
<td>WEEE(Europe)</td>
<td>WEEE(Europe)</td>
<td>WEEE(Europe)</td>
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<tr>
<td></td>
<td>REACH(Europe)</td>
<td>REACH(Europe)</td>
<td>REACH(Europe)</td>
<td>REACH(Europe)</td>
</tr>
<tr>
<td><strong>Software Specifications</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Basic features</strong></td>
<td>TCP, UDP, ICMP, IPv4, IPv6</td>
<td>PPP protocols: PPP, PAP, IPCP, CHAP, and BCP</td>
<td>DHCP server/client/relay, DNS client/proxy/relay, Dynamic DNS NAT</td>
<td></td>
</tr>
<tr>
<td><strong>WLAN</strong></td>
<td>WLAN radio management, WLAN VAP management, WLAN user management, WLAN anti-attack, WLAN QoS</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>LAN</strong></td>
<td>IEEE 802.1P, 802.1Q, 802.3</td>
<td>VLAN management, MAC address management</td>
<td>STP, etc.</td>
<td></td>
</tr>
<tr>
<td><strong>Unicast routing</strong></td>
<td>RIP, BGP, RIPv2, BGP4+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>VPN</strong></td>
<td>GRE tunnel</td>
<td>IPsec tunnel</td>
<td>L2TP Client VPN</td>
<td></td>
</tr>
<tr>
<td><strong>QoS</strong></td>
<td>Traffic classification based on the Layer-2 header, Layer-3 information, Layer-4 information, and 802.1p priority, Traffic policing (CAR), Traffic shaping</td>
<td>Queue scheduling of PQ, WRR, DRR, PQ+WRR, and PQ+DPR</td>
<td>Congestion avoidance, such as WRED and tail drop</td>
<td></td>
</tr>
<tr>
<td><strong>Security</strong></td>
<td>AAA, RADIUS authentication, 802.1X, MAC bypass authentication, Certificate authentication and PKI management, Firewall, Packet filtering, and firewall log, Anti-DDoS attack, TCP SYN flood attack defense, UDP flood attack defense, broadcast storm suppression, heavy traffic attack defense, Provides CPU protection, Ping and Tracer function</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Edge Computing</strong></td>
<td>Open platform in the edge of the network</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>WAN failover/fail back</strong></td>
<td>Interface Backup: Business continuity guarantee for wired networks via instantaneous failover/failback to/from 4G/5G/5G networks, Intelligent delay mechanism for controlling failover/failback procedure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Configuration and maintenance</strong></td>
<td>Web-GUI (HTTPS)</td>
<td>CLI, Telnet, and SSH (v1/v2) terminals</td>
<td>SNMP/v1/v2/v3, including cellular-specific MIB, config and firmware download</td>
<td>Boot ROM upgrades and remote upgrades</td>
</tr>
<tr>
<td><strong>Firmware management</strong></td>
<td>Firmware upgrade locally via LAN or remotely over-the-air (HTTPS, SNMP)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Event Alert</strong></td>
<td>SYSLOG</td>
<td>Trap and Alarm by SNMP</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Table 2: AR502C Technical Specifications

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hardware Specifications</strong></td>
<td>Box: Plastics</td>
<td>Processor: Powerful 700MHz ARM Dual-Core Cortex A9</td>
<td>DRAM (DDR3): 256 MB</td>
<td>Flash memory: 512 MB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Operating System: Wind River LINUX 6.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4G/LTE: FDD-LTE: Band 1, Band 2, Band 2, Band 4, Band 5, Band 7, Band 8, Band 20, all bands with diversity, UL 50 Mbps, DL 150 Mbps</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3G: WCDMA/HSPA+UL/HSPA+/HSUPA+: Band 1, Band 2, Band 5, Band 8, all bands with diversity, UL 5.76 Mbps, DL 42 Mbps</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>GSM: EDGE throughput up to 236 kbps</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4G/LTE: One SIM card support, Lockable tray reader with push-button-to-release Supports m-r SIM format (2FF)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Serial: 1 x RS232 (RS45 connector, non-isolated)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Configure button</strong></td>
<td>Switch function between service and management for RS232 port when press button for no longer than 5s</td>
<td>Restore to default configuration when press button for no less than 5s</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ethernet</strong></td>
<td>2 x 10/100/1000M base-T</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>WLAN</strong></td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DVD</strong></td>
<td>1 alarm inputs to detect dry contact open or close, 9.6 to 60V input, State “0”/“1” can be configured</td>
<td>1 relay output with current carrying capacity of 1 A @ 60 VDC, normally open/closed</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>USB</strong></td>
<td>1 x USB 2.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Specifications

### Antenna
- 2 x Internal antennas for Main and Div
- 1 x SMA connector for 3G/4G (1x Main)
  - Replace internal main Antenna when external antenna is installed

### LED indicators

<table>
<thead>
<tr>
<th>LED</th>
<th>2G Mode</th>
<th>3G Mode</th>
<th>SM Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWR</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RUN/ALM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RSSI</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2G</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3G</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>SIM</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

### 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)

### Installation mode
- Wall mounted (Mounting brackets is included by default)
- DIN-Rail mounted (Supported by default) horizontally

### Installation mode
- Wall mounted (Mounting brackets is included by default)
- DIN-Rail mounted (Supported by default) horizontally

### EMC
- EN 301 386 V1.6.1(2012-09)
- EN 55022:2010
- EN 55024:2010
- EN 301 489-1 V1.9.2(2011-09)
- EN 301 489-17 V2.1(2012-09)
- EN 61000-4-2:2009
- EN 61000-4-4:2012
- EN 61000-4-5:2014
- EN 61000-4-6:2014
- EN 61000-4-8:2010
- EN 61000-4-11:2004
- EN 61000-4-17:2002

### Safety

### 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, VLAN address management, STP, etc.

#### Unicast routing
- Route policy, static route
- RPR, BGP
- RIPv, BGP4+

#### 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, HTTP/AAC authentication
- PPP protocols: PAP, IPCP, CHAP, and BCP
- Certificate authentication and PKI management
- Firewall, Packet filtering, and firewall log
- Anti-DDoS attack, TCP SYN flood attack defense, UDP flood attack defense, broadcast storm suppression, heavy traffic attack defense
- Provides CPU protection
- Ping and Tracer functions

#### WAN failover/fail back
- Interface Backup: Business continuity guarantee for wired networks via instantaneous failover/failback to/from 4G/3G/2G/3G/2G networks
- Intelligent delay mechanism for controlling failover/failback procedure
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 of the antennas according to the communication type and environment requirements.

Installation Materials
Select the DIN mounting base according to installation mode.

Ordering Information

<table>
<thead>
<tr>
<th>Model</th>
<th>Ordering Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR502EG-L</td>
<td>AR502EG-L, 1<em>RS485/RS422, 1</em>RS232, 6<em>DI/DO, 2</em>GE (10/100/1000M RJ45), LTE (dual SIM), 1*USB2.0, 0.8-36VDC</td>
</tr>
<tr>
<td>AR502EG-L-PD</td>
<td>AR502EG-L-PD, 1*GE, LTE (support CAT6), POE PD, IP65</td>
</tr>
<tr>
<td>AR502EGW-L</td>
<td>AR502EGW-L, 1<em>RS485/RS422, 1</em>RS232, 6<em>DI/DO, 802.11bgn, 2</em>GE (10/100/1000M RJ45), LTE (dual SIM), 1*USB2.0, 0.8-36VDC</td>
</tr>
<tr>
<td>AR502EGRz-L</td>
<td>AR502EGRz-L, 1<em>RS485/RS422, 1</em>RS232, 1<em>DI, 1</em>DO, Zigbee, 2<em>GE (10/100/1000M RJ45), LTE (dual SIM), 1</em>USB2.0, 0.8-36VDC</td>
</tr>
<tr>
<td>AR502CG-L</td>
<td>AR502CG-L, 1<em>RS232, 1</em>DI/1<em>DO, 2</em>GE (10/100/1000M RJ45), LTE 1*USB2.0, 0.8-36VDC</td>
</tr>
</tbody>
</table>

Power Supply

- PAC-60WB: 60W AC Power Module (No Fan)
- PAC-24V: 24V Power Adapter

Antennas

- ASMA0008: Ispistic Antenna, 698MHz-960MHz, 1*DI, 1*DO, Vertical, Omni (2.5dBi), SMA (698-960 MHz) (1710-1990 MHz) (2.1dBi), SMA-J
- ASMA0002: Isotropic Antenna, 3*698MHz-960MHz, 1*DI, 1*DO, Vertical, Omni (4.6dBi), SMA (698-960 MHz) (2.1dBi), SMA-J
- ASMA0007: Omni-directional Antenna, 698MHz-960MHz, 1*DI, 1*DO, Vertical, Omni (5.0dBi), SMA (698-960 MHz) (2.5dBi), SMA-J
- ASMA0003: Isotropic Antenna, 2400-2500MHz, 1*DI, 1*DO, Vertical, Omni (5.0dBi), SMA (698-960 MHz) (2.5dBi), SMA-J
- TQI-2400-11-T2: Omni-directional Antenna, 2400-2500MHz, 1*DI, Vertical, Omni (3.5dBi), SMA-J

Installation Materials

- DINRAIL002: Mounting base

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