

# Huawei AR502H Data Sheet (Edge Computing Scenario)




The AR502H is purpose-built for edge computing and industrial gateway scenarios. This data sheet focuses merely on the edge computing scenario.

## Overview

Huawei AR502H is an EC-IoT gateway designed for communication on large-scale edge computing and IoT networks with challenging environments such as extreme temperature, humidity, and electromagnetic interference.

The AR502H is purpose-built for edge computing and industrial gateway scenarios. This data sheet focuses merely on the edge computing scenario. For details about the industrial gateway scenario, see the data sheet for the industrial gateway scenario.

### Appearance of Huawei AR502H

Product Name	Overview	Application Scenario
 <p><b>AR502H</b></p>	<p>AR502H router:</p> <ul style="list-style-type: none"> <li>Industry-grade and high-performance edge computing</li> <li>Fan-free and dual-power supply redundancy design</li> <li>ARM quad-core A53, 2 GB memory, 2 GB flash</li> </ul>	<p>Industry-grade edge computing scenarios</p>
 <p><b>NetEngine AR502H-5G</b></p>	<p>NetEngine AR502H-5G router:</p> <ul style="list-style-type: none"> <li>Industry-grade and high-performance edge computing</li> <li>Fan-free and dual-power supply redundancy design</li> <li>ARM quad-core A53, 2 GB memory, 2 GB flash</li> <li>5G, LTE TDD, LTE FDD, WCDMA</li> </ul>	<p>Industry-grade edge computing scenarios</p>
 <p><b>iCUBE-PLC100</b> (optional)</p>	<p>Box-shaped PLC communication unit:</p> <ul style="list-style-type: none"> <li>Built-in power supply, enabling independent deployment</li> <li>IPv6 and automatic addressing</li> <li>Ethernet to PLC</li> </ul>	<p>PLC communication scenarios</p>

# Features and Highlights

## Edge IoT, Enhancing Security and Reliability

- Edge computing architecture, open software and hardware resources, support for multi-container management, and on-demand app deployment
- Standard Debian-based development environment, and a wide variety of SDKs for flexibly invoking compute, storage, and network resources
- Mainstream IoT communication protocols, such as MQTT and CoAP
- Data encryption, non-privileged containers, and dual-partition backup, enhancing device security and reliability

## High-Quality, Industrial-Grade Design

- Fan-free design, wide operating temperature range, from  $-40^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$
- Resilient to strong magnetic interference
- IEC 61850-3/IEEE 1613 compliant
- Dual power supplies for redundancy, DI/DO alarm

## Extensive Interfaces, Enabling Flexible Expansion

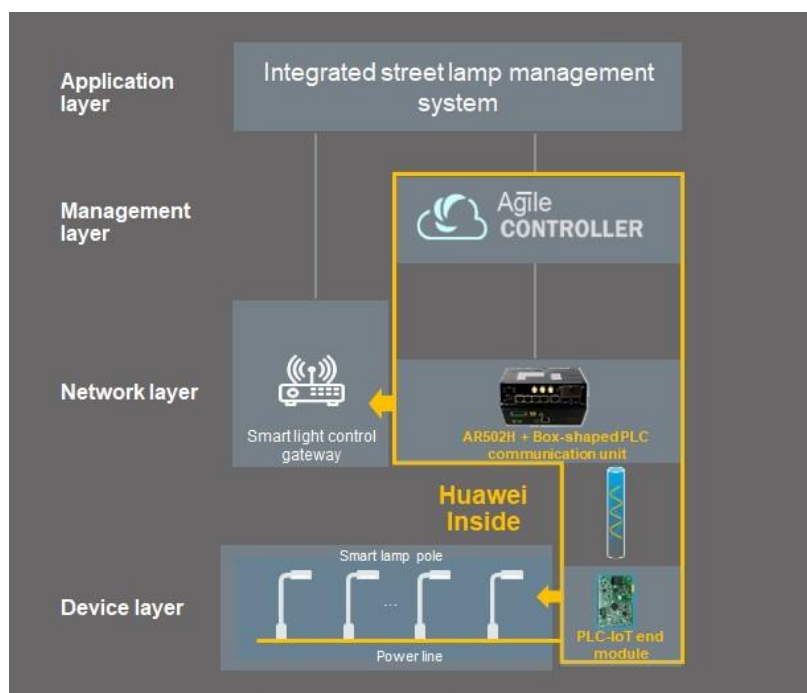
- LTE FDD and LTE TDD, compatibility with WCDMA, GPRS, and GSM
- 5G NR SA and NSA, LTE FDD and LTE TDD, compatibility with WCDMA/GPRS
- Multiple interfaces, including GE, RS232, RS485, and DI/DO
- M.2 hard drive interface, scalability to up to 256 GB (provided by customers)
- Support for all global positioning systems: BeiDou, GPS, Galileo, and GLONASS

## Simple Deployment and Easy O&M

- Cloud-based management through Agile Controller-IoT
- Visualized configuration, user-friendly GUI
- Remote container and app management, batch configuration and upgrade

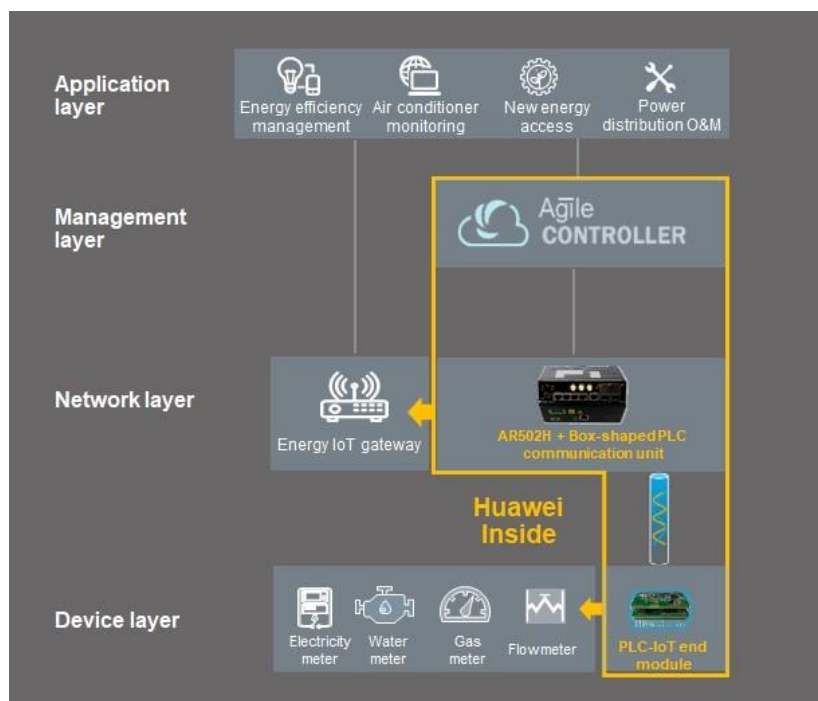
# Application Scenarios

## IoT Pole



Huawei AR502H, a smart light control gateway, integrates remote control, local management, computing, and communication functions. It uses IP-based PLC to connect and manage large numbers of smart lamp poles. In addition, it supports deployment of light control service applications, and provides multiple types of light control adjustment solutions, thereby delivering improved lighting quality with lower energy consumption.

## Smart IES



Huawei AR502H, a smart Integrated Energy Service (IES) IoT gateway, integrates remote control, local management, computing, and communication functions. The AR502H has multiple built-in containers, supports on-demand deployment of service apps, and works with the backend platform to display network-wide alarm status, site status, and device status. This achieves remote visualized management and real-time network monitoring.

# Product Specifications

Specification	AR502H	NetEngine AR502H-5G				
Hardware parameters						
Case	Die-casting					
Processor	ARM quad-core A53, 1 GHz					
DDR	2 GB, DDR4					
Flash	2 GB, SLC NAND					
Fixed Ethernet port	<ul style="list-style-type: none"> <li>3 x GE electrical ports, 10/100/1000 Mbit/s auto-sensing</li> <li>2 x GE combo</li> </ul>					
Fixed serial interface	2 x RS485 or RS232 (isolated; switching between RS485 and RS232 is controlled through software)					
Alarm port	<ul style="list-style-type: none"> <li>One DI port (passive contact input)</li> <li>One DO port (industrial terminal, supporting normally open and normally closed)</li> </ul>					
USB 3.0	1					
Console port	1					
SIM card	<ul style="list-style-type: none"> <li>Micro-SIM</li> </ul>					
RTC/Overtemperature alarm	Supported					
Global positioning system	BeiDou, GPS, Galileo, and GLONASS					
Reset/Configuration	Reset/Configuration button: used to manually restore factory default settings (hold down for at least 5 seconds) or to reset the router (hold down for less than 5 seconds).					
M.2 hard drive interface	Supported M.2 2242 SSD (using a SATA bus; industrial-grade SSDs provided by customers), scalable up to 256 GB					
LED indicators	2 x PWR, 1 x SSD, 1 x SIM, 1 x GPS, 1 x 2G, 1 x 3G		2 x PWR, 1 x SSD, 1 x SIM, 1 x GPS, 1 x 3G			
		2G LED	3G LED		3G/4G LED	NR LED
	2G	√	-	3G	√	-
	3G	-	√	4G/LTE	√	-
	4G/LTE	√	√	5G SA	-	√
			5G NSA	√	√	

Specification	AR502H	NetEngine AR502H-5G
Power supply	Dual DC power supplies: 9.6 V to 60 V (industrial terminal)	
Dimensions (H x W x D)	44 mm x 150 mm x 133 mm (1.73 in. x 5.91 in. x 5.24 in.)	
Net weight	1.1 kg	
Typical power consumption	< 8.5 W (excluding optical modules)	
Installation mode	DIN/wall-mounted	
Storage temperature	-40°C to +85°C	
Operating temperature	-40°C to +70°C	
Operating humidity	5% to 95% (non-condensing)	
IP rating	IP40	
EMC standards compliance	<ul style="list-style-type: none"> <li>• IEEE 1613</li> <li>• IEC 61850-3</li> <li>• EN 61000-6-5 (2009+2013)</li> </ul>	
Safety regulations	<ul style="list-style-type: none"> <li>• IEC 60950-1</li> <li>• IEC 61850-3</li> </ul>	
Certification mark	Conformite Europeenne (CE)	
<b>EC-IoT parameters</b>		
Maximum built-in flash for containers	1 GB	
Scalable storage	Up to 256 GB (M.2 hard drive interface)	
Maximum built-in memory for containers	1.5 GB	
Basic functions	<ul style="list-style-type: none"> <li>• Supports LXC and Docker</li> <li>• Installing, uninstalling, starting, and stopping apps</li> <li>• Installing, uninstalling, starting, and stopping containers</li> <li>• Upgrading apps in overwrite mode and incremental mode</li> </ul>	
Advanced functions	<ul style="list-style-type: none"> <li>• Allocating CPU cores to containers</li> <li>• Adjusting container storage and memory resources</li> <li>• Deploying multiple containers interconnected through message buses</li> </ul>	
Security functions	<ul style="list-style-type: none"> <li>• Container disk encryption</li> <li>• Container and app signature verification</li> </ul>	
IoT protocols	<ul style="list-style-type: none"> <li>• MQTT</li> <li>• CoAP</li> </ul>	

Specification	AR502H	NetEngine AR502H-5G
Support for secondary development	<ul style="list-style-type: none"> <li>• Standard Debian-based development environment, support for secondary development</li> <li>• Mainstream programming languages: C/C++, etc.</li> </ul>	
Software parameters		
Basic features	<ul style="list-style-type: none"> <li>• IPv4</li> <li>• TCP/UDP</li> <li>• Socket</li> <li>• ARP</li> <li>• ICMP</li> <li>• DHCP</li> <li>• NAT</li> <li>• NETCONF</li> </ul>	
Unicast routing	Static route	
Security and reliability	<ul style="list-style-type: none"> <li>• Non-privileged container</li> <li>• Protocol packet protection</li> <li>• ACL</li> <li>• CPU attack defense</li> <li>• Blacklist/Whitelist</li> <li>• Packet filtering firewall</li> <li>• Key component management</li> <li>• Hardware random number</li> <li>• Dual-partition backup</li> <li>• Hard drive data encryption</li> </ul>	
Configuration maintenance	<ul style="list-style-type: none"> <li>• CLI, SSH v2 terminal</li> <li>• User operation logs</li> <li>• System status monitoring</li> <li>• Remote management through Agile Controller-IoT</li> <li>• USB-based deployment</li> </ul>	
Firmware management	Local and remote firmware upgrade	
Event alarm	System log	

Specification	iCUBE-PLC100
<b>Hardware parameters</b>	
Operating temperature	–40°C to +70°C
Relative operating humidity	5% to 95% (non-condensing)
Storage temperature	–40°C to +85°C
Rated voltage range	200 V AC to 240 V AC (phase-A power supply)
Working frequency	50 Hz/60 Hz
Output power	36 W
Maximum power consumption	< 6 W
Power output port	12 V DC (industrial terminal)
Ethernet port	<ul style="list-style-type: none"> <li>• 100 Mbps (RJ45)</li> <li>• Connecting to the AR502H through the Ethernet port (used for internal cascading)</li> </ul>
Fixed serial interface	1 x RS485 (isolated)
IP rating	IP40
LED indicators	<ul style="list-style-type: none"> <li>• 1 x PWR</li> <li>• 1 x SYS</li> <li>• 1x Tx</li> <li>• 1 x Rx</li> </ul>
Dimensions (H x W x D)	44 mm x 150 mm x 133 mm (1.73 in. x 5.91 in. x 5.24 in.)
Net weight	0.5 kg
<b>PLC-IoT interface parameters</b>	
Protocol compliance	<ul style="list-style-type: none"> <li>• IPv6, 6LoWPAN</li> <li>• DTLS</li> <li>• CoAP</li> </ul>
PLC type	Huawei broadband PLC
Modulation format	OFDM
Frequency range	0.7 to 12 MHz
PLC cable connection	Three-phase four-wire
Tx power	PSD ≤ –45 dBm/Hz
Receive sensitivity	> 0.2 mVpp

Specification	iCUBE-PLC100
Application-layer rate	100 kbps to 1.8 Mbps
<b>Software parameters</b>	
Networking	<ul style="list-style-type: none"> <li>• Multi-level networking</li> <li>• Automatic traffic steering</li> <li>• Dynamic topology optimization</li> <li>• Star networking topology</li> <li>• Domain-based networking: Each PLC end module can form independent networks of different domains in the same frequency band, without interference.</li> </ul>
IPv6	<ul style="list-style-type: none"> <li>• Access to PLC nodes based on IPv6 addresses</li> <li>• 6LoWPAN compression and fragmentation</li> </ul>
Deployment of plug-and-play devices	Plug-and-play low-voltage devices
Transformer district identification	Software-based transformer district identification
Power outage reporting	Supported
Access authentication	<ul style="list-style-type: none"> <li>• Digital certificate-based authentication (authentication with the AR502H)</li> <li>• DTLS authentication (authentication with the AR502H)</li> </ul>
Data security	<ul style="list-style-type: none"> <li>• AES128-based data encryption</li> <li>• Integrity check</li> </ul>
Whitelist	<ul style="list-style-type: none"> <li>• Enabling and disabling a whitelist</li> <li>• Adding records to, deleting records from, and querying records in a whitelist</li> <li>• Configuring a whitelist based on the module MAC address, module serial number, and end device ID</li> </ul>
Management and maintenance	<ul style="list-style-type: none"> <li>• Configuring and querying PLC network parameters, such as the network topology</li> <li>• Remotely obtaining PLC site information</li> <li>• Self-healing of PLC networks and PLC sites</li> </ul>



# Power Specifications

60 W power supply



Specification	Power Adapter
Power specifications	<p>Power input (integrated high-voltage AC/DC):</p> <ul style="list-style-type: none"> <li>• 88 V DC to 300 V DC (industrial terminal)</li> <li>• 90 V AC to 264 V AC (industrial terminal)</li> </ul> <p>Power output:</p> <ul style="list-style-type: none"> <li>• 12 V DC (industrial terminal)</li> </ul>
Power	60 W
Weight	0.9 kg
Dimensions (H x W x D)	40 mm x 150 mm x 133 mm (1.57 in. x 5.91 in. x 5.24 in.)
Storage temperature	-40°C to +85°C
Operating temperature	-40°C to +70°C
Installation mode	Installed on the DIN rail
Operating humidity	5% to 95% (non-condensing)

## Ordering Information

Code	Ordering Information
<b>Device</b>	
AR502H	Router,AR502H 2*RS485(or 2*RS232),1*DI/DO,3*GE (10/100/1000M RJ45),2*GE COMBO,1*LTE (dual SIM),1*USB3.0,GPS/GLONASS/BDS,9.6-60VDC
AR502H-5G	Router,AR502H-5G 2*RS485(or 2*RS232),1*DI/DO,3*GE (10/100/1000M RJ45),2*GE COMBO,1*5G(dual SIM),1*USB3.0,GPS/GLONASS/BDS,9.6-60VDC
<b>Accessories (optional)</b>	
iCUBE-PLC100	Modem,iCUBE-PLC100 1*RS485,1*FE,90-264VAC,External,90-264VAC,NULL <i>Note: This model cannot be used in the Japanese market (110 V voltage).</i>
<b>Power supply</b>	
PAC-60WB	Function Module,AC Adapter,PAC-60WB,60W AC Power Module(No Fan) <i>Note: If the iCUBE-PLC100 is configured, this power module does not need to be configured.</i>
<b>4G Antennas</b>	
ASMAM0006	Omni-directional Antenna,698MHz-960MHz/1710MHz-2690MHz,1.0dBi(698MHz-960MHz)&3dBi(1710MHz-2690MHz),10W,SMA-J
<b>5G Antennas</b>	
ASMBF5G00	Omni-directional Antenna,698-960MHz/1710-2690MHz/3300-5000Mhz,2.0dBi(698-821MHz)&3dBi(824MHz-5000MHz),Vertical polarization,omnidirectional,5W,SMB-K,No bracket
A00NF5G00	Omni-directional Antenna,698MHz-960MHz/1710MHz-2700MHz/3400MHz~5000MHz,2dBi/3dBi/3dBi,linear polarization,Isotropic,20W,N/Female-4 Ports,with bracket,IP65
<b>GPS Antennas</b>	
ASMAM0015	Omni-directional Antenna,1555~1610 MHz,38+/-2 dB,right-handed circular polarization,Omni-directional,N/Female,No rack
WM1NANTENN07	Omni-directional Antenna,1555~1610 MHz,38+/-2 dB,right-handed circular polarization,Omni-directional,N/Female,No rack
<b>Installation materials</b>	
DINRAIL002	metals,DKBA61542001.ASM,mounting base,machining

# More Information

For more information, visit <https://e.huawei.com/en/> or contact us in the following ways:


- Global service hotline: <https://e.huawei.com/en/service-hotline-query>
- Logging in to the Huawei Enterprise technical support website: <https://support.huawei.com/enterprise/en/index.html>
- Sending an email to the customer service mailbox: [Support\\_e@huawei.com](mailto:Support_e@huawei.com)

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