AIG-502 Series

Advanced IIoT gateways with Intel® Core™ i7 processor, Azure IoT Edge software, -40 to 70°C operating temperature

Features and Benefits

- Supports Modbus RTU/ASCII/TCP Client

- Supports Azure IoT Edge

- Equipped with Secure Boot to prevent malicious software-injection attacks

- Built-in network traffic monitoring and diagnostic tool for easy troubleshooting

- Provides robust OTA function to prevent system failure during software upgrades

- LTE Cat. 4 US, EU, and APAC models available

- Compliance with IEC 62443-4-2 Security Level 2 requirements

- -40 to 70°C operating temperature range

Certifications

Introduction

The AIG-502 is a robust Industrial IoT (IIoT) gateway designed to provide secure and reliable data communication for industrial applications. Compliance with the IEC 62443-4-2 Security Level 2 requirements ensures secure network connectivity, data transmission, and device authentication. The AIG-502 is equipped to acquire field data via Modbus RTU, ASCII, and TCP protocols, enabling seamless integration with the Azure cloud platform. With ample computing power, it supports advanced edge computing capabilities using Azure IoT Edge modules, making it an ideal solution for industries seeking to enhance data-driven operations securely and efficiently.

Boost Edge Computing Capabilities With Azure IoT Edge

AIG-502 supports Azure IoT Edge to bring in a multitude of benefits including edge computing capabilities, reduced bandwidth costs, flexibility and scalability, seamless integration with Azure services, and ease of management and update. Specifically, with the AIG-502 processing data locally, it not only offers rapid responses and low latency but also effectively reduces network bandwidth usage, thereby cutting costs. Additionally, the modular design of the AIG-502 and Azure IoT Edge support make your system both flexible and easily expandable. At the same time, AIG-502's seamless integration with Azure cloud services allows you to effortlessly extend cloud capabilities to edge devices.

Reliable Software Updates With Easy Installation and Recovery

The software update function ensures easy, reliable, and secure system upgrades. Through the web console, users can install Debian, and specific patches using Debian APT, or apply a comprehensive update pack provided by Moxa. Updates can be retrieved online or manually uploaded with options for immediate or scheduled installation. The function also supports download resumption and automatic recovery, providing a seamless and resilient update experience to keep systems running smoothly.

Security Dashboard Optimized for Detecting Security Issues

A security dashboard utilizes device scans to identify potential cybersecurity threats from multiple angles, such as during account settings management, application networking, application resource usage monitoring, product certificates deployment, service settings modifications, and system status checks. Upon detecting threats, a mitigation plan is recommended to resolve issues.

Appearance

LEDs x 6
(Storage, Power, Tx, Rx)

USB Hosts x 3
(3.0, type A)

HDMI

LAN Ports x 2
(100/1000 Mbps, RJ45)

Wireless Antenna
Connectors x 5

Serial Ports x 2
(RS-232/422/485, DB9)

Power Input
(terminal block)

Power Button

Reset Button   Ground Screw

SIM Card
Holder Cover
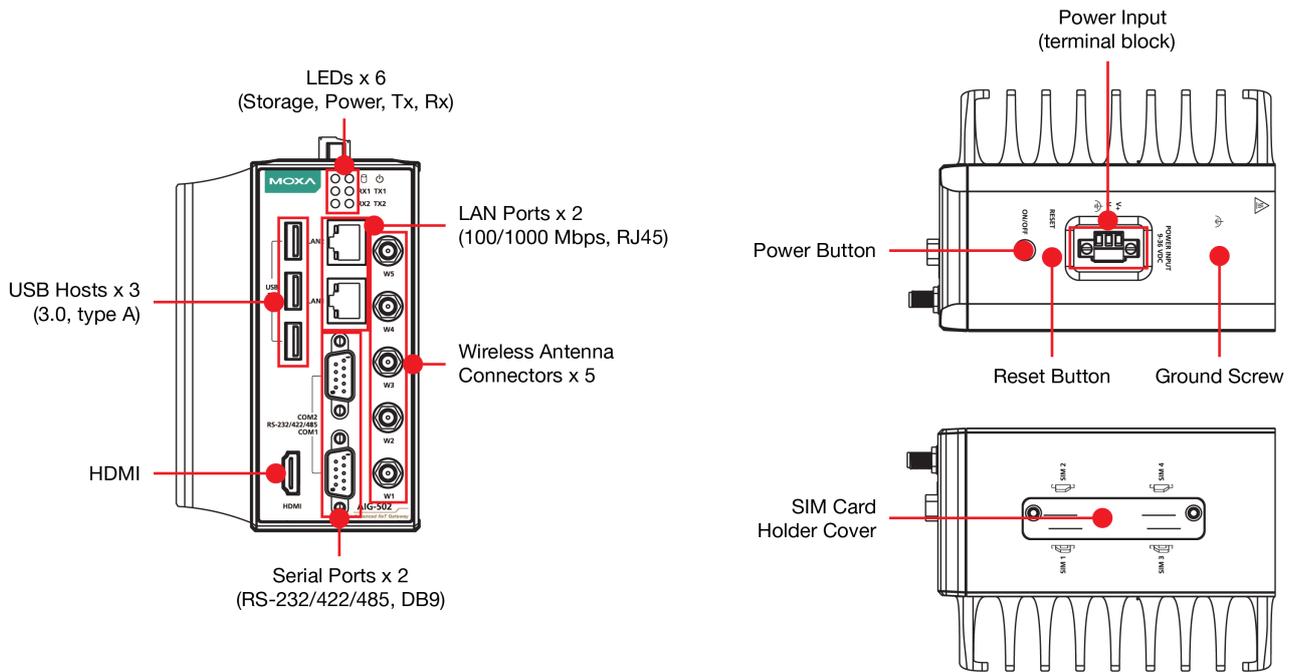
Specifications

Computer

CPU	Intel® Core™ i7-7600U processor (4M cache, up to 3.90 GHz)
DRAM	32 GB SODIMM DDR4
Storage Pre-installed	32 GB mSATA
Pre-installed OS	Moxa Industrial Linux (Debian 11, kernel 5.10.x)
Graphics Controller	Intel® HD Graphics 620

Computer Interface

Ethernet Ports	Auto-sensing 10/100/1000 Mbps ports (RJ45 connector) x 2
Serial Ports	RS-232/422/485 ports x 2 (software-selectable, DB9 male connector)
USB 3.0	USB 3.0 hosts x 3, type-A connectors
Wi-Fi Antenna Connector	RP-SMA x 2 (excluding AIG-502-T-AZU-LX)
Cellular Antenna Connector	SMA x 2 (excluding AIG-502-T-AZU-LX)
GPS Antenna Connector	SMA x 1 (excluding AIG-502-T-AZU-LX)
Expansion Slots	mPCIe slots x 1 (for optional Wi-Fi module)
SIM Format	Nano (excluding AIG-502-T-AZU-LX)
Number of SIMs	2
Video Output	HDMI x 1
TPM	TPM v2.0

Ethernet Interface

10/100/1000BaseT(X) Ports (RJ45 connector)	2
Magnetic Isolation Protection	1.5 kV (built-in)

Ethernet Software Features

Industrial Protocols	Azure IoT Edge
Configuration Options	Web Console (HTTP/HTTPS)
Time Management	NTP Server/Client GPS
Security	SSH HTTPS/SSL TLS Firewall

Serial Interface

No. of Ports	2
Connector	DB9 male
Baudrate	50 bps to 115.2 kbps
Data Bits	7, 8
Stop Bits	1, 2
Parity	None, Even, Odd, Space, Mark
Flow Control	RTS/CTS, XON/XOFF, ADDC (automatic data direction control) for RS-485

Serial Signals

RS-232	TxD, RxD, RTS, CTS, GND
RS-422	Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w	Tx+, Tx-, Rx+, Rx-, GND
RS-485-4w	Data+, Data-, GND

Serial Software Features

Industrial Protocols	Modbus RTU/ASCII Master

Cellular Interface

Cellular Standards	LTE Cat. 4
Band Options (US)	LTE Band 2 (1900 MHz) / LTE Band 4 (1700 MHz) / LTE Band 5 (850 MHz) / LTE Band 12 (700 MHz) / LTE Band 13 (700 MHz) / LTE Band 14 (700 MHz) / LTE Band 66 (1700 MHz) / LTE Band 71 (600 MHz) UMTS/HSPA 850 MHz / 1900 MHz Carrier Approval: Verizon, AT&T Note: LTE Band 71 (600 MHz). is not included in the selectable antenna support range. Please contact Moxa if you need to use this band.
Band Options (EU)	LTE Band 1 (2100 MHz) / LTE Band 3 (1800 MHz) / LTE Band 7 (2600 MHz) / LTE Band 8 (900 MHz) / LTE Band 20 (800 MHz) UMTS/HSPA 900 MHz / 1800 MHz / 2100 MHz
Band Option (APAC)	LTE Band 1 (2100 MHz) / LTE Band 3 (1800 MHz) / LTE Band 5 (850 MHz) / LTE Band 8 (900 MHz) / LTE Band 28 (700 MHz) UMTS/HSPA 850 MHz / 900 MHz / 2100 MHz

GPS Interface

Receiver Types	GPS/GLONASS/BeiDou/Galileo/QZSS
Accuracy	Position: 2.0 m @CEP50

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Sensitivity	Acquisition: -147.0 dBm Cold starts: -145 dBm Tracking: -160 dBm
Update Rate	1 Hz

Azure IoT Edge

Versions Supported	v1.4.33
Authentication Methods	Manual / Connection String DPS / Symmetric Encryption DPS / X.509 Certificate DPS / TPM
Azure Direct Methods	Reboot Software Upgrade Remote API Invocation
Azure Module Twin	Device Configuration
Moxa Functions	Custom Payload Message Group

Modbus RTU/ASCII

Mode	Client (Master)
Functions Supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Max. No. of Commands	256 per port
Max. No of Connected Devices	31 slave devices per serial port

Modbus TCP

Mode	Client (Master), Server (Slave)
Functions Supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Max. No. of Server Connections	64
Max. No. of Client Connections	4
Max. No. of Commands	3000

LED Indicators

System	Power x 2
LAN	2 per port (10/100/1000 Mbps)
Serial	2 per port (Tx, Rx)

Power Parameters

Input Voltage	9 to 36 VDC 12 to 36 VDC, 6A (for hazardous locations)
Input Current	8 A @ 9 VDC 2 A @ 36 VDC
Power Consumption	72 W (max.)
Power Connector	3-pin terminal block

Reliability

Automatic Reboot Trigger	External WDT (watchdog timer)

Physical Characteristics

Housing	Metal
IP Rating	IP20
Dimensions	134 x 60.4 x 120 mm (5.28 x 2.38 x 4.72 in)
Weight	1,500 g (3.3 lb)
Installation	DIN-rail mounting (with optional kit) Wall mounting (with optional kit)

Environmental Limits

Operating Temperature	-40 to 70°C (-40 to 158°F)
Storage Temperature (package included)	-40 to 75°C (-40 to 167°F)
Ambient Relative Humidity	5 to 95% (non-condensing)
Shock	IEC 60068-2-27
Vibration	IEC 60068-2-64

Standards and Certifications

EMC	EN 55032/35 EN 61000-6-2/-6-4
EMI	CISPR 32, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV IEC 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF
Safety	UL 62368-1 EN 62368-1
Radio	NCC RCM
Carrier Approvals	AT&T Verizon PTCRB
RED	EN 300 328 EN 301 489-1/17/19/52 EN 301 511 EN 301 893 EN 301 908-1 EN 303 413 EN 62311
Hazardous Locations	Class I Division 2, ATEX, IECEx
International Approval	BSMI
Green Product	RoHS, CRoHS, WEEE

MTBF

Time	510,913 hrs
Standards	Telcordia (Bellcore) Standard TR/SR, GB

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Warranty

Warranty Period	3 years
Details	See www.moxa.com/warranty

Package Contents

Device	1 x 1 x AIG-502 Series computer
Installation Kit	1 x DIN-rail mounting kit
Cable	1 x terminal block to power jack converter
Documentation	1 x quick installation guide 1 x warranty card 1 x sheet of tamper-proof labels

Dimensions

Unit: mm (inch)

87 (3.43)

134 (5.28)

60.4 (2.38)

120 (4.72)

140.7 (5.54)
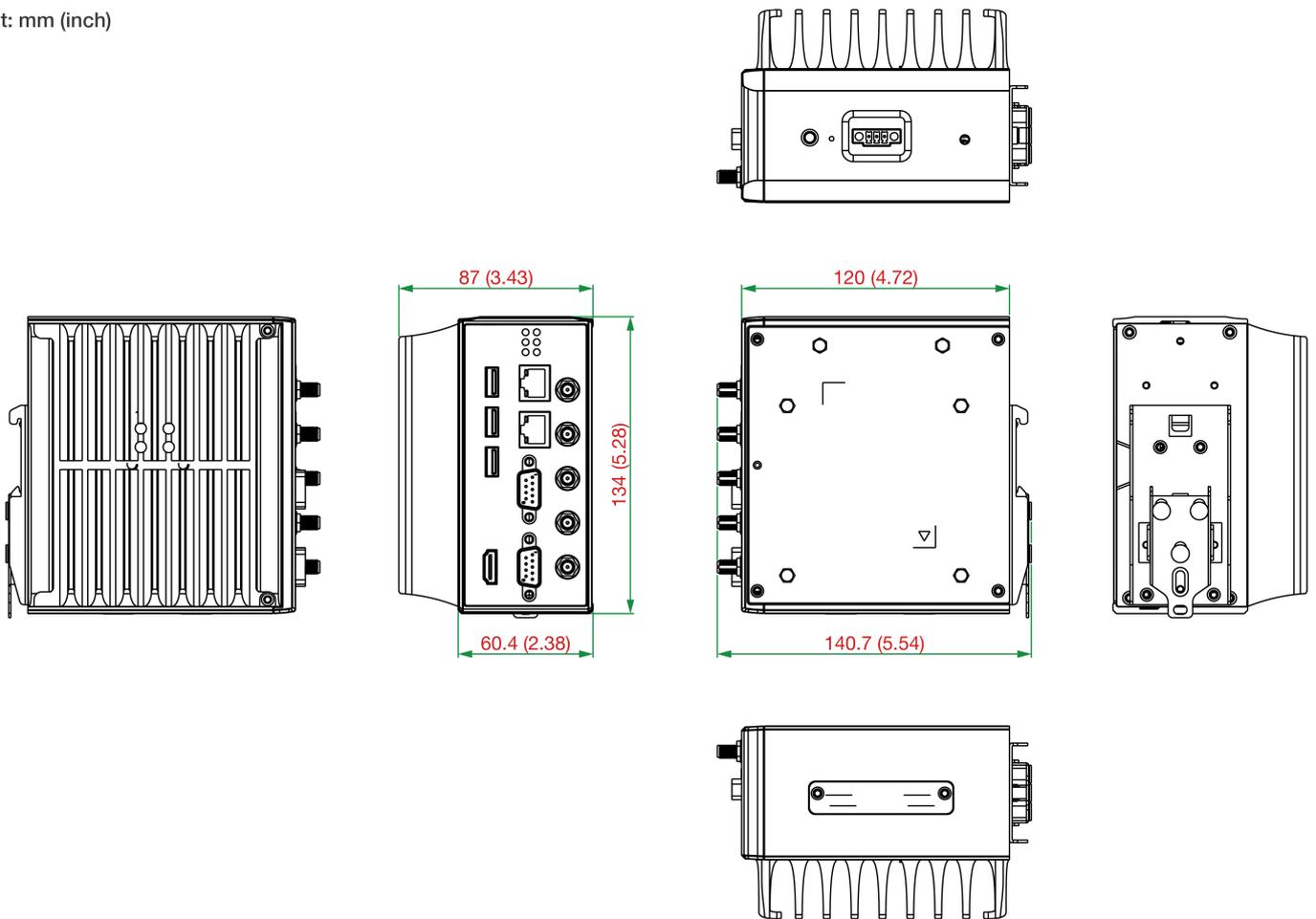
Ordering Information

Model Name	mPCIe Slot 1 for LTE Module	mPCIe Slot 2 for Wi-Fi Module	Operating Temperature
AIG-502-T-AZU-LX	–	–	-40 to 70°C
AIG-502-T-US-AZU-LX	US region LTE module preinstalled	Reserved	-40 to 70°C
AIG-502-T-EU-AZU-LX	Europe region LTE module preinstalled	Reserved	-40 to 70°C
AIG-502-T-AP-AZU-LX	APAC region LTE module preinstalled	Reserved	-40 to 70°C

Accessories (sold separately)

Power Adapters

PWR-24250-DT-S1	Desktop power supply (requires power cord), 24 VDC, 2.5 A, 100 to 240 VAC, 0 to 40°C operating temperature

Wi-Fi Wireless Modules

MC-1220-WLAN11-AC	Wireless package for the MC-1200 Series with WPEQ-261ACNI(BT) 802.11ac/a/b/g/n Wi-Fi module and mPCIe module

Antennas

ANT-LTEUS-ASM-01	GSM/GPRS/EDGE/UMTS/HSPA/LTE, 1 dBi, omnidirectional rubber-duck antenna
ANT-LTE-OSM-03-3m BK	700-2700 MHz, multiband antenna, specifically designed for 2G, 3G, and 4G applications, 3 m cable
ANT-WDB-ARM-0202	2 dBi at 2.4 GHz or 2 dBi at 5 GHz, RP-SMA (male), dual-band, omnidirectional antenna
ANT-GPS-CSM-04-3m BK	20 dBi at 1575 to 1605 MHz, SMA (male), right-hand circular polarization (RHCP), active GPS antenna, 3-meter cable

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