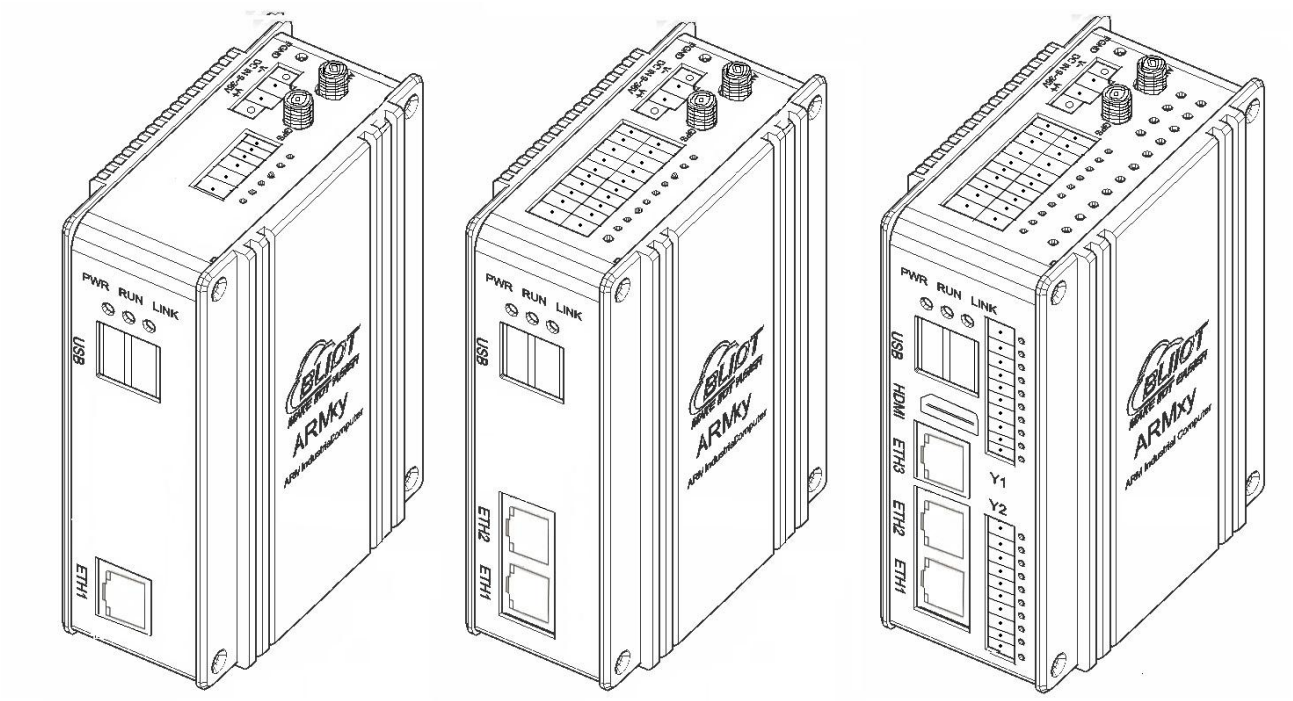


ARMXY EMBEDDED

COMPUTER DATASHEET

ARMxy BL460 Series

Version History

Version	V1.0	2024-10-19	Initial Release	

Contents

1. Overview

The BL460 Series from the ARMxy family is an industrial-grade ARM controller based on the Broadcom BCM2712 quad-core Cortex-A76 processor (up to 2.4GHz). It offers flexible configurations with up to 64GB eMMC and 16GB LPDDR4X RAM, and rich I/O options including 1–3 Ethernet ports, USB 3.0, HDMI, M.2, Mini PCIe, and expandable X/Y series I/O boards.

Compatible with the Raspberry Pi ecosystem, the BL460 supports Linux, Raspberry Pi OS, Docker, Node-Red, and Qt, enabling fast development and cross-platform integration. It also supports BLIoTLink for industrial data acquisition and protocol conversion, BLRAT for remote access, and the QuickConfig tool for easy setup.

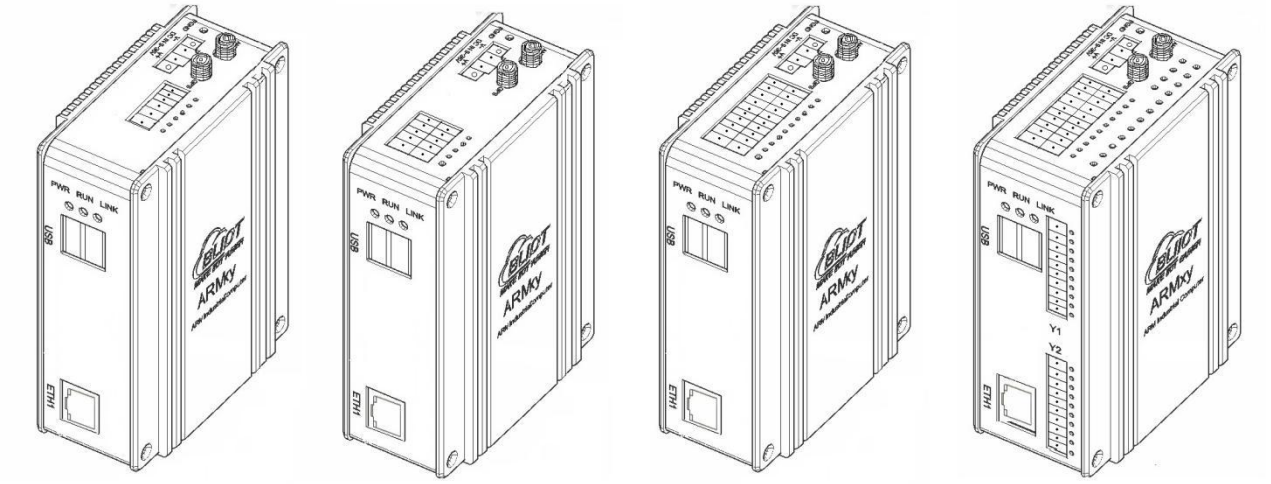
Designed for edge computing, industrial control, IoT gateways, and smart automation, the BL460 operates reliably in -20°C to +85°C environments and supports DIN-rail mounting for industrial applications.

2. Typical Application Areas

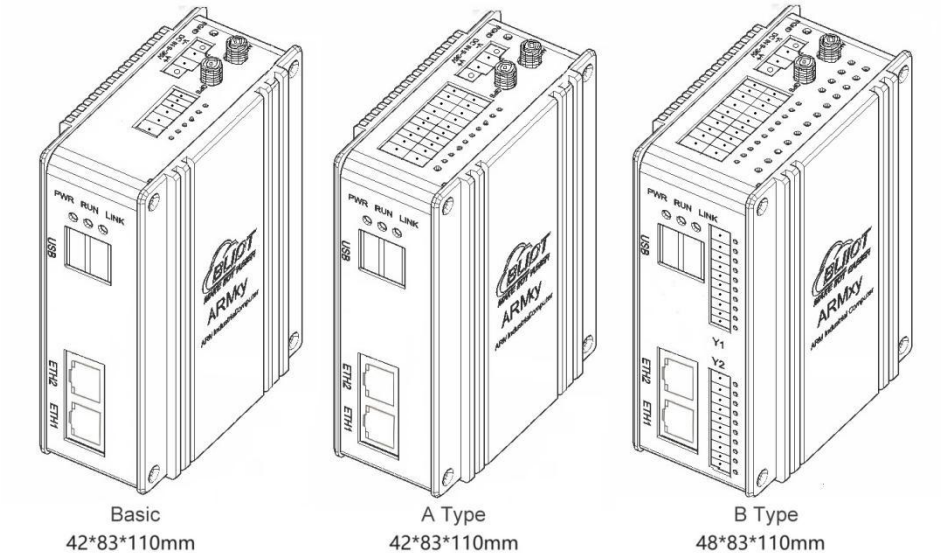
- ✓ Industrial Control
- ✓ Industrial PLC
- ✓ Edge Computing Gateway
- ✓ Blood Analyzer
- ✓ Communication Management Unit
- ✓ Testing Instruments and Equipment
- ✓ Rail Transit
- ✓ Energy Storage System
- ✓ Motion Controller
- ✓ EV Charging Pile
- ✓ Smart Manufacturing
- ✓ AGV Robot
- ✓ Industrial Robot
- ✓ Smart Devices

3. Software and Hardware Specifications

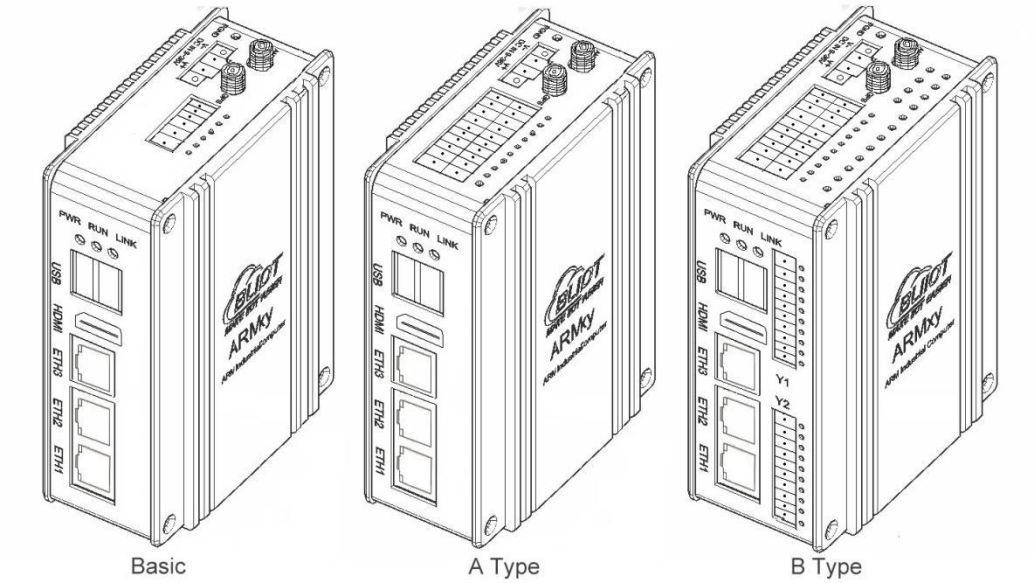
Exterior Structure and Dimensions of Product with 1 Ethernet Port:



Exterior Structure and Dimensions of Product with 2 Ethernet Ports:



Exterior Structure and Dimensions of Product with 3 Ethernet Ports:



Basic
42*83*110mm

A Type
42*83*110mm

B Type
48*83*110mm

Hardware	Parameters
CPU	Broadcom BCM2712, 16nm
	4xCortex-A76, Clock Speed: 2.4GHz
	GPU: VideoCore VII, supports OpenGL ES 3.1, Vulkan 1.2, and 4Kp60 HEVC deco ding
ROM	8/16/32/64GByte eMMC
RAM	2/4/8/16GByte LPDDR4X
ETH	RJ-45, 1~3, 1x10/100/1000M, 2x10/100M, ESD Level 3, EFT Level 3
USB	2xUSB 3.0, up to 5.0 Gbps, ESD Level 3
HDMI	1xHDMI 2.1, supports 4K @ 60fps
I/O Slot	X series IO board slot: 1, X series IO board, support RS485, RS232, RS422, DI, D O, GPIO, etc; Y series IO board slot: 2, Y series IO board, support RS485, RS232, RS422, DI, D O, Relay output, AI, AO, PT100, PT1000, TC, IEPE, etc.
LED	1x power indicator light
	2x user-programmable indicator light
Mini PCIE	1, Supports 4G module
M.2	1x M.2 slot, supports 2242-size SSD
SIM Slot	1 slot, NANO
Antenna	2, For 4G/5G/WIFI/GPS
Debug	1x Micro USB debug port

SD Slot	1(For Lite version SOM only)
Reset	1 reset button
Watchdog	Onboard independent hardware watchdog
Power	Rated DC 24V, supports wide voltage range of 12-24VDC Equipped with reverse polarity protection and overcurrent protection 2-pin terminal block with screw terminals
Grounding	1-pin GND terminal
Installation	DIN35 rail mounting, wall mounting
Material	Aluminum alloy casing + stainless steel
Dimension	110*83*42mm or 110*83*48mm

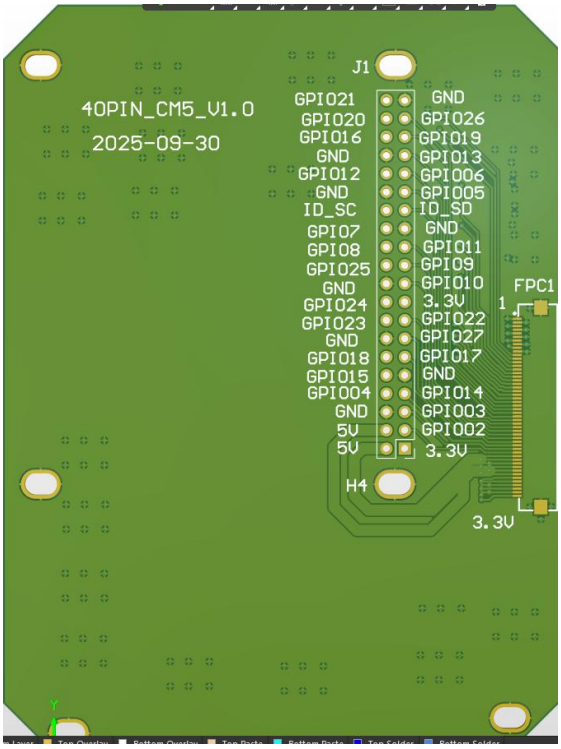
Software	Parameters
Kernel	Linux 6.6.78-v8-16k
Operating System	Raspberry Pi OS, Linux6.6.78
GUI development tool	Qt-5.15.11
Protocol Conversion Software	BLIoTLink, used for protocol conversion, such as Modbus,PLC, BACnet, IEC104, MQTT, OPC UA, support AWS IoTCore, Thingsboard, IgnitionSCADA, Alibaba IoT, HUAWEI IoT.
Remote Quick Configuration Tool & AI Assistant	QuickConfig
Remote Access Tool	BLRAT, enables remote device access for convenient remote maintenance.
Other Software	Node-Red, Python, Docker, C#, MySQL, SQLite

40-pin Expansion Board

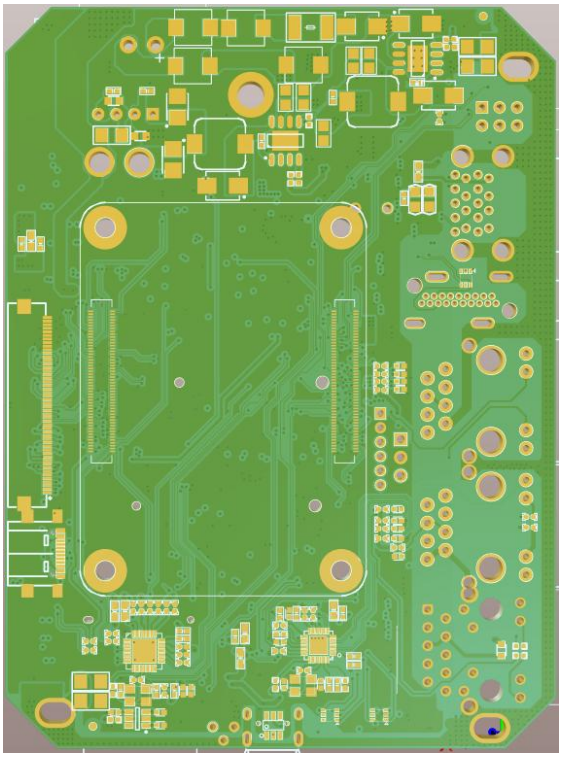
Using the WiringPi hardware control library, the 40-pin GPIO pins can be controlled easily, quickly, and intuitively.

The 40-pin expansion board and the mainboard layout are shown in the figure below.

40-pin Expansion Board



Mainboard



Note:

GPIO14 and GPIO15 are shared with the mainboard debug port, and GPIO2 and GPIO17 a re used for power and network indicators. Modifying these GPIOs will disable the correspon ding functions.

When used with X-board: GPIO3, 4, 5, 7, 12, 13, 16, 22, 23, 24, 25, and 27 are shared b etween the X-board and the 40-pin header; modifying them may cause conflicts.

When used with Y-board:

Slot 1 shares GPIO1, 8, 9, 10, 11, and ID_SC

Slot 2 shares GPIO0, 18, 19, 20, 21, and 26

Modifying these GPIOs will cause the Y-board connection to fail.

4. Product Selection

The ARMxy series ARM embedded controllers adopt a flexible design concept, allowing user s to customize ROM and RAM combinations by choosing different System-on-Module(SOM) boards as needed. Additionally, various X and Y boards can be selected to achieve diverse IO configurations, catering to the requirements of different application scenarios.

Product naming convention

Host Model Number - SOM Model Number - X Board Model Number - Y1 Board ModelNum ber - Y2 Board Model Number

For example, if we had a specific product configuration:

BL461-SOM4612-X10

Means 2 Ethernet port, 32GB eMMC storage, 16GB LPDDR4X, and 4 RS485 ports

If you need to add a 4G module, you would append "L" to the host model number.

For example: BL461L-SOM4612-X10

ARMxy BL460 Model List

Model	ETH	USB	HDMI	X board IO Slot	Y board IO Slot	Dimension
BL460	1x10/100/1000M	2	X	1x6PIN	X	42x83x110mm
BL460A	1x10/100/1000M	2	X	1x20PIN	X	42x83x110mm
BL460B	1x10/100/1000M	2	X	1x20PIN	2	48x83x110mm
BL460C	1x10/100/1000M	2	X	1x10PIN	X	42x83x110mm
BL461	1x10/100/1000M，1x10/100M	2	X	1x6PIN	X	42x83x110mm
BL461A	1x10/100/1000M，1x10/100M	2	X	1x20PIN	X	42x83x110mm
BL461B	1x10/100/1000M，1x10/100M	2	X	1x20PIN	2	48x83x110mm
BL462	1x10/100/1000M，2x10/100M	2	1	1x6PIN	X	42x83x110mm
BL462A	1x10/100/1000M，2x10/100M	2	1	1x20PIN	X	42x83x110mm
BL462B	1x10/100/1000M，2x10/100M	2	1	1x20PIN	2	48x83x110mm

ARMxy BL460 SOM Model List

You can select the appropriate ROM, RAM, and temperature grade based on your requirements.

Model	MCU	Clock Speed	Wireless	eMMC	LPDDR4X	Temperature
SOM4601	BCM2712	2.4GHz	x	0GB (Lite)	2GB	-20~85℃
SOM4602	BCM2712	2.4GHz	x	16GB	2GB	-20~85℃
SOM4603	BCM2712	2.4GHz	x	32GB	2GB	-20~85℃
SOM4604	BCM2712	2.4GHz	x	0GB (Lite)	4GB	-20~85℃
SOM4605	BCM2712	2.4GHz	x	16GB	4GB	-20~85℃
SOM4606	BCM2712	2.4GHz	x	32GB	4GB	-20~85℃
SOM4607	BCM2712	2.4GHz	x	0GB (Lite)	8GB	-20~85℃
SOM4608	BCM2712	2.4GHz	x	16GB	8GB	-20~85℃
SOM4609	BCM2712	2.4GHz	x	32GB	8GB	-20~85℃
SOM4610	BCM2712	2.4GHz	x	0GB (Lite)	16GB	-20~85℃
SOM4611	BCM2712	2.4GHz	x	16GB	16GB	-20~85℃
SOM4612	BCM2712	2.4GHz	x	32GB	16GB	-20~85℃
SOM4613	BCM2712	2.4GHz	x	64GB	16GB	-20~85℃
SOM4621	BCM2712	2.4GHz	PCB/ext	0GB (Lite)	2GB	-20~85℃
SOM4622	BCM2712	2.4GHz	PCB/ext	16GB	2GB	-20~85℃
SOM4623	BCM2712	2.4GHz	PCB/ext	32GB	2GB	-20~85℃
SOM4624	BCM2712	2.4GHz	PCB/ext	0GB (Lite)	4GB	-20~85℃
SOM4625	BCM2712	2.4GHz	PCB/ext	16GB	4GB	-20~85℃
SOM4626	BCM2712	2.4GHz	PCB/ext	32GB	4GB	-20~85℃

SOM4627	BCM2712	2.4GHz	PCB/ext	0GB (Lite)	8GB	-20~85℃
SOM4628	BCM2712	2.4GHz	PCB/ext	16GB	8GB	-20~85℃
SOM4629	BCM2712	2.4GHz	PCB/ext	32GB	8GB	-20~85℃
SOM4630	BCM2712	2.4GHz	PCB/ext	64GB	8GB	-20~85℃
SOM4631	BCM2712	2.4GHz	PCB/ext	0GB (Lite)	16GB	-20~85℃
SOM4632	BCM2712	2.4GHz	PCB/ext	16GB	16GB	-20~85℃
SOM4633	BCM2712	2.4GHz	PCB/ext	32GB	16GB	-20~85℃
SOM4634	BCM2712	2.4GHz	PCB/ext	64GB	16GB	-20~85℃

X Series IO Board Model List

You can select the appropriate X series IO board based on your requirements, ensuring that the number of pins on the X series IO board is compatible with the industrial computer's casing.

Model	RS232/RS485	CAN	DI	DO	GPIO	PIN
X10	2	x	x	x	x	6PIN
X13	x	x	2	2	x	6PIN
X14	x	x	4	x	x	6PIN
X15	x	x	x	4	x	6PIN
X16	x	x	x	x	4	6PIN
X20	4	x	x	x	x	10PIN
X23	4	x	4	4	x	20PIN
X26	2	x	8	4	x	20PIN
X28	2	x	12	x	x	20PIN

Y Series IO Board Model List

You can select the appropriate Y series IO board based on your requirements, as the Y series IO modules are compatible with all Y slots.

When the Y63 is selected, you can not choose second Y-series IO board.

Model	Description		Model	Description
Y01	4DI+4DO, NPN		Y41	4AO, 0/4~20mA
Y02	4DI+4DO, PNP		Y43	4AO, 0~5/10V
Y11	8DI, NPN		Y46	4AO, ±5V/±10V
Y12	8DI, PNP		Y51	2RTD, 3-Wire PT100
Y13	8DI, Dry Contact		Y52	2RTD, 3-Wire PT1000
Y21	8DO, PNP		Y53	2RTD, 4-Wire PT100
Y22	8DO, NPN		Y54	2RTD, 4-Wire PT1000

Y24	4DO, Relay		Y58	4TC
Y31	4AI, single-ended, 0/4~20mA		Y63	4 RS485 or RS232
Y33	4AI, single-ended, 0~5/10V		Y95	4 PWM Output + 4 Pulse Counter (1 High-Speed, 3 Low-Speed), NPN
Y34	4AI, differential, 0~5/10V		Y96	4 PWM Output + 4 Pulse Counter (1 High-Speed, 3 Low-Speed), PNP
Y36	4AI, differential, ±5V/±10V		/	/

5. Electromagnetic Compatibility Testing

Test	Item	Standard	Level	Condition	Result	Remarks
Electromagnetic Emission	Conducted Emission	GB/T 9254 Class A/ CISPR 32 Class A	Class A	150 kHz - 30 MHz	PASS	Complies with limits for general industrial environments
	Radiated Emission	GB/T 9254 Class A/ CISPR 32 Class A	Class A	30 MHz - 1 GHz	PASS	Complies with limits for general industrial environments
Immunity Testing	ESD	GB/T 17626.2/IEC 61000-4-2	Level III	Contact discharge: ±6 kV; Air discharge: ±8 kV	PASS	—
	Radiated RF Immunity	GB/T 17626.3/ IEC 61000-4-3	Level III	Field strength: 10 V/m, 80 MHz – 1 GHz	PASS	—
	EFT	GB/T 17626.4/ IEC 61000-4-4	Level III	Power lines: 2 kV; Signal lines: 1 kV	PASS	—
	Surge	GB/T 17626.5/ IEC 61000-4-5	Level III	Differential mode: 2 kV; Common mode: 4 kV	PASS	—
	Voltage Dips and Interruptions	GB/T 17626.11/ IEC 61000-4-11	Level III	Voltage dip: 70% for 500 ms; Complete interruption: 10 ms	PASS	—
	Power Frequency Magnetic Field Immunity	GB/T 17626.8/ IEC 61000-4-8	Level III	Test intensity: 30 A/m, 50 Hz	PASS	—

6. Environmental Suitability Testing

Test Item	Standard	Level	Condition	Result	Remarks
Low-Temperature Startup & Operation	GB/T 2423.1-2008/IEC 60068-2-1	N/A	Ambient temperature: +40°C, device starts and operates normally	Compliant	Meets basic low-temperature startup requirements for industrial environments.
High-Temperature Startup & Operation	GB/T 2423.2-2008/IEC 60068-2-2	N/A	Ambient temperature: +85°C, device starts and operates normally	Compliant	Meets basic high-temperature startup requirements for industrial environments.
Constant Damp Heat	GB/T 2423.3-2016/IEC 60068-2-78	N/A	Ambient temperature: +40°C, relative humidity: 85%, powered operation for 48 hours	Compliant	Ensures stable operation in humid environments.
Sinusoidal Vibration	GB/T 2423.10-2019/IEC 60068-2-6	N/A	Frequency range: 5 Hz to 500 Hz, acceleration: 2g, 10 cycles per axis (3 axes)	Compliant	Validates vibration resistance during transportation and installation.
Free Fall	GB/T 2423.7-2018/IEC 60068-2-31	N/A	With packaging: Free fall from 0.8 meters, 1 drop per face (6 faces total)	Compliant	Ensures impact resistance during transportation.
IP	GB/T 4208-2017/IEC 60529	IP30	Dust protection: Prevents entry of solid foreign objects ≥2.5mm in diameter	Compliant	Meets industrial environmental protection requirements.

Test Conclusion

After undergoing fundamental environmental adaptability testing, the device fully complies with the basic requirements of the Chinese GB/T national standards and corresponding IEC standards, demonstrating stable operation in standard industrial environments.

The following results ensure the device meets a wide range of industrial application scenarios:

- Low/High-Temperature Tests: Validates the device's operational capability under basic industrial environmental conditions.
- Vibration and Free Fall Tests: Ensures reliability during transportation and installation.
- IP Test: Complies with fundamental protection requirements for industrial environments.

7. Packing List

- One ARM embedded controller
- One set of DIN35 mounting brackets
- Pre-installed BLIoTLink software
- Pre-installed BLRAT software
- Linux file system
- Pressure-free terminal blocks configured according to selected accessories
- When purchasing WiFi and 4G modules, antennas for WiFi and 4G modules will be included.

8. Technical Support & Services

- ◆ Provide system firmware images, file system images, kernel driver source code, and a variety of demo programs.
- ◆ Offer a comprehensive platform development kit and introductory tutorials to save software organization time and simplify application development.
- ◆ Provide a rich set of development examples for reference to simplify application development, including:
- ✓ Linux, Linux-RT, Qt Application Development Examples
- ✓ BLIoTLink Industrial Protocol Data Collection and Cloud Platform Integration Development Case
- ✓ BLRAT Remote Access Usage Case
- ✓ Node-Red IoT Application Development Case
- ✓ Docker Container Technology, MQTT Communication Protocol Examples
- ✓ 4G/5G/WIFI/Bluetooth Development Cases
- ✓ X-board, Y-board and other peripheral drivers
- ✓ Assistance with Product Customization and Development
- ✓ Customized Research and Development (R&D) and Manufacturing
- ✓ Provide Long-Term After-Sales Service

Shenzhen Beilai Technology Co.,Ltd

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