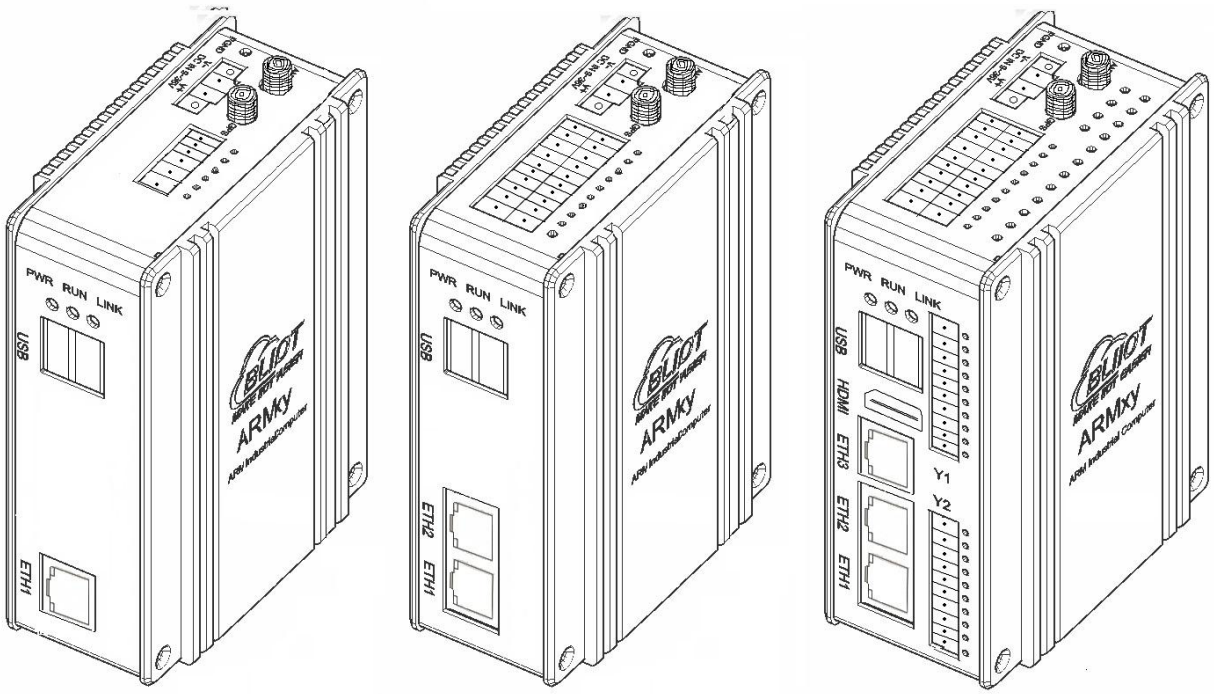


ARMXY EMBEDDED

COMPUTER DATASHEET

ARMxy BL350 Series

Version History

Version	V1.0	2024-12-19	Initial Release	

Contents

1. Overview

BL350 series of ARM embedded computers from the ARMxy lineup is designed based on the TI Sitara AM62x processor, offering a multi-core architecture with single-core, dual-core, or quad-core ARM Cortex-A53 (clock speed up to 1.4GHz) and a single-core ARM Cortex-M4F (clock speed up to 400MHz). Built on an advanced 16nm process, it integrates a 3D graphics accelerator, delivering high performance with low power consumption. The BL350 series is widely used in industrial control, industrial PLCs, motion controllers, edge computing gateways, smart manufacturing, commercial and industrial energy storage EMS, EV charging stations, blood analyzers, and more.

The BL350 series provides a rich set of interfaces, including 1 to 3 adaptive 10/100M RJ45 Ethernet ports, 2 USB 2.0 ports, 1 optional HDMI 2.0 port, 1 optional X-series I/O board, and 2 optional Y-series I/O boards. It supports communication functions, PWM output, pulse counting, and other data acquisition and control features. Additionally, the device supports 1080P@60fps H.264 video encoding and 1080P@60fps H.265 video decoding. It comes with a Mini PCIe slot, allowing expansion with Bluetooth, WiFi, 4G, and 5G modules.

The BL350 series supports multiple operating systems, including Linux-5.10.168, Linux-RT-5.10.168, Yocto 3.1 (dunfell), and Ubuntu 20.04. It also integrates Docker containers, Node-Red graphical development tools, and the Qt-5.14.2 graphical interface development framework. The device comes with BLIoTLink industrial protocol conversion software, supporting Modbus, PLC, MQTT, and other protocols, enabling seamless integration with mainstream IoT cloud platforms and SCADA systems.

With the BLRAT remote access tool, users can perform remote operation and maintenance, enhancing management efficiency. Designed for industrial applications, the BL350 series features professional electrical performance design and undergoes high and low-temperature testing, ensuring stable operation in extreme environments ranging from -40°C to 85°C. It is resistant to harsh electromagnetic conditions and supports DIN35 rail mounting, making it ideal for various industrial applications.

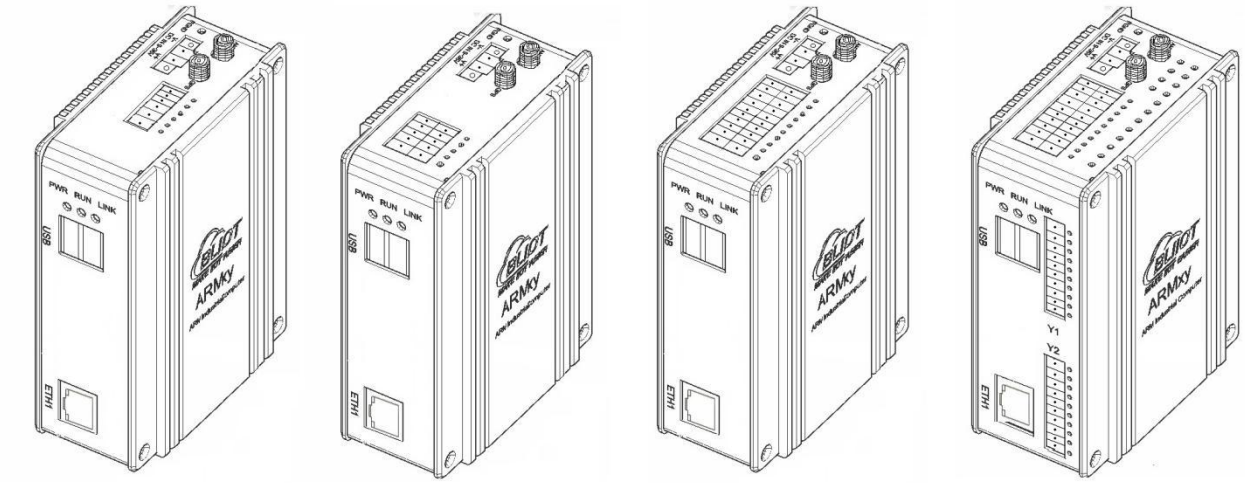
2. Typical Application Areas

- ✓ Industrial Control
- ✓ Energy Storage Systems EMS/BMS
- ✓ Industrial PLC
- ✓ Motion Controllers
- ✓ Edge Computing Gateway
- ✓ EV Charging Stations
- ✓ Blood Analyzers
- ✓ Smart Manufacturing
- ✓ Communication Management Unit

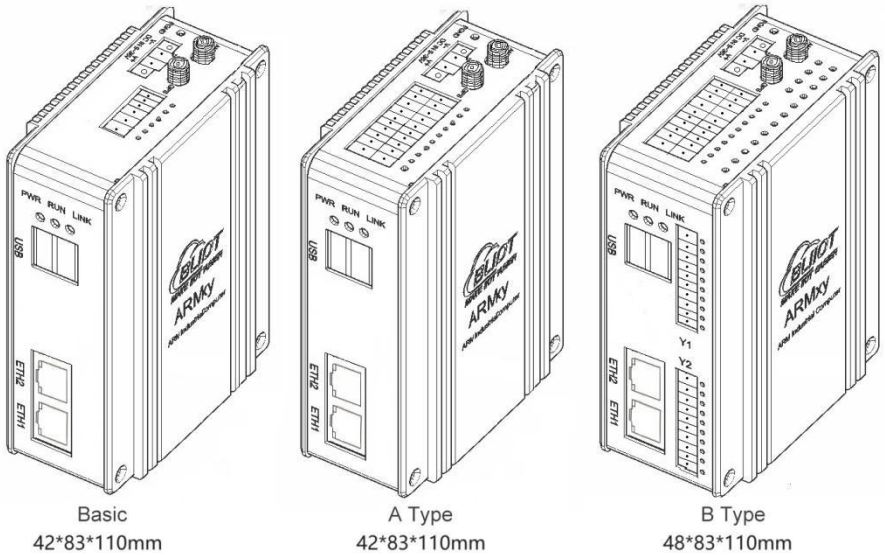
- ✓ AGV Robots
- ✓ Testing Instruments & Equipment
- ✓ Industrial Robots
- ✓ Rail Transit
- ✓ Smart Devices

3. Software and Hardware Specifications

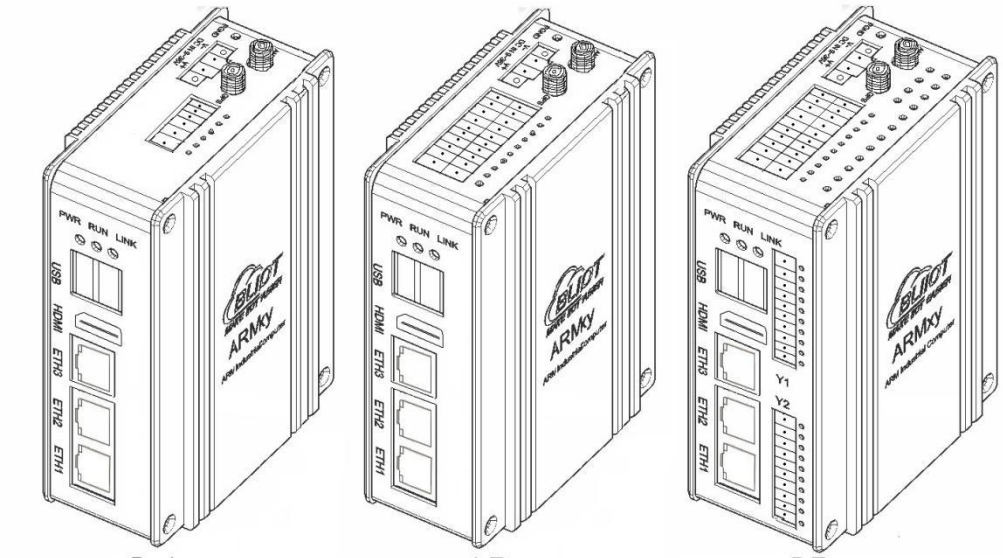
Exterior Structure and Dimensions of Product with 1 Ethernet Port:



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	TI Sitara AM6231/AM6232/AM6254, 16nm
	1/2/4x ARM Cortex-A53 (64-bit), clock speed 1.4GHz
	1x Cortex-M4F, dedicated real-time processing unit, clock speed 400MHz
	1x Cortex-R5F, clock speed 400MHz Note: The Cortex-R5F is primarily responsible for system startup, resource management, and power management functions.
	1x PRU-ICSS, with two 32-bit programmable real-time units (PRU0 and PRU1), clock speed 333MHz Note: PRU-ICSS supports GPIO, UART, and I2C expansion but does not support industrial communication protocols or Ethernet expansion.
	3D GPU: Graphics accelerator, supports OpenGL 3.x/2.0/1.1 and Vulkan 1.2 (AM6254 only)
	Encoder: Supports 1080P@60fps H.264
	Decoder: Supports 1080P@60fps H.265 and 1080P@60fps H.264
ROM	4/8GByte eMMC
RAM	512MB/1/2GByte DDR4
ETH	RJ-45, 1~3, 3x10/100M adaptive, ESD Level 3, EFT Level 3
USB	2x USB 2.0 HOST (USB1, USB2), speed up to 480Mbps, ESD Level 3
HDMI	1x HDMI 2.0, supports 1080P@60fps

IO Slot	X series IO board slot: 1, X series IO board, support RS485, CAN, RS232, RS422, DI, DO, GPIO, etc; Y series IO board slot: 2, Y series IO board, support RS485, CAN, RS232, RS422, DI, DO, Relay output, AI, AO, PT100, PT1000, TC, IEPE, etc.
LED	1x power indicator light
	2x user-programmable indicator light
Mini PCIE	1, Supports Bluetooth, WiFi, 4G module, etc.
SIM Slot	1 slot, NANO
Antenna	2, For 4G/WIFI/GPS
Debug	1x Micro USB debug port
SD Slot	1
Reset	1 reset button
Watchdog	Onboard independent hardware watchdog
Power	Rated DC 24V, supports wide voltage range of 9-36VDC 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-5.10.168 Linux-RT-5.10.168
File System	Yocto 3.1(dunfell) Ubuntu
GUI development tool	Qt-5.14.2
Software Development Kit	Processor-SDK Linux-RT MCU-PLUS-SDK
Protocol Conversion Software	BLIoTLink, used for protocol conversion, such as Modbus, PLC, BACnet, IEC104, MQTT, OPC UA, support AWS IoT Core, Thingsboard, IgnitionSCADA, Alibaba IoT, HUAWEI IoT.
Remote Access Tool	BLRAT, enables remote device access for convenient remo te maintenance.
Other Software	Node-Red, Python, Docker, C#, MySQL, SQLite

4. Product Selection

The ARMxy series ARM embedded controllers adopt a flexible design concept, allowing users to customizeROM and RAM combinations by choosing different System-on-Module (SOM) boards as needed. Additionally, various X and Y boards can be selected to achi eve diverse IO configurations, catering to the requirements of different application scenar ios.

Product naming convention

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

For example, if we had a specific product configuration:

Host Model: BL350

SOM Model: SOM351

X Board Model: X10

The complete product name would be:

BL350-SOM351-X10

Means 1 Ethernet port, 8GB eMMC storage, DDR4 is 1GByte, and 2 RS485

If you need to add WiFi, then you would append "W" to the host model number.

For example: BL350W-SOM351-X10

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

For example: BL350L-SOM351-X10

ARMxy BL350 Model List

Model	ETH	USB	HDMI	X board IO Slot	Y board IO Slot	Dimension
BL350	1x10/100M	2	X	1x6PIN	X	42x83x110mm
BL350A	1x10/100M	2	X	1x20PIN	X	42x83x110mm
BL350B	1x10/100M	2	X	1x20PIN	2	48x83x110mm
BL350C	1x10/100M	2	X	1x10PIN	X	42x83x110mm
BL351	2x10/100M	2	X	1x6PIN	X	42x83x110mm
BL351A	2x10/100M	2	X	1x20PIN	X	42x83x110mm
BL351B	2x10/100M	2	X	1x20PIN	2	48x83x110mm
BL352	3x10/100M	2	1	1x6PIN	X	42x83x110mm
BL352A	3x10/100M	2	1	1x20PIN	X	42x83x110mm
BL352B	3x10/100M	2	1	1x20PIN	2	48x83x110mm

ARMxy BL350 SOM Model List

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

Model	MCU	Clock Speed	Kernel	eMMC	DDR4	Temperature
SOM350	AM6232	1.4GHz	2 x A53 +M4F	4GByte	512MB	-40~85°C
SOM351	AM6232	1.4GHz	2 x A53 +M4F	8GByte	1GByte	-40~85°C
SOM352	AM6254	1.4GHz	4 x A53 +M4F	8GByte	1GByte	-40~85°C
SOM353	AM6254	1.4GHz	4 x A53 +M4F	8GByte	2GByte	-40~85°C

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
X11	x	2	x	x	x	6PIN
X12	1	1	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
X21	3	1	x	x	x	10PIN
X22	2	2	x	x	x	10PIN
X23	4	x	4	4	x	20PIN
X24	3	1	4	4	x	20PIN
X25	2	2	4	4	x	20PIN
X26	2	x	8	4	x	20PIN
X27	1	1	8	4	x	20PIN
X28	2	x	12	x	x	20PIN
X29	1	1	12	x	x	20PIN
X30	x	x	x	x	16	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		Y56	Resistance measurement
Y31	4AI, single-ended, 0/4~20mA		Y57	Voltage measurement
Y33	4AI, single-ended, 0~5/10V		Y58	4TC
Y34	4AI, differential, 0~5/10V		Y63	4 RS485 or RS232
Y36	4AI, differential, ±5V/±10V		Y95	4 PWM Output + 4 Pulse Counter (1 High-Speed, 3 Low-Speed), NPN
Y37	4 IEPE Measurement		Y96	4 PWM Output + 4 Pulse Counter (1 High-Speed, 3 Low-Speed), PNP

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: ±4 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/	Level III	Differential mode: 2	PASS	—

		IEC 61000-4-5		kV; Common mode: 4 kV		
	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 wit h the basic requirements of the Chinese GB/T national standards and corresponding IEC sta

ndards, 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
- Ubuntu 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:

✓ BLIoTLink Industrial Protocol Data Collection and Cloud Platform Integration Development Case

✓ Linux, Linux-RT Application Development Examples

✓ BLRAT Remote Access Usage Case

✓ Node-Red IoT Application Development Case

✓ Docker Container Technology, MQTT Communication Protocol Examples

✓ Cortex-A53 and Cortex-M4F Inter-Core Communication Example

✓ Graphical Interface Development Tool Qt-5.14.2 Software Development Kit

✓ Yocto, Ubuntu Operating System Demonstration Example

✓ Cortex-M4F Development Examples

✓ IPC Multi-Core Communication Development Examples

- ✓ EtherCAT Development Examples
- ✓ 4G/WiFi Development Examples
- ✓ 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

https://www.BLIIoT.COM