Email
sales.aurtron@gmail.com

DA51LD REV.B

Product Datasheet



Version V1.00

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Verification	Review	Approval

About This Document

This document mainly introduces the specification parameters of the DA51LD REV.B.

Revision History

Date	Version	Release notes
2026.03.10	V1.00	Initial release

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Contact Us

Sales Hotline: 020-38325879 ext. 302

Support Hotline: 020-38325879 ext. 401

Email: sales.aurtron@gmail.com

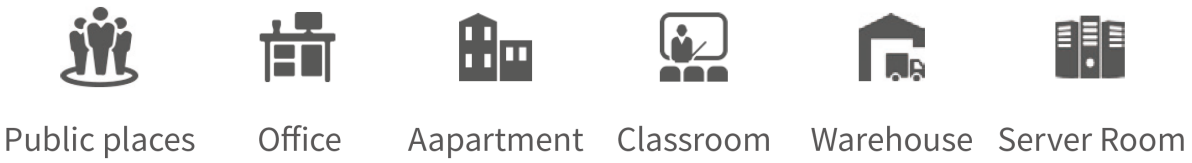
Website: www.aurtron.com

Address: 10th Floor, Building A, No. 3 Juquan Road, Guangzhou Science City, Huangpu District, Guangzhou, Guangdong, P.R. China

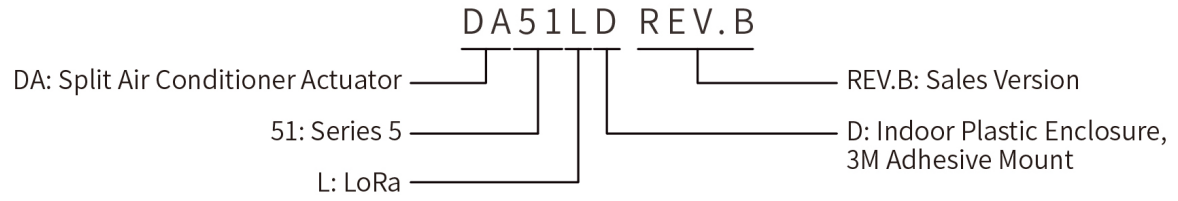
1. Overview

The LoRa Split Air Conditioner Actuator DA51LD REV.B is designed for wireless remote monitoring of split-type air conditioners. It supports the international standard LoRaWAN protocol and RS-485 communication protocol, enabling remote query, configuration, and commissioning of connected AC units. The product is compatible with most major air conditioner brands available worldwide.Equipped with current monitoring and temperature monitoring functions, the actuator ensures safe and reliable operation of air conditioning systems. It features easy installation, low power consumption, simple maintenance, compact size, and lightweight construction, allowing traditional air conditioners to quickly connect to the Internet of Things. By enabling intelligent management of air conditioning equipment, the DA51LD REV.B strongly supports the development of smart cities.

2. Application Scenarios



3. Product Selection



Model	Transmit power	Band	Areas
DA51LD REV.B(CN490LC22V-1R1T,16A)	+22dBm	China	CN490
DA51LD REV.B(EU868HS22V-1R1T,16A)	+22dBm	Europe	EU868
DA51LD REV.B(AS923HS22V-1R1T,16A)	+22dBm	Asia Pacific	AS923

4. Product Features

- 1-channel LoRa wireless communication
- 1-channel push button

- 1-channel LED indicator
- 1-channel RS-485 communication
- 1-channel BLE wireless configuration
- 1-channel IR transceiver cable
- 1-channel temperature sensor (optional)
- 1-channel current transformer (CT, optional)
- Supports most major global air conditioner brands (via IR remote control)
- Supports IR signal parsing and forwarding
- Supports external CT for current monitoring and energy metering (calculated based on user preset voltage and power factor, with limited accuracy)
- Supports LoRaWAN 1.0.2 communication protocol
- Supports operating mode: Class C
- Supports activation method: OTAA activation
- Supports remote LoRaWAN communication using Modbus-RTU protocol
- Supports local RS-485 communication using Modbus-RTU protocol
- Supports LoRaPMAC proprietary protocol communication
- Supports remote AT commands to modify communication frequency band and data rate
- Supports remote unicast and multicast control modes
- Supports periodic/active reporting of current air conditioner operating status
- Supports remote control permission settings
- Supports IR operating mode: parallel mode
- Supports temperature over-limit correction function
- Supports scenario modes
- Supports offline scheduled tasks
- Supports firmware/library upgrade via TF card

5. Electrical Characteristics

5.1. Power Supply

Parameter	Min	Typ	Max	Remarks
Rated Voltage	-	5V DC	-	-
Standby Power Consumption	-	-	55mA	-
IR Transceiver Power Consumption	-	-	70mA	-

LoRa Transmit Power Consumption	-	-	185mA	-

5.2. LoRa RF

Parameter	Min	Typ	Max	Remarks
Frequency Range	410MHz	-	960MHz	-
Transmit Power	-	-	+22dBm	-
Receive Sensitivity	-	-134dBm	-	SF10@BW125KHz

5.3. BLE RF

Parameter	Min	Typ	Max	Remarks
Frequency Range	2402MHz	-	2480MHz	-
Transmit Power	-	0 dBm	-	-
Receive Sensitivity	-94 dBm	-	92dBm	-
Communication Distance	-	10m	-	Open Environment

5.4. RS-485

Parameter	Min	Typ	Max	Remarks
BaudRate	1200bps	9600bps	115200bps	-
Communication Distance	-	-	1000m	9600bps with shielded twisted-pair connection

5.5. Environmental

Parameter	Min	Typ	Max	Remarks
Rated Operating Temperature	-25℃	-	60℃	Normal operating conditions
Extended Operating Temperature	-40℃	-	85℃	Short-term tolerance
Storage Temperature	-40℃	-	85℃	-
Humidity	5%	-	95%	Non-condensing
Altitude	-	-	2000m	-
Protection Rating	-	IP20	-	IP Rating (Dust and Water Resistance

5.6. Reliability

Parameter	Min	Typ	Max	Remarks
ESD Protection Level	-	Level 1	-	-

5.7. Absolute Maximum Ratings

Absolute Maximum Ratings

Parameter	Min	Max
Supply Voltage	-0.3Vdc	+5Vdc
RS-485 Common-Mode Voltage	-7Vdc	+12Vdc
Temperature Range	-40℃	+85℃

Note: Exceeding the above absolute maximum ratings may cause permanent damage to the device. These values represent only the rating limits and do not imply that the device can operate normally under these conditions or any other conditions beyond the specifications detailed in the operational section of this technical document. Prolonged operation under absolute maximum rating conditions may adversely affect device reliability.

ESD (Electrostatic Discharge) Sensitive Device

Charged devices and circuit boards may discharge inadvertently without visible indication. Although this product incorporates protection circuits, exposure to high-energy discharge events may result in damage. Therefore, appropriate precautions must be implemented to prevent performance degradation or functional failure.

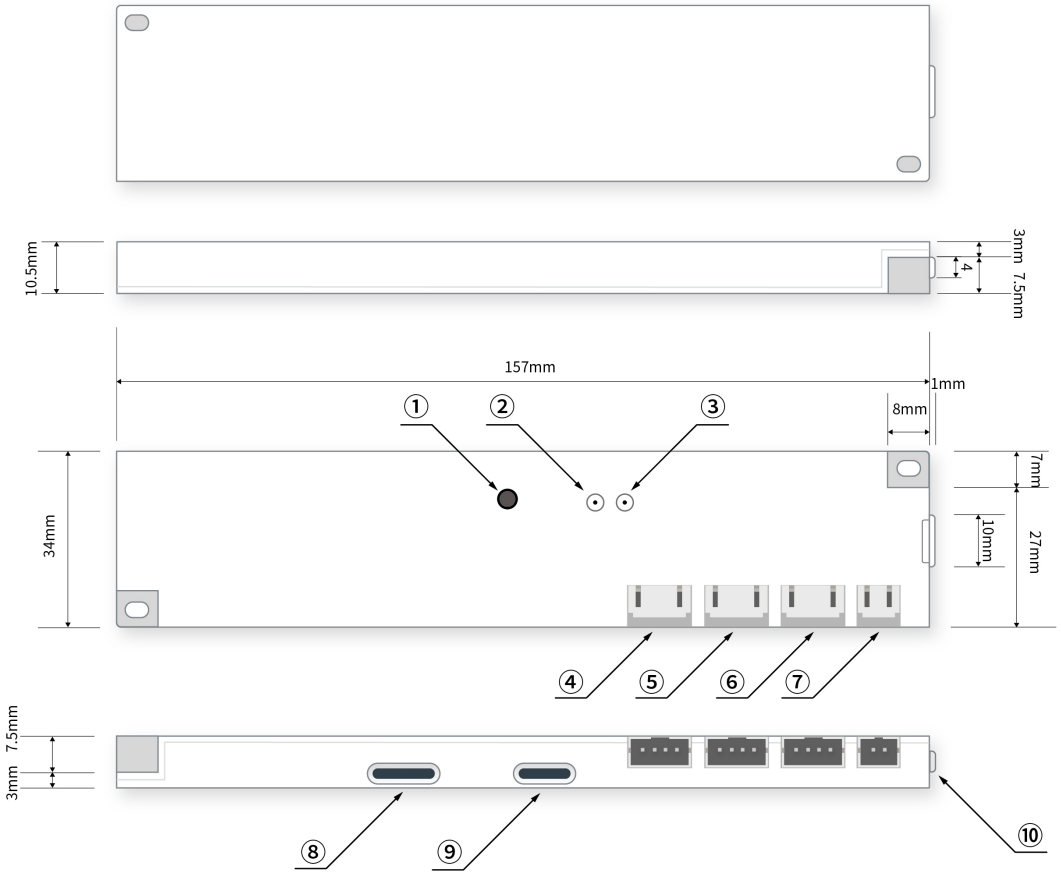


6. Hardware Description

6.1. Hardware Dimensions

Unit：All linear dimensions are specified in millimeters (mm).

Tolerances: ±0.2 mm.



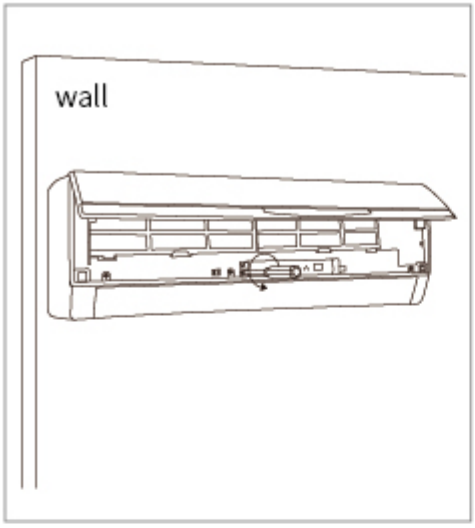
6.2. Hardware Interfaces

Please refer to the hardware identification in the six-view drawing in Section 6.1.

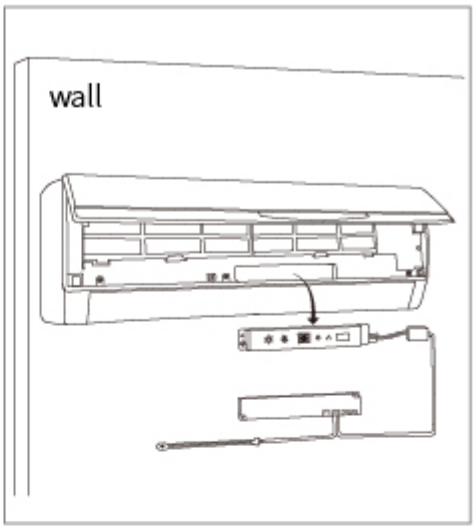
Sequence	Description	Function Description	Remarks
1	Function key	1. Repor the current air conditioner status 2. Trigger firmware/library	-

		upgrade	
2	Power Indicator	Indicates power status	Solid red
3	Run Indicator	Manufacturer reserved	Reserved
4	Temperature Sensor Port	Air conditioner outlet temperature collection	Temperature sensor is optional
5	IR Transceiver Port	IR reception/transmission	When the IR operating mode is parallel, cooperate with the IR transceiver module for reception, decoding and transmission of IR signals
6	RS-485 Port	ModBus-RTU wired communication	-
7	Current Transformer Port	Air conditioner operating current collection	Current transformer is optional
8	SIM Card Slot	-	Reserved
9	TF Card Slot	Firmware upgrade, library upgrade	-
10	Debug Serial Port	-	Reserved

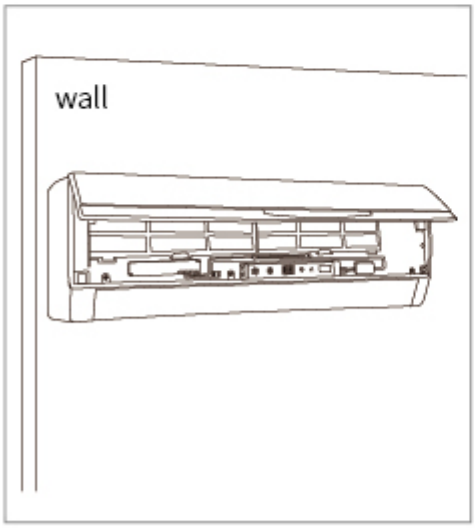
7. Installation Description



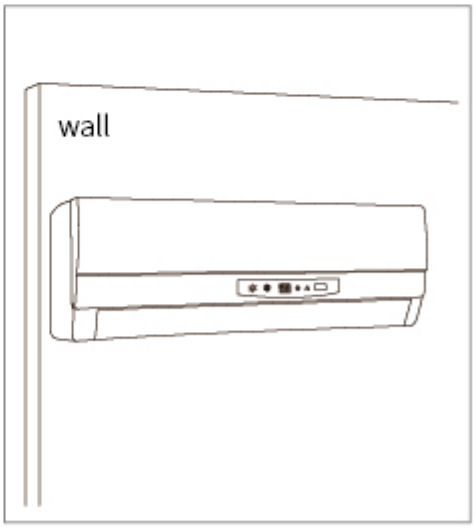
❶ Remove the AC main panel/cover



❷ Connect the internal wiring

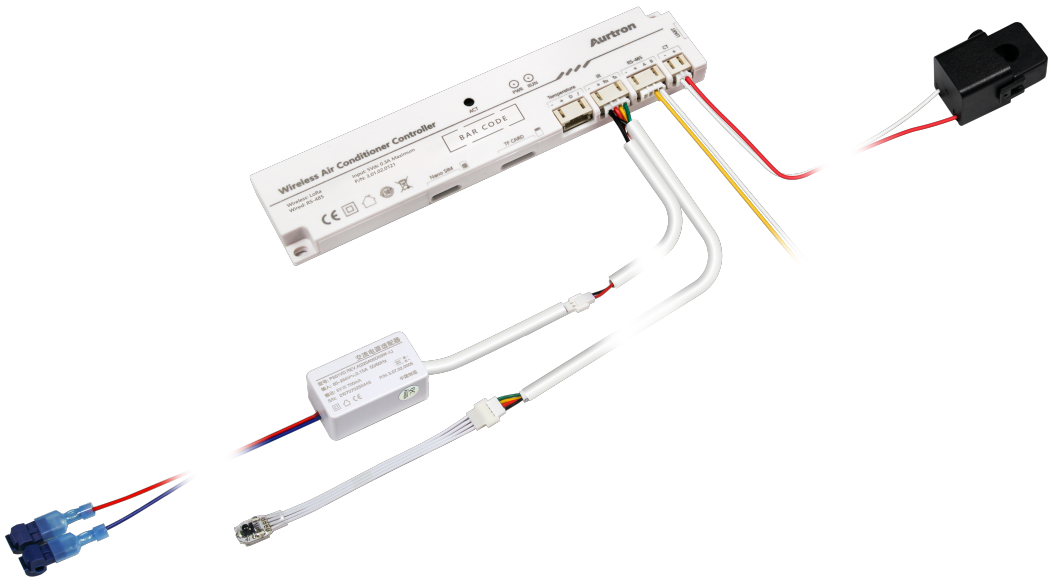


❸ Adhere the product inside the AC unit



❹ Reinstall the AC main panel/cover

8. Wiring Instructions



9. Packing List

Sequence	Material	Number
1	LoRa Split Air Conditioning Actuator	1
2	PS05LD Power Adapter	1
3	Current Transformer (CT, Optional)	1
4	Temperature Sensor Cable (Optional)	1
5	Power Crimp Terminals	1
6	RS-485 Cable	1
7	IR Cable	1
8	Light-blocking Tape	1
9	EUI Label	1
10	Certificate of Conformity	1