






Coupler
LM110&LM120
User manual
IM19H43-E

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Symbol Definition	
	WARNING: Indicates information that a potentially hazardous situation which, if not avoided, could result in serious injury or death.
	RISK OF ELECTRICAL SHOCK: Indicates information that Potential shock hazard where HAZARDOUS LIVE voltages greater than 30V RMS, 42.4V peak, or 60V DC may be accessible.
	ESD HAZARD: Indicates information that Danger of an electro-static discharge to which equipment may be sensitive. Observe precautions for handling electrostatic sensitive devices
	ATTENTION: Identifies information that requires special consideration.
	TIP: Identifies advice or hints for the user.

Security& Caution Symbols

The following table lists Security& Caution symbols used on equipments.














No.	Symbol	Description
1		Direct current (DC)
2		Alternating current (AC)
3		Ground (Earth) terminal
4		Protective earth (ground) terminal
5		Reference ground (Earth) terminal
6		Frame or chassis
7		Equipotentiality
8		On (power)
9		Off (power)
10		Caution, risk of electric shock
11		Caution, hot surface
12		Caution, risk of danger
13		Electrostatic sensitive devices (ESD)

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Coupler LM110&LM120

Section 1 Overview

Coupler LM110 (LM110 in short below) can connect several non-redundant PROFIBUS-PA devices with non-redundant PROFIBUS-DP bus.

Coupler LM120 (LM120 in short below) can connect several non-redundant PROFIBUS-PA devices with redundant PROFIBUS-DP bus.

Section 2 Network

PROFIBUS network architecture is shown in Figure 2-1. Coupler connects field PA device with PROFIBUS-DP bus.

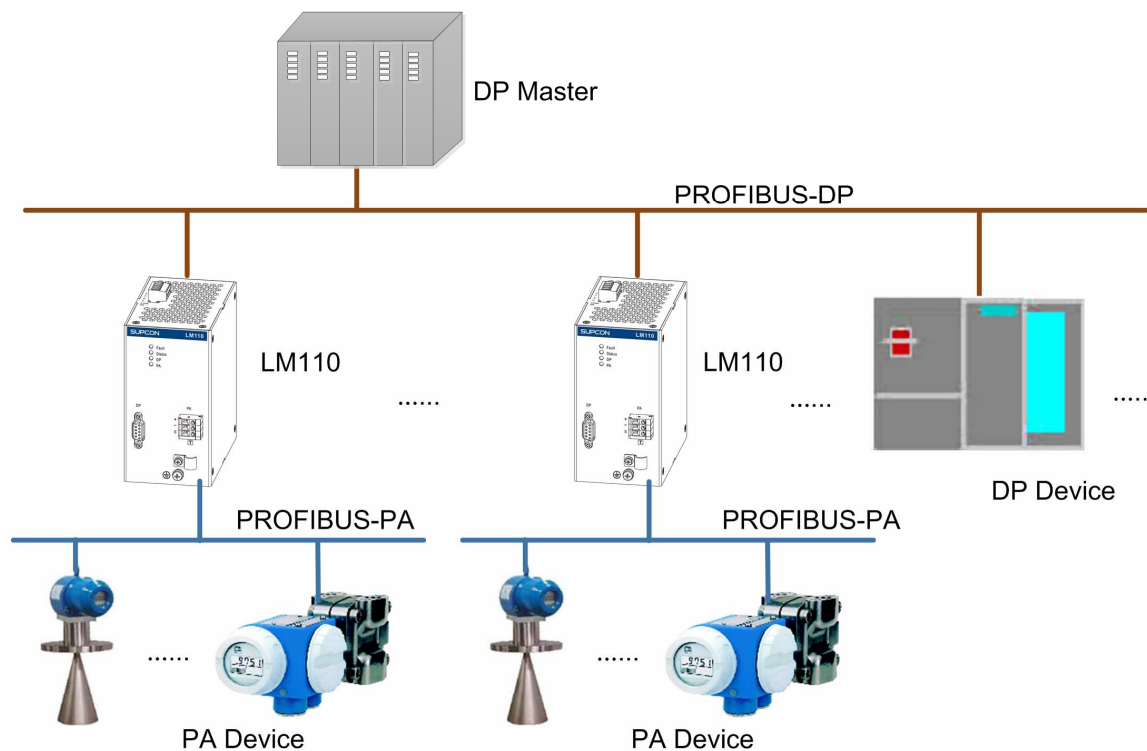


Figure 2-1 LM110 network architecture

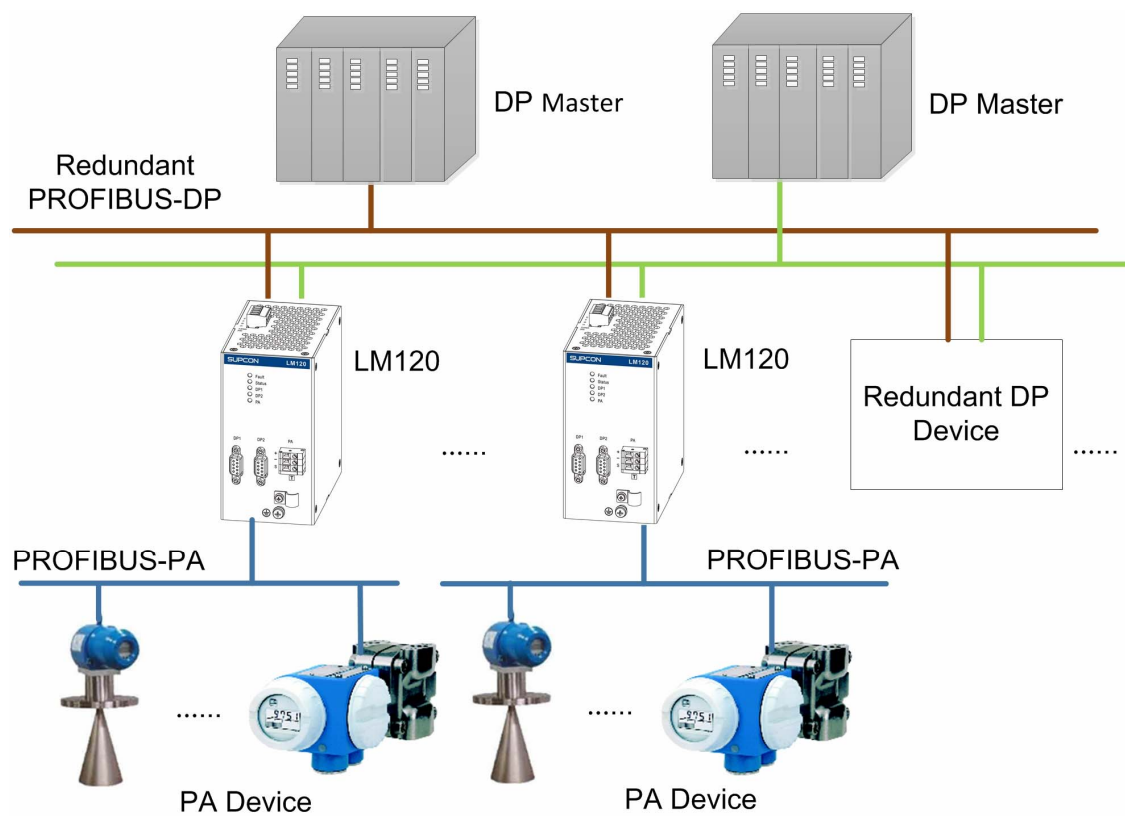


Figure 2-2 LM120 network architecture

Section 3 Specifications

As shown in Table 3-1.

Table 3-1 Specifications

Parameters		Instruction
Temperature	Operating temperature	(-40~75) °C
	Storage temperature	(-40~80) °C
Humidity	Operating humidity	5% RH~90% RH, no condensation
	Storage humidity	5% RH~95% RH, no condensation
System power		24V DC \pm 10%
Rated consumption		LM110, LM120: 11W ¹
Isolation voltage of PA port		500V AC
Devices connecting PA slave station		Maximum 32 (Remarks: Maximum output current of PA bus is 500mA, so devices connected are limited.)
PA bus rated voltage		24V DC
PA bus maximum output current		500mA
PA bus output voltage		24V DC \pm 10%
Module address		The module does not occupy address in the bus and it is transparent to the master
Baud rate of DP port		45.45 Kbps, 187.5 Kbps, 500 Kbps, 1500Kbps
Baud rate of PA port		31.25Kbps
Slave device address range		3~126
Installation type		Standard DIN guide rail

Attention:



1: Since LM110 and LM120 needs to distribute power to the devices on the PA bus, its power consumption is directly affected by the PA bus power distribution current. If the PA bus distribution current is 300mA (about 20 PA meters), its power consumption is about 11W.

Section 4 Appearance

4.1 LM110

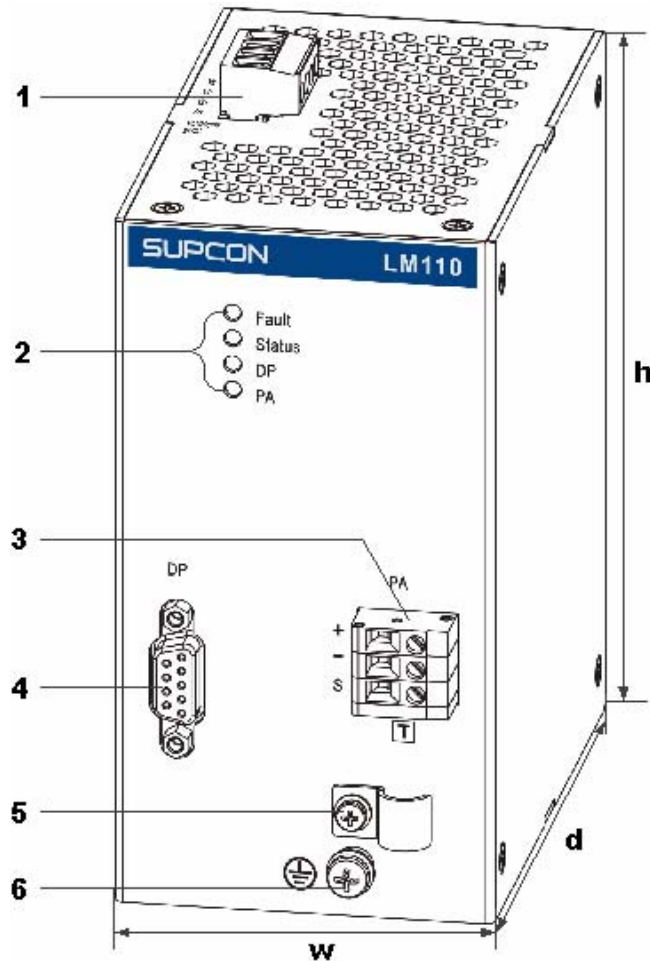


Figure 4-1 LM110 structure

As shown in Figure 4-1, dimension (w*d*h): (72*120*135)mm, instruction for connectors in the module is shown below.

- 1: Power terminal: V1+, v2+, v1-, v2-, connect with 2-channel redundant 24VDC power.
- 2: LED indicators: indicate the working status of module.
- 3: PA device interface: Connect with field PA device.
- 4: DP bus interface: Connect with non-redundant PROFIBUS-DP bus.
- 5: PA device wiring fixed buckle: Fix PA device connecting wire.
- 6: Earth terminal: Connect with protection ground.

4.2 LM120

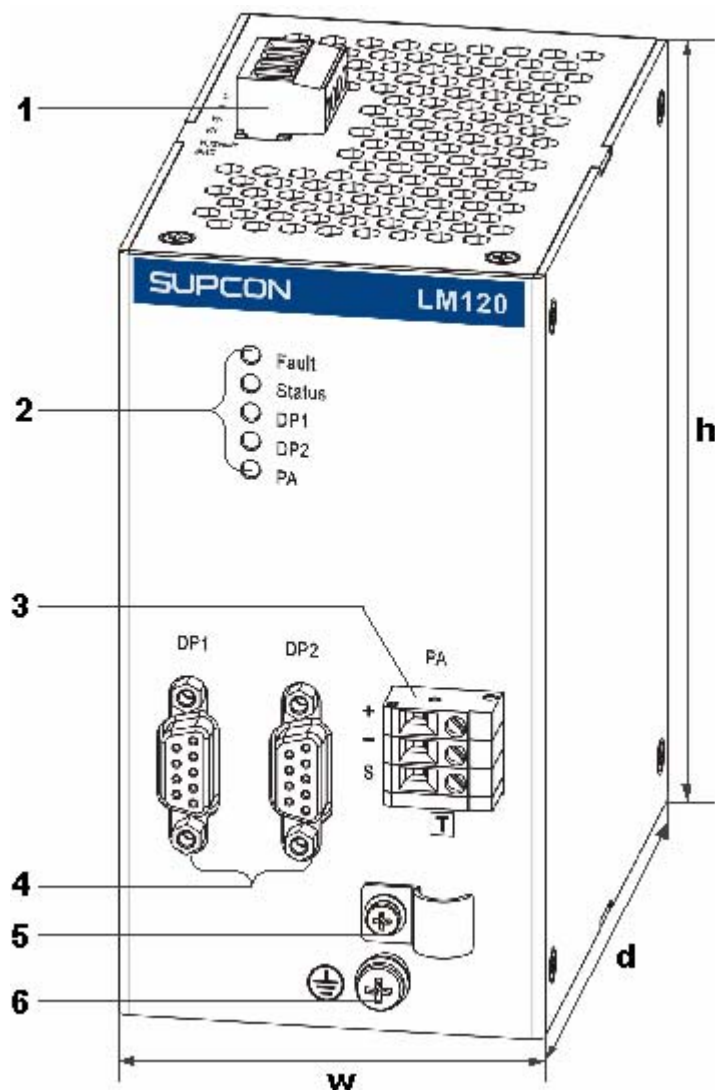


Figure 4-2LM120 structure

As shown in Figure 4-2, dimension (w*d*h): (72*120*135) mm , instruction for connectors in the module is shown below.

- 1: Power terminal: V1+, v2+, v1-, v2-, connect with 2-channel redundant 24VDC power.
- 2: LED indicators: indicate the working status of module.
- 3: PA device interface: Connect with field PA device.
- 4: Redundant DP bus interface: Connect 2-channel dual-redundant PROFIBUS-DP buses separately.
- 5: PA device wiring fixed buckle: Fix PA device connecting wire.
- 6: Earth terminal: Connect with protection ground.

Section 5 Wiring

This section introduces contents such as wire specifications and wiring method for all interfaces in the module.

5.1 Connect with Power

As shown in Figure 4-1 and Figure 4-2, there are 4 power terminals (V1+, V2+, V1-, V2-) on the top of module for connecting with the 2-channel redundant 24VDC power.

Power line terminal allows wire with maximum section of 2.5mm^2 . Wires with section of 1mm^2 or 1.5mm^2 are recommended. The recommended wire stripping length is 8mm, and the tightening torque is (0.5~0.6) Nm.

5.2 Connect Non-redundant PA Device with Non-redundant DP Bus

LM110 can connect several non-redundant PROFIBUS devices in slave station with non-redundant DP bus. Therefore, connecting DP bus end has 1 interface (DP), connecting PA slave station device has 3 terminals (+, -, S).

5.2.1 Connect with DP bus

DP bus interface is shown in Figure 5-1.

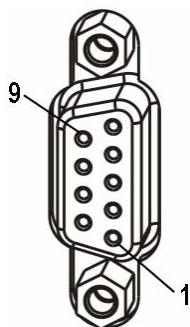


Figure 5-1 DP interface

Instruction for DP bus interface pins is shown below:

Table 5-1 Instruction for DP bus interface pins

Pin No.	DP	Instruction
1	Empty	Empty
2	Empty	Empty
3	RXD0/TXD0-P	Signal positive
4	Empty	Empty
5	GND	Power negative
6	VCC	Power positive

Pin No.	DP	Instruction
7	Empty	Empty
8	RXD0/TXD0-N	Signal negative
9	Empty	Empty

5.2.2 Connect with PA device

PA device interface is shown in Figure 5-2.

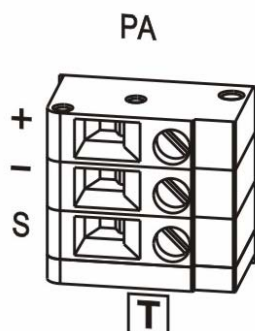


Figure 5-2 PA slave station interface

+ connects with field bus positive, - connects with field bus negative, S connects with the shielding layer of field bus.

When connecting several PA devices, interface can be extended via wiring module in field.

5.3 Connect Non-redundant PA Device with Redundant DP Bus

LM120 can connect several non-redundant PROFIBUS devices in slave station with redundant DP bus. Therefore, connecting DP bus has 2 interfaces (DP1 and DP2), connecting slave station device has 3 terminals (+, -, S).

5.3.1 Connect with DP Bus

DP bus interface is shown in Figure 5-3.

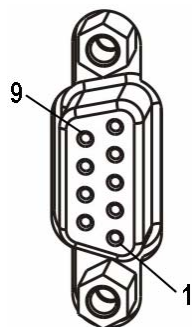


Figure 5-3 DP interface

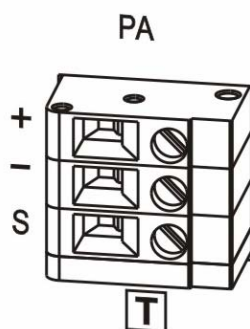
Instruction for DP bus interface pins is shown below:

Table 5-2 Instruction for DP bus interface pins

Pin No.	DP1	DP2	Instruction
1	Empty	Empty	Empty
2	Empty	Empty	Empty
3	RXD0/TXD0-P	RXD0/TXD0-P	Signal positive
4	Empty	Empty	Empty
5	GND	GND	Power negative
6	VCC	VCC	Power positive
7	Empty	Empty	Empty
8	RXD0/TXD0-N	RXD0/TXD0-N	Signal negative
9	Empty	Empty	Empty

5.3.2 Connect with PA device

PA device interface is shown in Figure 5-4.

**Figure 5-4 PA slave station interface**

Standard PA wire, + connects with field bus positive, - connects with field bus negative, S connects with the shielding layer of field bus.

When connecting several PA devices, interface can be extended via wiring module in field.

5.4 Grounding

As shown in Figure 4-1 and Figure 4-2, bottom of module has 1 grounding screw to connect with protection ground.

5.5 Wiring

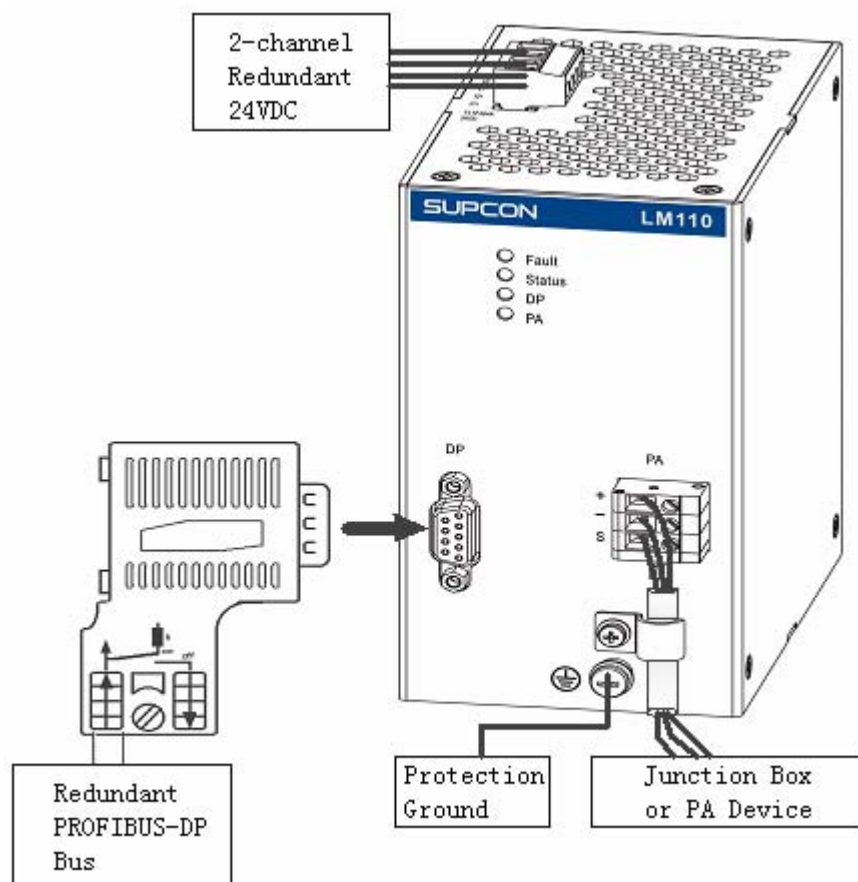


Figure 5-5 LM110 wiring

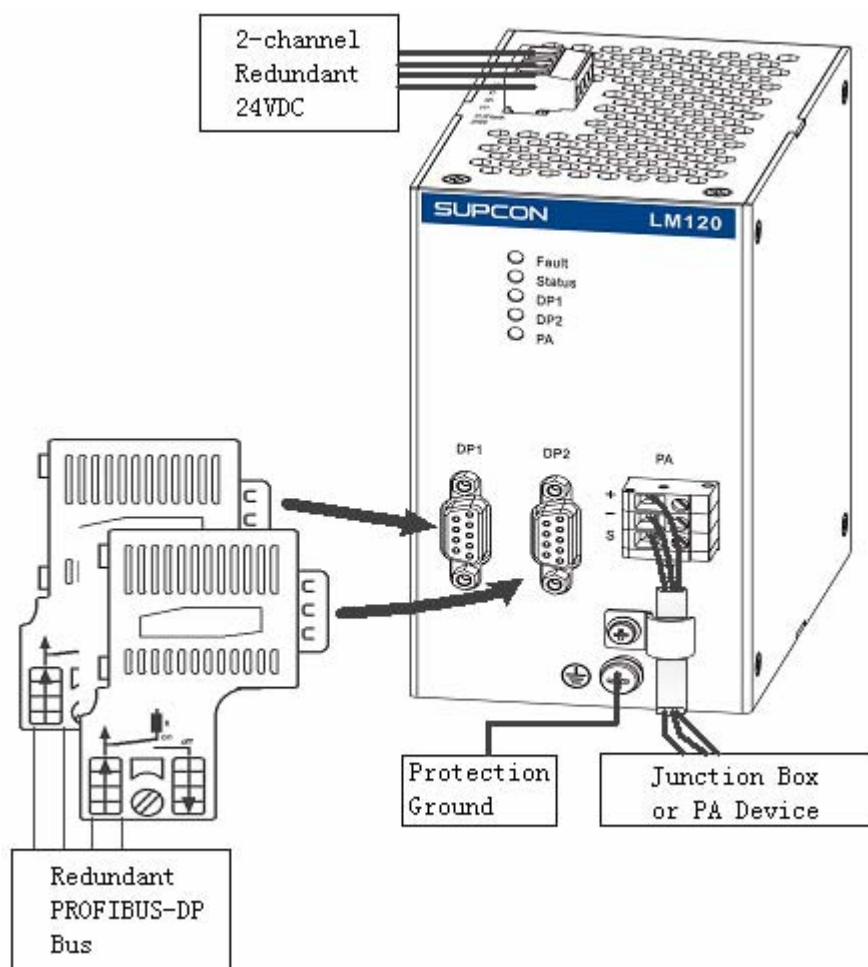


Figure 5-6 LM120 wiring

Section 6 Running Status

After power on module, meanings of LED indicator status are shown below.

Table 6-1 Instruction for LM110 running status

Mark	Status	Meaning
Fault (red)	ON	Fault
	Off	Normal
Status (Green)	ON	At least 1 device configures successfully, in real-time data communication.
	Flash	None device below is configured.
	Off	Running fault
DP (Green)	ON	Communication with PROFIBUS bus is normal.
	Off	Communication fault
PA (Green)	ON	Communication with field PA device is normal.
	Off	Communication fault.

Table 6-2 Instruction for LM120 running status

Mark	Status	Meaning
Fault (red)	ON	Fault
	Off	Normal
Status (Green)	ON	At least 1 device configures successfully, in real-time data communication.
	Flash	None device below is configured.
	Off	Running fault
DP1 (Green)	ON	PROFIBUS bus communication connecting with DP1 is normal.
	Off	Communication fault
DP2 (Green)	ON	PROFIBUS bus communication connecting with DP2 is normal.
	Off	Communication fault
PA (Green)	ON	Communication with field PA device is normal.
	Off	Communication fault.

Section 7 Install and Uninstall

The module can be installed with standard DIN guide rail.

How to install the module:

1. Insert one side of module without buckle into rail, as shown in 1 of Figure 7-1.
2. Rotate the module, as shown in 2 of Figure 7-1, to insert the other side into the guide rail to complete the installation.
3. Wiring, manage the wires.

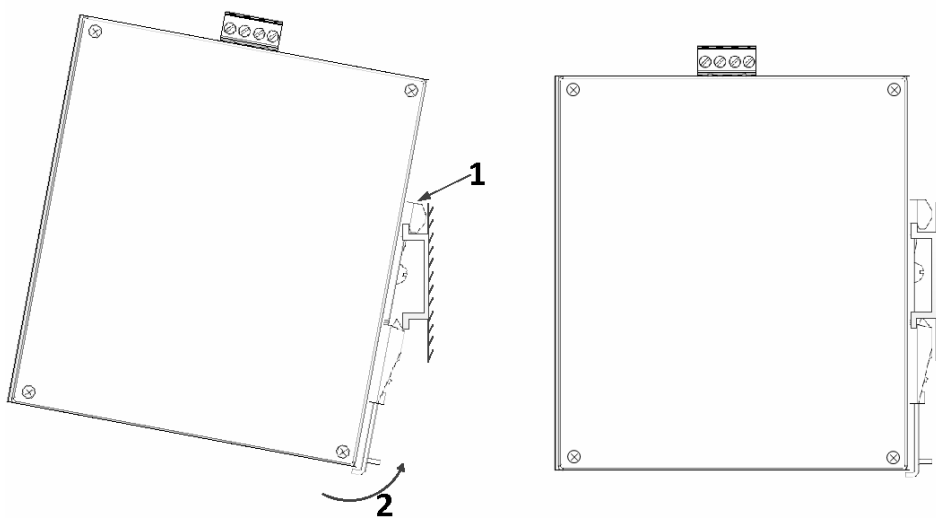


Figure 7-1 Installing steps

How to uninstall the module:

1. Cut off the power, remove wires.
2. Use straight screwdriver (medium or small size) to open the buckle, as shown in 1 of Figure 7-2.
3. Then rotate the module, as shown in 2 of Figure 7-2.
4. Remove the module from guide rail to complete the uninstalling.

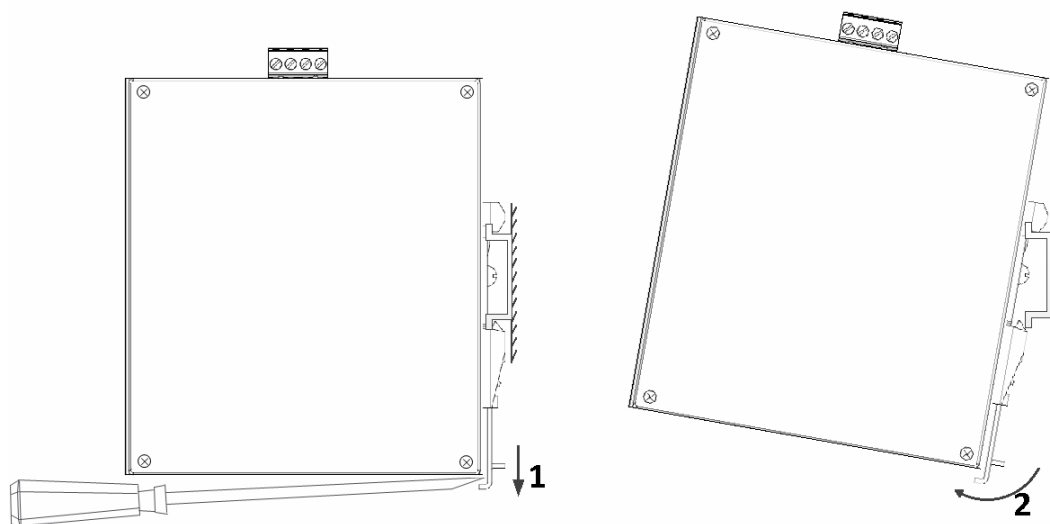


Figure 7-2 Uninstalling steps

Section 8 Revision

Table 8-1 Retrofit list of the version

Document Version	Model	Remarks
V1.0(20160122)	LM110 V1.00.00.00 and later versions. LM120 V1.00.00.00 and later versions.	
V1.1(20180830)		Add Code
V1.2(20210610)		