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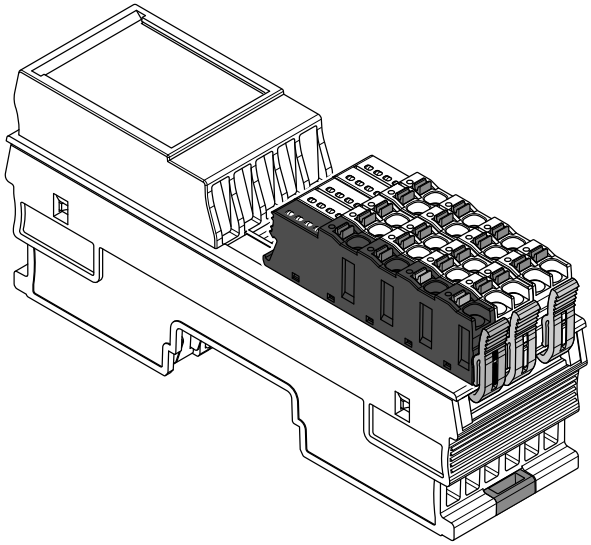
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GETTING STARTED GUIDE

NI REM-11100

Voltage Input Module for Remote I/O



This document explains how to connect to the REM-11100.

Note The guidelines in this document are specific to the REM-11100. The other components in the system might not meet the same safety ratings. Refer to the documentation for each component in the system to determine the safety and EMC ratings for the entire system.

Caution Do not operate the REM-11100 in a manner not specified in this document. Product misuse can result in a hazard. You can compromise the safety protection built into the product if the product is damaged in any way. If the product is damaged, return it to NI for repair.

NATIONAL INSTRUMENTS

Isolation Withstand Voltages

Test section	Test voltage
5 V communications power (logic), 24 V supply (I/O)	500 VAC, 50 Hz, 1 min.
5 V supply (logic) / analog inputs	500 VAC, 50 Hz, 1 min.
5 V supply (logic) / functional earth ground	500 VAC, 50 Hz, 1 min.
24 V supply (I/O) / analog inputs	500 VAC, 50 Hz, 1 min.
24 V supply (I/O) / functional earth ground	500 VAC, 50 Hz, 1 min.
Analog inputs / functional earth ground	500 VAC, 50 Hz, 1 min.

Electromagnetic Compatibility Guidelines

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) stated in the product specifications. These requirements and limits provide reasonable protection against harmful interference when the product is operated in the intended operational electromagnetic environment.

This product is intended for use in industrial locations. However, harmful interference may occur in some installations, when the product is connected to a peripheral device or test object, or if the product is used in residential or commercial areas. To minimize interference with radio and television reception and prevent unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Furthermore, any changes or modifications to the product not expressly approved by National Instruments could void your authority to operate it under your local regulatory rules.

Preparing the Environment

Ensure that the environment in which you are using the REM-11100 meets the following specifications.

Operating temperature	-25 °C to 60 °C
Operating humidity	5% RH to 95% RH, noncondensing
Pollution Degree	2
Maximum altitude	3,000 m

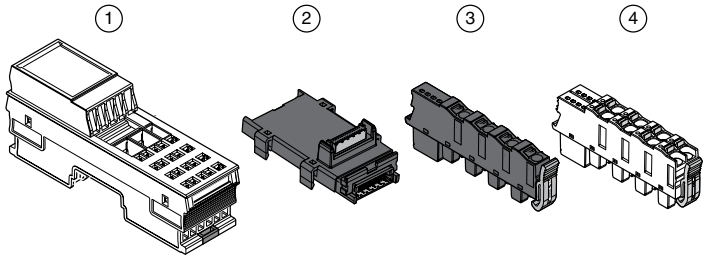
Indoor use only.

Note Refer to the device datasheet on *ni.com/manuals* for complete specifications.

Verifying the Kit Contents

Verify that the following items are included in the REM-11100 kit.

Figure 1. REM-11100 Kit Contents



1. NI REM-11100
2. Bus connector
3. Supply voltage connector
4. Spring-terminal block (x2)

Unpacking the Kit

Caution To prevent electrostatic discharge (ESD) from damaging the device, ground yourself using a grounding strap or by holding a grounded object, such as your computer chassis.

1. Touch the antistatic package to a metal part of the computer chassis.
2. Remove the device from the package and inspect the device for loose components or any other sign of damage.

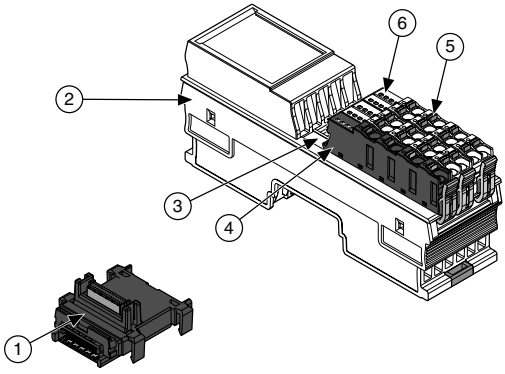
   Caution Never touch the exposed pins of connectors.

   Note Do not install a device if it appears damaged in any way.
3. Unpack any other items and documentation from the kit.

Store the device in the antistatic package when the device is not in use.

Installing the REM-11100

Figure 2. Structure of the REM-11100



1. Bus connector
2. REM-11100
3. Module function label
4. Supply voltage connector
5. Spring-terminal block
6. LED indicators

Table 1. Module Function Labels

Label Color	Module Function
Blue	Digital input
Red	Digital output
Green	Analog input, thermocouple
Yellow	Analog output
White	Bus coupler, power module

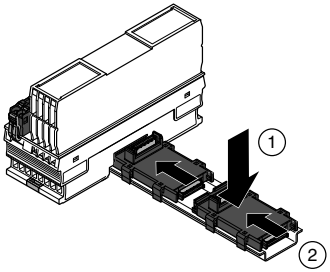
Installing Bus Connectors

What to Use

- Bus connector
- DIN rail

What to Do

Complete the following steps to install bus connectors on the DIN rail.



1. Insert the bus connector for the REM-11100 into the DIN rail.

   Caution Verify that you are using the correct bus connector for the module width.

2. Slide the bus connector along the DIN rail until it connects to the preceding bus connector.

   Note A bus connector will not attach to a preceding bus connector with a mounted module. Remove the preceding module before installing additional bus connectors.

3. Repeat Steps 2 and 3 for additional bus connectors.

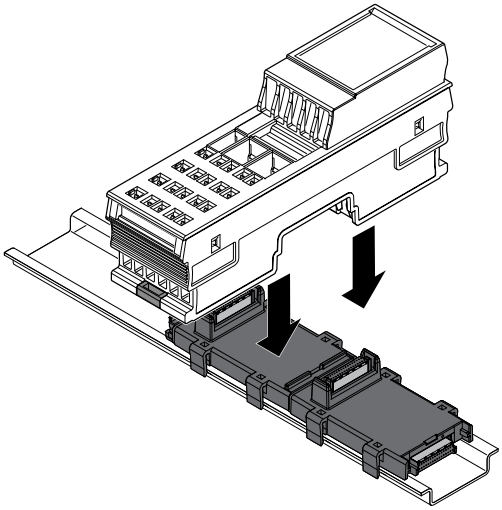
Installing the Module

What to Use

- REM-11100
- Mounted bus connector

What to Do

Complete the following steps to install the REM-11100 on the DIN rail.



Note When using the Remote I/O Shield Set, install the shield rail supports before mounting the module.

1. Align the REM-11100 over the appropriate bus connector.

   Note Verify that the bus connector socket aligns with the socket on the underside of the module.

2. Press the REM-11100 directly onto the bus connector and DIN rail until it clicks into place.

   Caution Tilting the module when mounting it on the DIN rail will damage the contacts.

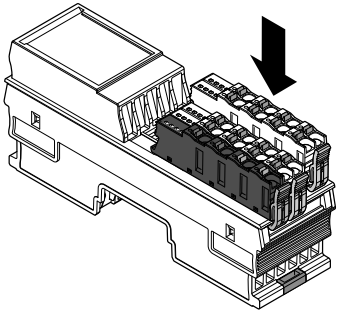
Installing Spring-Terminal Blocks

What to Use

- REM-11100
- Spring-terminal block

What to Do

Align the spring-terminal block over the REM-11100 and press until it clicks into place.



REM-11100 Pinout

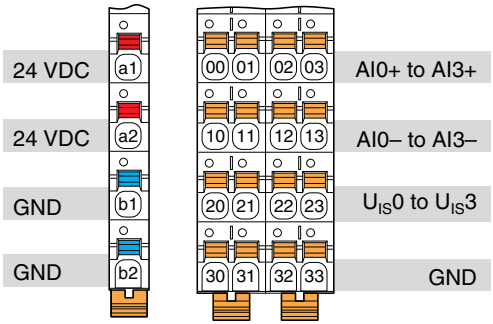


Table 2. REM-11100 Signal Descriptions

Signal	Color	Description	
a1, a2	Red	24 VDC (U_A)	Supply for analog modules (internally jumpered)
b1, b2	Blue	GND	Reference potential of the supply voltage (internally jumpered)
00 to 03	Orange	AI0+ to AI3+	Positive voltage connection for channel 0 to 3
10 to 13		AI0- to AI3-	Negative voltage connection for channel 0 to 3
20 to 23		$U_{IS}0$ to $U_{IS}3$	24 V sensor supply for channel 0 to 3
30 to 33		GND	Reference potential of sensor supply

Figure 3. REM-11100 LEDs

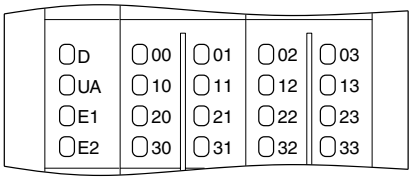


Table 3. LED Indicators

LED	LED Color	LED Pattern	Indication
D	Green	Solid	The REM-11100 is ready for operation.
		Flashing	Data is invalid or unavailable.
	Green/Yellow	Flashing	The REM-11100 cannot communicate with the connected devices.
D	Yellow	Solid	The REM-11100 did not detect a valid cycle after power-on.
		Flashing	The REM-11100 is not part of the configuration.
	Red	Solid	The REM-11100 has lost connection to the Bus Coupler.
		Flashing	The REM-11100 has lost connection to the preceding adjacent module.
	—	Off	The REM-11100 is in reset mode.
UA	Green	Solid	Supply for analog modules U_A present.
	—	Off	No Supply for analog modules U_A.
E1	Red	Solid	Supply for analog modules U_A is faulty.
	—	Off	Supply for analog modules U_A is OK.
E2	Red	Solid	I/O or channel error has occurred.
	—	Off	No error

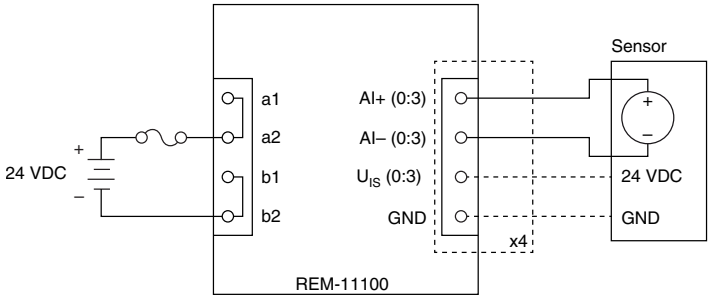
Table 4. Error Status of E1 and E2 LEDs

Error	E1 LED	E2 LED
No error	Off	Off
Underrange	Off	On
Overrange	Off	On
Supply voltage faulty (supply for analog modules U_A)	On	On
Parameter table invalid	Off	On
Device error	Off	On
Flash format error	Off	On

Note The reported error depends on the measuring range. For information about input scaling, refer to the device datasheet on *ni.com/manuals*.

Connecting the REM-11100

Figure 4. REM-11100 Voltage Measurement Connection



U_{IS} and GND are optional, sensor-dependent connections.

Note For information about fuse ratings for the REM-11100, refer to the device datasheet on *ni.com/manuals*.

Connection Guidelines

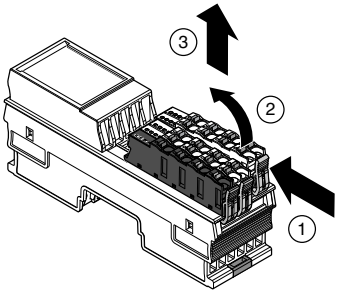
- Always connect analog signals using shielded, twisted pair cables. Unshielded cables may lead to values outside the specified tolerance limits in environments subject to heavy noise.
- Connect the cable shield to functional earth ground immediately after the cables enter the control cabinet.
- Connect the cable shield to a shield bus if you are not using a closed control cabinet.

- NI recommends using the NI Remote I/O Shield Set for optimal shield connection.
- Make sure that devices you connect to the REM-11100 are compatible with the module specifications.
- Push the wire into the terminal when using a solid wire or a stranded wire with a ferrule.
- Open the terminal by pressing a screwdriver into the spring lever when using a stranded wire without a ferrule.

Removing Components

Removing Spring Terminal Blocks

Complete the following steps to remove a spring-terminal block from the REM-11100.



1. Press the locking latch to release the spring-terminal block.
2. Tilt the block toward the center of the module.
3. Remove the connector from the module.

Removing the REM-11100

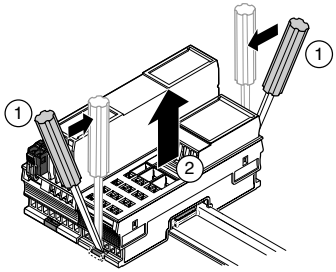
Remove all connections before removing the REM-11100, either by disconnecting the cables or removing the spring-terminal block.

What to Use

- Flathead Screwdriver

What to Do

Complete the following steps to remove the REM-11100 from the DIN rail.



1. Insert the screwdriver and loosen the base latches on either end of the module.
2. Remove REM-11100 perpendicular to the DIN rail.

Caution Tilting the module when removing it from the DIN rail will damage the contacts.

Removing Bus Connectors

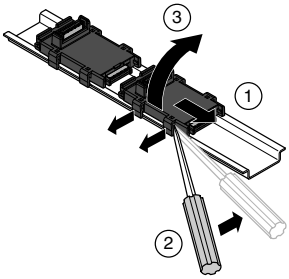
Complete the following steps to remove bus connectors from the DIN rail.

What to Use

- Flathead Screwdriver

What to Do

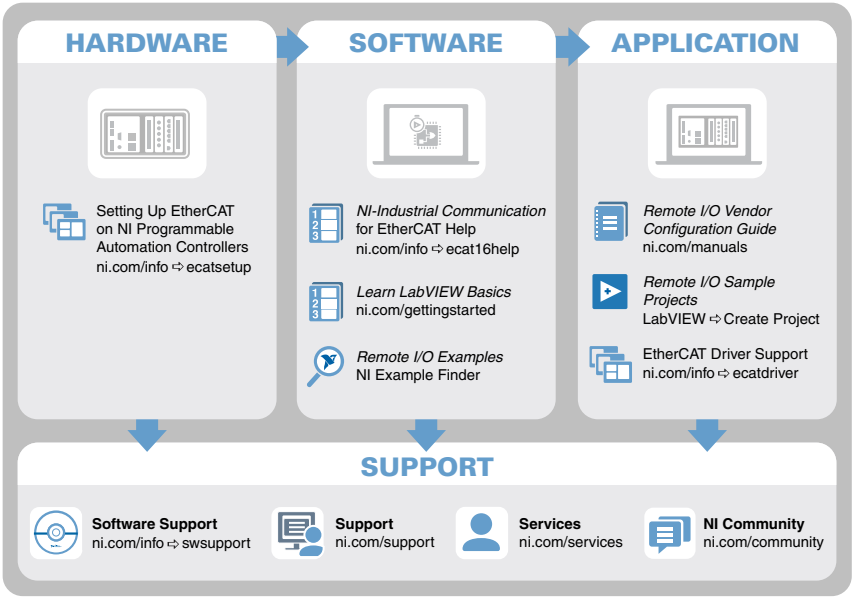
Note You must remove the preceding module before removing the bus connector.



1. Slide the bus connector away from the preceding bus connector at least 5.0 mm (0.20 in.).
2. Insert the screwdriver and loosen both latches on one side of the DIN rail.
3. Rotate the bus connector to remove it from the DIN rail.

Note If you want to remove a bus connector in the middle of the system, you must remove any modules or bus connectors following the desired connector or slide them along the DIN rail at least 15.0 mm (0.60 in.).

Where to Go Next



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