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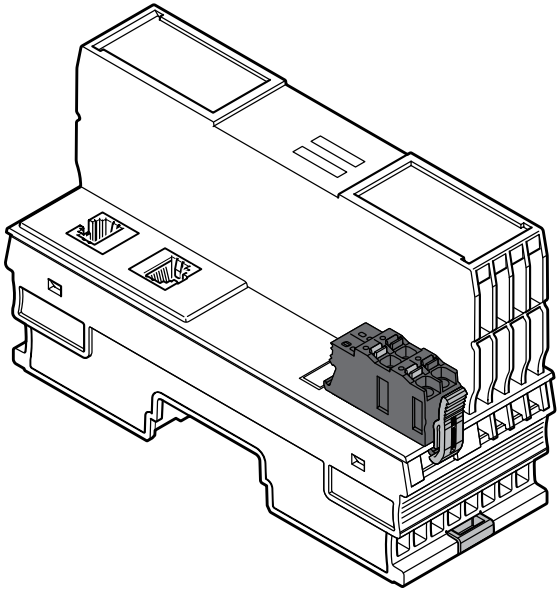
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GETTING STARTED GUIDE

NI REM-11180

Bus Coupler for Remote I/O



This document explains how to connect to the REM-11180.

Note The guidelines in this document are specific to the REM-11180. 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-11180 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.

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

NATIONAL INSTRUMENTS

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-11180 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

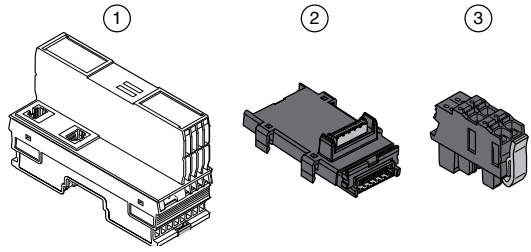
Indoor use only.

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-11180 kit.

Figure 1. REM-11180 Kit Contents



1. NI REM-11180
2. Bus connector
3. Supply voltage connector

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.

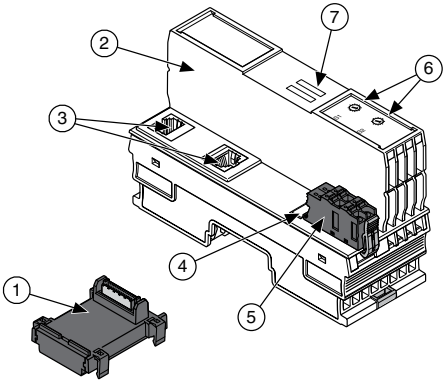
Note Do not install a device if it appears damaged in any way.

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-11180

Figure 2. Structure of the REM-11180



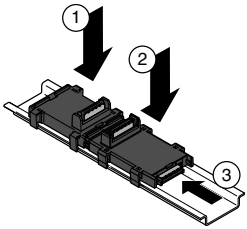
1. Bus connector
2. REM-11180
3. Ethernet connectors
4. Module function label
5. Supply voltage connector
6. Rotary encoding switch
7. LED indicators

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

Complete the following steps to install bus connectors on the DIN rail. Install the bus connectors for the REM-11180 and all appropriate I/O module before mounting the modules.



1. Insert the bus connector for the REM-11180 into the DIN rail.
2. Insert the bus connector for an I/O module into the DIN rail.

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

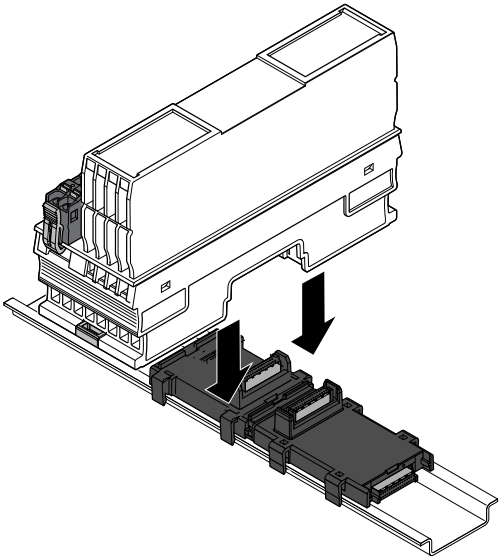
3. Slide the I/O module bus connector along the DIN rail until it connects to the preceding bus connector.

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

4. Repeat Steps 2 and 3 for all necessary bus connectors.

Installing the REM-11180 Bus Coupler

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



1. Align the REM-11180 over the first bus connector.

   Note Verify that the bus connector socket aligns with the socket on the underside of the REM-11180.

2. Press the REM-11180 directly onto the bus connector and DIN rail until it clicks into place.

   Caution Tilting the REM-11180 when mounting it on the DIN rail will damage the contacts.

   Note For information about connecting the Bus Coupler to an NI cRIO RT controller, refer to the device user manual on *ni.com/manuals*.

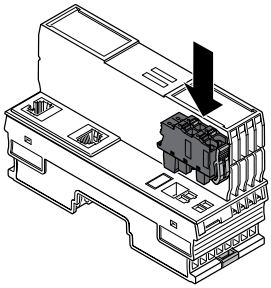
Installing Spring-Terminal Blocks

What to Use

- REM-11180
- Spring-terminal block

What to Do

Align the spring-terminal block over the REM-11180 and press until it clicks into place.



Connection Guidelines

- Make sure that devices you connect to the REM-11180 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.

REM-11180 Pinout

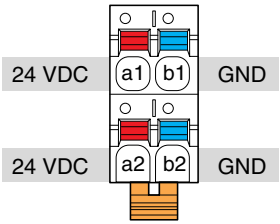


Table 2. REM-11180 Signal Descriptions

Signal	Color	Description	
a1, a2	Red	24 VDC (U_L)	Supply of logic voltage (internally jumpered)
b1, b2	Blue	GND	Reference potential of the supply voltage (internally jumpered)

Figure 3. REM-11180 LEDs

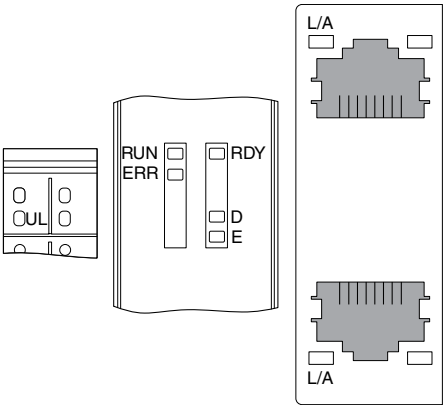


Table 3. LED Indicators

LED	LED Color	LED Pattern	Indication
UL	Green	Solid	Communications power supply present.
		Unlit	Communications power supply not present.
RUN	Green	Unlit	Bus coupler in Init state
		Flashing slowly (2.5 Hz)	Bus coupler in Pre-Operational state
		Single pulse	200 ms on, 1000 ms off; bus coupler in Safe-Operational state
		Solid	Bus coupler in Operational state
		Flashing (10 Hz)	Bus coupler in Bootstrap state
ERR	Red	Unlit	No error
		Flashing slowly (2.5 Hz)	Configuration error; a state transition initiated by the master cannot be executed
		Single pulse	200 ms on, 1000 ms off; local application error
		Double pulse	200 ms on, 200 ms off, 200 ms on, 1000 ms off; watchdog timeout
		Solid	Critical internal error

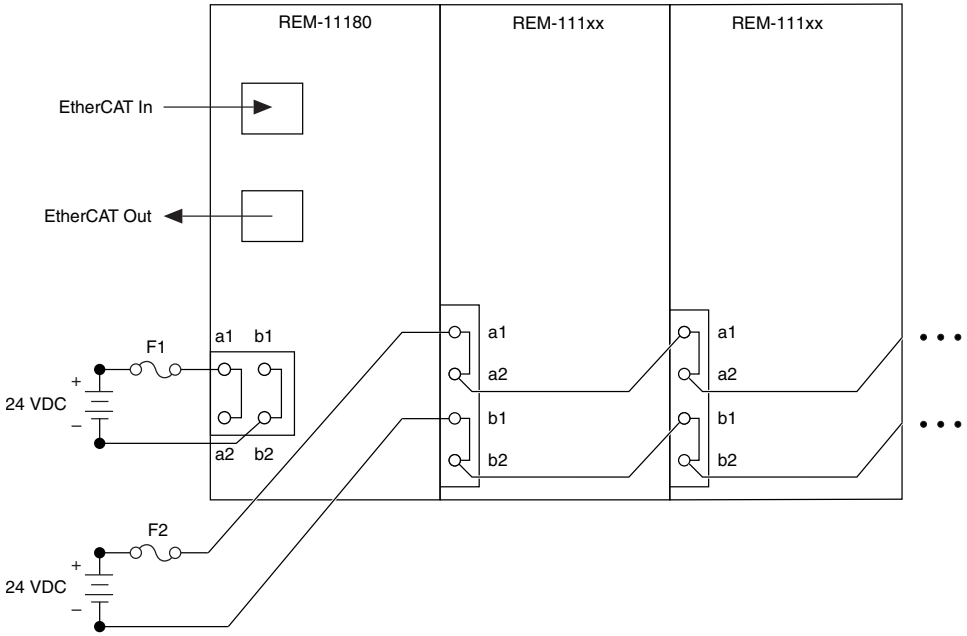
Table 3. LED Indicators (Continued)

LED	LED Color	LED Pattern	Indication
RDY	Green	Solid	Device is ready for operation.
	Green/Yellow	Flashing	• Communications power undervoltage or surge voltage • Overtemperature
	Yellow	Solid	Firmware/bus coupler is booting
		Flashing	Firmware update is being performed.
	Yellow/Red	Solid	Firmware update has failed.
	Red	Solid	Rotary encoding switches are set to an invalid/ reserved position
	Unlit		Device is not ready to operate.
D	Green	Solid	Run: Data exchange; status and data from the higher-level system is transmitted.
		Flashing	Active: configuration is active, data exchange with invalid process data, PDI channel can be used.
	Yellow	Solid	Ready: Device is ready to operate, no data is exchanged.
		Flashing	Access from Startup+ in I/O check mode
	Yellow Red	Flashing	Bus error during active I/O check
	Red	Flashing	Local bus error on startup
		Solid	• General local bus error • Communication error • Local bus device has been removed or configured device is missing. • Reset at a local bus device • Serious device error at a local bus device (local bus device can no longer be reached)
E	Yellow	Solid	I/O warning at a local bus device
	Red	Solid	I/O error at a local bus device

Table 3. LED Indicators (Continued)

LED	LED Color	LED Pattern	Indication
L/A	Green	Solid	Connection present at EC IN/EC OUT.
		Flashing	Transmission or reception of Ethernet telegrams at EC IN / EC OUT.
		Unlit	Connection not present at EC IN/EC OUT.

Connecting the REM-11180



The supply terminals blocks contain internal jumpers. You can use the first connection for supply and the second connection to forward a potential to the next module.

Caution Connect an 8 A external fuse to the 24 V U_L supply to protect against polarity reversal. The power supply must provide four times the nominal current of the external fuse. This rating ensures that the fuse trips in the event of an error.

Connecting the REM-11180 to an NI Master Controller

Before you connect the REM-11180 to an NI master controller, you must setup and connect the NI master controller to a network. Refer to your master controller documentation on *ni.com/manuals* for setup information.

NI recommends that you install a private network segment for your deterministic Ethernet expansion devices. Slave devices cause network flooding on a standard network. Non-EtherCAT frames jeopardize the system performance and determinism on an EtherCAT network. Refer to the EtherCAT Technology Group Web site at *www.ethercat.org* for more information.

What to Use

- REM-11180
- NI Master Controller[1]
- Category 5 Ethernet Cable

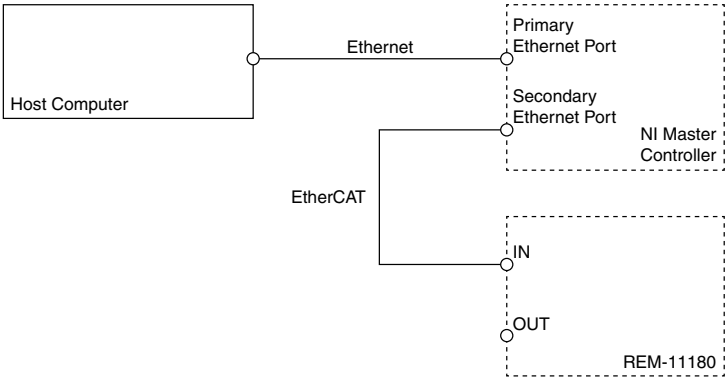
Note To prevent data loss and to maintain the integrity of your EtherCAT installation, do not use a CAT-5 Ethernet cable longer than 100 m. NI recommends using a CAT-5 or better shielded twisted-pair Ethernet cable

What to Do

Connect the REM-11180 to the NI master controller as shown in the following figure.

[1] For supported NI master controllers, visit *ni.com/info* and enter the Info Code `ecatmaster`.

Figure 4. Connecting to an NI Master Controller

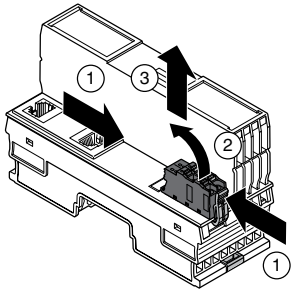


Tip Use the OUT port on the REM-11180 to connect additional slave chassis.

Removing Components

Removing Spring Terminal Blocks

Complete the following steps to remove a spring-terminal block from the REM-11180.



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.

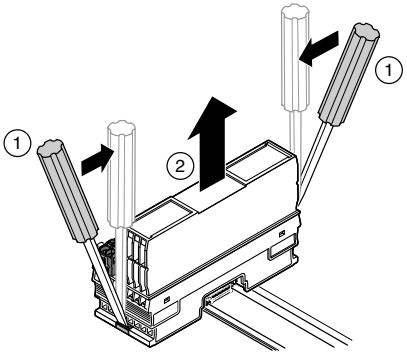
Removing the Bus Coupler

Complete the following steps to remove the REM-11180 from the DIN rail.

What to Use

- Flathead Screwdriver

What to Do



1. Insert the screwdriver and loosen the base latches on either end of the REM-11180.
2. Remove REM-11180 perpendicular to the DIN rail.

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

Removing Bus Connectors

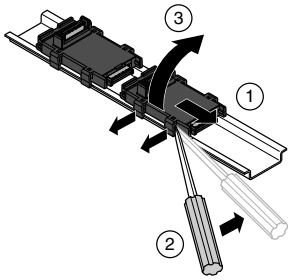
Complete the following steps to remove bus connectors from the DIN rail.

What to Use

- Flathead Screwdriver

What to Do

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

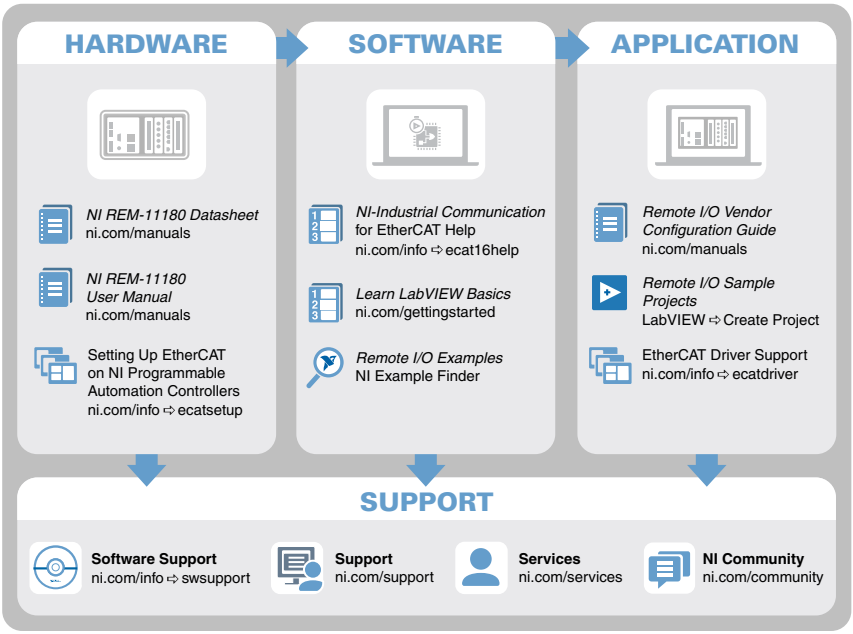


1. Slide the bus connector away from the preceding bus connector at least 5.0 mm (0.20 in.).
2. Insert the screwdriver and loosen both latches on one side of the DIN rail.

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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