

Dual RS485 Option Module (12979)

INSTALL SHEET

This document covers the mounting and wiring of a Dual RS485 option module (12979) for a JACE-8000 controller (12977).

Model / Description: NPB-8000-2X-485 (12979): Dual port, electrically isolated RS485 adapter, with two 3-position, removable screw-terminal connector plugs. Each port has an RS485 bias switch to set or remove biasing. LEDs verify power and termination from the controller and indicate RS485 trunk message traffic.

Module Combinations: The controller supports a maximum total of two Dual RS485 modules and up to a total of four option modules across all option types. If you use a single RS-485 module, you can add three non-485 modules. If you use the maximum of two Dual RS485 modules, you can add one more non-485 module for a total of three modules.

COM Port Assignments: The controller has two *onboard* RS485 ports that always operate as COM1 and COM2. Installed serial option modules continue COM port numbering based on proximity to the controller, where the option module closest to the controller base operates as the next available serial COM port(s). For example, if attached directly to the controller, this dual RS485 option module operates as COM3 (upper port) and COM4 (lower port).

For related details, see “COM port usage,” page 2.

Related topics such as the mounting and wiring of the controller or other option modules, installation of Niagara 4 software, and usage of the various RS485-based drivers are in other documents. See “Related documentation,” page 4.

Included in this package

Included in this package you should find the following items:

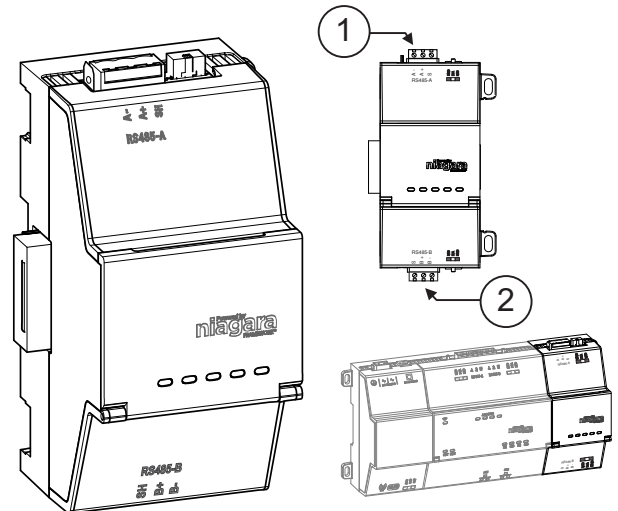
- One Dual RS485 (12979) option module, with two 3-position terminal plugs for wiring to an RS485 trunk, and a grounding wire with quick-disconnect connector.
- This *Dual RS485 Option Module (12979) Install Sheet*

Material and tools required

Suitable tools and fasteners for mounting the unit, attaching it to an already mounted JACE-8000 controller. DIN-rail mounting of the controller and all its option modules is recommended.

A small flat-blade screwdriver is required to make wiring connections to RS485 trunks.

Figure 1 Dual RS485 Option module.





1	RS485-A port COM n (<i>next available</i>). For example, COM3
2	RS485-B port COM $n+1$ (<i>next + 1</i>). For example, COM4

Precautions

The following are warnings relating to the installation of the controller option module.


General precautions

-  **Caution** Remove all power to controller before attaching (plug in) or detaching (unplug) any option module, to prevent possible equipment damage.

-  **Caution** Removal of the cover is not required. No configurable or user-serviceable items (such as jumpers) are inside the option module.

Static discharge precautions

Static charges produce voltages high enough to damage electronic components. The microprocessors and associated circuitry within the devices are sensitive to static discharge.


-  **Caution**
 - Work in a static-free area.
 - Discharge any static electricity you may have accumulated. Discharge static electricity by touching a known, securely grounded object.



Mounting on DIN rail

Mounting

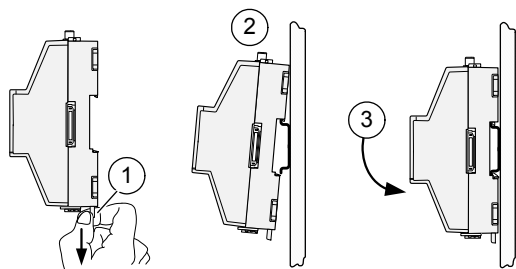
Mounting the controller and all option modules on a 35mm wide DIN rail is recommended. Mounting on a DIN rail ensures accurate alignment of connectors between all modules. Tabs on the controller or module can be used for panel mounting as an alternate to DIN rail mounting

Caution  **Remove all power to controller** before installing or removing option modules. See “Precautions,” page 1.

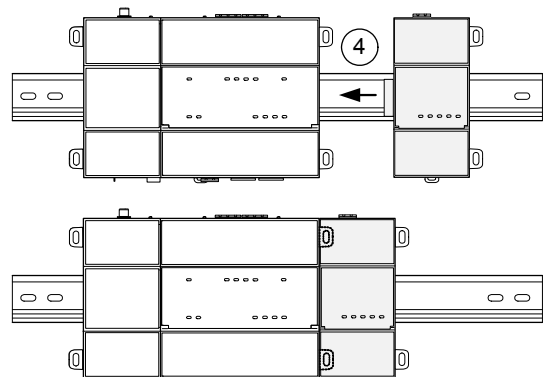
Mounting on DIN rail

Prerequisite: JACE-8000 controller is securely mounted on a 35mm DIN rail, with adequate room left to mount the module.

1. Pull the option module's locking clip down.

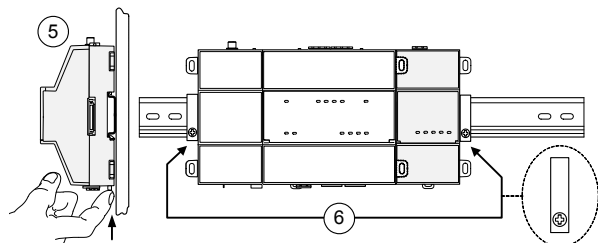


2. Tilt the module to hook over the DIN rail.
3. Push down and in on the unit, fastening to the rail.
4. Slide the module firmly into the controller's connector (or existing option module) to seat.



Repeat for other modules as needed (4 maximum).

5. Push up the locking clip on all modules.



6. Carefully secure both ends of the final assembly with DIN rail end-clips provided by the DIN rail vendor.

NOTE: To remove a unit from the DIN rail, pull down its locking clip. Slide the unit away from other devices, then swing the bottom out and lift away from the rail.

COM port usage

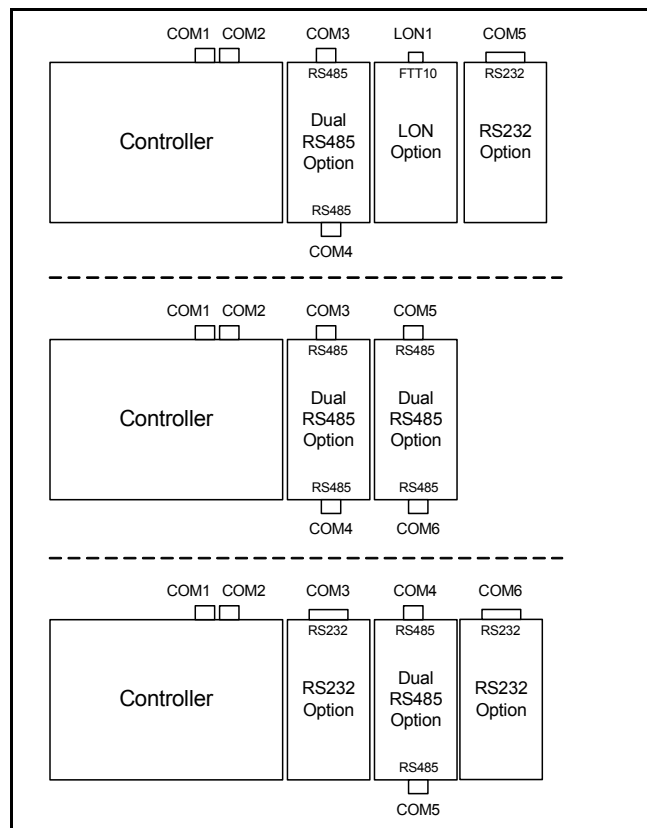
The Dual RS485 option adds two COM ports on the installed JACE-8000 controller. The controller has two *onboard* RS485 ports. In a Niagara 4 station running on the controller, these two ports always operate as COM1 and COM2.

Installed serial option modules (RS485 or RS232) continue COM port numbering based on proximity to the controller, where the option module closest to the controller base operates as the next available serial COM port(s).

For example, if attached directly to the controller, this dual RS485 option module operates as COM3 and COM4. If another dual RS485 option module is attached to it, the second module operates as COM5 and COM6.

Figure 2 shows a few combinations with port assignments.

Figure 2 COM port numbering examples.

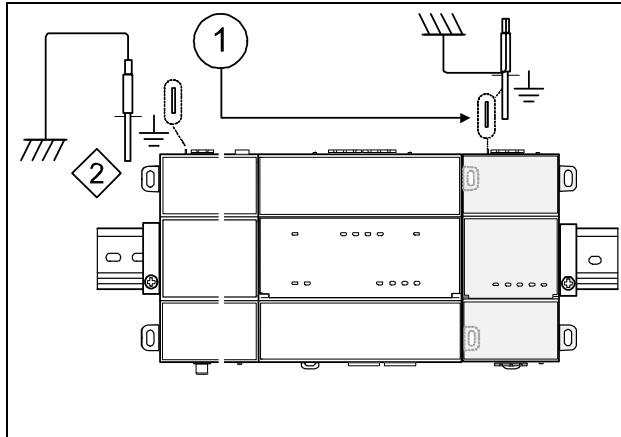


Wiring

Earth ground wiring

Earth grounding provides protection from electrostatic discharge or other forms of EMI.

Figure 3 Earth ground to option module (and controller).



Prerequisite: Nearby earth grounding point.

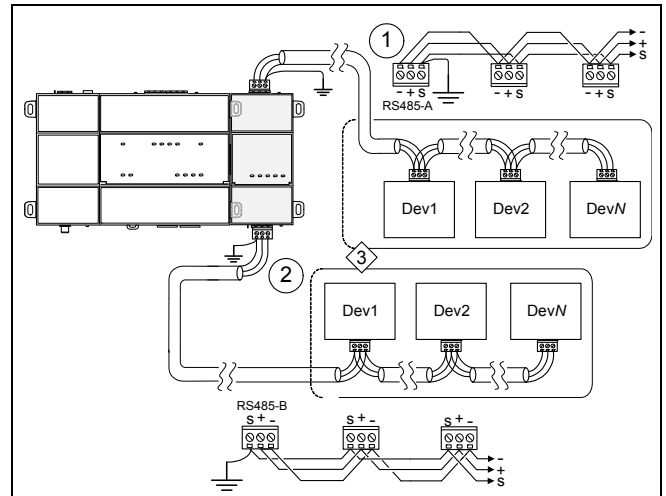
1. Install the included earth ground wire to the option module's earth ground spade lug, and terminate the other end to a nearby earth ground.
2. (NOTE): Controller's earth ground spade lug should also be terminated to earth ground. This also applies to any other option module with a ground spade lug.

RS485 wiring

Each of the two RS485 ports is capable of up to 115,200 baud, and uses a 3-position, removable, screw terminal connector. Use shielded, twisted-pair, 18-22 AWG cabling to wire in a continuous multidrop fashion to other RS485 devices: "minus to minus", "plus to plus", and "shield to shield".

Connect the shield wire to earth ground at one end only, for example at the option module. [Figure 4](#) shows example RS485 wiring.

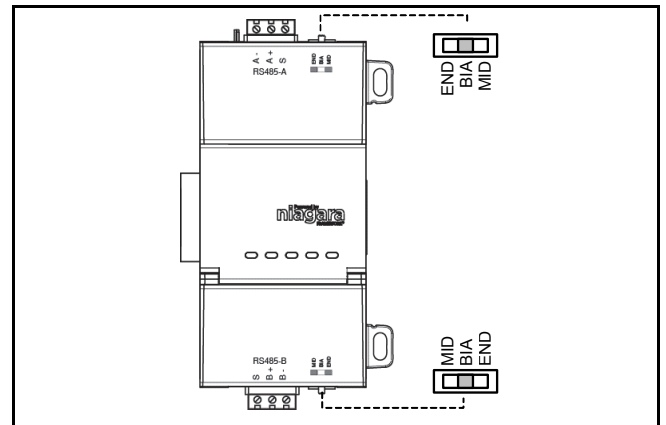
Figure 4 RS485 wiring example.



1	RS485-A port COMn with a network of RS485 devices.
2	RS485-B port COMn+1 with a network of RS485 devices.
3	(NOTE): RS485 devices on the same network should use the same protocol and baud rate. Up to 32 or more devices may be supported, depending on device specifications.

RS485 bias switches — Each RS485 port has an adjacent 3-position biasing switch.

Figure 5 RS485 module bias switches



Settings of each RS485 bias switch are as follows:

- **BIA** - (Default, middle) RS485 biasing and termination: 2.7K bias resistors with no termination resistor
- **END** - RS485 biasing and a termination: 562 Ohm bias resistors and 150 Ohm termination resistor
- **MID** - RS485 biasing or termination: 47.5K bias resistors with no termination resistor

Often, adding RS-485 biasing can improve communications by eliminating indeterminate idle states.

Typical scenarios for the best RS485 bias switch position are as follows:

- **BIA** - (Default, middle) Often best if the RS485 trunk needs biasing, but when the controller is not installed at the end of the trunk.
- **END** - Often best if the controller is installed at the end of an RS485 trunk of devices that is not already biased.
- **MID** - Often best if the controller is put in the middle of an already-biased RS485 trunk.

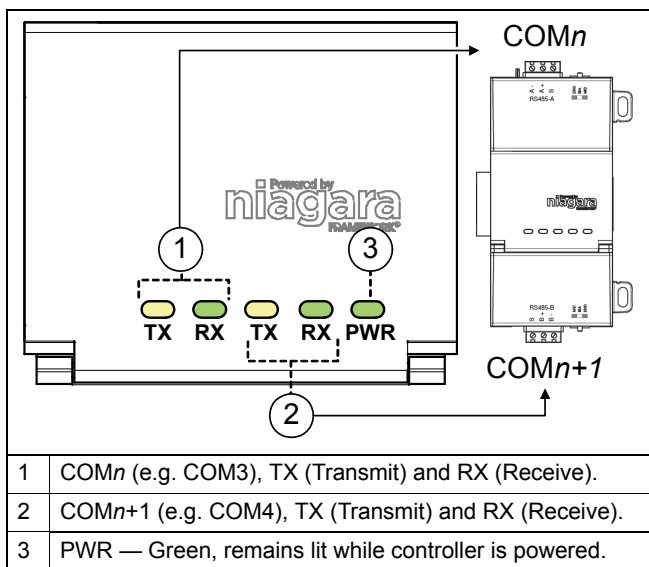
If desired, you can change the position of an RS485 port's bias switch while the controller is running.

Each RS485 port also has two LEDs. See "LEDs".

LEDs

Five LEDs are on the front of the Dual RS485 option module.

Figure 6 LEDs on Dual RS485 option.



LED pairs TX and RX operate as follows:

- TX (yellow) — Transmit, flashes when the controller is sending data to a device connected on the RS485 trunk.
- RX (green) — Receive, flashes when the controller is receiving data from a device on the RS485 trunk.

These LEDs are also visible when the front access door is opened.

Related documentation

For more information on installing, configuring, and using the JACE-8000 controller with Dual RS485 option module, refer to the following documents:

- *JACE-8000 Controller (12977) Mounting and Wiring Guide*
- *JACE-8000 Controller (12977) Quick Start Install Sheet*
- *JACE-8000 Niagara 4 Install and Startup Guide*
- *Niagara 4 Drivers Guide*