

June 23, 2023

Dual RS485 Option Module (12979) Install Sheet

This document describes the mounting and wiring of a Dual RS485 option module (12979) for a JACE-8000 controller (12977) and a JACE-9000 controller (15885).

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 indicate RS485 trunk message traffic.

Module Combinations

The controller supports a maximum 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.” Other 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 the “Related Documentation” section.

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 & Tools Required

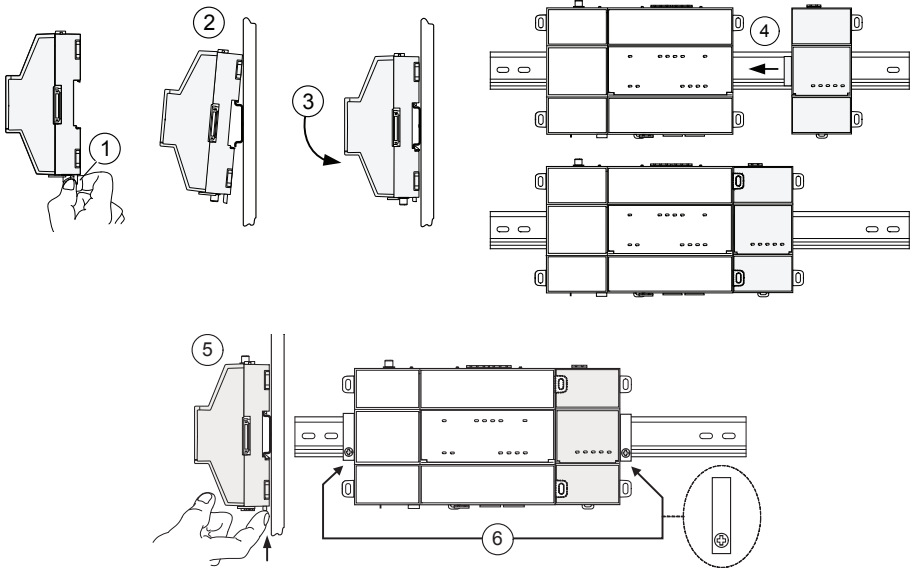
Suitable tools and fasteners for mounting the unit, attaching it to an already mounted. DIN-rail mounting of the controller and all its option modules is recommended.

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



T-12388-C

Figure 2: DIN rail mounting



Precautions

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

General Precautions

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

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.

- ⚠ Remove all power to controller before installing or removing option modules. See “Precautions”.**

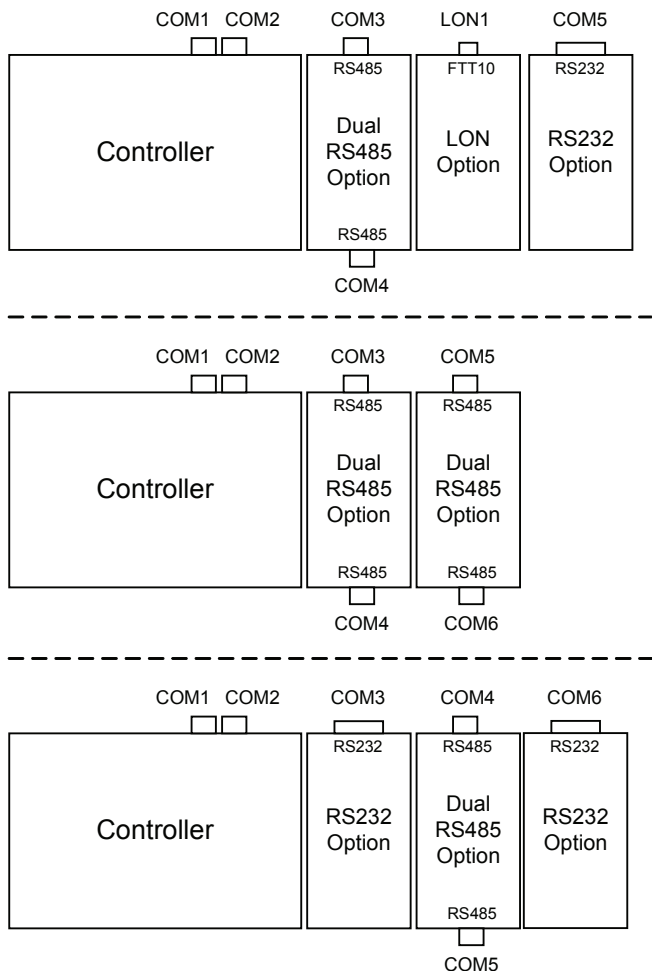
Mounting on DIN Rail

Prerequisite: The 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.

Figure 3: COM Port Numbering Examples

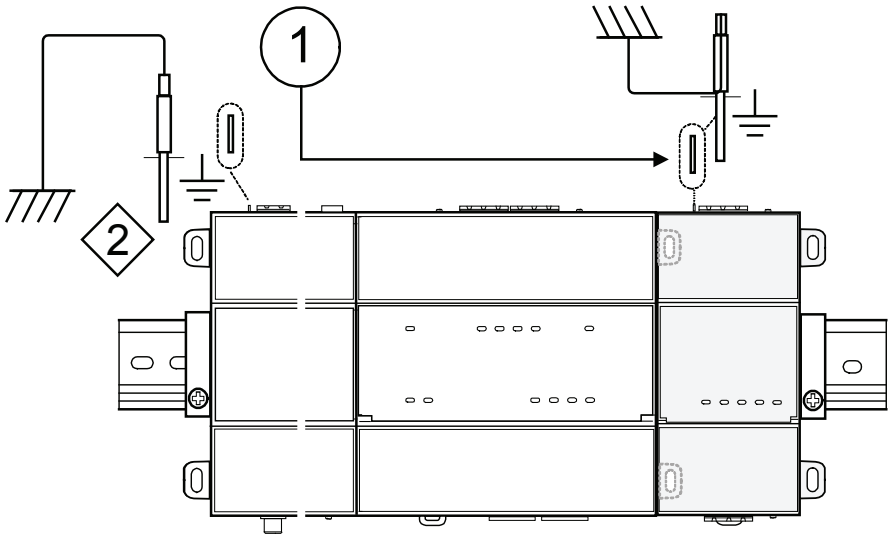


COM Port Usage

The Dual RS485 option adds two COM ports on the installed 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 4: Earth Ground to Option Module (and Controller)



Wiring

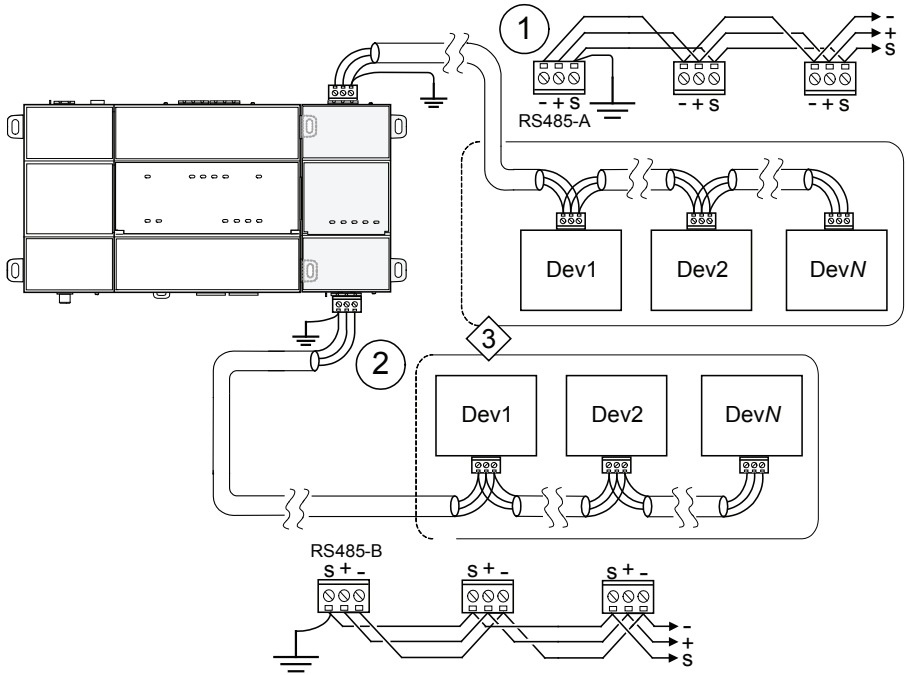
Earth Ground Wiring

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

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.

Figure 5: RS485 Wiring Example



RS485 Wiring

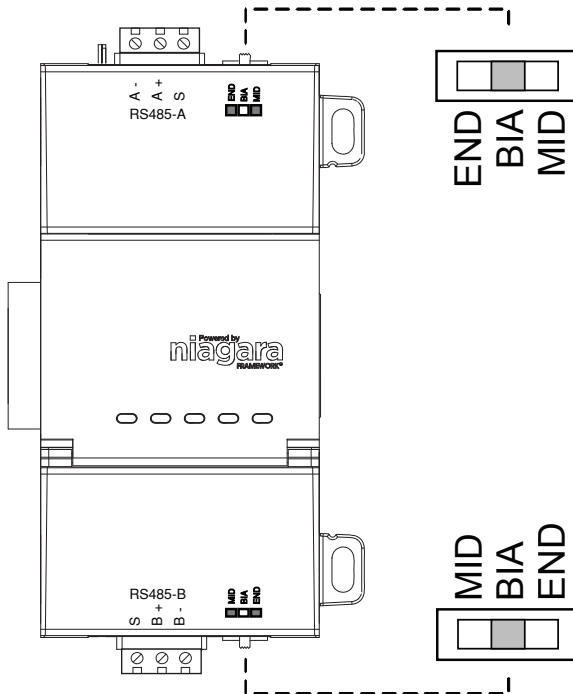
Each of the two RS485 ports is capable of up to 115,200 baud, and uses a 3-position, removable, screw terminal connector.

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.

- 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.

Figure 6: RS485 Module Bias Switches



RS485 Bias Switches

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

Settings of each RS485 bias switch are as follows:

- **BIA** - (middle, as-shipped setting) RS485 biasing. 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:

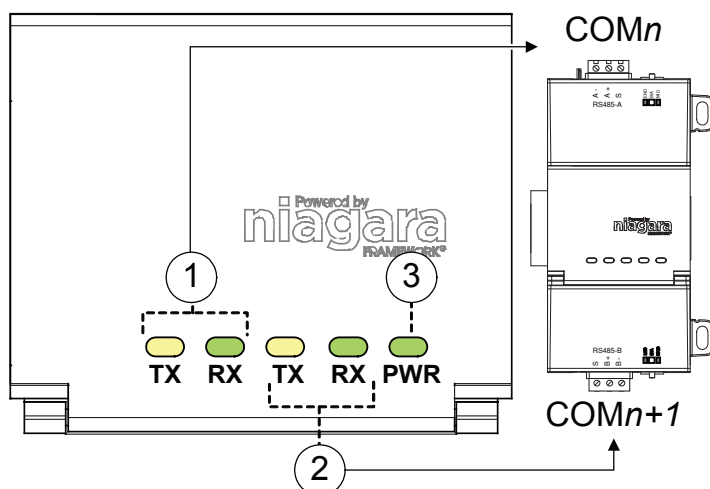
- **BIA** - (middle, as-shipped setting) Often best if the RS485 trunk needs biasing, but when the controller is not installed at the end of the trunk.
- **END** - Often best if the controller is installed at the end of an RS485 trunk of devices that is not already biased. In this position, device serves as end of line resistor.
- **MID** - (no biasing) 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**”.

Figure 7: LEDs on Dual RS485 Option



LEDs

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

- ① **COMn** (e.g. COM3), **TX** (Transmit) and **RX** (Receive)
- ② **COMn+1** (e.g. COM4), **TX** (Transmit) and **RX** (Receive)
- ③ **PWR** - Green, remains lit while controller is powered.

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 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*
- *JACE-9000 Controller (15885) Mounting and Wiring Guide*
- *JACE-9000 Controller (15885) Quick Start Install Guide*
- *JACE-9000 Niagara 4 Install and Startup Guide*
- *Niagara Drivers Guide*

Compliance



Complies with the requirements of the relevant ACMA Standards.

Manufacturer Representative:

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Brooks Green Road
Coolham, West Sussex
RH13 8GR United Kingdom



China EEP Hazardous Substance Information

Restricted Materials Above Threshold

部件名称与型号 Assembly Name and Model		有害物质 Hazardous Substances					
型号 Model	部件名称 Assembly Name	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr6+)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
12979	PWB 组件 PWB Assemblies	X	O	O	O	O	O
本表格依据 SJ/T 11364 的规定编制。 This table is prepared in accordance with the provisions of SJ/T 11364.							
O: 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。 Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.							
X: 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。 Indicates that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572							
“未列入表内的其他部件，皆不含任何超出限量要求的限制使用物质。” All other components, not listed in the table, do not contain restricted substances above the threshold level							
电子电气产品的环保使用期限依据SJ/T11388 标准的规定确定。 The EPUP value of EEP is defined according to SJ/T 11388 standard.							

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