

Dual RS485 Option Module



Figure 1: Dual RS485 Option module

Product Description

The RS485 is a dual port, electrically isolated adapter, with two 3-position, removable screw-terminal connector plugs for the EC-BOS-8 and EC-BOS-9. Each port has an RS485 bias switch to set or remove biasing. LEDs verify power and termination from the EC-BOS and indicate RS485 trunk message traffic.

Module Combinations

The EC-BOS 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 EC-BOS 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 EC-BOS, where the option module closest to the EC-BOS base operates as the next available serial COM port(s). For example, if attached directly to the EC-BOS, this dual RS-485 option module operates as COM3 (upper port) and COM4 (lower port).

For related details, see “[COM Port Usage \[pg. 4\]](#),” page 3.

Related topics such as the mounting and wiring of the EC-BOS or other option modules, installation of EC-Net™ 4 software, and usage of the various RS-485-based drivers are in other documents. See “[Related Documentation \[pg. 7\]](#),” page 4.

Included in this Package

Included in this package:

- ☐ One Dual RS485 option module, with two 3-position terminal plugs for wiring to an RS485 trunk, and a grounding wire with quick-disconnect connector.

Materials and Tools Required

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

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

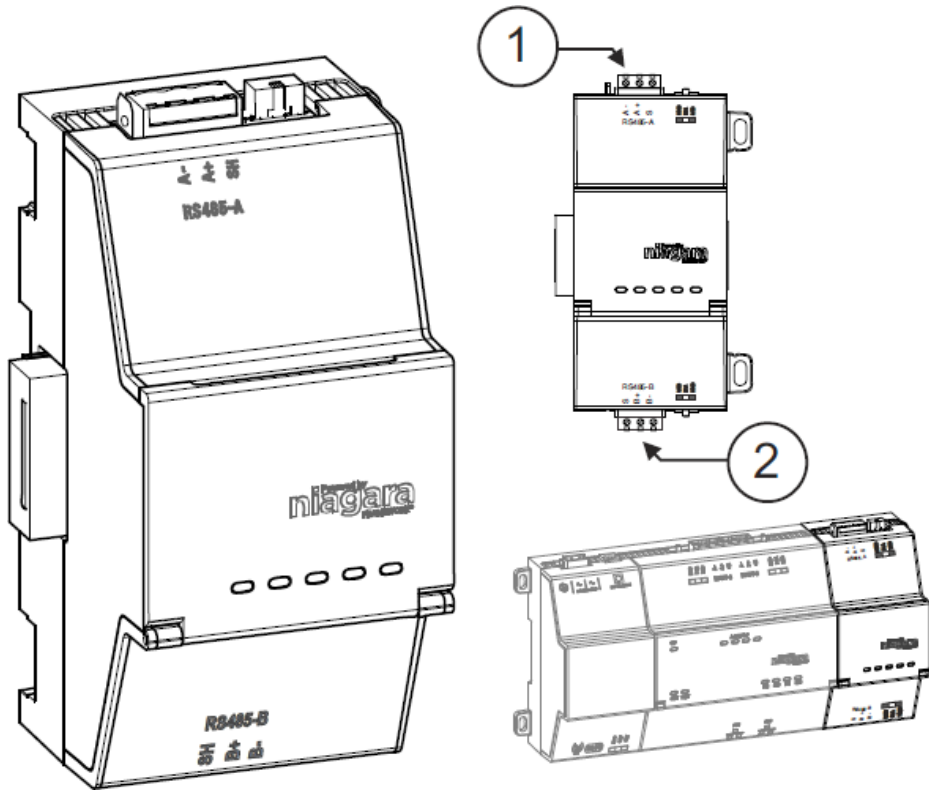



Figure 2: Dual RS485 Option module

This document covers the mounting and wiring of a Dual RS485 option module for an EC-BOS.


1	RS485-A port COMn (next available). For example, COM3
2	RS485-B port COMn+1 (next + 1). For example, COM4

Precautions

The following are warnings relating to the installation of the EC-BOS option module.


-  ☐ **Remove all power to the EC-BOS before attaching (plug in) or detaching (unplug) any option module**, to prevent possible equipment damage.
- ☐ **Removal of the EC-BOS's cover is not required.** No configurable or user-serviceable items (such as jumpers or a battery) are inside the option module.

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

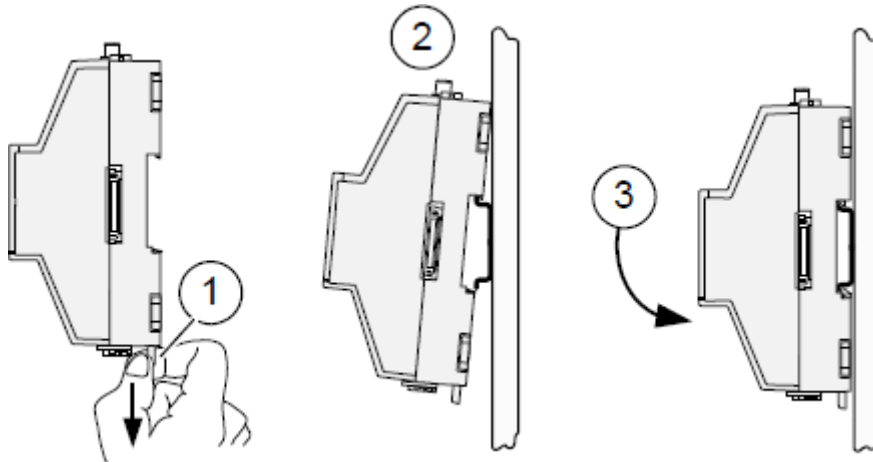
Mounting the EC-BOS and all option modules on a 35mm wide DIN rail is recommended. Mounting on a DIN rail ensures accurate alignment of connectors between all modules. Tabs on the EC-BOS or module can be used for panel mounting as an alternate to DIN rail mounting.

-  ☐ **Remove all power to the EC-BOS** before installing or removing option modules. See [“Precautions \[pg. 2\],”](#) page 2.

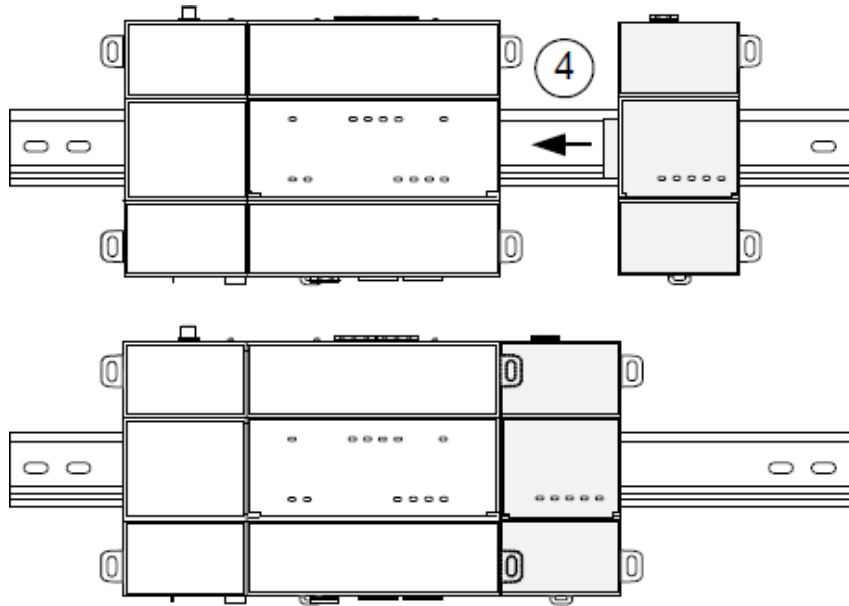
Mounting on DIN Rail

Prerequisite: The EC-BOS is securely mounted on a 35mm DIN rail, with adequate room left to mount the module.

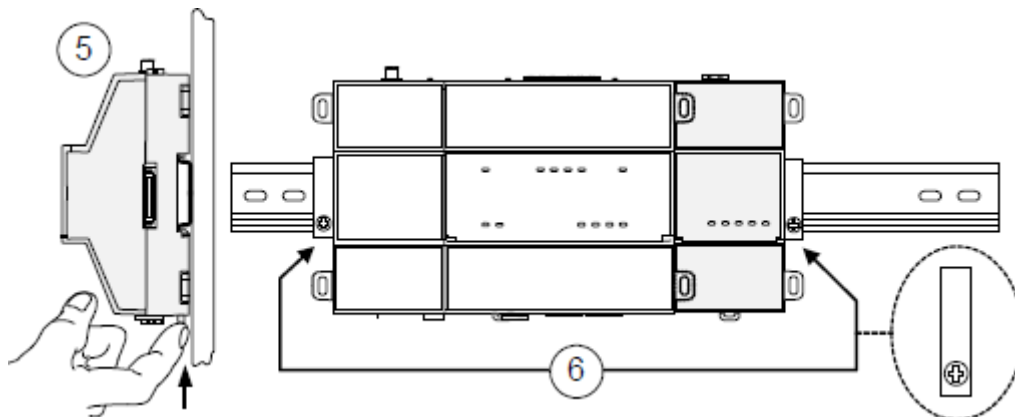
1. Pull the option module's locking clip down.




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 EC-BOS'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.

 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 EC-BOS. The EC-BOS has two *onboard* RS485 ports. In an EC-Net 4 station running on the EC-BOS, 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 EC-BOS, where the option module closest to the EC-BOS base operates as the next available serial COM port(s).

For example, if attached directly to the EC-BOS, 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. The figure below shows a few combinations with port assignments.

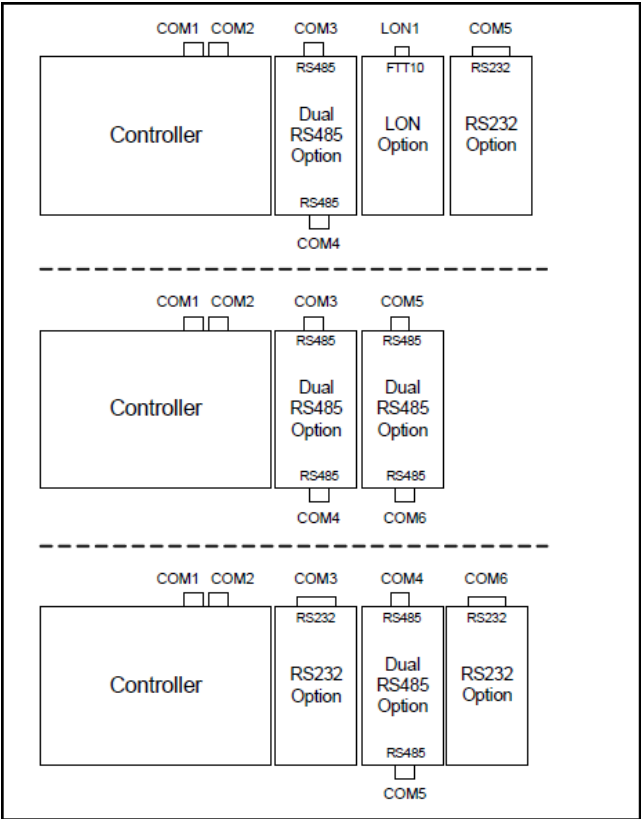


Figure 3: COM port numbering examples

Wiring: Earth Ground Wiring

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

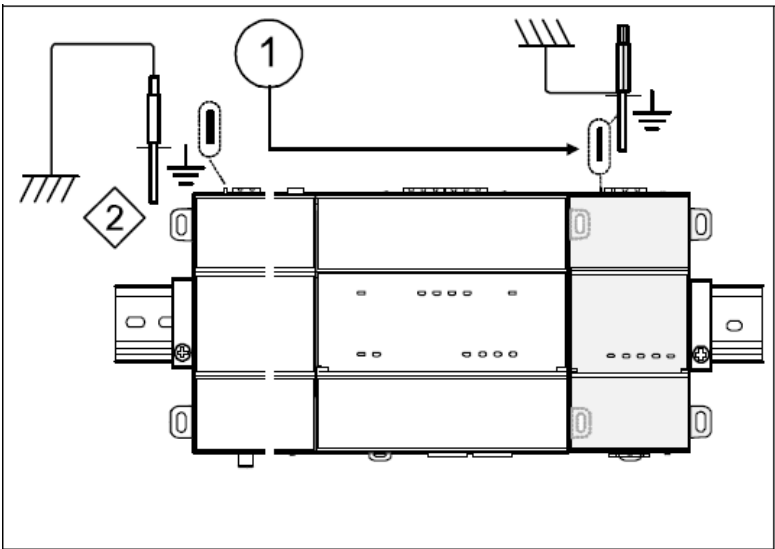


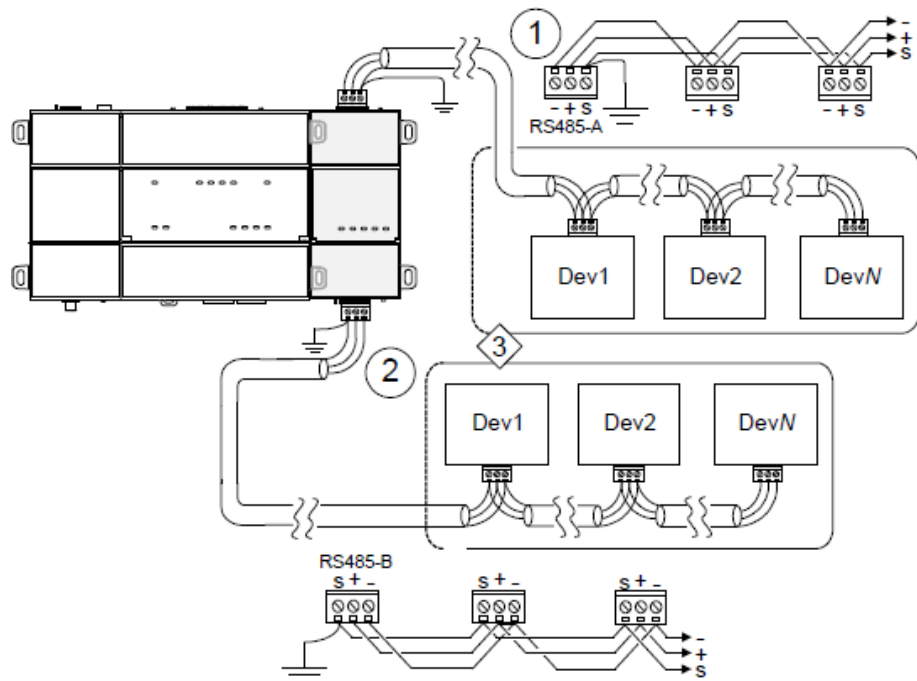
Figure 4: Earth ground to option module (and EC-BOS)

- 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. The EC-BOS'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. The figure below shows an example of RS485 wiring.



1	RS485-A port COM n with a network of RS485 devices.
2	RS485-A port COM $n+1$ with a network of RS485 devices.
3	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.

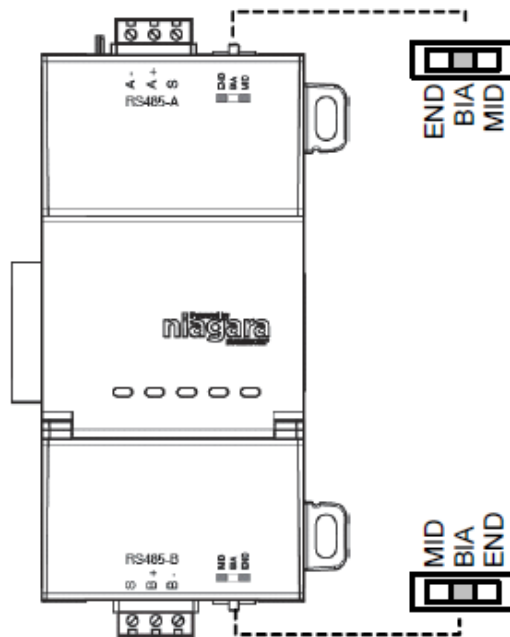


Figure 5: RS485 module bias switches

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 EC-BOS is not installed at the end of the trunk.
- ☐ **END** - Often best if the EC-BOS is installed at the end of an RS485 trunk of devices that is not already biased.
- ☐ **MID** - Often best if the EC-BOS 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 EC-BOS is running.

Each RS485 port also has two LEDs. See "[LEDs \[pg. 6\]](#)".

LEDs

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

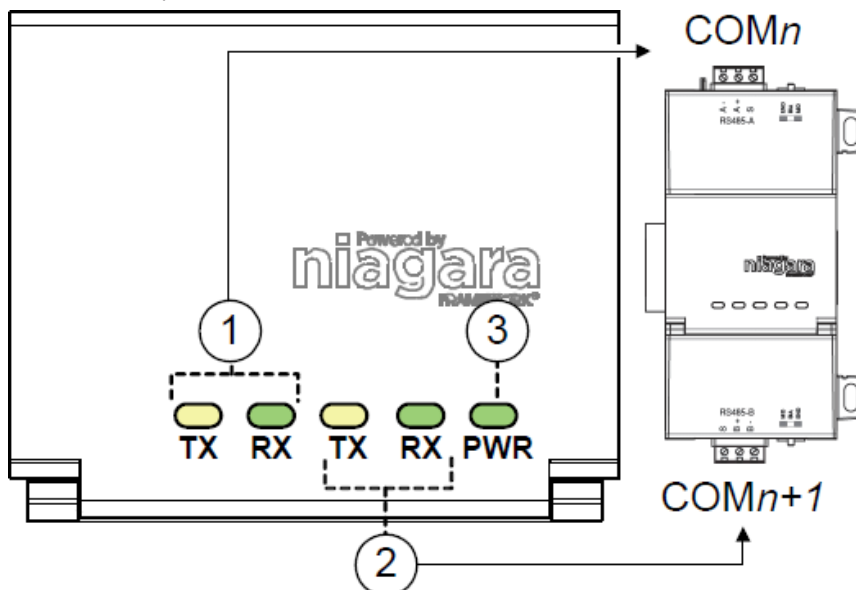


Figure 6: LEDs on Dual RD485 option module

1	COM n (e.g. COM3), TX (Transmit) and RX (Receive).
2	COM $n+1$ (e.g. COM4), TX (Transmit) and RX (Receive).
3	PWR — Green, remains lit while EC-BOS is powered.

LED pairs TX and RX operate as follows:

- ☐ TX (yellow) — Transmit, flashes when the EC-BOS is sending data to a device connected on the RS485 trunk.
- ☐ RX (green) — Receive, flashes when the EC-BOS 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 EC-BOS with Dual RS485 option module, refer to the following documents:

- ☐ *EC-BOS-8 and EC-BOS-9 Mounting and Wiring Guides*
- ☐ *EC-BOS-8 and EC-BOS-9 Quick Start Guides*
- ☐ *EC-BOS EC-Net 4 Install and Startup Guide*
- ☐ *EC-Net Drivers Guide*