

Control Bus for use with Powerlink™ Systems

Retain for future use.

Introduction

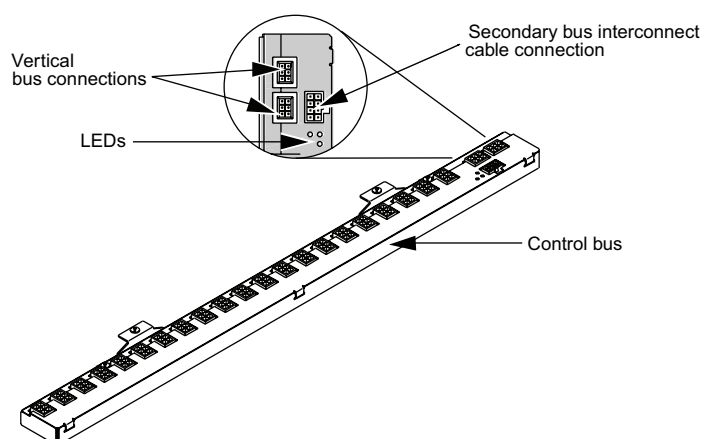
This bulletin explains how to install a control bus, which is used to connect the Powerlink remotely operated circuit breakers and the Powerlink electronics.

Components of a Control Bus

The Powerlink system uses one or more NF Powerlink control busses attached to interior rails in a panelboard. The control busses are used only with NF panelboards manufactured August 1, 2000 or later because these panelboards have holes on the interior rails for mounting Powerlink control busses. The date code is located on a yellow sticker on the deadfront and also on the UL label located on the interior rail. The first number represents the year, the second number represents the week of the year, and the third number represents the day of the week (Monday = 1, Tuesday = 2, Wednesday = 3, etc.). NF panelboards with a date code of 00 31 2 or later are furnished with the above referenced mounting holes.

A control bus has a series of bus connections, or poles, which varies in number and is selected based on the size and type of the panelboard. Every control bus has a section containing one secondary bus interconnect cable connection, three LEDs, and vertical bus connections (see Figure 1). The vertical bus connections are used to connect the power supply, controller, or the secondary address selector accessory.

Figure 1 - Control Bus



When installing control busses in a standard NF panelboard, there will be both left and right control busses. On an eighty-four space panel there are up to four control busses.

The size of the panelboard used will determine the control bus size, and the number of poles will determine whether installation of both left and right control busses is needed (see Table 1 or Table 2). The left control bus is mounted to the left interior rail, while the right control bus is mounted to the right interior rail.

For a column-width panelboard, both control busses are mounted to the same interior rail. The left control bus is inverted and mounted at the bottom of the interior rail, while the right control bus is mounted at the top.

Table 1 - Control Busses for Standard NF Panelboards

Panelboard Interior Size	Total Powerlink Pole Spaces	Available Powerlink Pole Spaces	Control Bus Catalog Number	Mounting Location
30 circuit	24	12 or less	NF12SBLG3	Left
		13–24	NF12SBLG3	Left
			NF12SBRG3	Right
42 circuit	36	18 or less	NF18SBLG3	Left
		19–36	NF18SBLG3	Left
			NF18SBRG3	Right
54 circuit	42	21 or less	NF21SBLG3	Left
		22–42	NF21SBLG3	Left
			NF21SBRG3	Right

Table 2 - Control Busses for Column-width NF Panelboards

Panelboard Interior Size	Total Powerlink Pole Spaces	Available Powerlink Pole Spaces	Control Bus Catalog Number	Mounting Location
30 circuit	24 (30) ¹	12 or less	NF12SBRG3	Top
		18 or less	NF18SBRG3	Top
		21 or less	NF21SBRG3	Top
		22–24	NF12SBRG3	Top
			NF12SBLG3	Bottom
		(22–30) ¹	(NF18SBRG3) ¹	(Top) ¹
			(NF12SBLG3) ¹	(Bottom) ¹
42 circuit	36 (42) ¹	12 or less	NF12SBRG3	Top
		18 or less	NF18SBRG3	Top
		21 or less	NF21SBRG3	Top
		22–36	NF18SBRG3	Top
			NF18SBLG3	Bottom
		(22–42) ¹	(NF21SBRG3) ¹	(Top) ¹
			(NF21SBLG3) ¹	(Bottom) ¹

1. Items in parenthesis pertain to secondary panelboards that do not have mounted electronics.

LED Function and Operation

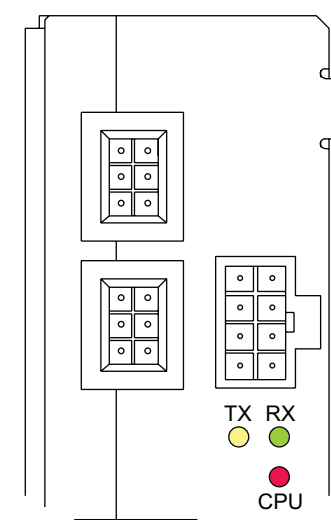
The three LED lights on a control bus indicate various network communications (see Figure 2). The LEDs are different colors and blink when data has been received or transmitted and whether the processor is active and functioning. LED Activity, page 3 lists the LEDs and how they function.

Table 3 - LED Activity

LED	Color	LED Activity
RX	Green	When flashing, it indicates that data is being received.
TX	Yellow	When flashing, it indicates that data has been received and a response has been sent.
CPU	Red	When flashing concurrently with the RX LED, it indicates that the processor is active and data has been received.
		If the CPU LED flashes a steady on/off pattern with 0.5 seconds between each flash, the control bus is not receiving data.

- NOTE:** Every 30 seconds, all of the LEDs will flicker concurrently for 1 second. This activity indicates that the controller is searching for other control busses on the subnetwork.
- NOTE:** If a control bus does not receive communications from a controller after 10 minutes, the control bus will turn on all of its circuit breakers at a rate of one per second. Some third parties have turned off this feature.

Figure 2 - TX, RX, and CPU LEDs on a Control Bus



Installing the Control Bus

Follow these instructions to install the control bus into a panelboard. The installation is illustrated in Figure 3. If installing the control bus into a column-width panelboard, refer to Column-width Control Bus Installation, page 5.

⚠ DANGER**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E, NOM-029-STPS or CSA Z462 or local equivalent.
- Electrical equipment must be installed, operated, serviced, and maintained only by qualified personnel.
- Turn off all power supplying the panelboard interior and the equipment in which it is installed before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.
- Before energizing panelboard, all unused spaces must be filled with blank fillers.

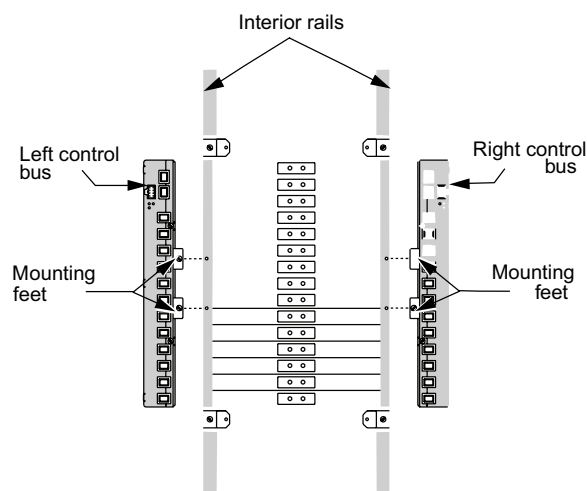
Failure to follow these instructions will result in death or serious injury.



WARNING: This product can expose you to chemicals including nickel compounds, which are known to the State of California to cause cancer, and Bisphenol A (BPA), which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

1. Disconnect all power to the panelboard.
2. Remove the panelboard cover and deadfront. Verify that all power is off using a properly rated voltage sensing device.
3. Remove all branch circuit breakers (not required).
4. Position the left control bus so its mounting feet are aligned with the holes on the left interior rail in the panelboard. Notice that the vertical bus connections for the power supply are at the top of the control bus (see Figure 3).

Figure 3 - Control Bus Installation



5. Secure the mounting feet to the interior rail using the screws provided and a screwdriver. Torque the screw 20 to 30 lb-in. (2.3 to 3.4 N•m), then verify that the control bus is securely mounted to the interior rail and does not move or slide on the rail.
6. If a right control bus is needed, position it so the mounting feet are aligned with the holes on the right interior rail in the panelboard. Notice that the vertical bus connections for the controller are at the top of the control bus.

7. Secure the mounting feet to the interior rail using the screws provided and a screwdriver. Verify that the control bus is securely mounted to the interior rail and does not move or slide on the rail.
8. Proceed with the installation of Powerlink remote-controlled circuit breakers, controller, or power supply as indicated in related installation information. If finished with the installation, replace the deadfront and panelboard cover, and turn on the power.

Column-width Control Bus Installation

Follow these instructions to install the control bus into a column-width panelboard. The installation is illustrated in [Control Bus Installation in a Column-width Panelboard](#), page 5.

⚠ DANGER

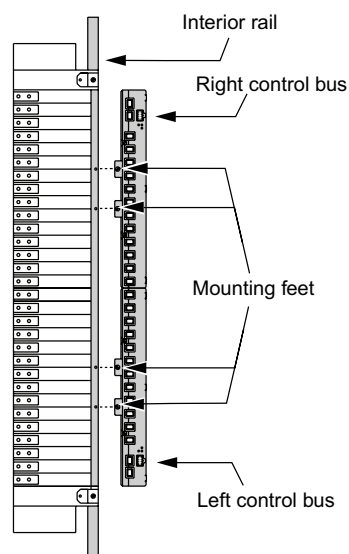
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Turn off all power supplying the panelboard interior and the equipment in which it is installed before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.

Failure to follow these instructions will result in death or serious injury.

1. Disconnect all power to the panelboard.
2. Remove the panelboard cover and deadfront. Verify that all power is off using a properly rated voltage sensing device.
3. Remove all branch circuit breakers.
4. Position the right control bus so its mounting feet are aligned with the holes on the interior rail near the top of the column-width panelboard. Notice that the vertical bus connections for the controller are at the top of the control bus.

Figure 4 - Control Bus Installation in a Column-width Panelboard



5. Use a screwdriver to secure the mounting feet to the rail using the screws provided. Torque the screw 20 to 30 lb-in. (2.3 to 3.4 N•m), then verify that the control bus is securely mounted to the rail and does not move or slide on the rail.
6. Position the left control bus so the mounting feet are aligned with the holes on the interior rail in the panelboard. Notice that the vertical bus connections for the power supply are at the bottom of the control bus.
7. Secure the mounting feet to the interior rail using the screws provided and a screwdriver. Verify that the control bus is securely mounted to the interior rail and does not move or slide on the rail
8. Proceed with the installation of Powerlink remotely operated circuit breakers, controller, and power supply as indicated in the related installation information. If finished with the installation, replace the deadfront and panelboard cover, and turn on the power.