Installation Guide

1.0 Notice

These instructions cover the installation of the D9051 RS-485 Bus Module in an analog system controlled by a Radionics D8024 or D10024 Analog Fire Alarm Control Panel (FACP).

Install, test and maintain the D9051 according to these instructions, NFPA 72, Local Codes and the Authority Having Jurisdiction. Failure to follow these instructions may result in failure of the device to operate properly. Radionics is not responsible for improperly installed, tested or maintained devices.

CAUTION

These instructions contain procedures to follow in order to avoid personal injury and damage to equipment.

IMPORTANT

NFPA 72 requires a complete system-wide functional test be performed following any modifications, repair, upgrades or adjustments made to the system's components, hardware, wiring, programming and software/ firmware.

2.0 Device Description

The D9051 RS-485 Bus Module is a network expander that provides an optically isolated interface between the control module of the D8024 or D10024 Analog FACP and peripheral bus devices. It supports up to 32 peripheral bus devices, the first 15 of which are reserved for D9070 system controllers. The D9051 also has two connection points for two-wire RS-485 communication circuits. This circuit may be up to 4,920 ft. (1,500 m) in length. Circuit wiring is #18 AWG (1.2 mm) twisted pair, shielded or non-shielded. Notification appliances on this circuit are powered by 24 VDC from the FACP, or an approved 24 VDC auxiliary power source. Depending on the control module port the D9051 is connected to, it can support an RS-485 panel-to-master data link or panel-to-graphics data link, an RS-485 output to networked panels or a peripheral circuit for remote annunciators, controllers, four-way notification appliances, synchronized notification appliances and other serial peripheral devices. See Section 3.0 of this manual for port applications.

3.0 D9051 Port Applications

See Table 1 for the D9051 Port Assignments for each control panel.

	FACP	
Port	D8024	D10024
B	N/A	Supports an RS-485 output to networked panel.
C	Supports an RS-485 output to networked panels, or an RS-485 panel-to-master data link/panel-to-graphics data link.	Supports an RS-485 panel-to-master data link/panel-to-graphics data link.
D	Supports a peripheral circuit for D9069 System Annunciators, D9070 System Controllers, four-way notification appliances, synchronized notification appliances and other serial peripherals.	Supports a peripheral circuit for D9069 System Annunciators, D9070 System Controllers, four-way notification appliances, synchronized notification appliances and other serial peripherals.

Table 1: D9051 Port Assignments

Mounting the D9051

4.0 Mounting the D9051

Inform the operator before installing this device in an existing system. Remove all power (AC and battery) to the FACP before installing this device. Failure to do so may result in personal injury and/or damage to the equipment.

Do not attempt to plug the eight-wire ribbon plug into the ten-wire ribbon socket, or vice-versa.

4.1 D8024 Control Module Mounting Instructions

1) Remove AC power from the system at the dedicated 120 VAC breaker, "lock out" the breaker and remove the standby battery power before making or breaking any connections to the FACP.
2) Plug the D9051 into either Port C or Port D on the D8024 Control Module. These are the two ports on the left side of the control module. Use the four pillars supplied to mount the D9051 to the D8024 Control Module.
3) Connect the eight-wire ribbon plug into the eight-wire ribbon socket. See Figure 1.

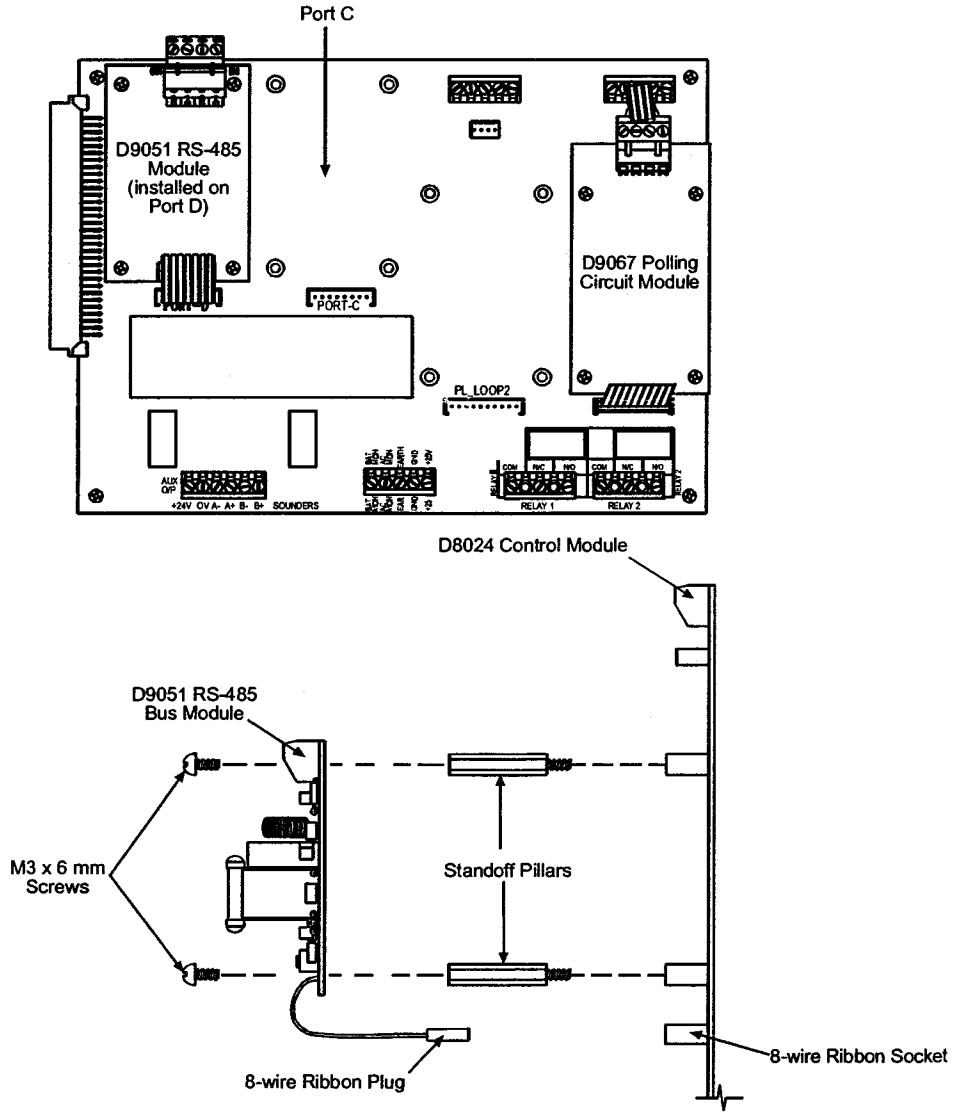

Figure 1: D9051 - D8024 Mounting

4.2 D10024 Control Module Mounting Instructions

1) Remove AC power from the system at the dedicated 120 VAC breaker, "lock out" the breaker and remove the standby battery power before making or breaking any connections to the FACP.
2) Plug the D9051 into either Ports B, C or D on the D10024 Control Module. These are the three ports on the left side of the control module. Use the four pillars supplied to mount the D9051 to the D10024 Control Module.
3) If the D9051 must be "stack-mounted" over a D9067 Polling Circuit Module due to the system configuration, Ports B, C or D may also be used for "stack-mounting" purposes. Mount the D9067 to the D10024 Control Module. Then "stack" the D9051 over the D9067 with standoff pillars. See Figure 2.
3) Connect the eight-wire ribbon plug into the eight-wire ribbon socket. See Figure 2. Connect the ten-wire ribbon plug from the D9067 Polling Circuit Module if "stack-mounting."

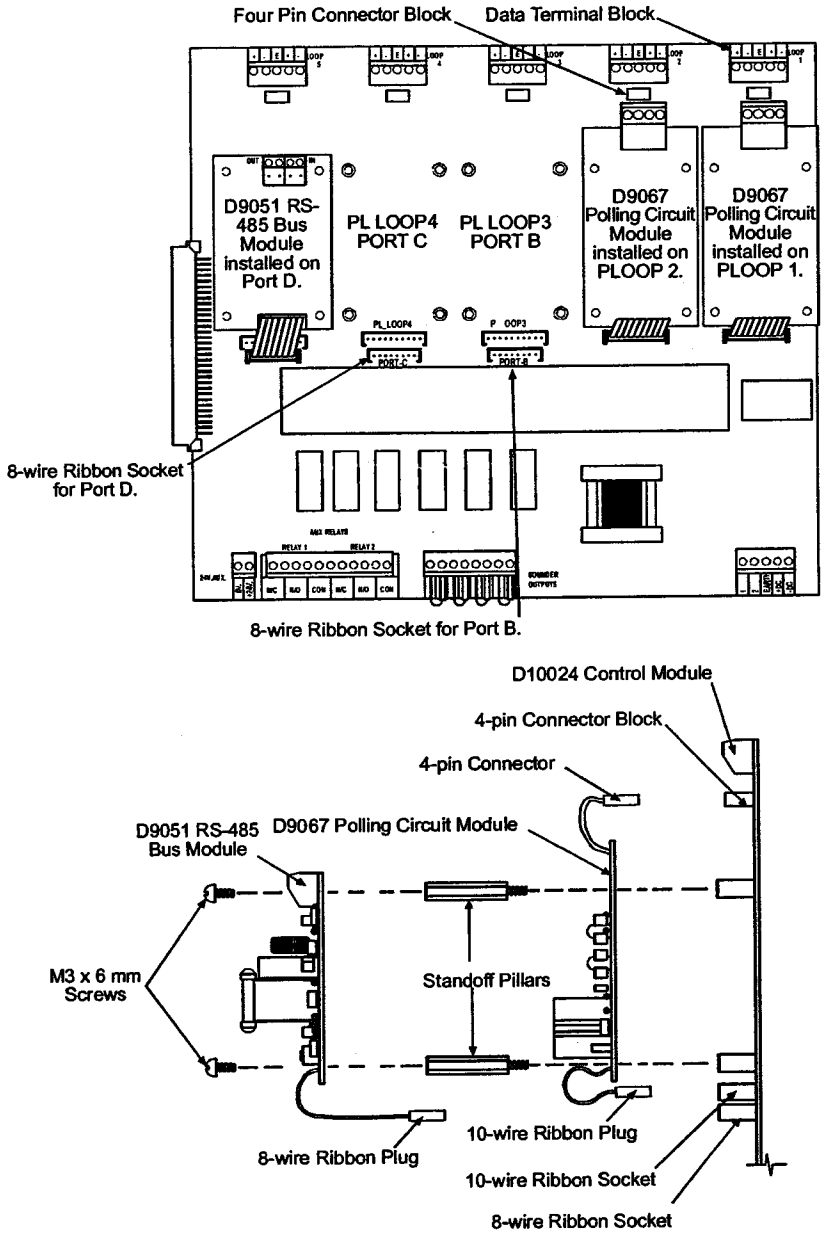

Figure 2: D9051 - D10024 Mounting

4.0 Wiring the D9051

4.1 Circuit Length Requirements

Circuit length is the distance over the circuit from the connection at the D9051 RS-485 Bus Module to the most distant device and back to the D9051. The maximum RS-485 circuit length is 4,920 ft. (1,500 m). Use shielded twisted pair cable Type 2, UL style 2092 such as Data Grade Cable D293 or its equivalent.

RS-485 Peripheral Circuit Length	Wire Gauge
Up to 4,920 ft. (1,500 m)	#18 AWG (1.2 mm)

Table 2: RS-485 Peripheral Circuit Length/Wire Gauge

4.2 RS-485 Peripheral Circuit Wiring

Port D on the D8024 and D10024 supports a peripheral circuit for serial peripheral devices such as the D9069 Remote Annunciator, D9070 Fire System Controller, D9072 Four-Output NAC Module and the D9078 LED Driver Module.

The two-wire RS-485 communication circuit may be connected to either side, or both sides, ("IN" or "OUT") of the D9051 terminal block.

1) Connect the "B" wire to the "B" terminal (left-side terminal) of the terminal block on the top of the D9051 terminal block.
2) Connect the "A" wire to the "A" terminal next to the "B" terminal.
3) Connect the unused terminals of the last device in the circuit with an EOL resistor. Two 150 Ω, ¼ watt EOL resistors are provided with each D9051 Module.
4) If shielded cable is used, connect the drain wire(s) to the "E" terminal of the terminal block at the top of the control module. See Figure 3.

See Figure 4 for an example of an RS-485 peripheral circuit.

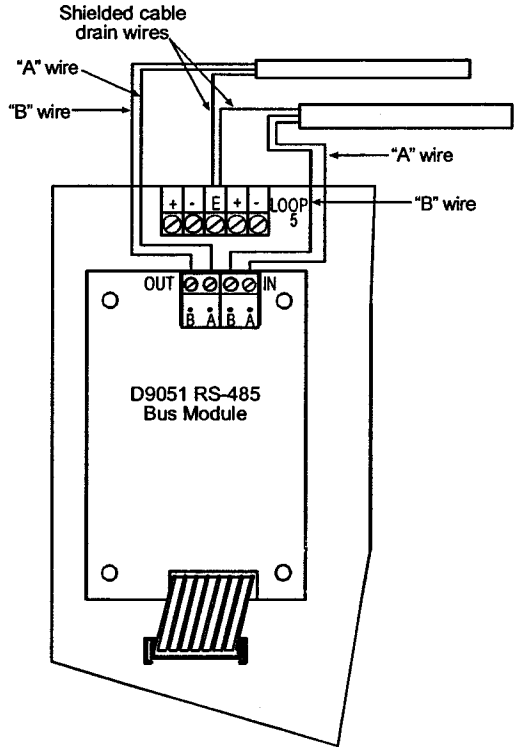

Figure 4: D9051 Wiring Connections

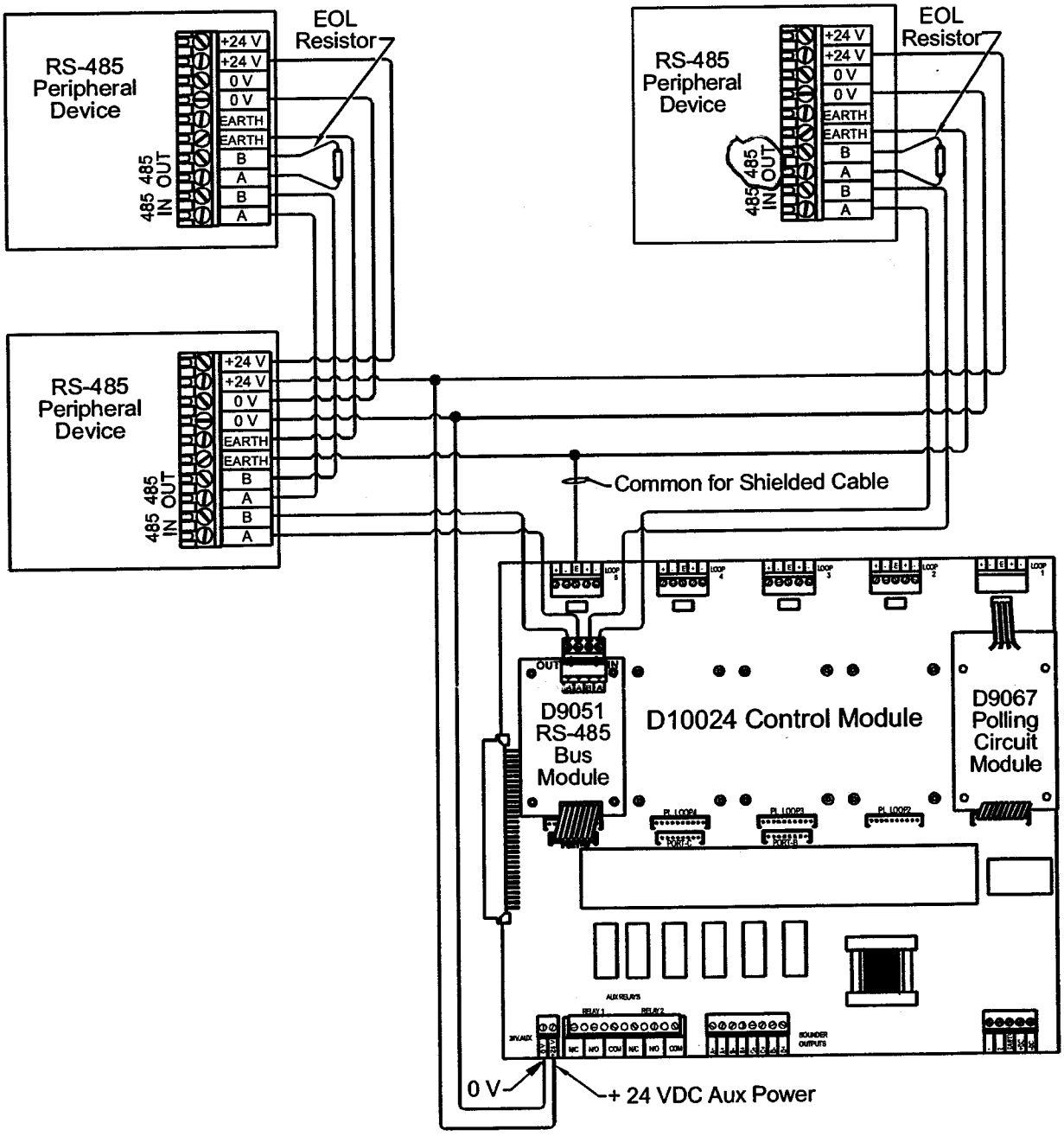

Figure 4: RS-485 Peripheral Circuit

Note: *The example in Figure 4 also applies to the D8024.*

4.3 RS-485 Network Circuit Wiring

Serial network data communications take place using D9051 RS-485 Bus Modules attached to Serial Port C on the control module.

The control panels are wired in series to an NFPA Class B, Style 3.5 Signaling Line Circuit (SLC) on the appropriate RS-485 bus. The RS-485 terminals on the D9051 are polarity sensitive. The channels are marked "A" and "B", and data wires should be connected "A" to "A" and "B" to "B." Cross-wiring between channels will result in corrupted data, but will not damage equipment. To avoid data corruption, route cables so they do not run next to other cables.

Use shielded twisted pair wire, such as Data Grade Cable D293, Beldon 8670 two-core twisted pair, or non-shielded #18 AWG (1.2 mm) gauge wire from Atlas, Guardian Sound and Security or their equivalents.

The total length of the data cables between the two end panels must not exceed 3,935 ft. (1,200 m) per channel.

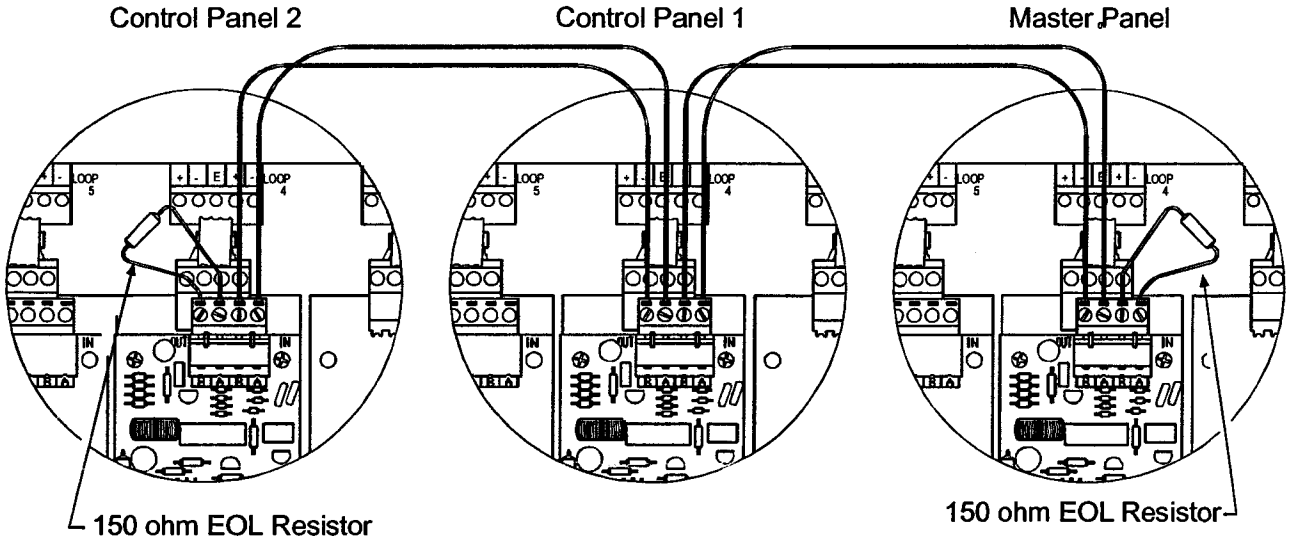

Figure 5: Network Circuit Wiring

Note: *For more information regarding control panel networking, consult the panel's installation guide and the* D8024/D10024 Networking Guide *(P/N: 34377).*

5.0 Specifications

D9051 Specification	Value
Panel Operating Voltage	17 to 39.5 VDC
Panel Nominal Supply Voltage	24 VDC
Operating Current Draw	59 mA per module
Operating Temperature	+32°F to +120°F (0°C to +49°C)
Maximum Humidity	85% RH non-condensing (@ 104°F, 40°C)
Width	2 in. (5.1 cm)
Height	3 in. (7.6 cm)

6.0 Peripheral Bus Device Address Record Sheet

Note: *A number in the Switch Setting columns indicates that the particular switch is in the ON position.*

	Switch Setting									
Address Value	1	2	4	8	16	32	64			
Address	1	2	3	4	5	6	7	8	Device	Notes
1	1									
2		2								
3	1	2								
4			3							
5	1		3							
6		2	3							
7	1	2	3							
8				4						
9	1			4						
10		2		4						
11	1	2		4						
12			3	4						
13	1		3	4						
14		2	3	4						
15	1	2	3	4						
16					5					
17	1				5					
18		2			5					
19	1	2			5					
20			3		5					
21	1		3		5					
22		2	3		5					
23	1	2	3		5					
24				4	5					
25	1			4	5					
26		2		4	5					
27	1	2		4	5					
28			3	4	5					
29	1		3	4	5					
30		2	3	4	5					
31	1	2	3	4	5					
32						6				