



4100/4120-0302, 4100-1290 24-Point Graphic I/O Module Installation Instructions

Introduction

This publication describes the installation procedure for the 4100/4120-0302 or 4100-1290 24-Point Graphic I/O Module.

Inspecting Contents of Shipment

Upon unpacking your Simplex® product, inspect the contents of the carton for shipping damage. If damage is apparent, immediately file a claim with the carrier and notify your local Simplex product supplier.

Related Documentation

- *Field Wiring Diagram for 4100 Power Limited* (841-731) or,
- *Field Wiring Diagram for 4100 Non Power Limited* (841-995)
- *4100ES Fire Alarm System Installation Guide* (574-848)

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Cautions, Warnings, and Regulatory Information

Cautions and Warnings



READ AND SAVE THESE INSTRUCTIONS- Follow the instructions in this installation manual. These instructions must be followed to avoid damage to this product and associated equipment. Product operation and reliability depend upon proper installation.



DO NOT INSTALL ANY SIMPLEX® PRODUCT THAT APPEARS DAMAGED- Upon unpacking your Simplex product, inspect the contents of the carton for shipping damage. If damage is apparent, immediately file a claim with the carrier and notify an authorized Simplex product supplier.



ELECTRICAL HAZARD - Disconnect electrical field power when making any internal adjustments or repairs. All repairs should be performed by a representative or authorized agent of your local Simplex product supplier.

STATIC HAZARD - Static electricity can damage components. Handle as follows:

- Ground yourself before opening or installing components.
 - Prior to installation, keep components wrapped in anti-static material at all times.
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Introduction to the 24-Point Graphic I/O Control Module

Overview

The 4100/4120-0302 or 4100-1290 24-Point Graphic I/O Module allows up to 24 inputs or outputs to be programmed and connected to the 4100 Fire Alarm Control Panel. These 24 points can be split up into any combination of inputs and outputs to meet customer requirements.

The 24 points on the module support a graphic annunciator interface for both lamps and switches. The lamp driver circuitry provides for LED annunciation, with programmable outputs of On Steady, Slow Pulse, and Fast Pulse. Inputs may be unsupervised, supervised for opens only, or supervised for opens and shorts; or they can monitor Hands Off Auto (HOA) switches, depending on how the switches are externally wired.

The module provides up to 24 points of supervised or unsupervised annunciation from point-wired peripheral devices, and can provide for supervised monitor and control functions in smoke control applications. It may also be configured to supervise outputs that operate remotely located relays, and supervise their feedback status points.

Mount the module in a remote annunciator panel within 3,000 feet (914 m) of an RUI card.

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Introduction to the 24-Point Graphic I/O Control Module, *Continued*

Illustration

Figures 1 and 2 depict the 24-point graphic I/O module.

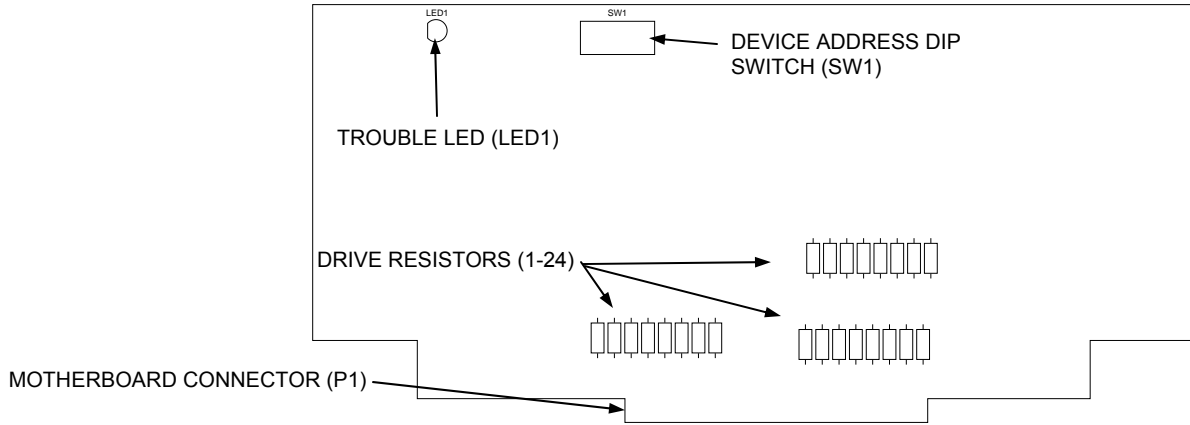


Figure 1. 24-Point Graphic I/O Card (Daughter Card)

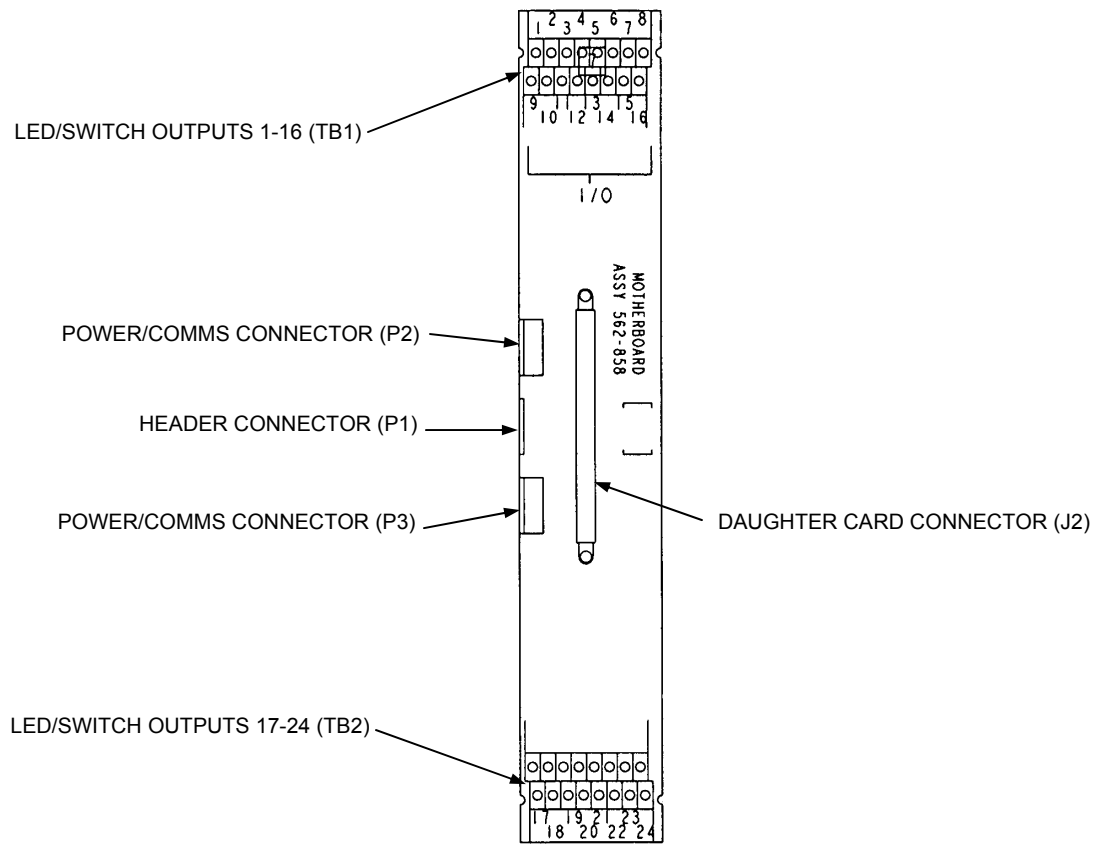


Figure 2. 24-Point Graphic I/O Motherboard

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Introduction to the 24-Point Graphic I/O Control Module, *Continued*

Requirements and Limitations

Refer to Table 1 for electrical and environmental requirements.

Table 1. Specifications

Electrical Specifications	
Voltage	24 VDC and 8 VDC from FACP (19 – 33V dc; 8V +/- 5%)
Standby Current	55 mA @ 8 VDC and 50 mA @ 24 VDC + all switch loads
Alarm Current	75 mA + all connected lamp/LED/relay currents and all switch current
Switch Current, Unsupervised	9.5 mA to 16.5 mA when closed, per switch
Switch Current, Supervised, Open Circuit	5 mA open, 12 mA closed, per switch
Switch Current, Supervised, Open/Short	4 mA open, 8 mA closed, per switch
HOA Mode Current	12 mA “on”, 8 mA “off”, 4.5 mA center position
Environmental Specifications	
Operating Temperature	32° to 120° F (0° to 49° C)
Humidity	90° F (32° C) at 93% relative humidity, non-condensing.

Note: LEDs or switches can be up to 25 feet (8 m) or 3 Ohms from their respective modules.

Input and Output Connections

Overview

The 24-point I/O card has 24 input/output points. Any number of points can be used as inputs and outputs, in any combination.

Each point has a corresponding resistor. The resistor used depends on whether the point is an input or output. The module is shipped with 2 K, 0.5 W resistors in place for all 24 points. As a result, the points are all inputs by default. To change points to outputs, use 20 Ohm, 1 W resistors, which are also shipped with the module.

Table 2, below, lists the drive numbers—each one corresponding to an I/O point with the same number—and their corresponding resistor numbers.

Table 2. Point and Resistor numbers

Drive Number	Resistor Number	Drive Number	Resistor Number
1	R20	13	R32
2	R21	14	R33
3	R22	15	R34
4	R23	16	R35
5	R24	17	R36
6	R25	18	R37
7	R26	19	R38
8	R27	20	R39
9	R28	21	R40
10	R29	22	R41
11	R30	23	R42
12	R31	24	R43

Guidelines

- Use 2 K, 0.5 W resistors for inputs.
- Use 20 Ohm, 1 W resistors for outputs.

Setting DIP Switch SW1

Overview

Switch SW1 on the 24-point graphic I/O card is a bank of eight DIP switches. From left to right (see Figure 3, below) these switches are designated as SW1-1 through SW1-8. The function of these switches is as follows:

- **SW1-1.** This switch sets the baud rate for the internal 4100 communications line running between the card and the 4100 CPU. Set this switch to ON.
- **SW1-2 through SW1-8.** These switches set the card's address within the 4100 FACP. Refer to Table 3 for a complete list of the switch settings for all of the possible card addresses.

Note: You must set these switches to the value assigned to the card by the Programmer.

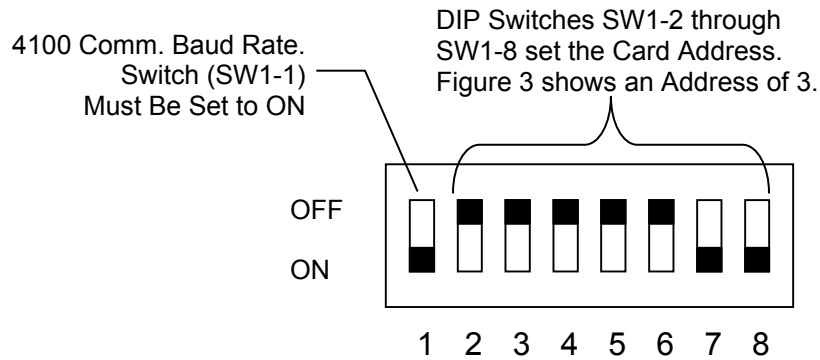


Figure 3. DIP Switch SW1

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Setting DIP Switch SW1, *Continued*

Overview

Table 3. Card Addresses

Address	SW 1-2	SW 1-3	SW 1-4	SW 1-5	SW 1-6	SW 1-7	SW 1-8	Address	SW 1-2	SW 1-3	SW 1-4	SW 1-5	SW 1-6	SW 1-7	SW 1-8
1	ON	ON	ON	ON	ON	ON	OFF	61	ON	OFF	OFF	OFF	OFF	ON	OFF
2	ON	ON	ON	ON	ON	OFF	ON	62	ON	OFF	OFF	OFF	OFF	OFF	ON
3	ON	ON	ON	ON	ON	OFF	OFF	63	ON	OFF	OFF	OFF	OFF	OFF	OFF
4	ON	ON	ON	ON	OFF	ON	ON	64	OFF	ON	ON	ON	ON	ON	ON
5	ON	ON	ON	ON	OFF	ON	OFF	65	OFF	ON	ON	ON	ON	ON	OFF
6	ON	ON	ON	ON	OFF	OFF	ON	66	OFF	ON	ON	ON	ON	OFF	ON
7	ON	ON	ON	ON	OFF	OFF	OFF	67	OFF	ON	ON	ON	ON	OFF	OFF
8	ON	ON	ON	OFF	ON	ON	ON	68	OFF	ON	ON	ON	OFF	ON	ON
9	ON	ON	ON	OFF	ON	ON	OFF	69	OFF	ON	ON	ON	OFF	ON	OFF
10	ON	ON	ON	OFF	ON	OFF	ON	70	OFF	ON	ON	ON	OFF	OFF	ON
11	ON	ON	ON	OFF	ON	OFF	OFF	71	OFF	ON	ON	ON	OFF	OFF	OFF
12	ON	ON	ON	OFF	OFF	ON	ON	72	OFF	ON	ON	OFF	ON	ON	ON
13	ON	ON	ON	OFF	OFF	ON	OFF	73	OFF	ON	ON	OFF	ON	ON	OFF
14	ON	ON	ON	OFF	OFF	OFF	ON	74	OFF	ON	ON	OFF	ON	OFF	ON
15	ON	ON	ON	OFF	OFF	OFF	OFF	75	OFF	ON	ON	OFF	ON	OFF	OFF
16	ON	ON	OFF	ON	ON	ON	ON	76	OFF	ON	ON	OFF	OFF	ON	ON
17	ON	ON	OFF	ON	ON	ON	OFF	77	OFF	ON	ON	OFF	OFF	ON	OFF
18	ON	ON	OFF	ON	ON	OFF	ON	78	OFF	ON	ON	OFF	OFF	OFF	ON
19	ON	ON	OFF	ON	ON	OFF	OFF	79	OFF	ON	ON	OFF	OFF	OFF	OFF
20	ON	ON	OFF	ON	OFF	ON	ON	80	OFF	ON	OFF	ON	ON	ON	ON
21	ON	ON	OFF	ON	OFF	ON	OFF	81	OFF	ON	OFF	ON	ON	ON	OFF
22	ON	ON	OFF	ON	OFF	OFF	ON	82	OFF	ON	OFF	ON	ON	OFF	ON
23	ON	ON	OFF	ON	OFF	OFF	OFF	83	OFF	ON	OFF	ON	ON	OFF	OFF
24	ON	ON	OFF	OFF	ON	ON	ON	84	OFF	ON	OFF	ON	OFF	ON	ON
25	ON	ON	OFF	OFF	ON	ON	OFF	85	OFF	ON	OFF	ON	OFF	ON	OFF
26	ON	ON	OFF	OFF	ON	OFF	ON	86	OFF	ON	OFF	ON	OFF	OFF	ON
27	ON	ON	OFF	OFF	ON	OFF	OFF	87	OFF	ON	OFF	ON	OFF	OFF	OFF
28	ON	ON	OFF	OFF	OFF	ON	ON	88	OFF	ON	OFF	OFF	ON	ON	ON
29	ON	ON	OFF	OFF	OFF	ON	OFF	89	OFF	ON	OFF	OFF	ON	ON	OFF
30	ON	ON	OFF	OFF	OFF	OFF	ON	90	OFF	ON	OFF	OFF	ON	OFF	ON
31	ON	ON	OFF	OFF	OFF	OFF	OFF	91	OFF	ON	OFF	OFF	ON	OFF	OFF
32	ON	OFF	ON	ON	ON	ON	ON	92	OFF	ON	OFF	OFF	OFF	ON	ON
33	ON	OFF	ON	ON	ON	ON	OFF	93	OFF	ON	OFF	OFF	OFF	ON	OFF
34	ON	OFF	ON	ON	ON	OFF	ON	94	OFF	ON	OFF	OFF	OFF	OFF	ON
35	ON	OFF	ON	ON	ON	OFF	OFF	95	OFF	ON	OFF	OFF	OFF	OFF	OFF
36	ON	OFF	ON	ON	OFF	ON	ON	96	OFF	OFF	ON	ON	ON	ON	ON
37	ON	OFF	ON	ON	OFF	ON	OFF	97	OFF	OFF	ON	ON	ON	ON	OFF
38	ON	OFF	ON	ON	OFF	OFF	ON	98	OFF	OFF	ON	ON	ON	OFF	ON
39	ON	OFF	ON	ON	OFF	OFF	OFF	99	OFF	OFF	ON	ON	ON	OFF	OFF
40	ON	OFF	ON	OFF	ON	ON	ON	100	OFF	OFF	ON	ON	OFF	ON	ON
41	ON	OFF	ON	OFF	ON	ON	OFF	101	OFF	OFF	ON	ON	OFF	ON	OFF
42	ON	OFF	ON	OFF	ON	OFF	ON	102	OFF	OFF	ON	ON	OFF	OFF	ON
43	ON	OFF	ON	OFF	ON	OFF	OFF	103	OFF	OFF	ON	ON	OFF	OFF	OFF
44	ON	OFF	ON	OFF	OFF	ON	ON	104	OFF	OFF	ON	OFF	ON	ON	ON
45	ON	OFF	ON	OFF	OFF	ON	OFF	105	OFF	OFF	ON	OFF	ON	ON	OFF
46	ON	OFF	ON	OFF	OFF	OFF	ON	106	OFF	OFF	ON	OFF	ON	OFF	ON
47	ON	OFF	ON	OFF	OFF	OFF	OFF	107	OFF	OFF	ON	OFF	ON	OFF	OFF
48	ON	OFF	OFF	ON	ON	ON	ON	108	OFF	OFF	ON	OFF	OFF	ON	ON
49	ON	OFF	OFF	ON	ON	ON	OFF	109	OFF	OFF	ON	OFF	OFF	ON	OFF
50	ON	OFF	OFF	ON	ON	OFF	ON	110	OFF	OFF	ON	OFF	OFF	OFF	ON
51	ON	OFF	OFF	ON	ON	OFF	OFF	111	OFF	OFF	ON	OFF	OFF	OFF	OFF
52	ON	OFF	OFF	ON	OFF	ON	ON	112	OFF	OFF	OFF	ON	ON	ON	ON
53	ON	OFF	OFF	ON	OFF	ON	OFF	113	OFF	OFF	OFF	ON	ON	ON	OFF
54	ON	OFF	OFF	ON	OFF	OFF	ON	114	OFF	OFF	OFF	ON	ON	OFF	ON
55	ON	OFF	OFF	ON	OFF	OFF	OFF	115	OFF	OFF	OFF	ON	ON	OFF	OFF
56	ON	OFF	OFF	OFF	ON	ON	ON	116	OFF	OFF	OFF	ON	OFF	ON	ON
57	ON	OFF	OFF	OFF	ON	ON	OFF	117	OFF	OFF	OFF	ON	OFF	ON	OFF
58	ON	OFF	OFF	OFF	ON	OFF	ON	118	OFF	OFF	OFF	ON	OFF	OFF	ON
59	ON	OFF	OFF	OFF	ON	OFF	OFF	119	OFF	OFF	OFF	ON	OFF	OFF	OFF
60	ON	OFF	OFF	OFF	OFF	ON	ON								

Installing Motherboards into 2975-91xx Back Boxes (4100)

Overview

The 24-point I/O module can be mounted to either 4100 Back Boxes (PID series 2975-91xx) or 4100U and 4100ES Back Boxes (PID series 2975-94xx).

- The 4120/4100-0302 version of the module is used with 4100 Back Boxes.
- The 4100-1290 version of the module is used with 4100U and 4100ES Back Boxes.

This section describes mounting the 4120/4100-0302 module into 4100 Back Boxes.

Installing into a 2975-91xx Master Controller Bay

Use the following guidelines and instruction when installing into a master controller bay.

- If the 575-274 Master Motherboard is used, it must be installed in the leftmost position of this bay. If the 575-274 Master Motherboard is not used, the CPU motherboard must be installed in the leftmost position of the bay.
- The power supply must be installed in the rightmost position of the bay.
- Relay cards must be installed in the slots immediately to the left of the power supply. This is necessary to allow for the proper routing of non-power limited wiring (120 VAC wiring connected to the relay card).
- If used, the Class B motherboard (575-275) must be installed to the left of the relay cards. If a physical bridge is used with the Class B motherboard, it must be to the right of any motherboards using NICs. This allows for earth ground detection via the physical bridge.

Install the motherboard as described below.

1. Orient the motherboard so that the connector labeled J1 is on the right and the header labeled P1 is on the left.
2. Slide the motherboard you are installing to the left until the pins are completely inserted in the connector of a previously installed motherboard.
3. Secure the motherboard to the chassis with four torx screws.

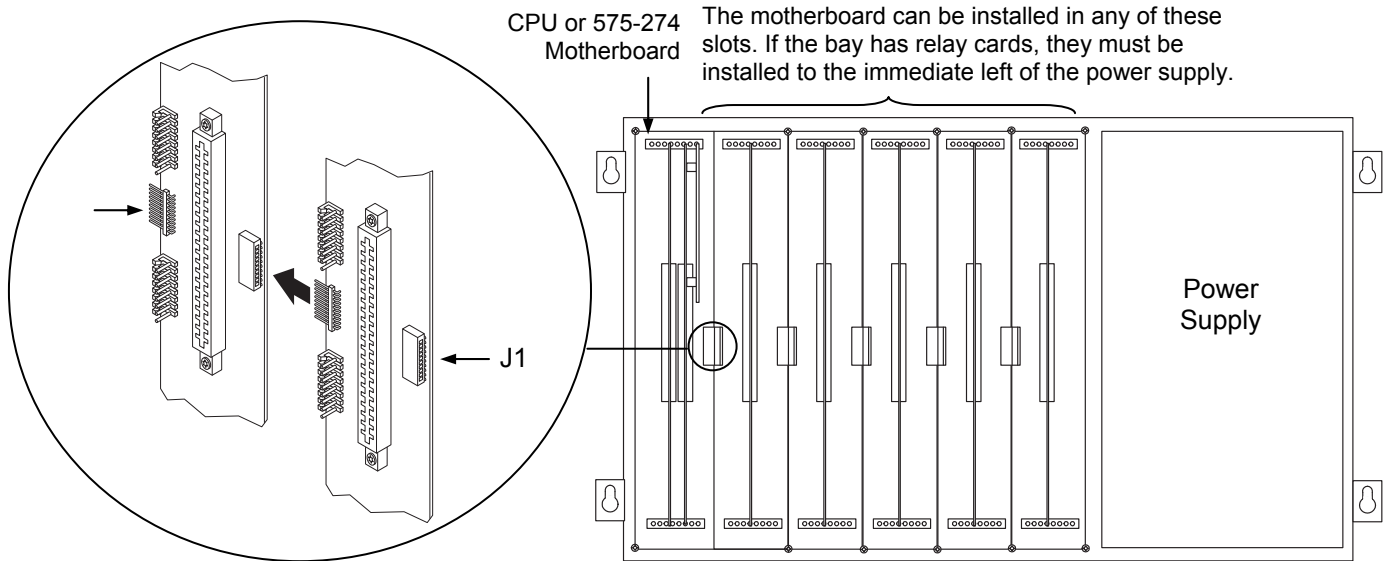


Figure 4. Installing the Motherboard into a 4100 Master Controller Bay

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Installing Motherboards into 2975-91xx Back Boxes (4100), *Continued*

Installing into a 2975-91xx Expansion Bay

Review the following guidelines before mounting the motherboard into a 2975-91xx Expansion Bay.

- If a power supply is installed in the bay, it must be installed on the far right of the bay and any relay modules must be installed in the slots immediately to its left.
- Relay cards **must be installed in the rightmost possible slots**. This is necessary to allow for the proper routing of non-power limited wiring (typically 120 VAC wiring), which could be connected to a relay module.
- If a 4100-0155 SDACT or a 4100-0153 CCDACT is installed in the bay, it must be installed in the far left or far right slot. Neither of these modules contains the J1 or P1 connectors, which are used to distribute power and communications to adjacent modules.

Use the following directions and Figure 5 to install a motherboard into an expansion bay.

1. Orient the motherboard with the connector labeled J1 on the right and the header labeled P1 on the left.
2. Match the connector on the previously installed motherboard with the pins on the motherboard you are installing. Slide the motherboard to the left until the pins are completely inserted in the connector of the previously installed motherboard. If you are installing the leftmost board, the pins will remain unconnected.
3. Secure the motherboard to the chassis with four torx screws.

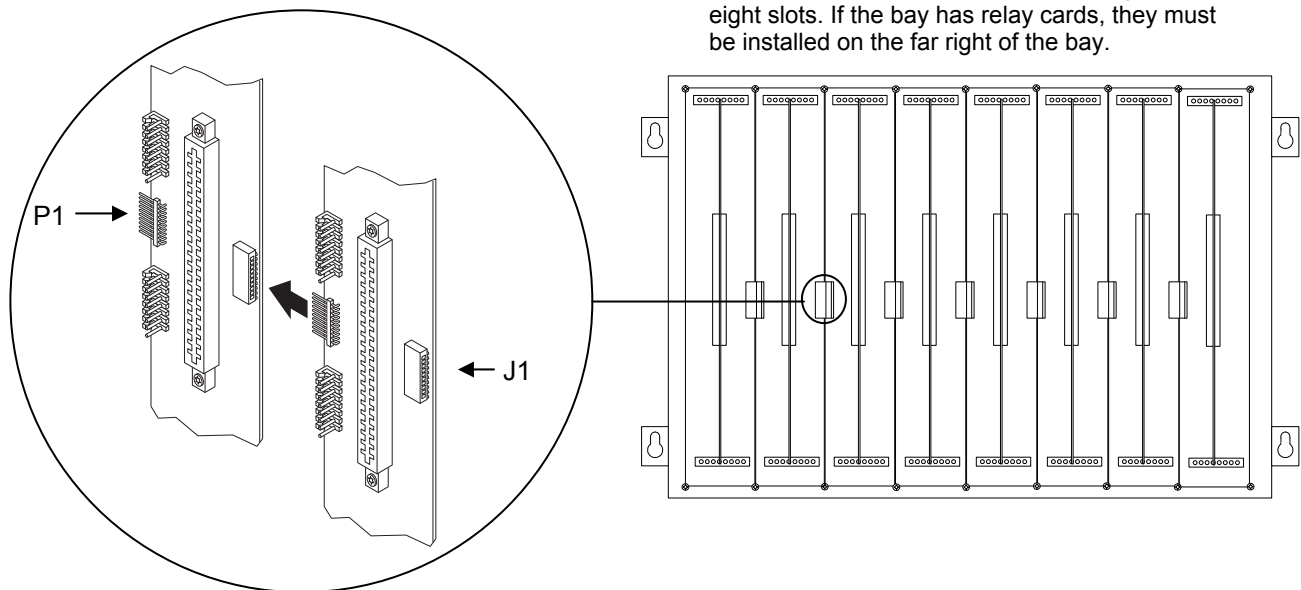


Figure 5. Installing the Motherboard into a 4100 Expansion Bay

4. If you are installing the leftmost motherboard, connect a 733-525 Power and Communication Harness. Continue to the next topic to connect the harness.

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Installing Motherboards into 2975-91xx Back Boxes (4100), *Continued*

Connecting the 733-525 Harness

1. Connect one end of the harness to a motherboard in an adjacent bay.

If the adjacent bay is a master controller bay, connect the harness to the P2 and P3 connectors of the master controller motherboard and continue to step 2.

If the adjacent bay is an expansion bay, connect the harness to the P2 and P3 connectors of the motherboard installed in the leftmost slot. (If a 4100-0155 SDACT or a 4100-0153 CCDACT occupies the leftmost slot, connect the harness to the motherboard in the second slot from the left.) Connect the harness as follows:

- a. Insert the harness connector with the blue wire into the P2 connector. Note that the P2 connector has eight pins. Insert the harness connector on either the top four pins or the bottom four pins, not in the middle.
- b. Insert the harness connector with the white wire into the P3 connector. Note that the P3 connector has eight pins. Insert the harness connector on either the top four pins or the bottom four pins, not in the middle.

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Installing Motherboards into 2975-91xx Back Boxes (4100), *Continued*

Connecting the 733-525 Harness

2. Connect the other end of the harness to the leftmost motherboard in the next bay, as described below. Make sure to route the wiring on the left side of the bay.
 - a. Insert the harness connector with the blue wire into the P2 connector. Note that the P2 connector has eight pins. Insert the harness connector on either the top four pins or the bottom four pins, not in the middle.
 - b. Insert the harness connector with the white wire into the P3 connector. Note that the P3 connector has eight pins. Insert the harness connector on either the top four pins or the bottom four pins, not in the middle.

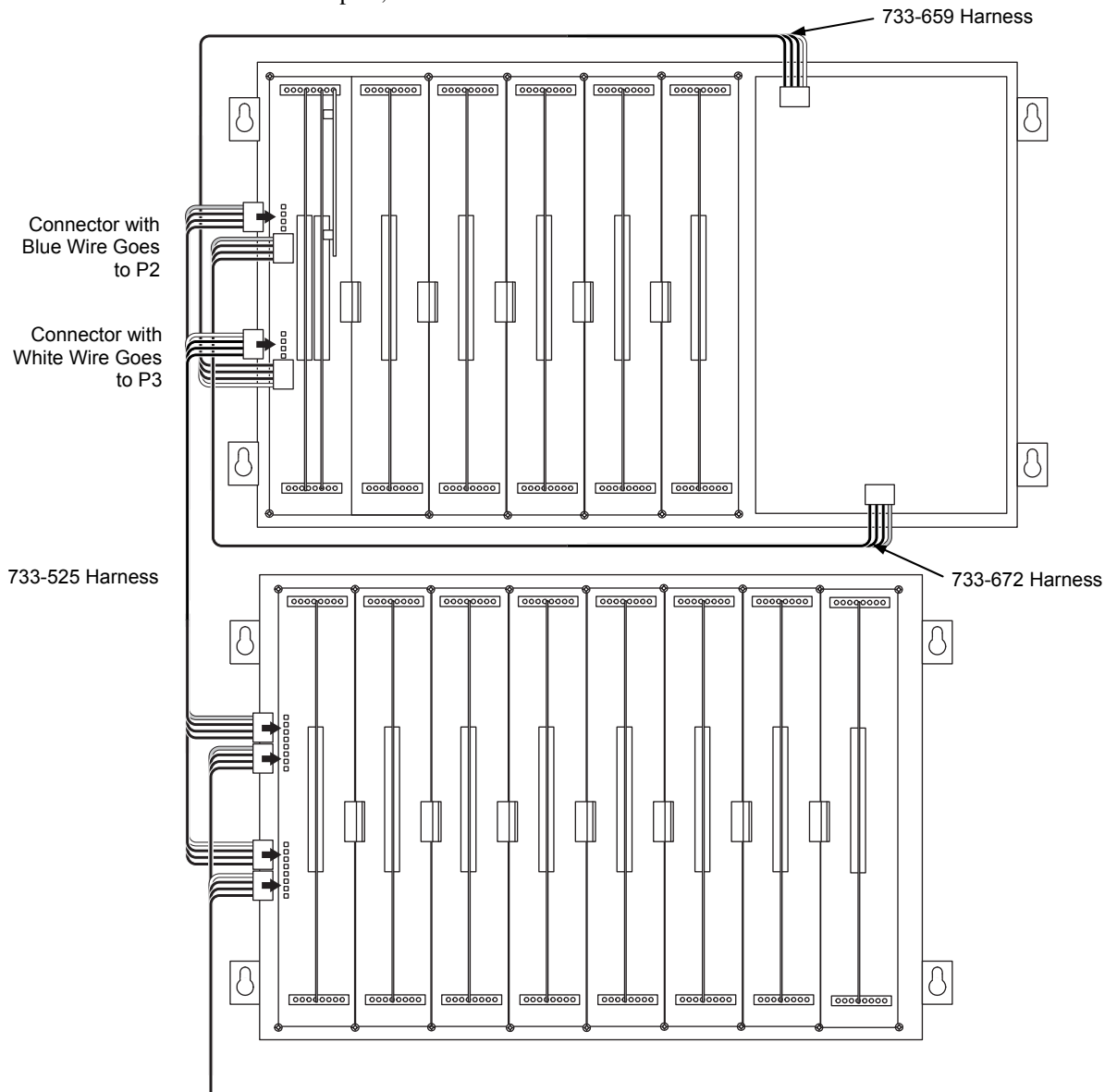


Figure 6. Power and Communication Wiring for Motherboards (4100)

Installing Motherboards into 2975-94xx Back Boxes (4100U/4100ES)

Overview

The 24-point I/O module can be mounted to either 4100 Back Boxes (PID series 2975-91xx) or 4100U/4100ES Back Boxes (PID series 2975-94xx).

- The 4120/4100-0302 version of the module is used with 4100 Back Boxes.
- The 4100-1290 version of the module is used with 4100U/4100ES Back Boxes.

Installing into a 2975-94xx CPU Bay

Up to two motherboards may be installed with the system CPU in the CPU bay.

1. Orient the motherboard with the connector labeled J1 on the right and the header labeled P1 on the left.
2. Slide the motherboard to the right until the pins from P1 on the motherboard to the right are completely inserted in the motherboard's J1 connector.
3. Attach four lockwashers and metal standoffs to the chassis, and secure the motherboard to the chassis using four #6 screws.

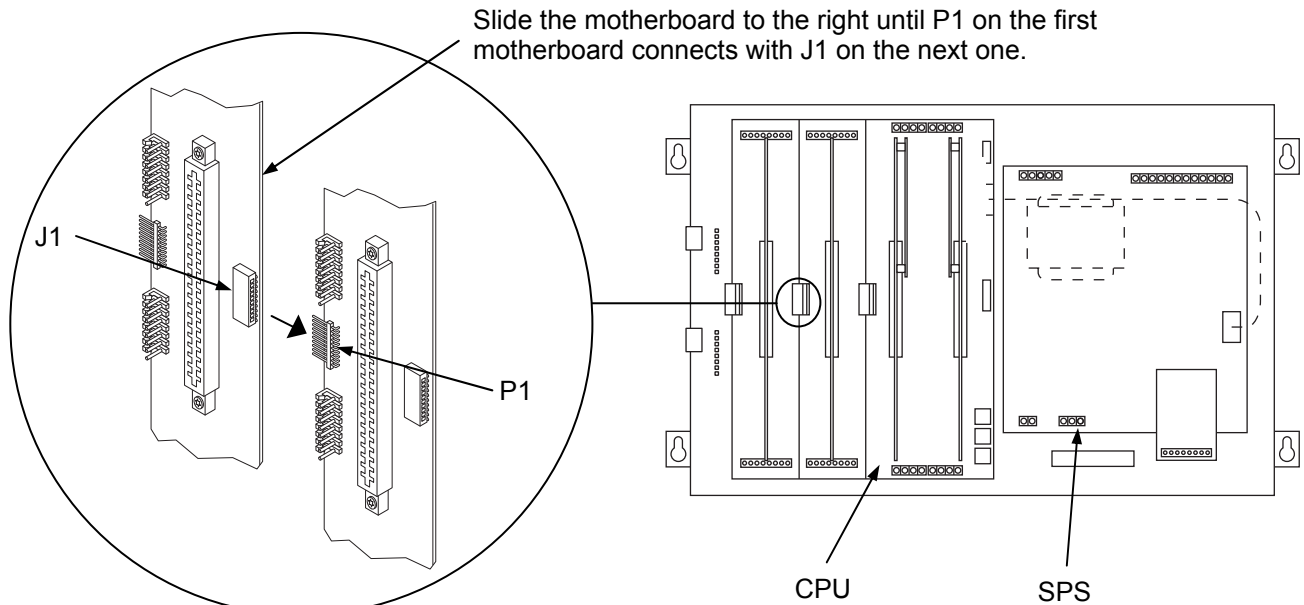


Figure 7. Installing the Motherboard into a 4100U/4100ES CPU Bay

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Installing Motherboards into 2975-94xx Back Boxes (4100U/4100ES), Continued

Installing into a 2975-94xx Expansion Bay

When installing 2" x 11 1/2" motherboards in a 4100U/4100ES expansion bay, adhere to the following guidelines:

- Each expansion bay assembly includes a chassis, two end supports, one LED/switch frame, and a power distribution interface (PDI) board.
- An expansion bay holds up to eight 4" X 5" modules. A double-size module, such as the expansion power supply (XPS), takes up two blocks of space as shown below.
- Up to seven 2" x 11 1/2" motherboards can be installed in an expansion bay **if no 4" X 5" modules are installed in the bay**. Motherboards are mounted on top of the PDI in expansion bays. The data and power that would normally be bussed via the PDI is instead routed across the boards via ribbon cable from one board to the next.
- As shown in the figure below, motherboards can be installed alongside 4"X 5" cards, if necessary.
- The leftmost slot must not contain a motherboard.
- 4" X 5" cards must be added from right to left.
- Motherboards must be added from left to right.

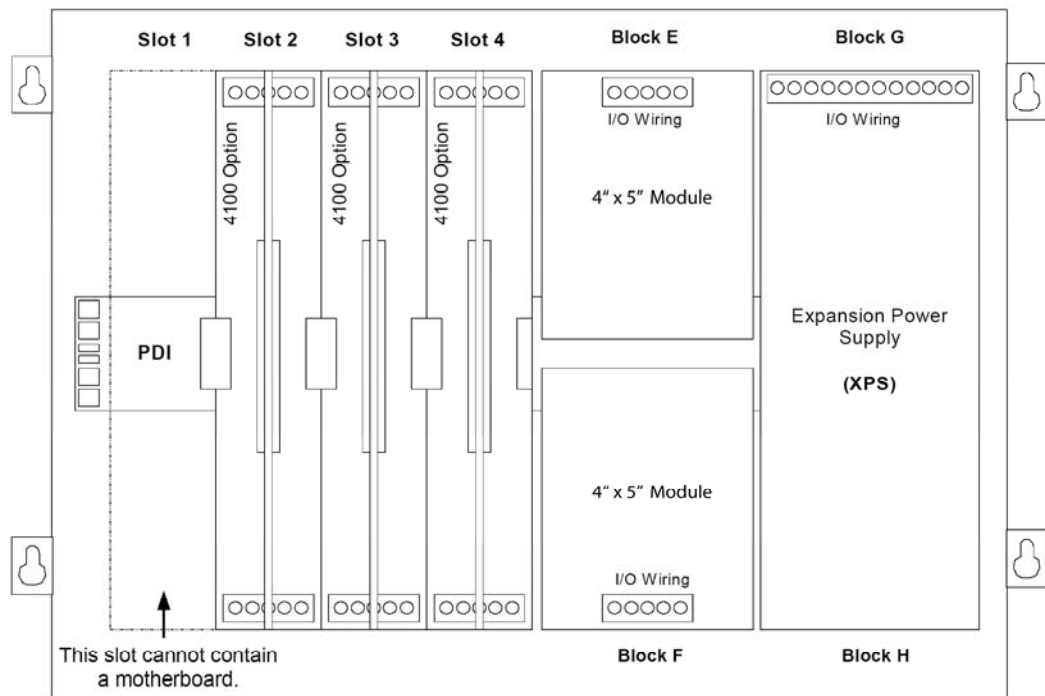


Figure 8. Installing the Motherboard in a 4100U/4100ES Expansion Bay

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Installing Motherboards into 2975-94xx Back Boxes (4100U/4100ES), *Continued*

Installing into a 2975-94xx Expansion Bay

Use the following procedure when installing motherboards in an expansion bay. Start with the second slot from the left and fill to the right.

1. Orient the motherboard with the connector labeled J1 on the right and the header labeled P1 on the left.
2. Attach four metal threaded standoffs and lockwashers into the screw holes on the chassis.
3. Secure the motherboard to the standoffs using four #6 torx screws as shown in Figure 9.

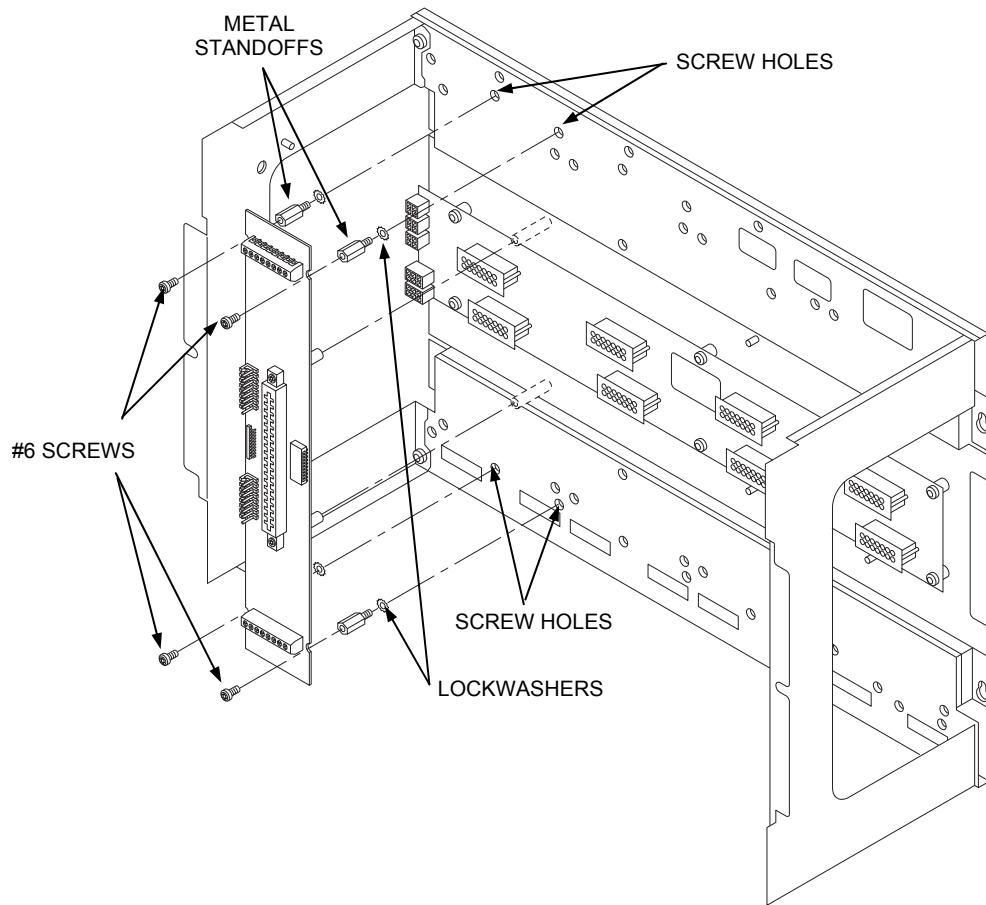


Figure 9. Installing the Motherboard in a 4100U/4100ES Expansion Bay

4. If you are installing the leftmost motherboard, connect a 733-525 Power and Communication Harness.

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Installing Motherboards into 2975-94xx Back Boxes (4100U/4100ES), *Continued*

Connecting the 733-525 Harness

If you need to connect a 733-525 Harness to a motherboard, refer to Figure 10 and follow these steps. Make sure to route the power and communication wiring on the left side of the bay.

1. Connect one end of the harness to a motherboard in an adjacent bay.

If the adjacent bay is the CPU bay, connect the harness to the P8 and P7 connectors of the CPU motherboard.

- Insert the harness connector with the blue wire into the P8 connector. Note that the P8 connector has eight pins. Insert the harness connector on either the top four pins or the bottom four pins, not in the middle.
- Insert the harness connector with the white wire into the P7 connector. Note that the P7 connector has eight pins. Insert the harness connector on either the top four pins or the bottom four pins, not in the middle.

If the adjacent bay is an expansion bay, connect the harness to the P2 and P3 connectors of the motherboard installed in the leftmost slot. (If an SDACT or CCDACT occupies the leftmost slot, connect the harness to the motherboard in the second slot from the left.) Connect the harness as follows:

- Insert the harness connector with the blue wire into the P2 connector. Note that the P2 connector has eight pins. Insert the harness connector on either the top four pins or the bottom four pins, not in the middle.
- Insert the harness connector with the white wire into the P3 connector. Note that the P3 connector has eight pins. Insert the harness connector on either the top four pins or the bottom four pins, not in the middle.

2. Connect the other end of the harness to the leftmost motherboard in the next bay, as described below. Make sure to route the wiring on the left side of the bay.

- Insert the harness connector with the blue wire into the P2 connector. Note that the P2 connector has eight pins. Insert the harness connector on either the top four pins or the bottom four pins, not in the middle.
- Insert the harness connector with the white wire into the P3 connector. Note that the P3 connector has eight pins. Insert the harness connector on either the top four pins or the bottom four pins, not in the middle.

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Installing Motherboards into 2975-94xx Back Boxes (4100U/4100ES), Continued

Connecting the 733-525 Harness

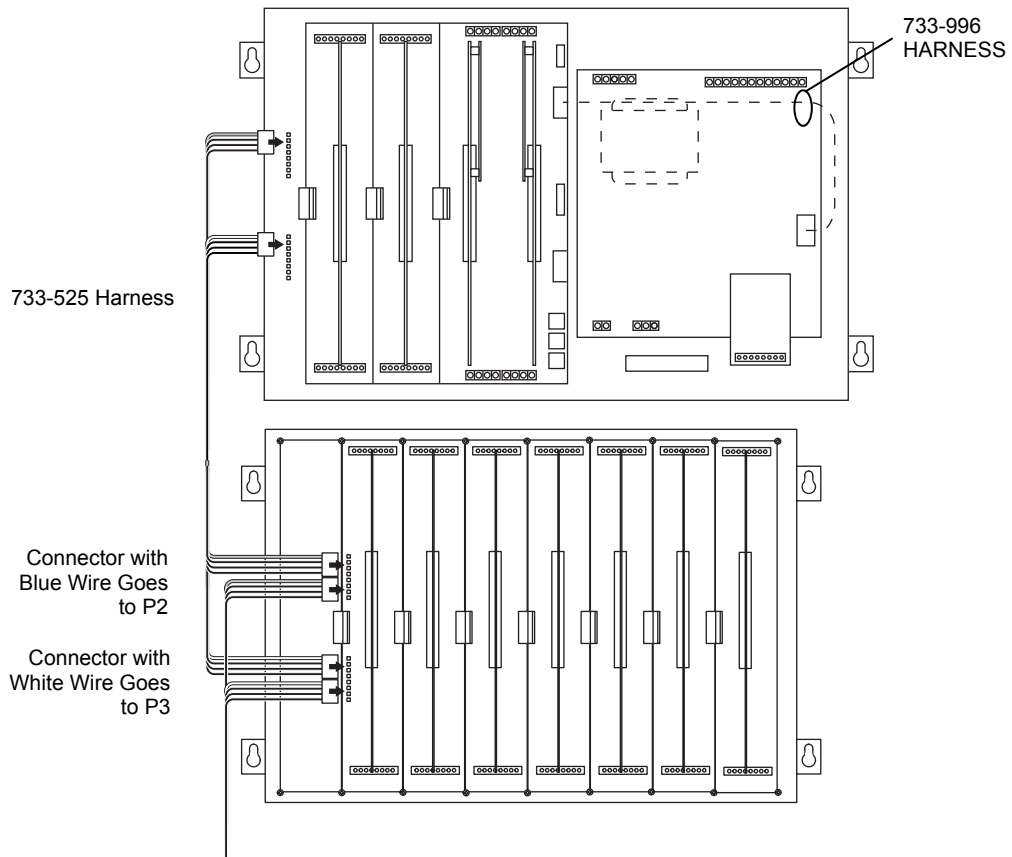


Figure 10. Power and Communication Wiring for Motherboards (4100U/4100ES)

Installing the Daughter Card

Installing the Daughter Card

The daughter card inserts into the connector located in the center of the motherboard. The connector is keyed so that the daughter card fits only one way. Before installing the card, examine the slot in the motherboard and the fingers on the daughter card and note where the key is located.

Note: The figure below is a general-purpose illustration that applies to all daughter cards.

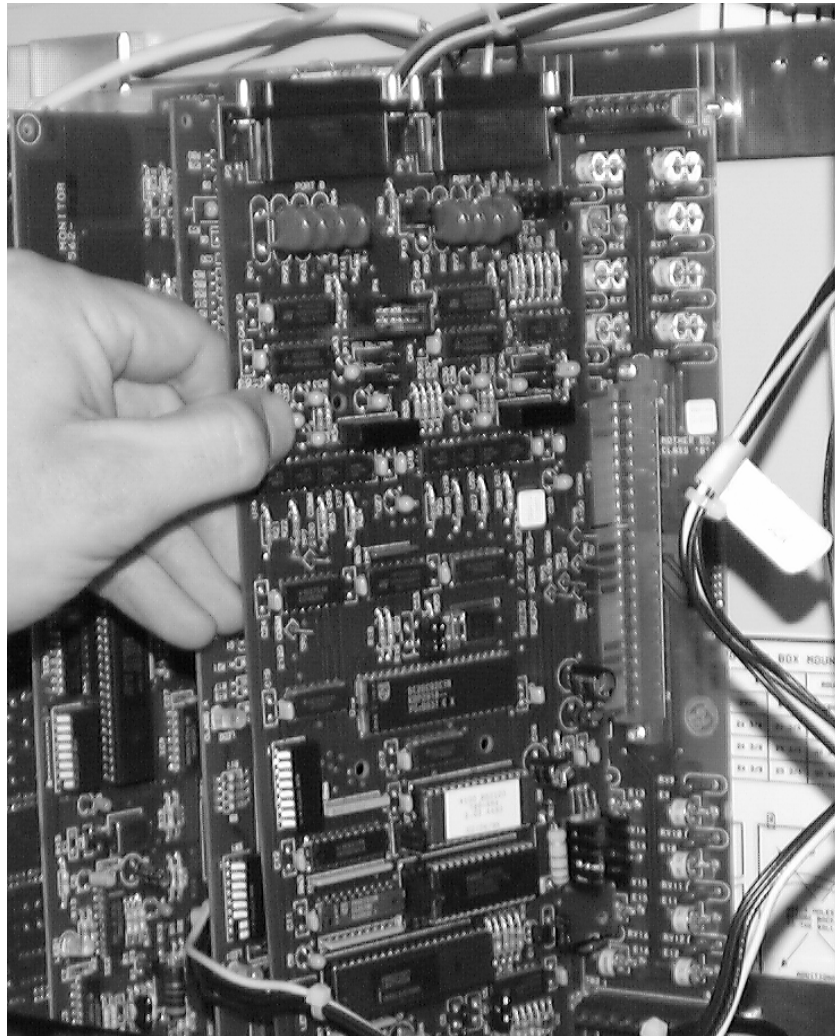


Figure 11. Installing the Daughter Card

Field Wiring

Overview

The 24-point graphic I/O module can be wired to various annunciators, fan control circuits, normally-open and normally-closed contacts, and tie points. It can also be wired to annunciate a communication loss. This section describes all of these field wiring options for the 24-point graphic I/O module.

General Guidelines

- All wires must be 18 AWG (0.8231 mm²), or as the local code dictates.
- Conductors must test free of all grounds.
- Wiring to I/O terminals must not be run with AC wiring.
- Power must come from a Simplex-approved power supply.
- All wiring must be done using copper conductors only, unless noted otherwise.
- If shielded wire is used,
 - the metallic continuity of the shield must be maintained throughout the entire cable length.
 - the entire length of the cable must have a resistance greater than 1 Megohm to earth ground.
- Underground wiring must be free of all water.
- In areas of high lightning activity, or in areas that have large power surges, the 2081-9027 Transient Suppressor should be used on monitor points (refer to 574-803 for installation details).
- Wires must not be run through elevator shafts.
- Wires that run in plenum must be in conduit.
- Splicing is permitted. All spliced connections must either be soldered (resin-core solder), crimped in metal sleeves, or encapsulated with an epoxy resin. When soldering or crimped metal sleeves are used, the junction must be insulated with UL-Listed electrical tape that is as sound as the original insulating jacket. Shield continuity must be maintained throughout.
- A system ground must be provided for earth detection and lightning protection devices. This connection must comply with approved earth detection per NFPA780.
- Only system wiring can be run together in the same conduit.
- *Output Driver Power:* The +24 VDC input is used to generate the supervision reference from the power supply that is feeding the 24 I/O points. The +24 VDC connects to TB2-15 (PWR IN+) and TB2-16 (“PWR IN-“).

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Field Wiring, *Continued*

Power-Limited Guidelines

- Non-power limited field wiring (AC power, batteries, City connection) must be installed and routed in the shaded areas shown in Figure 12.
- Power-limited field wiring must be installed and routed in the non-shaded areas shown in Figure 12, with the exception of City wiring.
- Excess slack should be kept to a minimum inside the back box enclosure. The wiring should be neatly dressed and bundled together using the wire ties provided with the equipment. Anchor power-limited wiring to tie points, as shown in Figure 12.

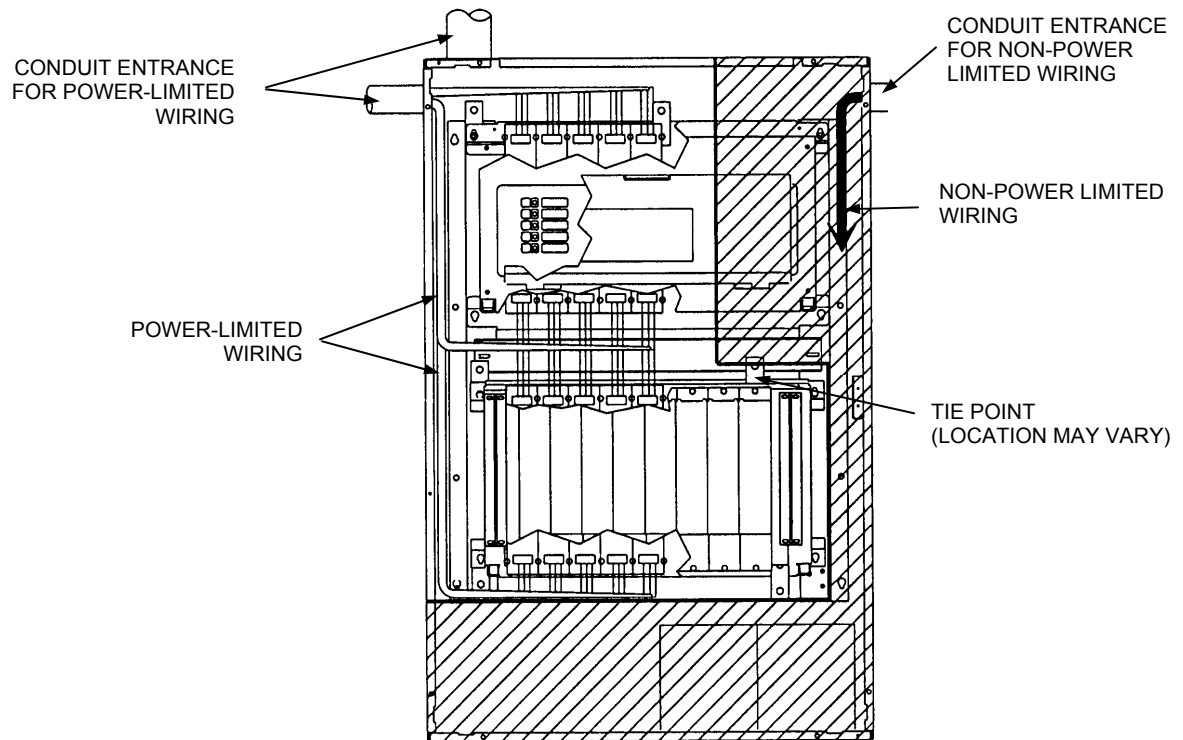


Figure 12. Power-Limited Wiring

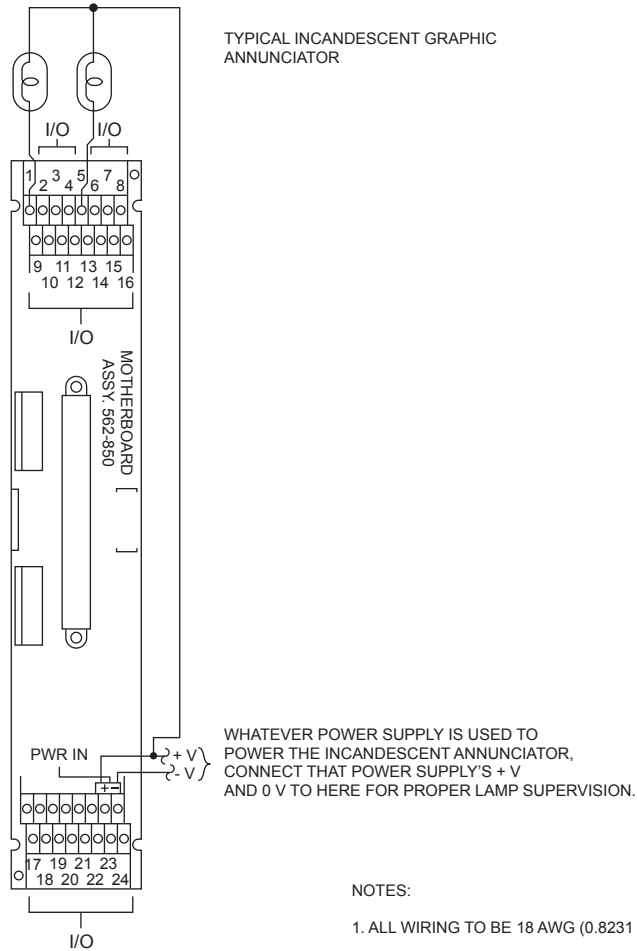
- Tie the wiring located between bays to the internal wiring troughs, if applicable.
- When powering remote units or switching power through relay contacts, power for these circuits must be provided by a power-limited power supply that listed for fire-protective signaling use.

Continued on next page

Field Wiring, *Continued*

Graphic I/O Incandescent Lamp Wiring

See below for Graphic I/O Incandescent Lamp Annunciator wiring.



NOTES:

1. ALL WIRING TO BE 18 AWG (0.8231 MM²) OR TO LOCAL CODE.
2. CONDUCTORS MUST TEST FREE FROM ALL GROUNDS.
3. MAXIMUM CURRENT....150 mA PER OUTPUT.
4. MAXIMUM VOLTAGE....32 VDC.
5. DRAWING DEPICTS TYPICAL WIRING. ALL OUTPUTS MAY
 - NOT BE WIRED.
6. PLUGGABLE RESISTORS ON GRAPHIC I/O ASSY. MUST BE
 - CHANGED TO 20 OHM, 1 W (SUPPLIED IN SHIPPING GROUP)
 - FOR EACH CORRESPONDING LAMP OUTPUT. LOOK FOR
 - THE RESISTOR MARKED DRIVER "X." ("X" IS A NUMBER
 - BETWEEN 1 AND 24.) REMOVE 2 K, 1/2 W RESISTOR AND
 - REPLACE WITH 20 OHM, 1 W RESISTOR.

Figure 13. Graphic I/O Incandescent Lamp Annunciator Wiring

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Field Wiring, *Continued*

Graphic I/O LED Annunciator Wiring

See below for Graphic I/O LED Annunciator wiring.

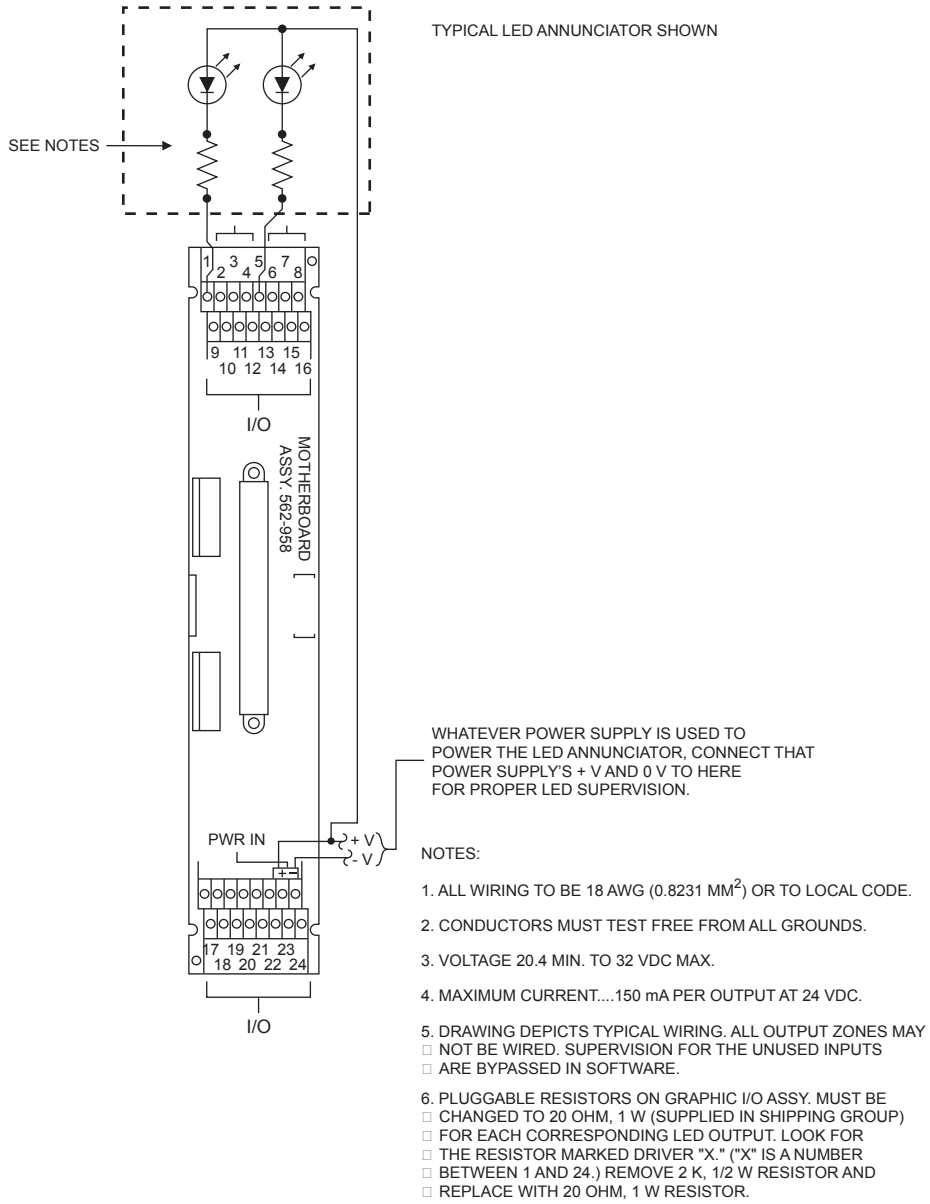


Figure 14. Graphic I/O LED Annunciator Wiring

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Field Wiring, *Continued*

N/O and N/C Switch Wiring

24-point IO wiring to normally open (N/O) and normally closed (N/C) switches is shown in Figure 15, below.

Notes:

- All wiring is unsupervised.
- Supervisory power (switch normal):
 - N/O switch: 0 mA
 - N/C switch: 12 mA
- Alarm power (switch off normal):
 - N/O switch: 12 mA
 - N/C switch: 0 mA
- The figure depicts typical wiring. For detailed connections, refer to the "Systems Summary" section of the programmers' report supplied with the envelope marked "Installation Instructions."
- Use FWD 841-731 or 841-995 (non power-limited) for further information if you are using the 4100 system.

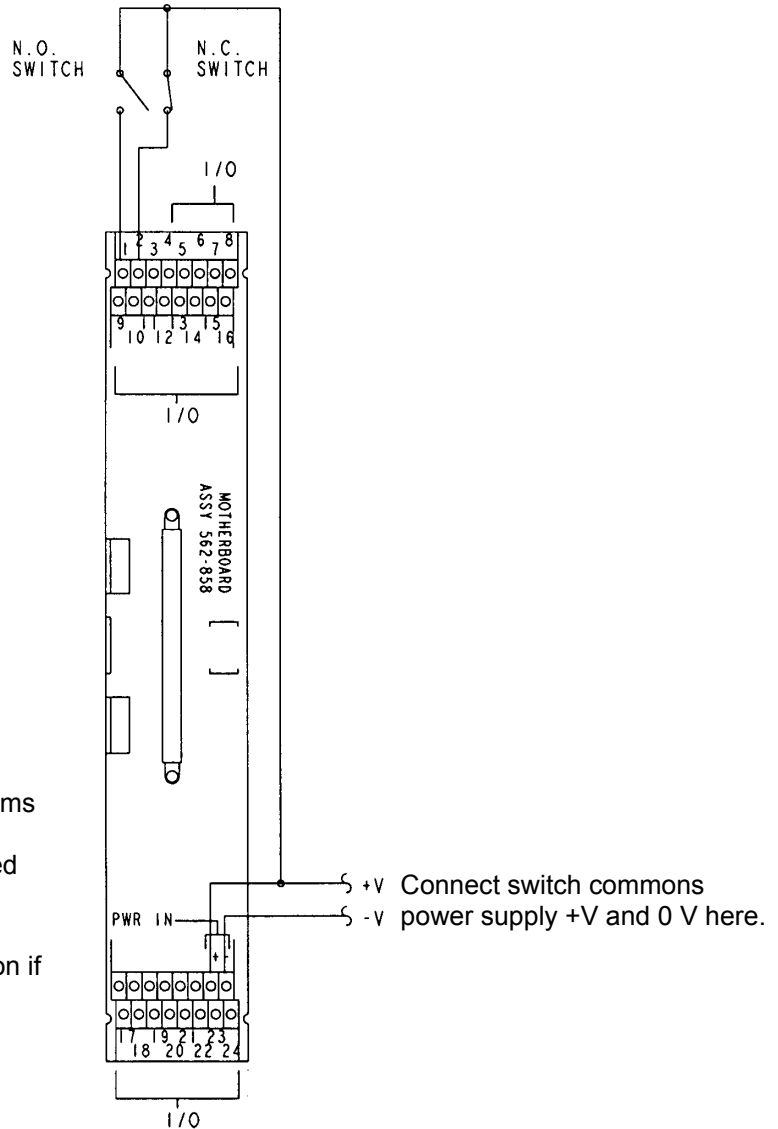


Figure 15. N/O and N/C Switch Wiring

Continued on next page

Field Wiring, *Continued*

Open-Supervised N/O and N/C Switch Wiring

The 24-point IO module can be wired to normally open (N/O) and normally closed (N/C) switches with supervision for open circuits as shown in Figure 16, below.

Notes:

- All wiring is supervised.
- Supervisory power (switch normal):
 - N/O switch: 5 mA at 24 VDC
 - N/C switch: 12 mA at 24 VDC
- Alarm power (switch off normal):
 - N/O switch: 12 mA at 24 VDC
 - N/C switch: 5 mA at 24 VDC
- The figure depicts typical wiring. For detailed connections, refer to the "Systems Summary" section of the programmers' report supplied with the envelope marked "Installation Instructions."
- The 3.3 K resistor part number is 733-893.
- Use FWD 841-731 or 841-995 (non power-limited) for further information if you are using the 4100 system.

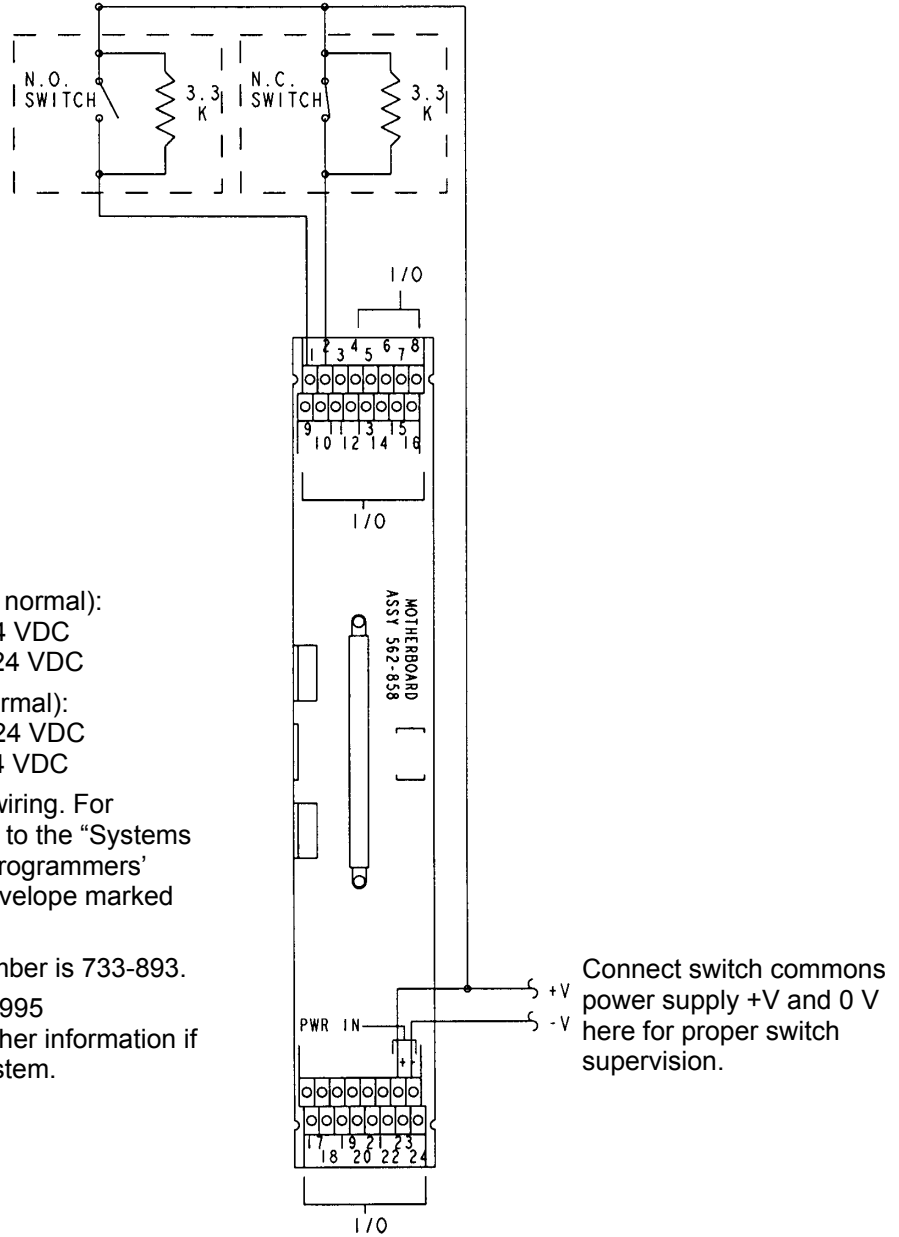


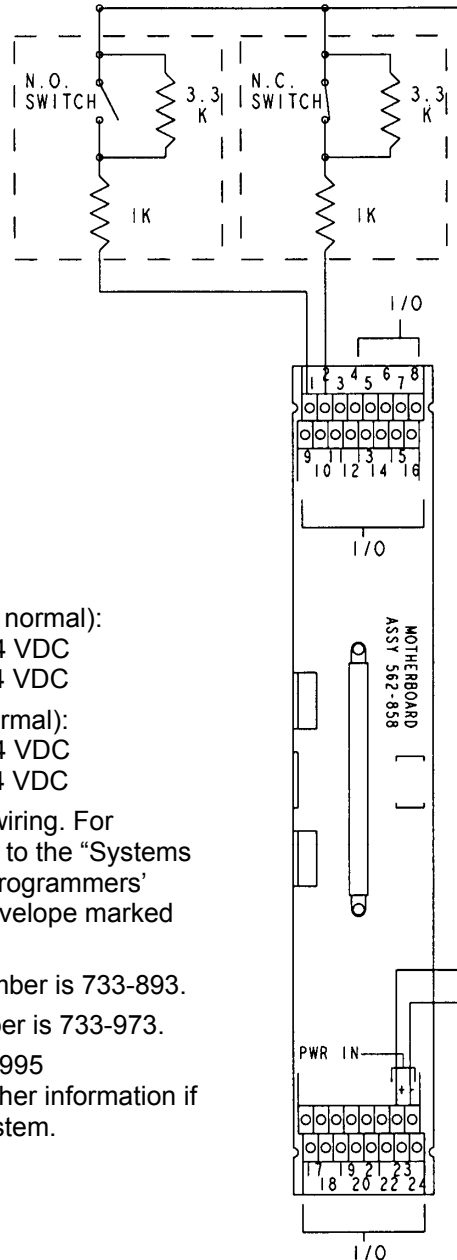
Figure 16. Open-Supervised N/O and N/C Switch Wiring

Continued on next page

Field Wiring, *Continued*

Open- and Short-Supervised N/O and N/C Switch Wiring

The 24-point IO module can be wired to normally open (N/O) and normally closed (N/C) switches with supervision for open and short circuits as shown in Figure 17, below.



Notes:

- All wiring is supervised.
- Supervisory power (switch normal):
 - N/O switch: 4 mA at 24 VDC
 - N/C switch: 8 mA at 24 VDC
- Alarm power (switch off normal):
 - N/O switch: 8 mA at 24 VDC
 - N/C switch: 4 mA at 24 VDC
- The figure depicts typical wiring. For detailed connections, refer to the "Systems Summary" section of the programmers' report supplied with the envelope marked "Installation Instructions."
- The 3.3 K resistor part number is 733-893.
- The 1 K resistor part number is 733-973.
- Use FWD 841-731 or 841-995 (non power-limited) for further information if you are using the 4100 system.

Connect switch commons power supply +V and 0 V here for proper switch supervision.

Figure 17. Open- and Short-Supervised N/O and N/C Switch Wiring

Continued on next page

Field Wiring, *Continued*

Wiring to Fan Control with an HOA Switch

The 24-point IO module can be wired to a fan control circuit with an HOA switch as shown in Figure 18, below.

Notes:

- All wiring is supervised.
- Supervisory power (switch normal):
 - ON position: 12 mA at 24 VDC
 - CENTER position: 4.5 mA at 24 VDC
 - OFF position: 8 mA at 24 VDC
- Alarm power (switch off normal):
 - ON position: 12 mA at 24 VDC
 - CENTER position: 4.5 mA at 24 VDC
 - OFF position: 8 mA at 24 VDC
- The figure depicts typical wiring. For detailed connections, refer to the "Systems Summary" section of the programmers' report supplied with the envelope marked "Installation Instructions."
- The 3.3 K resistor part number is 733-893.
- The 1 K resistor part number is 733-973.
- Use FWD 841-731 or 841-995 (non power-limited) for further information if you are using the 4100 system.

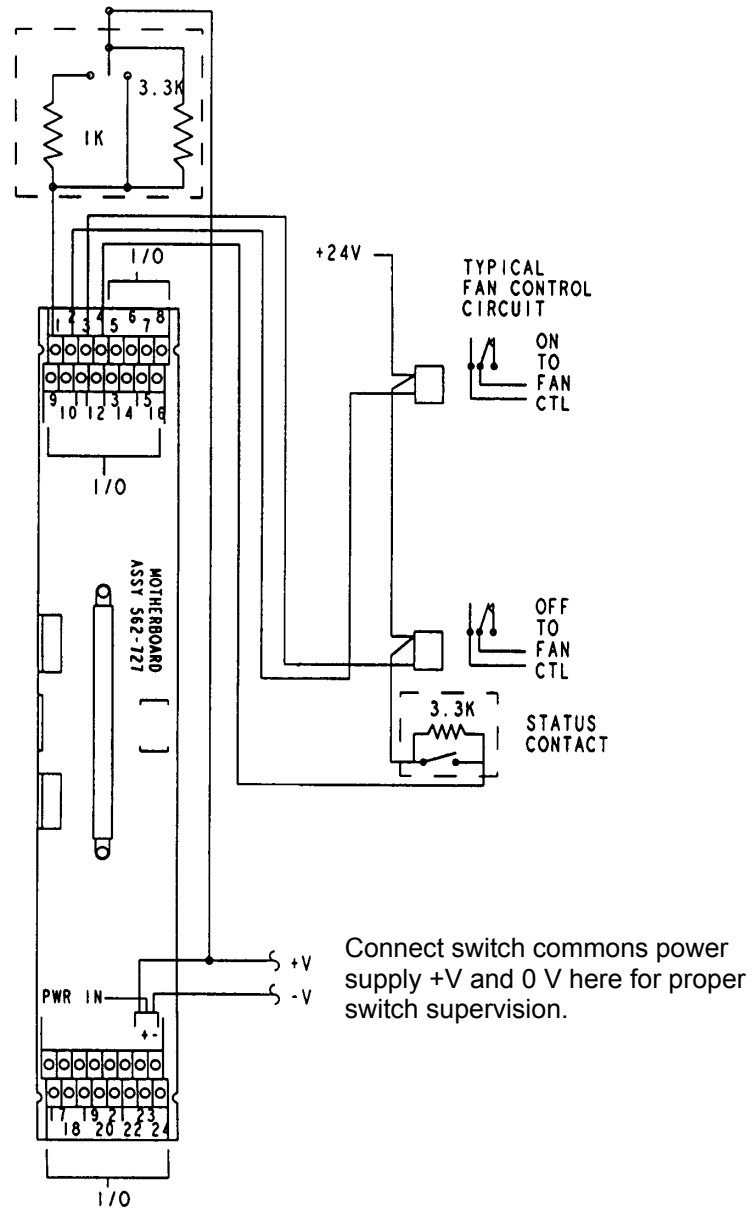


Figure 18. Fan Control Wiring

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Field Wiring, *Continued*

Open Collector Device Wiring

The 24-point I/O module can be wired to monitor a collector device in the unsupervised configuration shown in Figure 19, below.

Notes:

- All wiring is unsupervised.
- Supervisory power (transistor off): 0 mA
- Alarm power (switch off normal): 12 mA
- The figure depicts typical wiring. For detailed connections, refer to the “Systems Summary” section of the programmers’ report supplied with the envelope marked “Installation Instructions.”
- Change the appropriate pluggable resistor on the 24-point IO board to 22 K, 1 W.
- Transistor OFF is treated the same way as a normally-closed unsupervised switch in the CLOSED position. Transistor ON is treated the same way as a normally-closed unsupervised switch in the OPEN position.
- All wiring must be in conduit within 20 feet (6 m) of the control panel.
- Use FWD 841-731 or 841-995 (non power-limited) for further information if you are using the 4100 system.

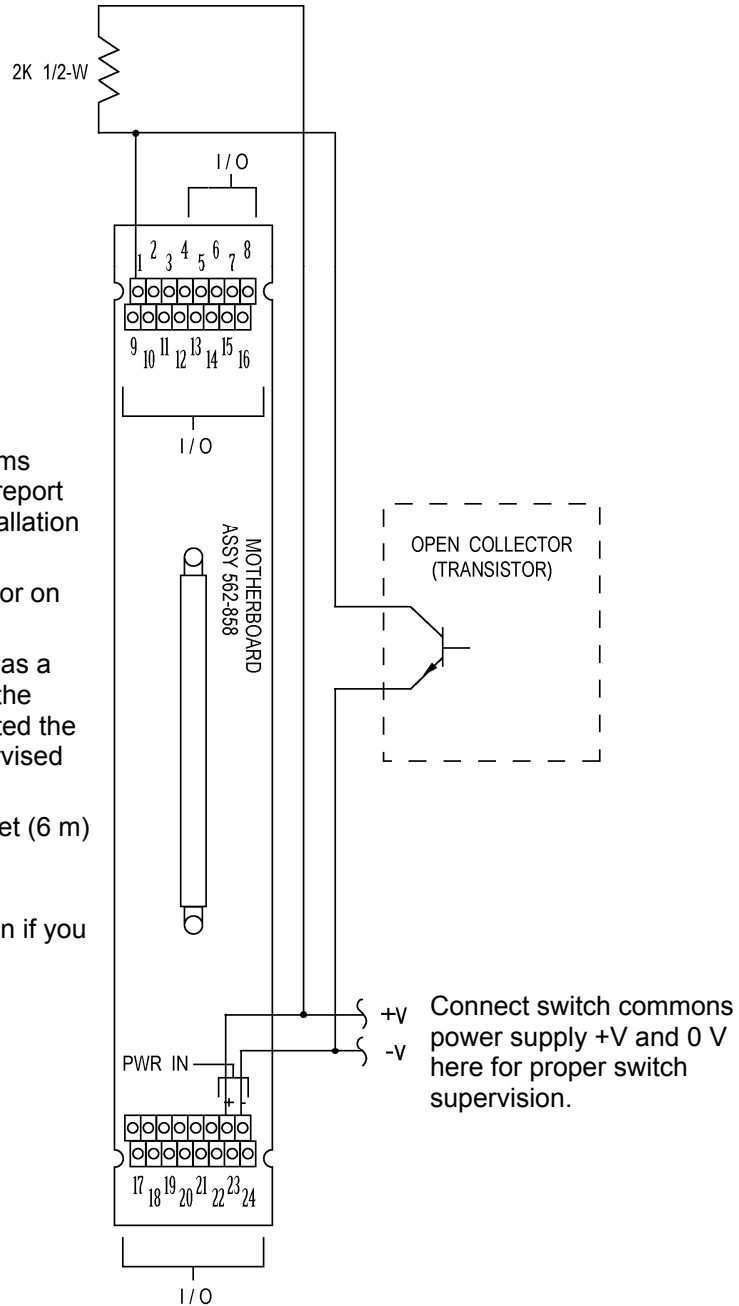


Figure 19. Open Collector Wiring

