2

Installation and Specifications

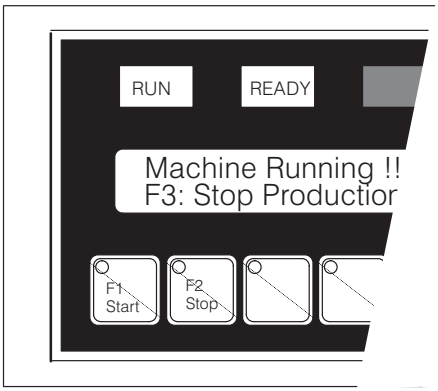
In This Chapter. . . .

Preparing Panel Labels

In any manufacturing environment, it is important to have legible markings on the lamps and pushbuttons. The lamp and pushbutton legends are different sizes and should be made separate for installation. You may create custom labels for your application. Use either the OP–WINEDIT Help screens template which allows label entry and printout, or use the templates provided on the following page.

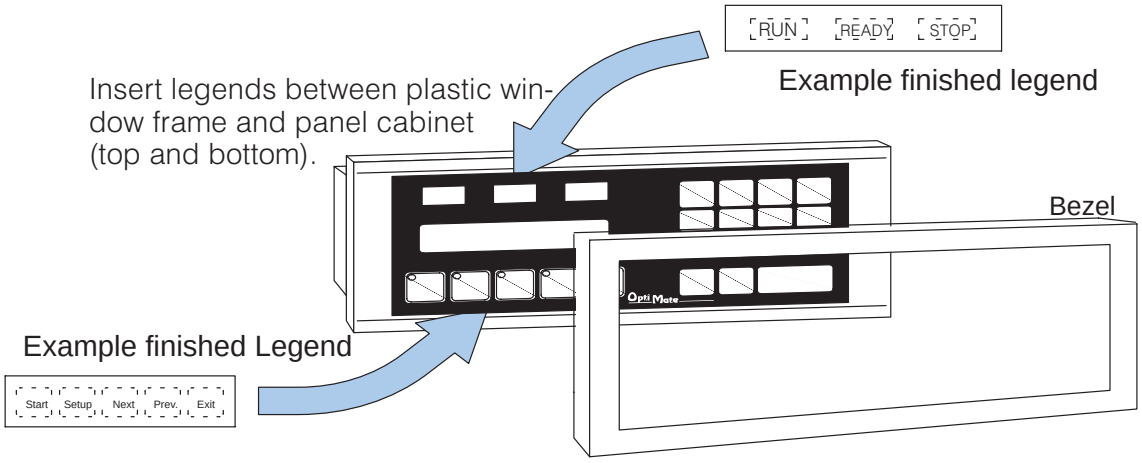
Labeling the Lamps and Pushbuttons

Use the templates provided on the next page to create the labels on transparent film. The transparent film can be purchased from almost any office supply store in standard 8 1/2” x 11” sheets. It is designed to run through a copy machine or laser printer. The nicest legends result from using a computer graphics program and a laser printer to create the transparency. The labels slide into the top and bottom pockets of the Operator panel overlay. Use the following procedure to install the labels which are required for your application.



Creating and Installing the labels

1. Remove the front frame or bezel from the module by unsnapping the four plastic tabs which hold the bezel to the module frame.
2. Create legends for the top and bottom areas (lamps and pushbuttons). Once you have created the labels on transparent film, you can cut around the outside of each legend so that it fits into the pocket.

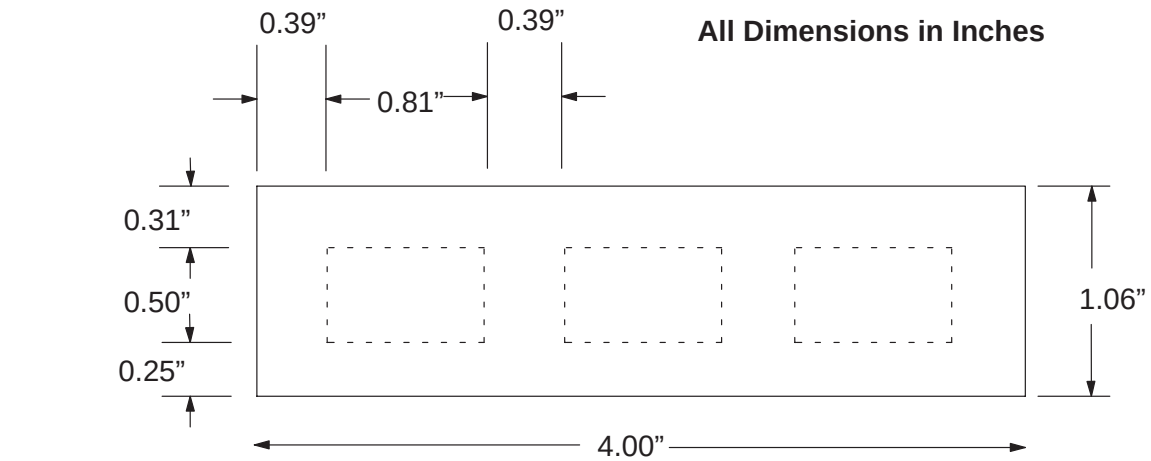


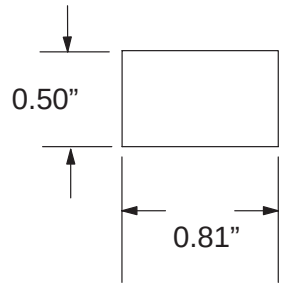
3. Use the pattern on the next page to cut out the legends from the transparency sheet.
4. Slide the finished legends into the pocket space between the front cover and the panel housing.
5. Re-attach the bezel by snapping the bezel onto the case.

Template for Creating Labels

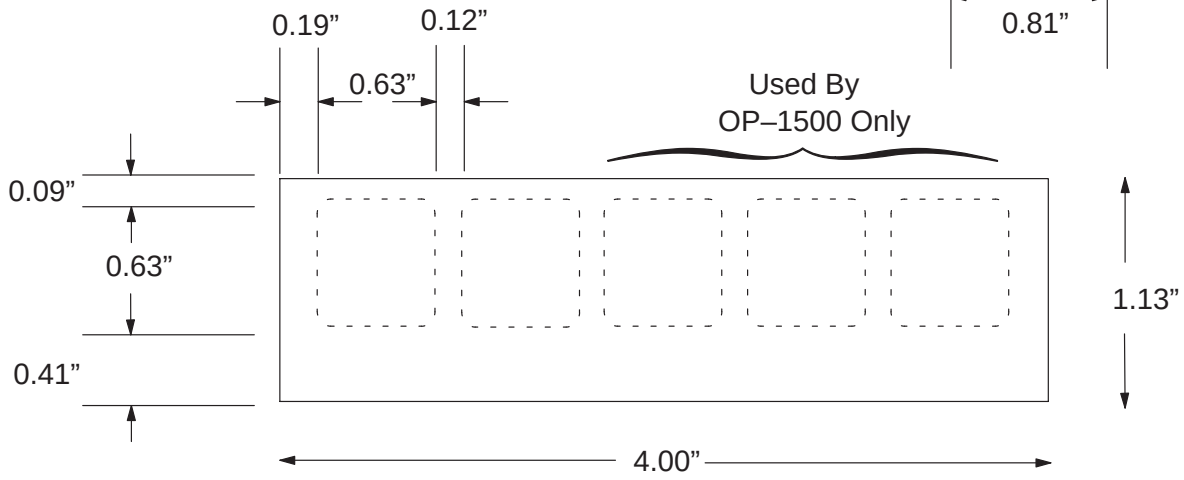
a

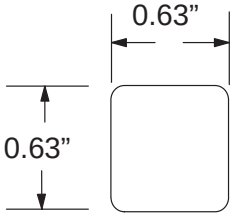
Top Legend (Lamps)



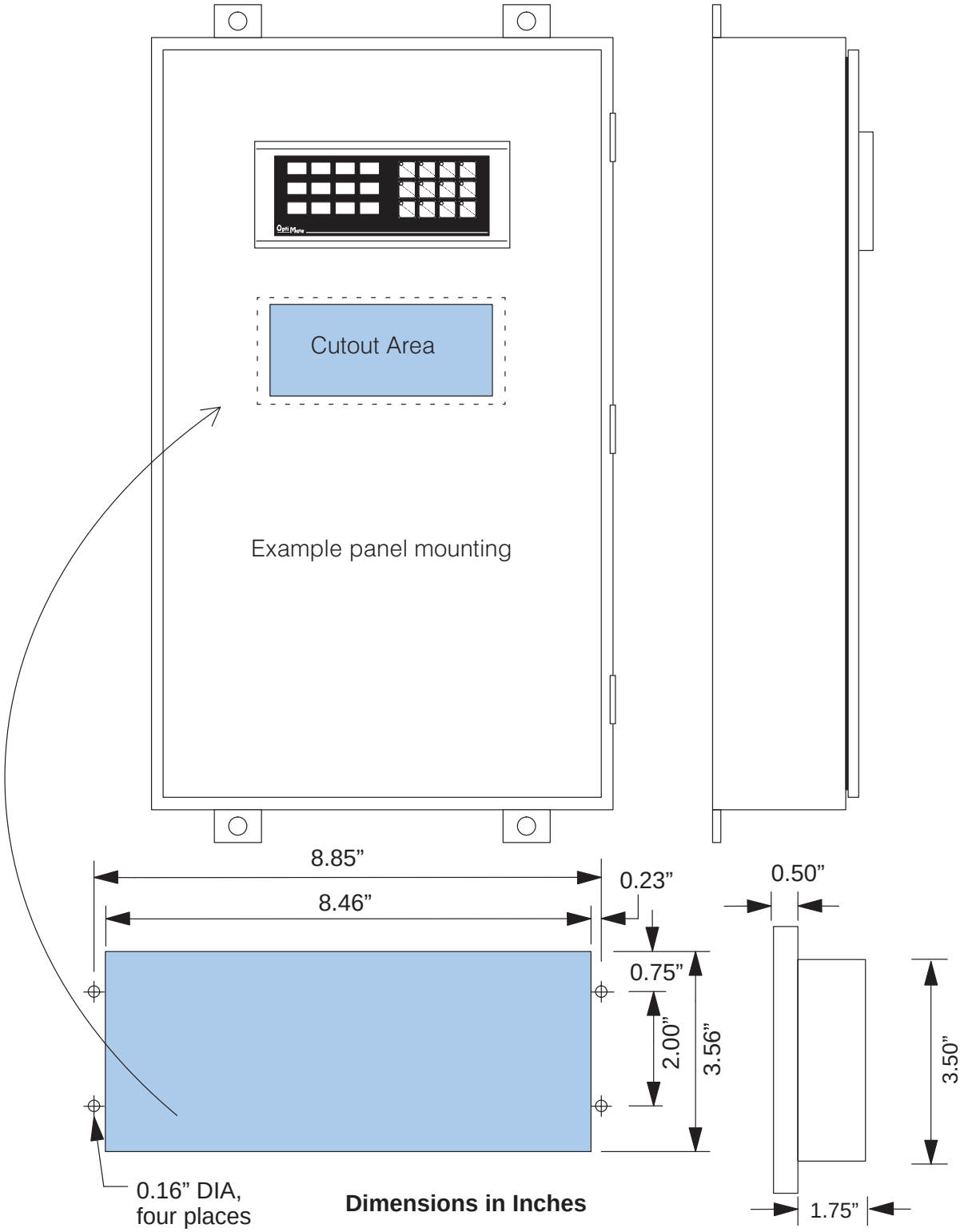


Bottom Legend (Pushbuttons)





Dimensions for Mounting



Dimensions in Inches

Panel Specifications

Physical Specifications

Weight	19 ounces
Panel Fasteners	Four 6x32 threaded studs
NEMA Rating	NEMA 4 (when properly installed)

Environmental Specifications

Operating Temperature	0° to 50° C
Storage Temperature	–20° to 80° C
Operating Humidity	5 to 95% (non-condensing)
Air Composition	No corrosive gases permitted

Operating Specifications

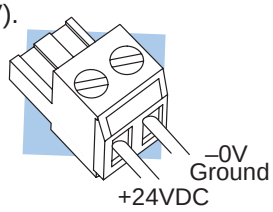
Power Budget Requirements	5 VA @ 8–30 VDC 0.35 A @ 12 VDC (all LEDs OFF) 0.42 A @ 12 VDC (all LEDs ON) 0.18 A @ 24 VDC (all LEDs OFF) 0.21 A @ 24 VDC (all LEDs ON)
Power Connector	Keyed Terminal Block (2 position)
Minimum Supply Voltage	+8 VDC
Maximum Supply Voltage	+32 VDC
Diagnostics	LCD Operator Message, LED Status
Communication Link	RS-232 for distance less than 50ft RS-422 for distance up to 4000ft. 4800, 9600 and 19200* baud 15-pin female D type connector *19200 baud rates *will not* work with Allen-Bradley PLCs.
Connector Kits	**OP–CMCON–1**: pack of 4 ribbon cable connectors. **OP–CMCON–2**: pack of 4 solder type connectors. **OP–CMCON–3**: (2) D-Shell connectors w/ terminal block. (Multi-panel appl.) **OP–PSCON**: pack of 4–24VDC power supply connectors w/ terminals.

Connecting a Power Supply

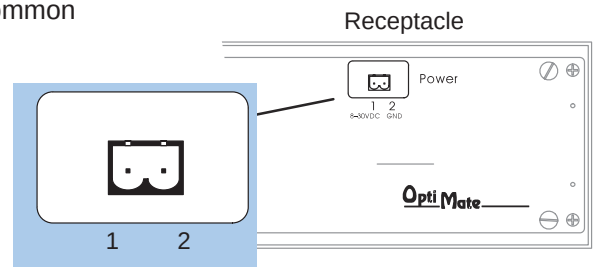
Power Supply Connections

An external power supply is adapted to supply operating voltage to the OP–1500 and OP–1510 units. The power supply must deliver a range between 8 to 30 VDC, and provide a minimum of 5 watts continuous power to the units. Connect your power supply using the terminal block connector supplied with each panel. The connector is keyed to prevent reversing the polarity. Pin 1 is the positive connection (8–30VDC), while pin 2 is the common (0VDC) or ground connection.

Use 18–24 AWG conductor wire and connect the power supply to connector block, which is supplied with each Operator panel. The terminal marked 1 must have the positive (+8–30 VDC) connected and terminal 2 is common ground (0V).

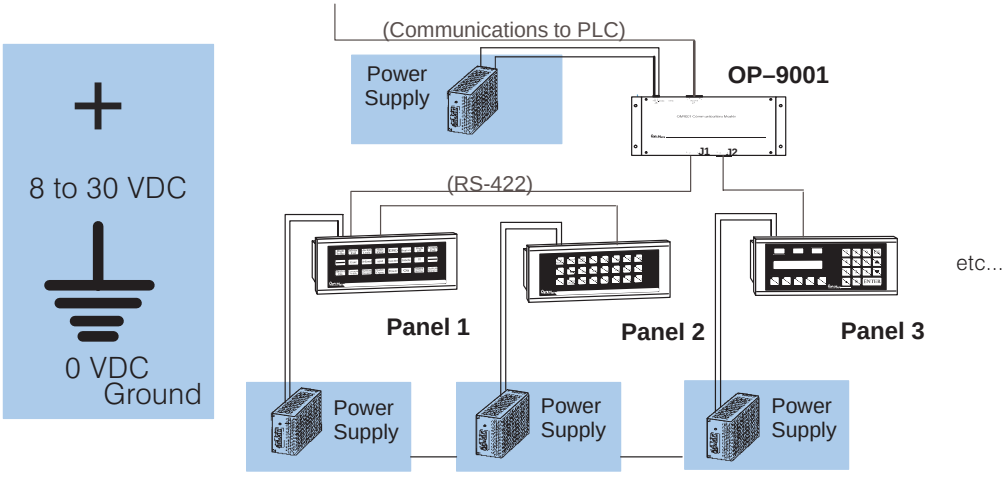


Plug the terminal block connector into Power receptacle located on the back side of the panel.



Multi-panel Power Supply connection

In Multi-panel applications, if separate power supplies are used, please ensure the electrical ground common do not have a great potential difference. For the use of a *single* power supply in a *Multi-panel* application, the supply must maintain the specified voltage and current consumption under all conditions (including power-up) for each of the individual units. See individual panel power requirements located on the previous page.

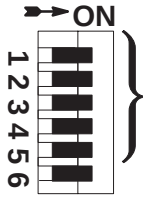


Preparing the Panel for Configuration

Selecting Configuration Mode

You may generate your operator panel configuration off-line. To download your configuration, the panel DIP switches must be set to address 31. Remove power from the OP-panel and set address 31 by sliding all switches 1 – 5 to the right most position (ON). The binary sum of all address switch values are the panel's address.

NOTE: Set the panel to address No. 31 for online configuration mode. Configuration mode allows download (write to panel) or upload (read from panel) application programs to your OP–1500 or OP–1510 panel.



SW1 Position	1	2	3	4	5	6
Address Value	**1**	**2**	**4**	**8**	**16**	**T**

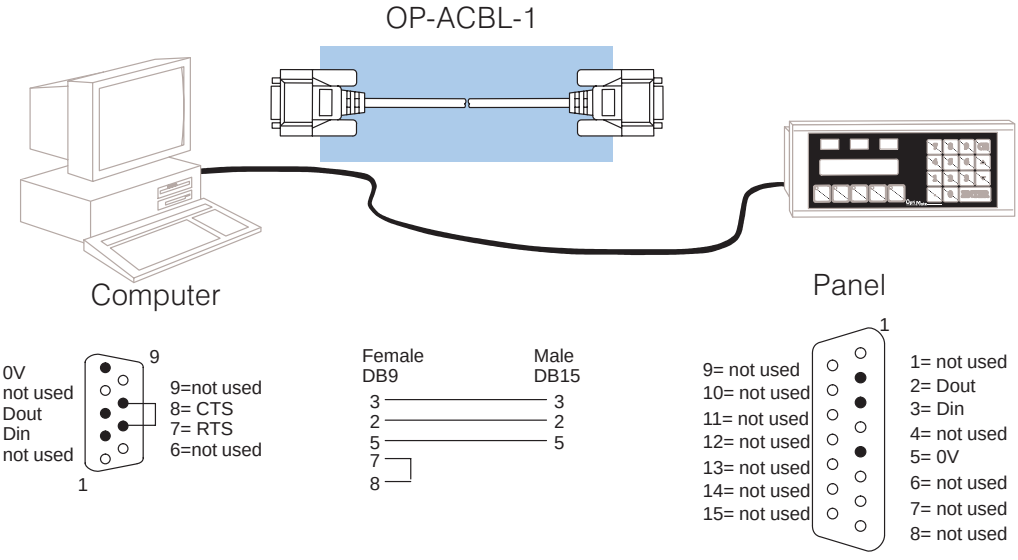
Termination Resistor

(**No. 31**)

NOTE: You must cycle power to the panel to activate the new switch settings.

Configuration Cable

Connect the configuration cable (OP–ACBL–1) between the serial port of the OP-panel and the serial port of the personal computer. The panels may then be configuring using the OP–WINEDIT configuration software. The figure below shows programming cable connectors and wiring specifications. Wiring diagrams refer to the cable connectors, *not* the communication ports.



Preparing the Panel for Communications

Assigning an Address

You can assign any address between 0 and 30 for valid communications to the OP–9001 or CPU. The address is set with the DIP switch block located on the back of the units.

How to Set the Address

The address block contains six slide switches, switch 1 through 5 are used for addressing your Operator panel. The figure below shows the binary-weighted value of each switch. If you are using a single panel configuration, all addresses 0–30 are valid for communicating to the CPU. Remove power from the panel and change switches 1 through 5 to set the desired panel address.

NOTE: Set the panel address between 0–30 for valid communications mode.

In this figure we have selected address No.14, placed switches 2, 3 and 4 to the right (ON), and switches 1 and 5 to the left (OFF).

Example Address Block Setting

SW1 Position	1	2	3	4	5	6
Address Value	**1**	**2**	**4**	**8**	**16**	**T**

(2 + 4+ 8 = 14)

Termination Resistor

TIP: You must cycle power to the OP-panel to activate the new switch settings.

OP- 9001 Multi-Panel Configurations

If you are connecting more than one OptiMate panel to a single CPU this is referred to as Multi-panel configuration. Multi-panel configurations require the OP–9001 Communications Master. The OP–9001 communicates with the CPU as well as the connected OP–panels. The OP–9001 Communications Master looks for an address within the range of 0 to 30 for each panel connected. Each panel connected in an RS-422 link must have a unique address. A more detailed description of multiple panel configurations and installation is given in the OP–9001–M User Manual.

The Termination Resistor

The last panel must be terminated when using an RS-422 communications link by setting switch 6 (ON). Operator panels communicating more than 50 feet distance *must* use RS-422 links. Systems which are using the OP–9001, in a multi-panel application use RS-422 wiring and properly set the terminating switch. Switch 6 is used for terminating an RS-422 communications link.

NOTE: Only the last panel of each RS-422 link should be terminated (switch 6 ON). All other panels must have switch 6 in the OFF position. After changing the DIP switch settings, remember to cycle power on the panel to activate the new switch settings.

Choosing Your Connecting Cables

Depending on which PLC you are using, you may require as many as two cables. Here are the requirements:

- **OP-ACBL-1:** *all* units require this cable for configuration. This is a 9-pin female to 15-pin male cable that connects your personal computer to the OP-panel. This cable is also used to connect an OP-panel to the Allen-Bradley SLC 500 CPUs listed.
- **CPU Cables:** You will also need the appropriate cable to connect your CPU to the OP-panel. Use the chart shown to the right to choose the correct communications cable.

OP-9001 Cable Connectors

If you're planning to use multiple panels and an OP-9001, then you'll need to build your own custom cables. Since the proper cable choice really depends on your application, we offer the following connectors.

- **OP-CMCON–1** — pack of 4 ribbon cable connectors.
- **OP-CMCON–2** — pack of 4 solder-type connectors.
- **OP-CMCON–3** — pack of 2 D–shell connectors with screw terminals for use with OP-9001 & multiple OP-panels.
- **OP-PSCON** — pack of 4 power supply block connectors.

For electrically noisy environments, we recommend an individually paired and shielded cable, such as Belden 9729 or equivalent. This type of cable will require the solder-type or D-shell with screw terminal connectors. If you're going 30 feet or less, you can use ribbon cable. For ribbon cable, we recommend Belden 9L28015 or 3M 3365/15.

OptiMate Cables

Family	CPU (or other device)	Port	Cable
*Direct*LOGIC™ DL105	DL130	Only port	OP–2CBL
*Direct*LOGIC™ DL205	DL230	Only port	OP–2CBL
	DL240	Top port	OP–2CBL
		Bottom port	OP–2CBL
	DL250	Top port	OP–2CBL
		Bottom port	OP–2CBL–1
	D2–DCM (module)	Only port	OP-4CBL–2
*Direct*LOGIC™ DL305	DL330	Requires DCU*	OP–4CBL–2
	DL330P	Requires DCU*	OP-4CBL–2
	DL340	Top port	OP-3CBL
		Bottom port	OP-3CBL
	DL350	Top port	OP-2CBL
		Bottom port	OP-4CBL-2
*Direct*LOGIC™ DL405	DL430	Top port (15-pin)	OP-4CBL–1
		Bottom port (25-pin)	OP-4CBL–2
	DL440**	Top port	OP-4CBL–1
		Bottom port	OP-4CBL–2
	DL450	Phone Jack	OP-2CBL
		Top port (15-pin)	OP-4CBL–1
		Bottom port (25-pin)	OP-4CBL–2
	D4–DCM (module)	Only port	OP-4CBL–2
	Slice I/O panels	Only port	OP-4CBL–1
GE® Series 1	IC610CPU105/106	Requires DCU*	OP-4CBL–2
GE® Series™ 90/30	All Models (311–351)	RS232, RS422 Serial Port	OP-GCBL–1
GE® Fanuc™ Series 90 Micro	All Models	RS232, RS422 Serial Port	OP-GCBL–1
MODICON	ModBus	RJ45 port	OP-MCBL–1
TI305™ / SIMATIC® TI305™	325–07, PPX:325–07	Requires DCU*	OP-4CBL–2
	330–37, PPX:330–37	Requires DCU*	OP-4CBL–2
	325S–07 (or 325 w/ Stage Kt)	Requires DCU*	OP-4CBL–2
	330S–37, PPX:330S–37	Requires DCU*	OP-4CBL–2
	335–37, PPX:335–37	Phone Jacks	OP-3CBL
		If DCU is used*	OP-4CBL–2
TI405™ / SIMATIC® TI405™	425–CPU, PPX:425–CPU **	Only port	OP-4CBL–1
	PPX:430–CPU	Top port (15-pin)	OP-4CBL–1
		Bottom port (25-pin)	OP-4CBL–2
	435–CPU, PPX:435–CPU **	Top port (15-pin)	OP-4CBL–1
		Bottom port (25-pin)	OP-4CBL–2
	Smart Slice™ I/O panels	Only port	OP-4CBL–1
A–B SLC 500	5/03, 5/04	Bottom port	OP-ACBL–1
A-B	MicroLogix	Only port	OP-ACBL–2

* — requires RS232 Data Communications Unit (D3–232–DCU)

** — also DC versions

Connecting Cable Details

Connecting Cable The OP–1500/1510 connecting cable may vary depending on the CPU used. Refer to the previous page to confirm the proper cable is chosen for connecting your PLC.