# OPTIMATE PANELS OVERVIEW



**OP-600 Series**

**OP-400 Series**

**OP-1000 Series**

## Overview

Our Optimate line offers another option for operator interface users. The units offer many features at a low cost.

You can connect the panels to your application by using the configuration software and ladder logic in your program.

## Compatibility

OP-400 series, OP-600 series and OP-1000 series panels all work with DL05, DL06, DL105, DL205, DL305, DL405, Allen-Bradley SLC 5/03, 5/04, 5/05 and MicroLogix 1000/1200/1500 PLCs.

OP-1000 series panels and the OP-9001 also work with GE Fanuc Series 90 Micro, GE 90/30 Series (SNP) and MODBUS (RTU) PLCs.

All panels require setup using our OP-WINEDIT configuration software. Simply choose the proper cable, and particular type of CPU in our configuration software.

A single OP-400 series panel can be used with one CPU port, while single or multiple (up to 31 panels using an OP-9001 communications panel) OP-600 and OP-1000 series panels can be used with one CPU port.

### Choosing the right panel

The following pages show a quick summary of our operator interface panels and the key features associated with them. Here are a few helpful hints to consider as you're reviewing the features:

**Do you need just a simple message display?** If so, look at the OP-420 or OP-440.

**Do you need pushbuttons or panel lamps without message capability?** Then look at the OP-406, OP-609, OP-613, OP-1124(-1), OP-1224 or OP-1212.

**Do you need a simple setpoint panel?** If so, check out the OP-413, OP-414, or OP-613.

**Do you need programmable function keys and a display?** Then look at the OP-420, OP-620, or OP-640.

# OPTIMATE PANELS SPECIFICATIONS

| Optimate Panel Specifications | | | | |
|---|---|---|---|---|
| **Specifications** | **OP-400 Series** | **OP600 Series** | **OP-1000 Series** | **OP-9001** |
| **Units per CPU** | One per port | 1 or multiple (up to 31 with OP-9001) | 1 or multiple (up to 31 with OP-9001) | One per port |
| **Service Power (Input)** | 5VDC | 8-30VDC | | 8-30VDC |
| **Power Consumption** | OP-406  0.25W @ 5VDC<br>OP-413  0.80W @ 5VDC<br>OP-414  0.85W @ 5VDC<br>OP-420  0.58W @ 5VDC<br>OP-440  0.75W @ 5VDC | OP-609  2.4W @ 83-30VDC<br>OP-613  2.2W @ 8-30VDC | OP-1124  10W @ 8-30VDC<br>OP-1212  7W @ 8-30VDC<br>OP-1224  4W @ 8-30VDC | 2W @ 8-30VDC |
| **In-Rush Current** | .35A-.44A for 1ms | 1.5-2.0A for 2ms max. | | n/a |
| **Serial Communication** | PLC port  RS-232 RJ12 | PLC Port RS-232/RS422  15 pin D-sub (female) | | 1-RS-232/422 to PLC<br>2-RS-422 to OP panels<br>(3 DB15 female) |
| **Max. Cable Length** | RS232: 50ft | RS232:  50ft.    RS422/OP-9001:  4000ft | | 4000ft. shielded cable<br>30ft. ribbon cable |
| **Configuration Software** | OP-WINEDIT | | | |
| **Environmental Specifications** | | | | |
| **Enclosure** | NEMA 4 | | | |
| **Agency Approval** | UL,CUL,CE | | | |
| **Operating Temp.** | 32 to 122°F  (0 to 50°C) | | | |
| **Storage Temp.** | -4 to 158°F (-20 to 70°C) | | | |
| **Humidity** | 10-95% R.H. (non-condensing) | | | |

## OP-400 Series
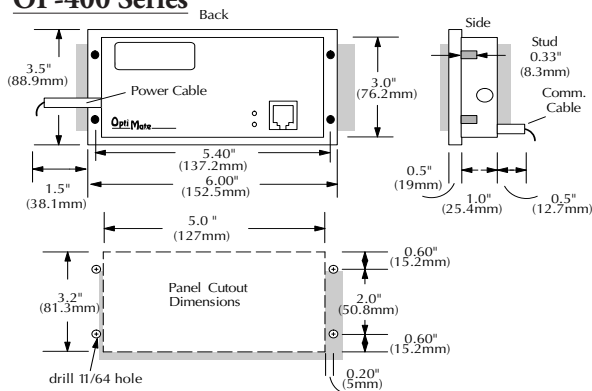


## OP-600 Series
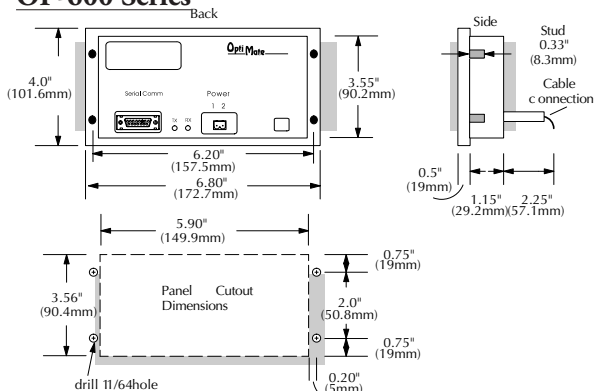


## OP-1000 Series
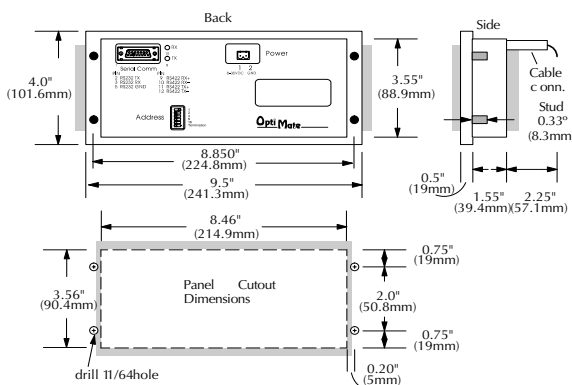


## OP-9001 Series
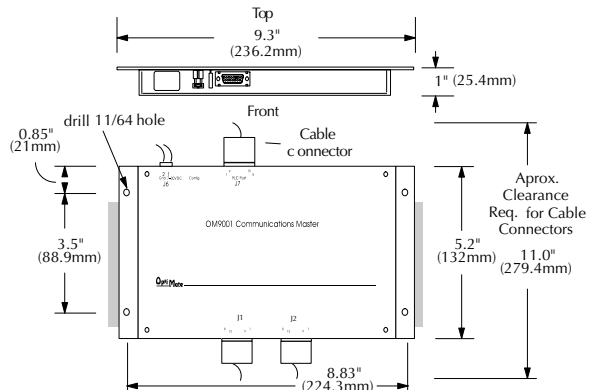
# OPTIMATE 400/600 SERIES

## OP-406

### Indicator/pushbutton panel
- 4 User-defined function keys with LED indicators
- 6 LED annunciator lamps

## OP-413

### Setpoint/display panel
- Read/write 6 PLC data registers with a bank of data locations
- 4-digit numeric display
- Make setpoint adjustments by using select button and arrows to change values

## OP-414

### Setpoint/display panel
- Read/write 6 PLC data registers with a bank of data locations
- 8-digit numeric display, allows BCD double operations
- Make setpoint adjustments by using select button and arrows to change values

## OP-420

### Operator panel
- 2x20 character LCD display
- 4 function keys with LEDs
- Display up to 160 pre-defined messages which reside in the panel's memory

## OP-440

### 4-line display panel
- 4x20 character LCD display with the ability to display text, BCD double, binary and floating-point numbers
- Display up to 160 predefined messages which reside in the panel's memory

## OP-PS400

### Power Supply
- External 5VDC power supply for OP-400 series panels
- Plugs into standard 120VAC receptacle

## OP-609

### Combination panel
- 9 user-defined function keys with LED indicators
- 6 LED annunciator lamps

## OP-613

### Setpoint/display panel
- Read/write 4 PLC data registers with a bank of data locations
- 4-digit numeric display
- Make setpoint adjustments by using select button and arrows to change values
- 4 user-defined function keys with LED indicators
- 2 LED annunciator lamps

# OptiMate 1000 Series

## OP-1124

### Annunciator panel

- 24 high-intensity LED annunciator lamps
- Interchangeable colors (red, green, yellow)
- Create custom labels
- OP-1124-1 comes with one row each of red, yellow and green light bars already installed.

## OP-1224

### Pushbutton panel

- 24 individual pushbuttons with LED indicators
- Create custom labels

## OP-1212

### Combination panel

- 12 high-intensity LED annunciator lamps
- Interchangeable colors (red, green, yellow)
- 12 pushbuttons with LED indicators
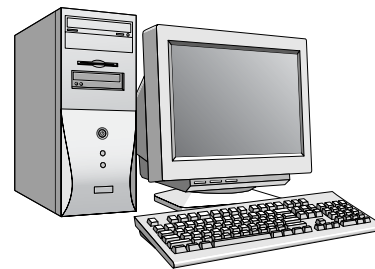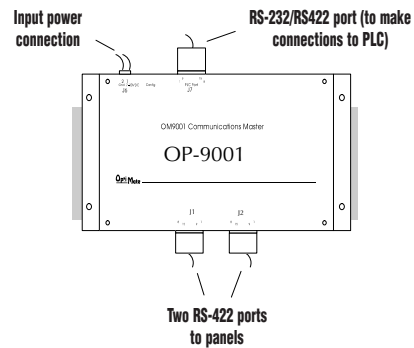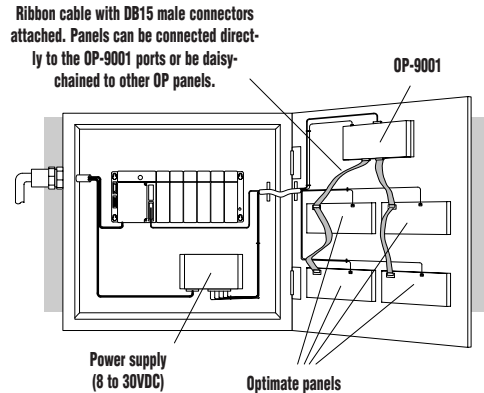- Create custom labels

OPER. INT.

# OPTIMATE ACCESSORIES

## OP-9001

### Communications master

The OP-9001 is a communication master unit for connecting two or more (up to 31) OP-600 and OP-1000 series OptiMate panels to a single CPU communications port. It connects to any *Direct*LOGIC, Allen-Bradley 5/03, 5/04, GE Series 90/30, GE Series 90 Micro, and Modicon (MODBUS) CPU.

*Note: The OP-9001 cannot be used with OP400 series panels.*

The adjacent figure is a typical multi-drop arrangement using an OP-9001 connected to four OptiMate Panels. The OP-9001 is surface-mounted to the cabinet. Notice the adequate space available to route cables and allow for proper clearance. All the panels are configured using OP-WINEDIT software.

Ribbon cable with DB15 male connectors attached. Panels can be connected directly to the OP-9001 ports or be daisy-chained to other OP panels.

OP-9001

Power supply
(8 to 30VDC)

Optimate panels

Input power connection

RS-232/RS422 port (to make connections to PLC)

OM9001 Communications Master

OP-9001

Two RS-422 ports
to panels

## OP-WINEDIT

### Configuration software

All of the OptiMate panels (including the OP-9001 communication master) are configured using the OptiMate OP-WINEDIT configuration software.

OP-WINEDIT software is compatible with computers running Windows 95/98/2000/NT/XP.

Simply load the software onto your personal computer. The simple setup instructions are described in the supplied manual and in the built-in HELP screens. The software allows setup of your complete panel applications, including the type of PLC being used, communications protocol, type of panel (or panels) being used, and in some cases, the format of the message text for the LCD display. Some panels even include the ability to design a menu tree. The setup steps are similar for all OptiMate panels. Use cable OP-CCBL to connect a PC to OP-400 series panels, or OP-ACBL-1 to connect to OP-600 or OP-1000.

*Note: When using the OptiMate 600 series panels (except for the OP-640), OP-WINEDIT software version 2.0 or later is required. When using the OptiMate 400 series panels or the OP-640, version 2.3 or later is required.*
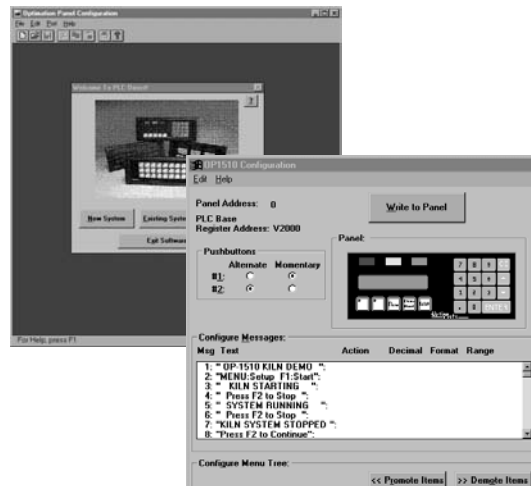
# OptiMate Cables

| Cables for OptiMate Panel-to-PLC Conn | | | | |
|---|---|---|---|---|
| **Family** | **CPU (or other device)** | **Port** | **Cables for 600/1000 Series** | **Cables for 400 Series** |
| *DirectLOGIC™ DL05* | DL05: D0-05 | Port 1 | OP-2CBL | OP-2CBL-2 |
| | | Port 2 | OP-2CBL | OP-2CBL-2 |
| *DirectLOGIC™ DL06* | DL06: D0-06 | Port 1 | OP-2CBL | OP-2CBL-2 |
| | | Port 2 | OP-2CBL-1 | not available*** |
| *DirectLOGIC™ DL105* | DL105: F1-130 | Only one | OP-2CBL | OP-2CBL-2 |
| *DirectLOGIC™ DL205* | D2-230 | Only one | OP-2CBL | OP-2CBL-2 |
| | D2-240 | Top port | OP-2CBL | OP-2CBL-2 |
| | | Bottom port | OP-2CBL | OP-2CBL-2 |
| | D2-250-1 D2-260 | Top port | OP-2CBL | OP-2CBL-2 |
| | | Bottom port | OP-2CBL-1 | not available*** |
| | D2-DCM (module) | Only one | OP-4CBL-2 | not available*** |
| *DirectLOGIC™ DL305* | D3-330 | Requires DCU* | OP-4CBL-2 | not available*** |
| | D3-330P | Requires DCU* | OP-4CBL-2 | not available*** |
| | D3-340 | Top port | OP-3CBL | OP-3CBL-1 |
| | | Bottom port | OP-3CBL | OP-3CBL-1 |
| | D3-350 | Top port | OP-2CBL | OP-2CBL-2 |
| | | Bottom port | OP-4CBL-2 | not available*** |
| *DirectLOGIC™ DL405* | D4-430 | Top port (15-pin) | OP-4CBL-1 | OP-4CBL-3 |
| | | Bottom port (25-pin ) | OP-4CBL-2 | not available*** |
| | D4-440 | Top port | OP-4CBL-1 | OP-4CBL-3 |
| | | Bottom port | OP-4CBL-2 | not available*** |
| | D4-450 | Phone jack | OP-2CBL | OP-2CBL-2 |
| | | Top port (15-pin) | OP-4CBL-1 | OP-4CBL-3 |
| | | Bottom port (25-pin) | OP-4CBL-2 | not available*** |
| | D4-DCM (module) | Only one | OP-4CBL-2 | not available*** |
| | Slice I/O panels | Only one | OP-4CBL-1 | OP-4CBL-3 |
| *GE® Series 1* | IC610CPU105, 106 | Requires DCU* | OP-4CBL-2 | not available*** |
| *GE® Series 90/30* | All models (311-351) | RS422 serial port | OP-GCBL-1** | not applicable |
| *GE® Fanuc™ Series 90 Micro* | All models | RS422 Serial port | OP-GCBL-1** | not applicable |
| *MODICON* | ModBus | RJ45 port | OP-MCBL-1** | not applicable |
| *TI305™/ SIMATIC® TI305™* | 325-07, PPX:325-07 | Requires DCU* | OP-4CBL-2 | not available*** |
| | 330-37, PPX:330-37 | Requires DCU* | OP-4CBL-2 | not available*** |
| | 325S-07 (or 325 w/Stage Kit) | Requires DCU* | OP-4CBL-2 | not available*** |
| | 330S-37, PPX:330S-37 | Requires DCU* | OP-4CBL-2 | not available*** |
| | 335-37, PPX:335-37 | Only one | OP-3CBL | OP-3CBL-1 |
| | | If DCU is used* | OP-4CBL-2 | not available*** |
| *TI405™/ SIMATIC® TI405™* | 425-CPU, PPX:425-CPU | Only one | OP-4CBL-1 | OP-4CBL-3 |
| | 430-CPU, PPX:430-CPU | Top port (15-pin) | OP-4CBL-1 | OP-4CBL-3 |
| | | Bottom port (25-pin) | OP-4CBL-2 | not available*** |
| | 435-CPU, PPX:435-CPU | Top port (15-pin) | OP-4CBL-1 | OP-4CBL-3 |
| | | Bottom port (25-pin) | OP-4CBL-2 | not available*** |
| | Smart Slice™ I/O panels | Only one | OP-4CBL-1 | OP-4CBL-3 |
| *Allen-Bradley™ SLC 500* | 5/03 5/04 | Bottom port | OP-ACBL-1 | OP-ACBL-3 |
| *Allen-Bradley™* | MicroLogix 1000/1200/1500 | Only one | OP-ACBL-2 | OP-ACBL-4 |

**\* Requires RS232 Data Communications Unit (D3-232-DCU)**   **\*\* 1000 series panels only**   **\*\*\* Cables for connecting to these ports must be built by the user. Pinout diagrams are in the OptiMate panel user manual.**

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# DIRECTVIEW 1000



**Clip mount**

**Keypad**

**4-line by 16-character backlit LCD display**

## DV-1000

### Overview

The *Direct*View DV-1000 is an incredibly small, low-cost operator interface. The DV-1000 can be directly connected to DL05, DL06, DL105, DL205, D3-350 or DL405 CPUs. The DV-1000 is a "ladder logic dependent" terminal which relies entirely on PLC ladder logic to perform its functions. The DV-1000 does not require any configuration software. Instead, setup is performed through special reserved memory locations inside of the CPU. These special memory areas tell the DV-1000 which modes to use, and more importantly, where to get its display data. The following functions can be performed by the DV-1000:

**View memory status:** Display up to four variable address values at a time on a single screen.

**View bit status:** Display 32 bits (4 lines of 8 bits) or 64 bits (4 lines of 16 bits) at a time on a single screen. Bit data types can include I/O points, control relays, timer/counter and stage bits.

**Change values of memory locations:** Up to 16 different variable memory values can be changed (32 for DL405). Just move the cursor over the appropriate digit and press the increment (+)/decrement (-) keys.

**Units per CPU:** Only one DV-1000 per CPU.

| Specifications | |
|---|---|
| **Cable Required** | DV-1000CBL or D4-1000CBL. See the following page |
| **Max. Distance** | 15 feet from the CPU |
| **Connector** | Phone jack RJ12 |
| **Power Consumption** | 150mA @ 5VDC max (supplied by PLC communication port) |
| **NEMA Rating** | None |
| **Agency Approval** | UL, CUL, CE |
| **Storage Temp** | -4 to 158°F   (-20 to 70°C) |
| **Operating Temp** | 32 to 122°F   (0 to 50°C) |
| **Humidity** | 5-95% (non-condensing) |
| **Vibration Resistance** | MIL STD 810C Method 514.2 |
| **Shock Resistance** | MIL STD 810C Method 516.2 |
| **Noise Immunity** | NEMA (ICS3-304) |
| **Atmosphere** | No corrosive gases |
| **Manufacturer** | Koyo Electronics |

| Part Number | Price | Description |
|---|---|---|
| **DV-1000** | check | *Direct*VIEW 1000 Timer/Counter access unit for *DirectLOGIC* PLCs |
| **DV-1000CBL** | check | Shielded cable to connect to *DirectLOGIC* PLCs, (RS-232C) |
| **D4-1000CBL** | check | Shielded cable to connect to 15-pin port on DL405 PLCs (RS232C) |

**Display user-defined messages, even with embedded V-memory values:** Each line may contain a maximum of four embedded values. Messages are stored in CPU variable memory. Therefore, the number of messages is limited only by available CPU variable memory.

**Display system-defined error messages and user-defined fault messages even in list format:** Scroll through errors and messages. Error logs can even show time and date stamps on D0-06, D2-240, D2-250-1, D2-260, D3-350, D4-440, D4-450 CPUs.

### Is the DV-1000 right for you?

The DV-1000 is best suited for displaying information and occasionally changing setpoint parameters. To use the DV-1000 you should be very comfortable with ladder logic programming. If you're looking for an operator control panel, you should consider the EZTouch or EZText panels. They are better suited for applications that require operator interaction as a normal part of operation.

### Which CPU is best to use with the DV-1000?

The DL05, DL105, DL06, D2-240, D2-250-1, D2-260, D3-350, D4-440, and D4-450 have ACON instructions that make the DV-1000 easier to work with. The DL105 and D2-230 have only one communication port, which can be a limitation in some cases. The DV-1000 does not work with D3-330 or D3-340 CPUs.

# DV-1000 DIMENSIONS AND INSTALLATION

The DV-1000 is designed to easily snap into a rectangular cutout in a control panel or other surface panel. On each side of the housing there is a retention clip to keep the unit in place after installation. There are no provisions for mounting screws, so if your particular application is subject to high amounts of vibration, this may be a factor in your selection process. The drawing gives the physical dimensions of the DV-1000 housing.

The panel cut-out dimensions provide necessary clearance for the body of the unit and allow the outer housing bezel to cover the edges of the cut-out for a nice finished appearance. The optimum panel thickness for using the retention clips is 1/16" to 1/8".
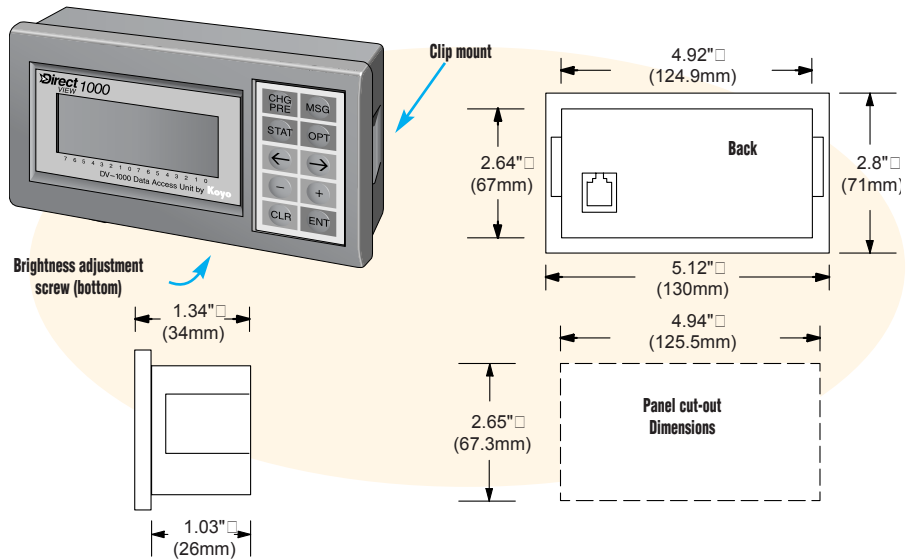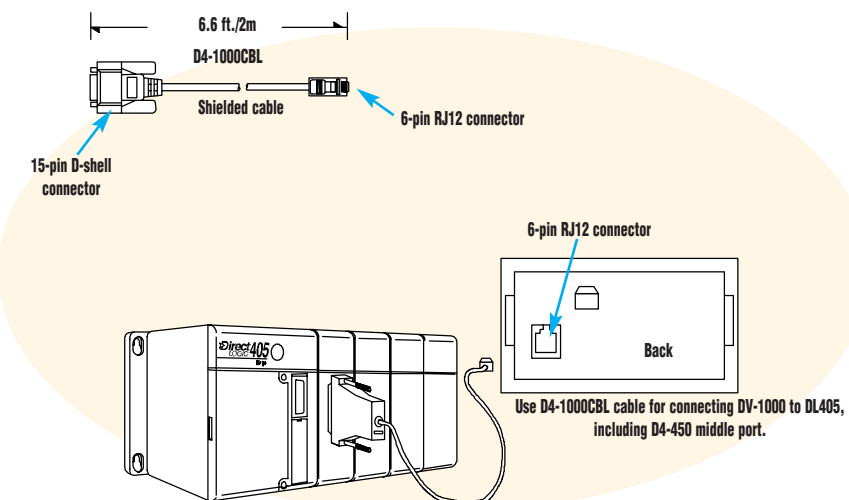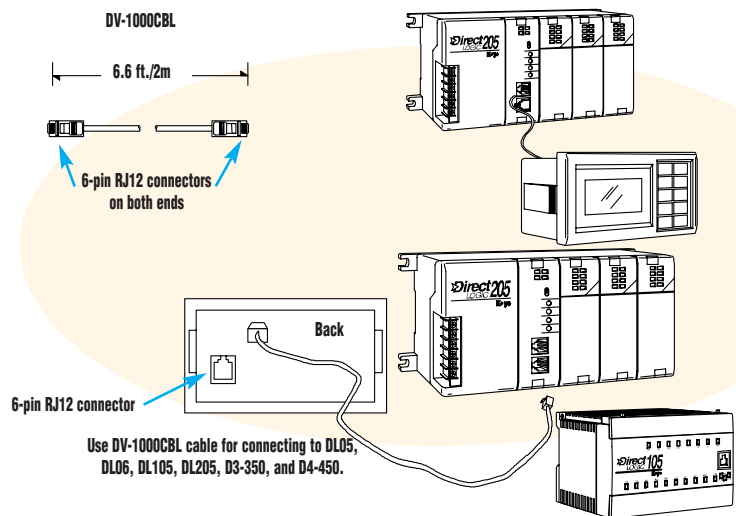
## Cabling requirements

Since the DV-1000 only works with the DL05, DL06, DL105, DL205, D3-350 and DL405 CPUs, your cabling choices are fairly simple.

- **DV-1000CBL** — connects to DL05, DL06, DL105, DL205, D3-350 and D4-450 phone jack.
- **D4-1000CBL** — connects to all DL405 CPU 15-pin ports.

Maximum cable length of 15 feet between the DV-1000 and the PLC is recommended.

The DV-1000 can be connected to a DL205 or DL405 DCM, but you have to build your own cable.

Clip mount

4.92" (124.9mm)

Back

2.64" (67mm)

2.8" (71mm)

5.12" (130mm)

1.34" (34mm)

4.94" (125.5mm)

Panel cut-out Dimensions

2.65" (67.3mm)

Brightness adjustment screw (bottom)

1.03" (26mm)

DV-1000CBL

6.6 ft./2m

6-pin RJ12 connectors on both ends

6-pin RJ12 connector

Back

Use DV-1000CBL cable for connecting to DL05, DL06, DL105, DL205, D3-350, and D4-450.

6.6 ft./2m

D4-1000CBL

Shielded cable

6-pin RJ12 connector

15-pin D-shell connector

6-pin RJ12 connector

Back

Use D4-1000CBL cable for connecting DV-1000 to DL405, including D4-450 middle port.