OP-414

Setpoint Panel

Manual Number OP-414-M

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To minimize the risk of potential safety problems, you should follow all applicable local and national codes that regulate the installation and operation of your equipment. These codes vary from area to area and usually change with time. It is your responsibility to determine which codes should be followed, and to verify that the equipment, installation, and operation is in compliance with the latest revision of these codes.

At a minimum, you should follow all applicable sections of the National Fire Code, National Electrical Code, and the codes of the National Electrical Manufacturer's Association (NEMA). There may be local regulatory or government offices that can also help determine which codes and standards are necessary for safe installation and operation.

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Manual Revisions

If you contact us in reference to this manual, be sure and include the revision number.

Title: OP-414 Setpoint Panel User Manual
Manual Number: OP-414-M

Issue	Date	Effective Pages	Description of Changes
Original	8/99	All	Original Issue

EU Information

This product is manufactured in compliance with European Union (EU) Directives and carries the CE mark. The following information is provided to comply with EU documentation requirements.

NOTE: Products with CE marks perform their required functions safely and adhere to relevant standards as specified by EU directives provided they are used according to their intended purpose and that the instructions in this manual are adhered to. The protection provided by the equipment may be impaired if this equipment is used in a manner not specified in this manual. Only replacement parts supplied by ***Automationdirect.com*** or its agents should be used. A listing of international affiliates is available at our Web site: **www.automationdirect.com**.

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SELV Circuits

All electrical circuits connected to the communications port receptacle are rated as Safety Extra Low Voltage (SELV).

Environmental Specifications

Operating Temperature	0° to 50° C
Storage Temperature	-20° to 70° C
Operating Humidity	95% (non-condensing)
Air Composition	No corrosive gases permitted

Preventative Maintenance and Cleaning

No preventative maintenance is required. To clean the exterior of the panel disconnect the input power and carefully wipe the panel with a cloth moistened with plain water.

External Fuse Protection for Input Power

There are no internal fuses for the input power circuits, so external circuit protection is needed to ensure the safety of service personnel and the safe operation of the equipment itself. To comply with EU specifications, the input power must be fused. Use a fuse rated at **twice** the input current rating of the panel. For example, if the panel has an input current rating of 0.5 amperes, use a fuse rated for 1 ampere.

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Getting Started

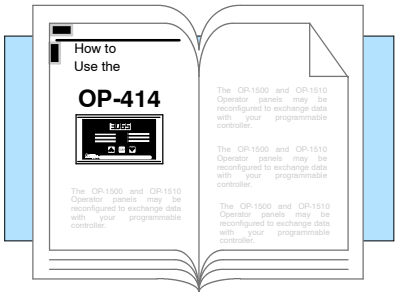
In This Chapter. . . .

- Introduction
- Conventions Used
- OP-414 Overview
- Frequently Asked Questions

Introduction

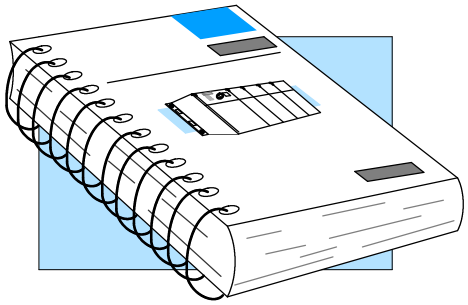
The Purpose of this Manual

Thank you for purchasing an OP-414 OptiMate panel. This User Manual shows you how to install, configure, and program the OP-414. Also included are application examples. Be sure to keep this manual handy for reference when you run into questions. If you understand PLC systems and operator interface units, this manual will provide all the information that you need to get and keep your panel up and running.



Supplemental Manuals

Reference the appropriate PLC/CPU user manuals for the commands and address references required for your system. If you are using a ***Direct***LOGIC PLC product, you will want to keep the ***Direct***SOFT User Manual handy while programming your system. For *other* PLC brands you must reference their user manuals to properly program the ladder logic required to operate the OP-panel.



Technical Support

We realize that even though we strive to be the best, we may have arranged our information in such a way that you cannot find what you are looking for. First, check these resources for help in locating the information:

- **Table of Contents** – chapter and section listing of contents, in the front of this manual
- **Quick Guide to Contents** – chapter summary listing on the next page

You can also check our online resources for the latest product support information:

- **Internet** – the address of our Web site is ***http://www.automationdirect.com***

If you still need assistance, please call us at 770-844-4200. Our technical support group will be glad to work with you in answering your questions. They are available Monday through Friday from 9:00 A.M. to 6:00 P.M. Eastern Standard Time. If you have a comment or question about any of our products, services, or manuals, please fill out and return the 'Suggestions' card that was shipped with this manual.

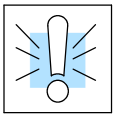
Chapters

The main contents of this manual are organized into the following five chapters:

1	**Getting Started**	Introduces the physical and functional characteristics. Discusses pushbuttons and the LCD display. Also provides introduction to planning your system.
2	**Installation and Specifications**	Shows how to prepare for system installation, including specifications and mounting instructions. Includes connecting cables part numbers and specifications.
3	**Understanding the Features**	Explains the features and functions of the OP-414. Teaches concept of how data is exchanged between the panel and the PLC. Also discusses the function of the status register.
4	**Configuring the Operator Panel**	Shows how to use the OP-WINEDIT configuration software to configure your panel. Shows how to load the software on your personal computer, call up the screens you will need and how to download the configuration program to your panel.
5	**Programming Examples**	Provides example programs for using the standard functions and features. These examples include ladder logic for implementing pushbuttons and messages using ***Direct***LOGIC compatibles and Allen-Bradley SLC 5/03, 5/04 and Micrologix CPUs. Also includes troubleshooting information.

Conventions Used

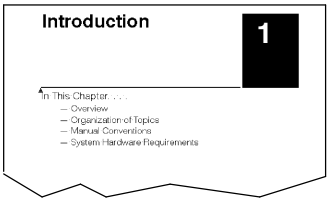
When you see the "notepad" icon in the left-hand margin, the paragraph to its immediate right will be a **special note**.
The word **NOTE:** in boldface will mark the beginning of the text.



When you see the "exclamation mark" icon in the left-hand margin, the paragraph to its immediate right will be a **warning**. This information could prevent injury, loss of property, or even death (in extreme cases).
The word **WARNING:** in boldface will mark the beginning of the text.

Key Topics for Each Chapter

The beginning of each chapter will list the key topics that can be found in that chapter.

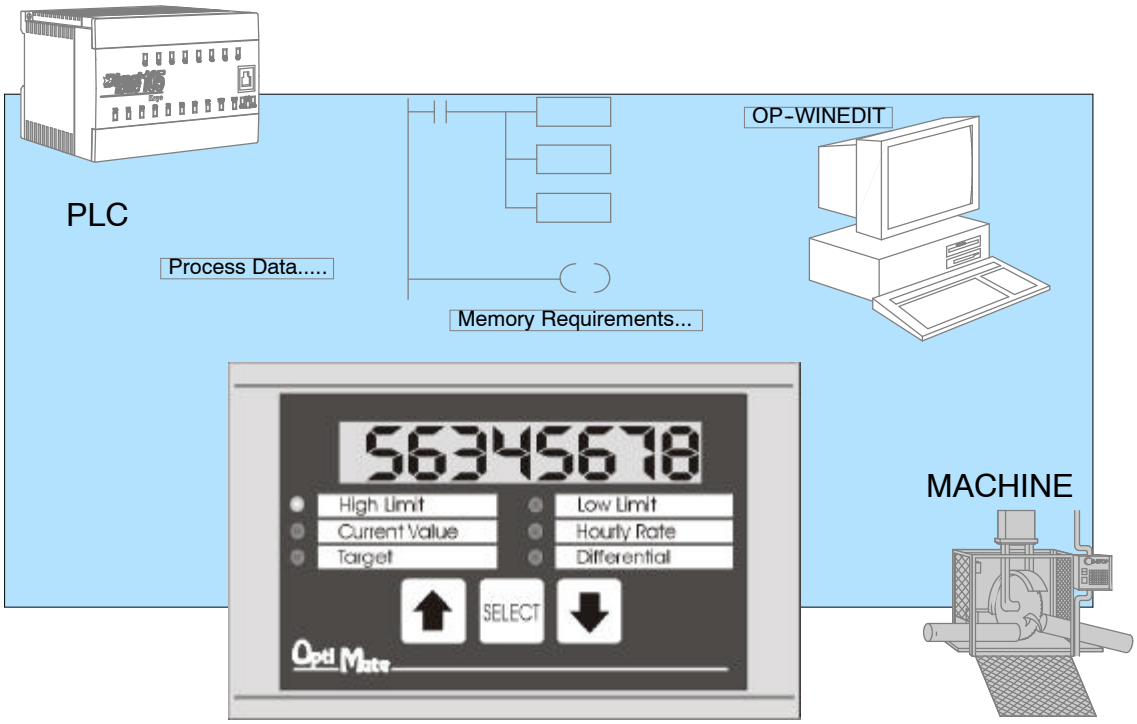


OP-414 Overview

Plan your System

Let's look at the OP-414 operator panel and its individually supported features. As you continue through this manual, try to relate the examples to your Operator Panel application.

It is important to read and understand all topics discussed before installing, configuring and programming your application. You should plan your system with all operator interface requirements in mind.



General Panel Information

The OP-414 operator panel provides a man-machine interface to your PLC automation system. This panel is *not* designed for applications which demand large amounts of operator data entry. The panel communicates with your PLC using RS-232 serial communication. Details on configuration software and programming your operator panel are covered in later chapters. All OP400 series panels can only be used in a stand alone fashion (one panel can be used with each CPU RS232 port). They cannot be used in multi-panel applications.

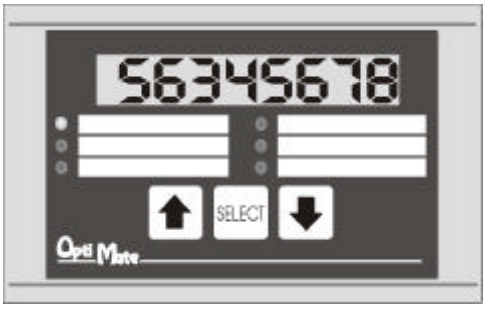
LED Numeric Display

The OP-414 features an eight digit LED numeric display to show user-defined PLC setpoints or current values. Up to 6 setpoints or current values may be configured and displayed using the OP-WINEDIT configuration software.

SELECT Button and Up/Down Arrows

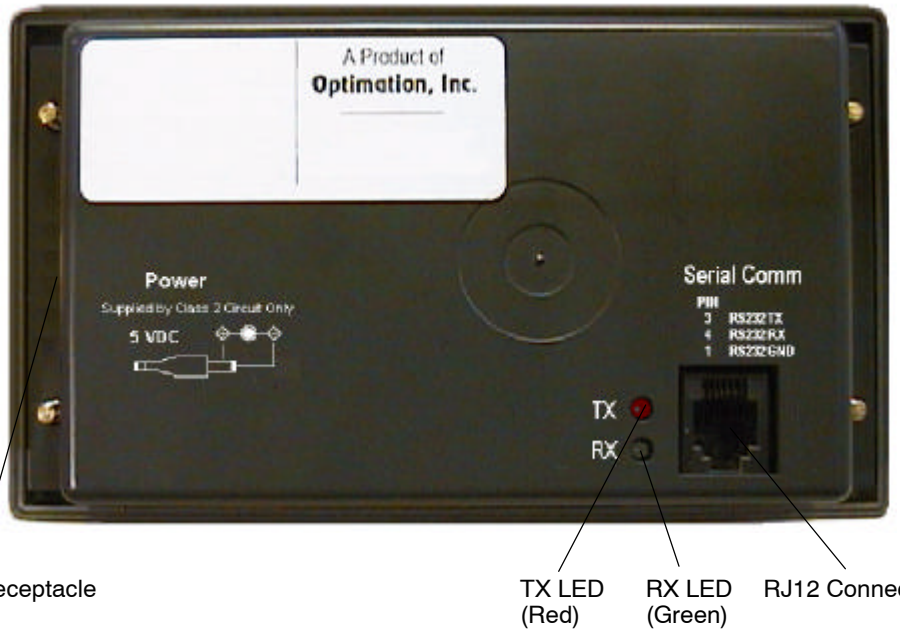
Press the SELECT button to select location to change or view.

Press Up or Down arrows to change setpoints.



Back-Panel Layout

The back side of the OP-414 contains a serial communications port with transmit (TX) and receive (RX) LEDs and a power receptacle.



Serial Communications Port

The serial communications port is a 6-pin RJ12 connector, which supports RS-232 interface wiring. This port is used for communications between the OP-panel and PLC, as well as for programming your panel configurations.

The OP-414 can also draw +5VDC input power through this port through the communications cable when using a DL05, DL105, DL205 or DL405 PLC. In this case, the OP-PS400 power supply is only needed for configuration.

Power Receptacle

The center-negative connector is located on the side of the panel, and is used to connect the OP-PS400 power supply. This power supply is used when configuring the panel. It is also used to power the panel when the panel is connected to any CPU that does not supply +5VDC from the communications port.

Frequently Asked Questions

Q. What is required to get started using the OP-414 in my application?

A. You must read this manual and understand the OP-panel requirements and application concepts. You must have programming knowledge for the PLC product you're using, the PLC serial communications capabilities which are available, as well as hook-up and connecting cable data.

Q. How do I configure the OP-414 operator panel?

A. Using the OP-WINEDIT configuration software. This software allows you to configure the OP-panels in a Microsoft Windows ™ environment. You may configure your programs offline, upload, and/or download them to your OptiMate panel. The OP-WINEDIT software is provided with installation documentation and Help screens.

NOTE: OP-WINEDIT version 2.3 or later is required when using OP400 series panels.

Q. Can the OP-414 be used with other PLC products?

A. Yes. The OP400 units do support Allen-Bradley SLC 5/03, SLC 5/04, and Micrologix.

Q. Can I connect more than one OP-414 panel to one PLC/CPU?

A. Yes, but only if the CPU has more than one communications port. OP400 series panels can only be used in a stand alone fashion; that is, one panel can be used with one CPU port. OP600 and OP1000 series panels can be used in multiple panel applications (even if the CPU has only a single communications port) with an OP-9001 communications panel.

Q. What are the power supply requirements for the OP-414?

A. The OP400 series panels require 5 VDC input power. A 5 VDC external power supply that plugs into a standard 120 VAC receptacle is available (part no. OP-PS400). This power supply (or equivalent, but it **must have** a center negative power jack) is required for configuring your panel. It is also required for operation **unless** you are using a DL05, DL105, DL205 or DL405 PLC; these products supply 5 VDC through the communications cable. All other PLCs, including DL305 CPUs, require the use of an external 5 VDC power supply.

Q. Will the OP-panels support graphics, animation, or color operator display screens?

A. No, the OP-panels which support display capabilities allow numeric data display, and some panels will also allow text message display.

2

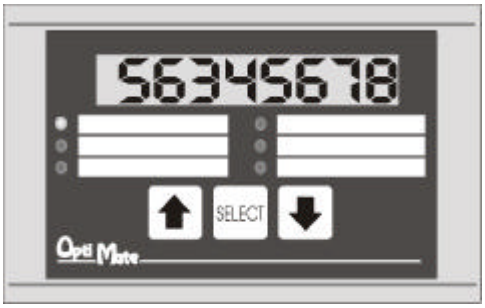
Installation and Specifications

In This Chapter. . . .

Labeling the Field Points

Labeling the Field Points

Labeling the OP-414 panel is a relatively simple process that involves removing the bezel and sliding a label transparency into a pocket in the panel overlay. 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.



Creating the Labels

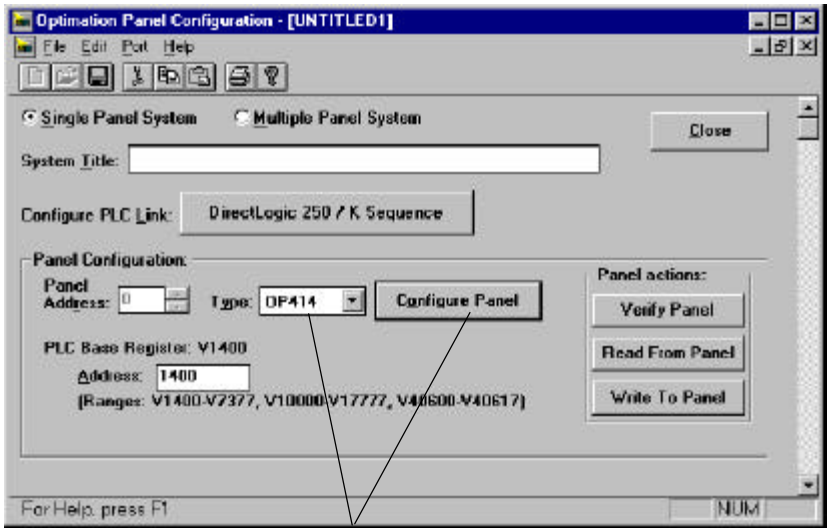
The easiest way to create labels is to use the built-in label making function of the OP-WINEDIT configuration software. This is the preferred method and is shown next. The labels can also be created manually using the template shown on page NO TAG. Here are some ways of manually creating labels:

- Use a computer graphics program and a laser printer to create the transparency directly, or print the labels on paper and photocopy them to a transparency sheet.
- Use press-on letters on a transparency sheet.
- Use a typewriter or lettering machine, or use press-on letters to create labels on a paper sheet, then photocopy the paper sheet onto a transparency sheet.

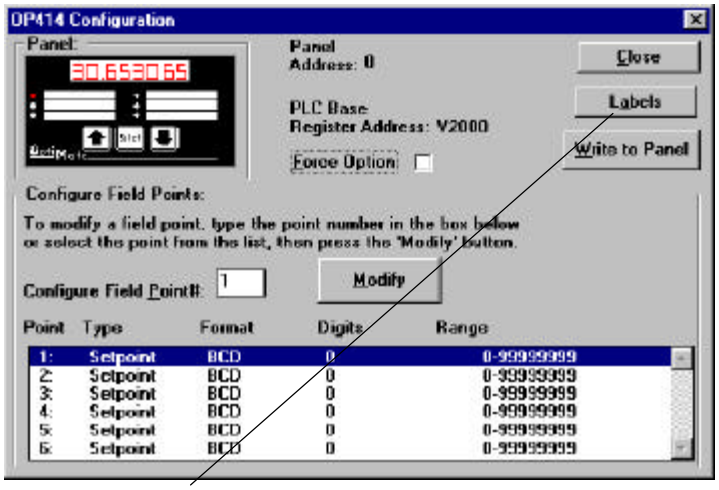
Creating Labels Using OP-WINEDIT

Making labels using the OP-WINEDIT configuration software is easy (see Chapter 4 for information on loading and using OP-WINEDIT). After loading OP-WINEDIT, follow these steps:

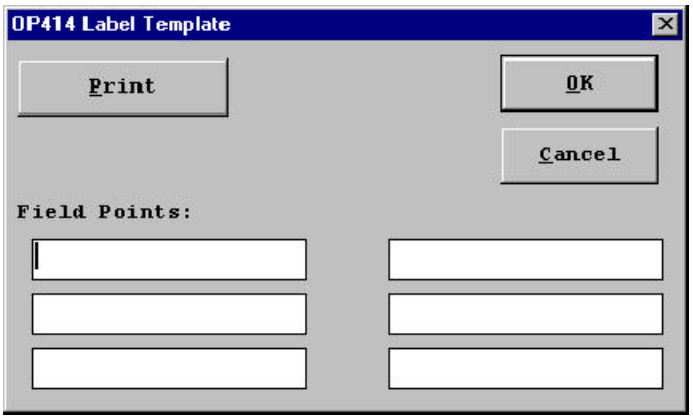
1. Open OP-WINEDIT and select **New System.**



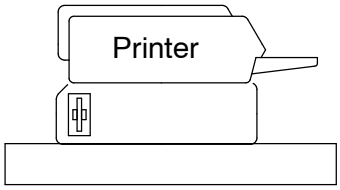
2. Select **OP-414**, and **Configure Panel.**

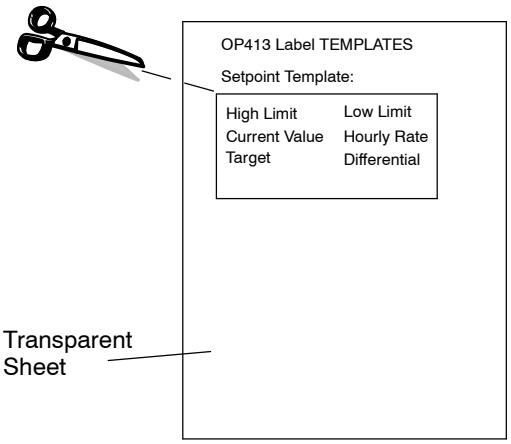


3. Select **Labels.**



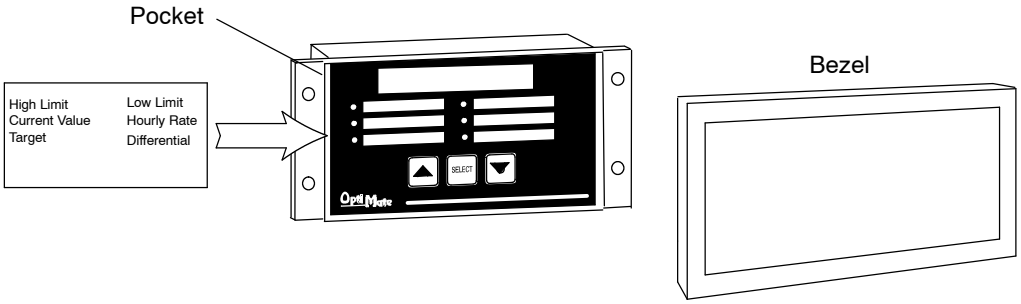
4. The OP-414 Label Template appears. Type in the label text for all six Field Points. Press **OK** to save the labels.





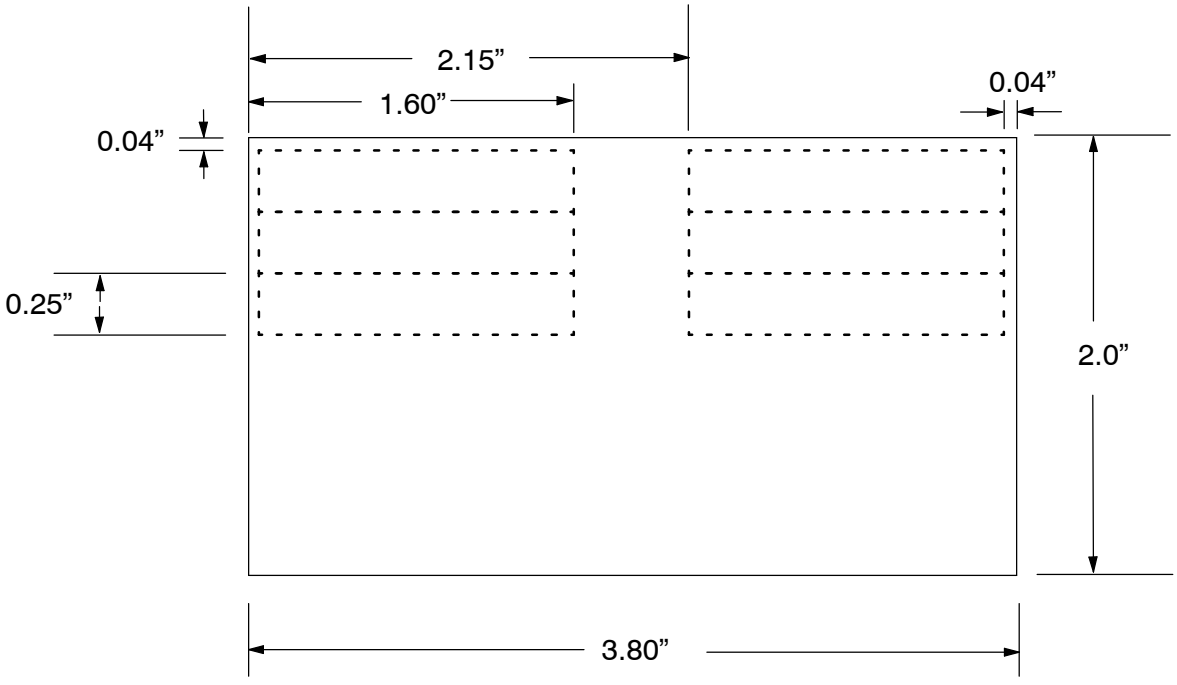
5. **Print** label on transparent film.

6. Cut out the block of labels and insert them in the panel.

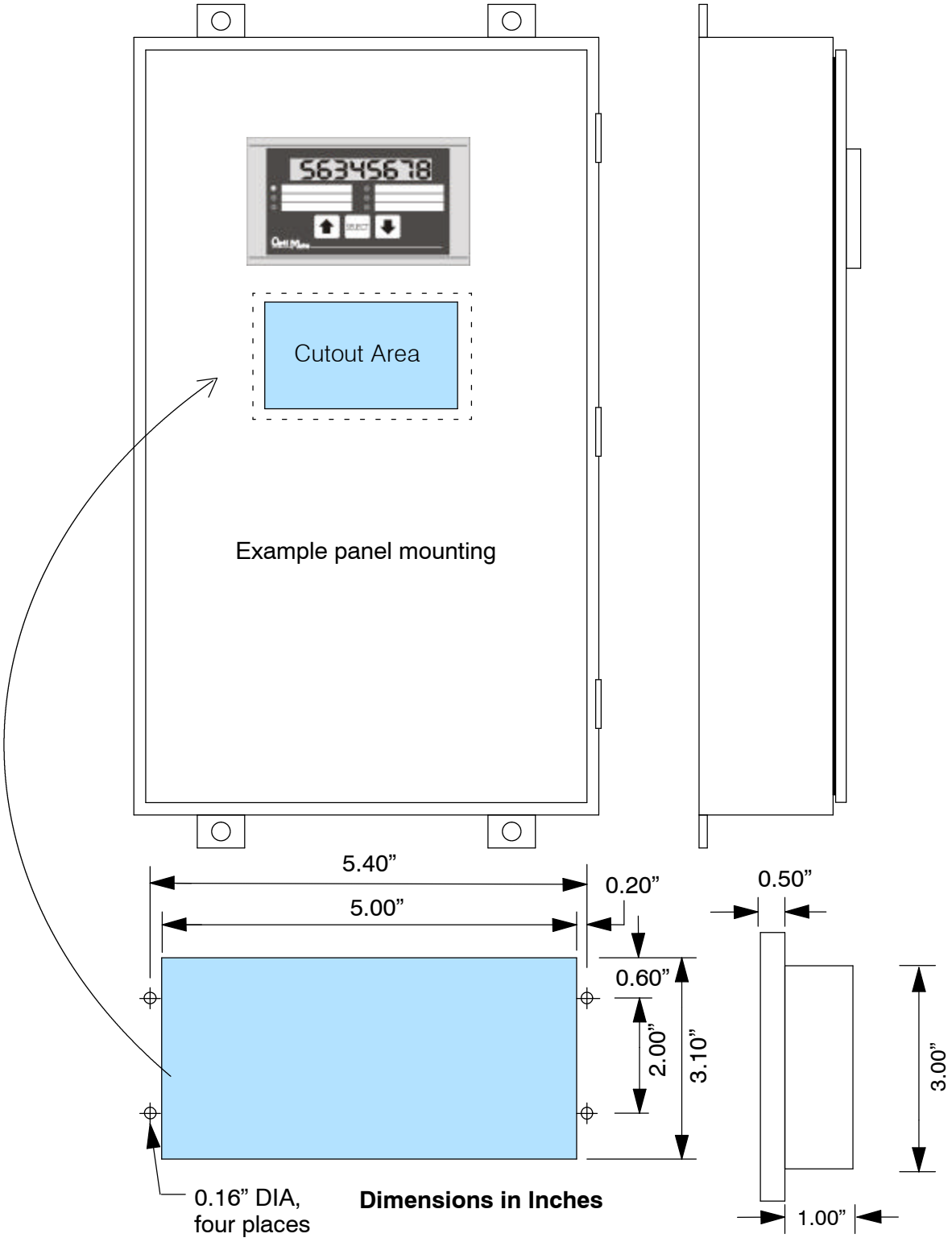


Remove the bezel from the module by unsnapping the four plastic tabs which hold the bezel to the module frame. Locate the pocket, and carefully slide the labels into place. Re-attach the bezel by snapping the bezel onto the case.

Template for Manually Creating Labels



Dimensions for Mounting



Panel Specifications

Physical Specifications

Weight	8 ounces
Panel Fasteners	Four 6x32 threaded studs
Pushbutton Life	1,000,000 switch cycles
Numeric LED Size	10.2mm high x 5.7mm wide
NEMA Rating	NEMA 4 (when properly installed)

Environmental Specifications

Operating Temperature	0° to 50° C
Storage Temperature	–20° to 70° C
Operating Humidity	95% (non-condensing)
Air Composition	No corrosive gases permitted

Operating Specifications

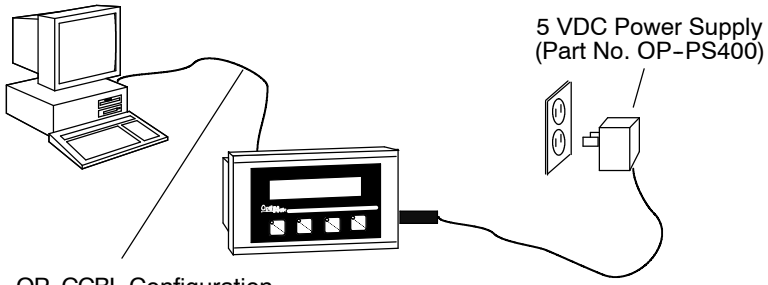
Power Consumption	0.85W @ 5 VDC (Power On surge of 0.35 A for 1 ms max.)
Power Connector	Three terminal DC power plug, center negative
Power Supply	+5 VDC external power supply required for configuration on all panels; required for operation on all PLCs **except** DL05, DL105, DL205 and DL405.
Minimum/Maximum Supply Voltage	+5 VDC only
Diagnostics	LED Status
Communication Link	RS-232 4800 to19200 baud 6-pin RJ12 phone jack type connector

Power Supply Connections

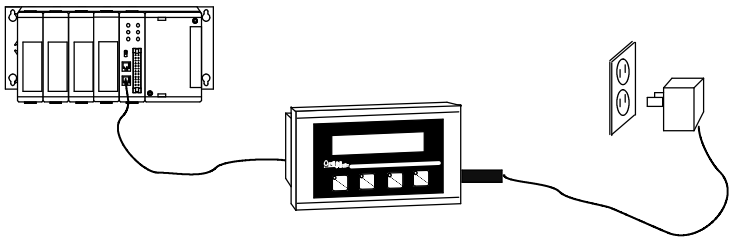
OP400 series panels require +5 VDC input power. An optional 5 VDC external power supply that plugs into a standard 120 VAC receptacle is available (part no. OP-PS400). This power supply (or equivalent) is required for configuring your panel. It is also required for operation **unless** you are using a DL05, DL105, DL205 or DL405 PLC; these products supply 5VDC through the communications cable. All other PLCs, including DL305 and Allen-Bradley 5/03, 5/04 and Micrologix, require the use of an external 5VDC power supply during operation.

NOTE: Only use a 5 VDC power supply that has a **center negative** DC power jack.

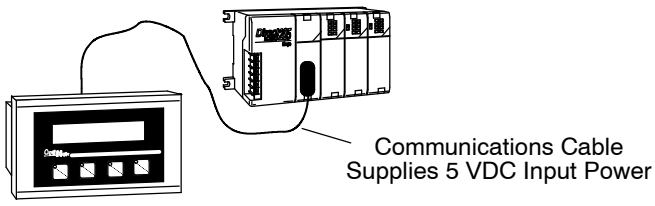
Configuration: 5 VDC Power Supply Required For Configuring **All** 400 series panels



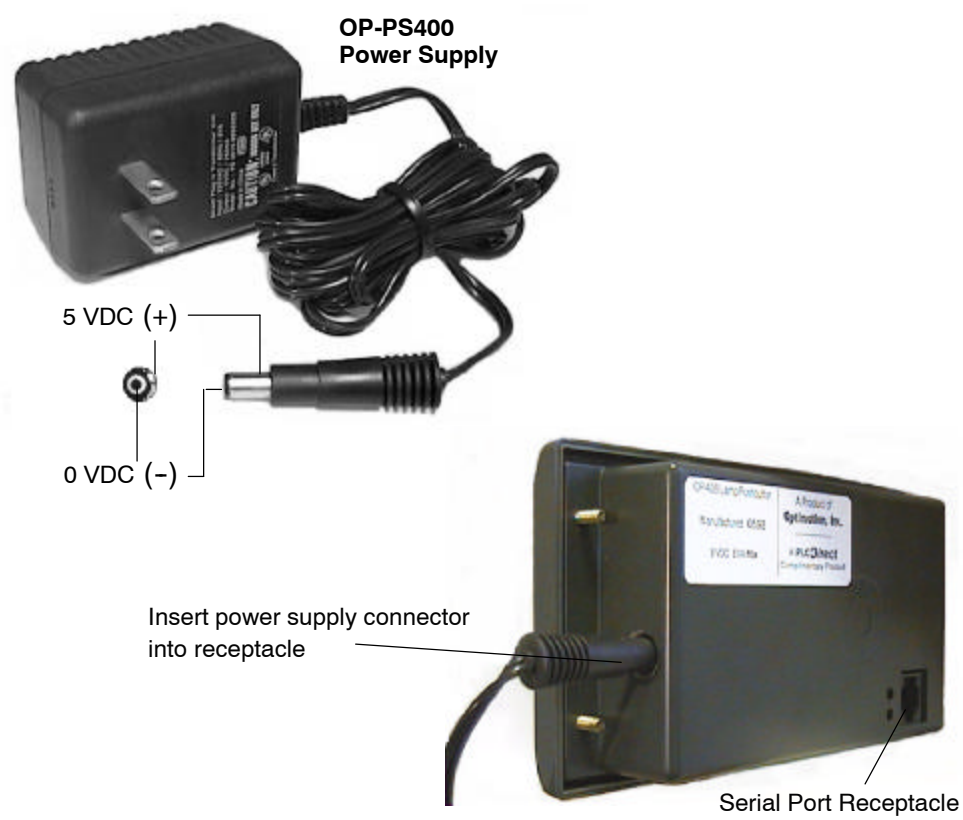
Operation Using a D3-340, D3-350, D3-330 w/DCU, Bottom Port of DL405 or Allen-Bradley CPU: 5 VDC Power Supply Required



Operation Using a DL05, DL105, DL205, or Top Port of DL405 CPU: 5 VDC Power Supply Not Required



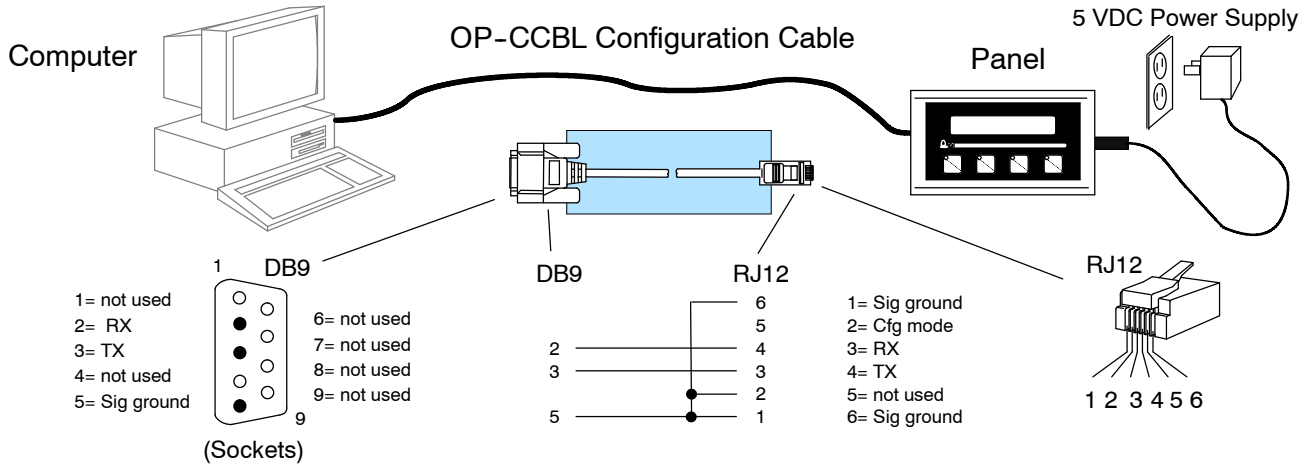
Power Supply Connections



Connecting the Configuration Cable

Configuration Cable

You will need two cables to use your OP-panel: A configuration cable (part number OP-CCBL) and a communications cable. Connect the configuration cable between the serial port on the rear of the OP-panel and the serial port of the personal computer. The panel may then be configured using the OP-WINEDIT configuration software. The figure below shows configuration cable connectors and wiring specifications. The wiring diagram refers to the cable connectors, *not* the communication ports. This cable is disconnected after configuration.



Selecting a Communications Cable

After configuration, connect the communications cable between the OP-panel and the PLC. Use the following table to select the proper communications cable.

Cables for OP400 Series OptiMate Panel-to-PLC Connections			
Family	**CPU (or other device)**	**Port**	**Cable**
DirectLOGIC™ DL05	D0-05xx	Ports 1 and 2	OP-2CBL-2
DirectLOGIC™ DL105	F1-130	Only one	OP-2CBL-2
DirectLOGIC™ DL205	D2-230	Only one	OP-2CBL-2
	D2-240	Top port	OP-2CBL-2
		Bottom port	OP-2CBL-2
	D2-250	Top port	OP-2CBL-2
		Bottom port	* (see note below)
	D2-DCM (module)	Only port	* (see note below)
DirectLOGIC™ DL305	D3-330	Requires DCU	* (see note below)
	D3-330P	Requires DCU	* (see note below)
	D3-340	Top port	OP-3CBL-1
		Bottom port	OP-3CBL-1
	D3-350	Top port	OP-2CBL-2
		Bottom port	* (see note below)
DirectLOGIC™ DL405	D4-430	Top port (15-pin)	OP-4CBL-3
		Bottom port (25-pin)	* (see note below)
	D4-440	Top port	OP-4CBL-3
		Bottom port	* (see note below)
	D4-450	Phone Jack	OP-2CBL-2
		Top port (15-pin)	OP-4CBL-3
		Bottom port (25-pin)	* (see note below)
	D4-DCM (module)	Only port	* (see note below)
	Slice I/O panels	Only one	OP-4CBL-3
TI305™ / SIMATIC® TI305™	325-07, PPX:325-07	Requires DCU	* (see note below)
	330-37, PPX:330-37	Requires DCU	* (see note below)
	325S-07 (or 325 w/ Stage Kt)	Requires DCU	* (see note below)
	330S-37, PPX:330S-37	Requires DCU	* (see note below)
	335-37, PPX:335-37	Phone Jacks	OP-3CBL-1
		If DCU is used	* (see note below)
TI405™ / SIMATIC® TI405™	425-CPU, PPX:425-CPU	Only one	OP-4CBL-3
	PPX:430-CPU	Top port (15-pin)	OP-4CBL-3
		Bottom port (25-pin)	* (see note below)
	435-CPU, PPX:435-CPU	Top port (15-pin)	OP-4CBL-3
		Bottom port (25-pin)	* (see note below)
	Smart Slice™ I/O panels	Only one	OP-4CBL-3
Allen-Bradley™ SLC 500	5/03, 5/04	Bottom port	OP-ACBL-3
Allen-Bradley	MicroLogix	Only one	OP-ACBL-4

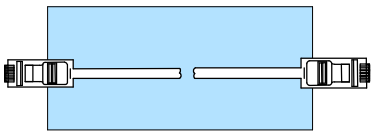
* **Note:** Pre-assembled cables for connecting to these ports are not supplied by **Automationdirect.com**; however, you can use the cable pinout diagrams in the following section to make your own cables.

Communications Cable Details

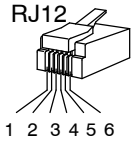
The drawings on this page are for cables which **are** supplied by **Automationdirect.com**. Use this page if you need to make your own cables. We recommend using 22 AWG shielded cable.

OP400 Series Communications Cables

OP-2CBL-2
(DL05, DL105, DL205, D3-350, D4-450)

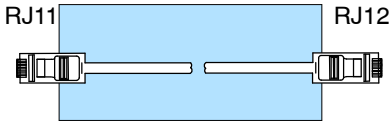


1= Sig ground
2= 5 VDC
3= RX
4= TX
5= not used
6= Sig ground

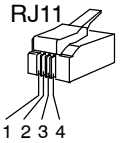


RJ12 (PLC)	RJ12 (Panel)
1	6
2	5
3	4
4	3

OP-3CBL-1 (D3-340)

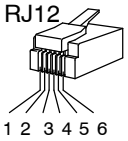


1= RX
2= TX
3= not used
4= Sig ground



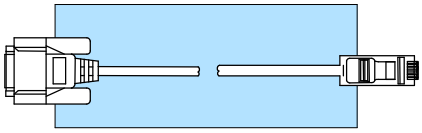
RJ11 (PLC)	RJ12 (Panel)
1	4
2	3
4	1

Panel Connection



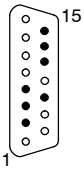
1= Sig ground
2= not used
3= RX
4= TX
5= 5 VDC
6= Sig ground

OP-4CBL-3 (DL405)



DB15

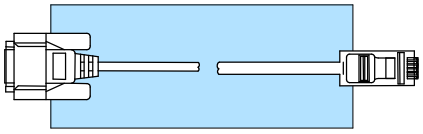
8= not used
7= not used
6= not used
5= not used
4= Sig ground
3= RX
2= TX
1= not used



15=Sig ground
14= Sig ground
13=Sig ground
12= not used
11= 5 VDC
10= not used
9= not used

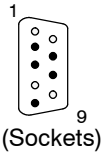
DB15 (PLC)	RJ12 (Panel)
2	3
3	4
11	5
4	1
13	6
14	
15	

OP-ACBL-3
(Allen-Bradley)



DB9

1= not used
2= RX
3= TX
4= not used
5= Sig ground



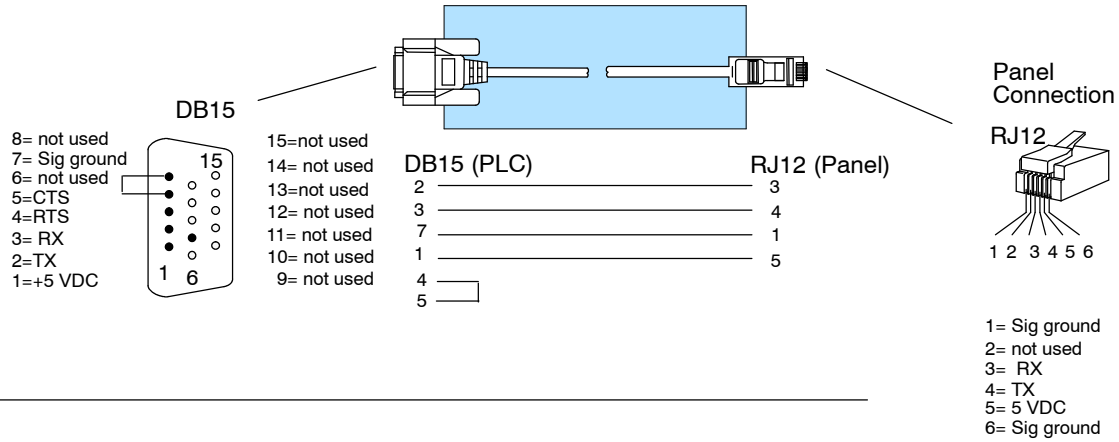
6= not used
7= RTS
8= CTS
9= not used

DB9 (PLC)	RJ12 (Panel)
2	4
3	3
5	1
7	6
8	

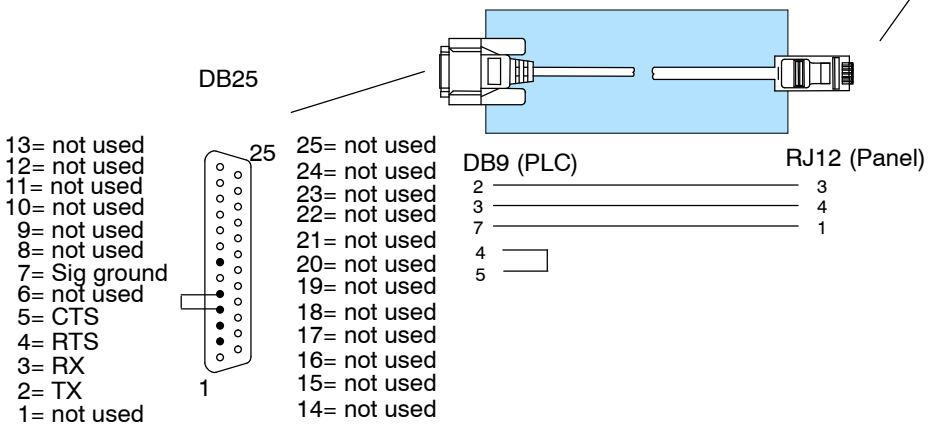
The drawings on this page are for cables which **are not** supplied by **Automationdirect.com**. Use the drawings to make your own cable. We recommend using a 22 AWG or larger shielded cable.

OP400 Series Communications Cables (continued)

Make this cable for use with D2-250 15-pin bottom port.



Make this cable for use with D3-330 w/DCU, D3-350, DL405 bottom ports, and all DCM modules (25-pin ports).



3

Understanding the Features

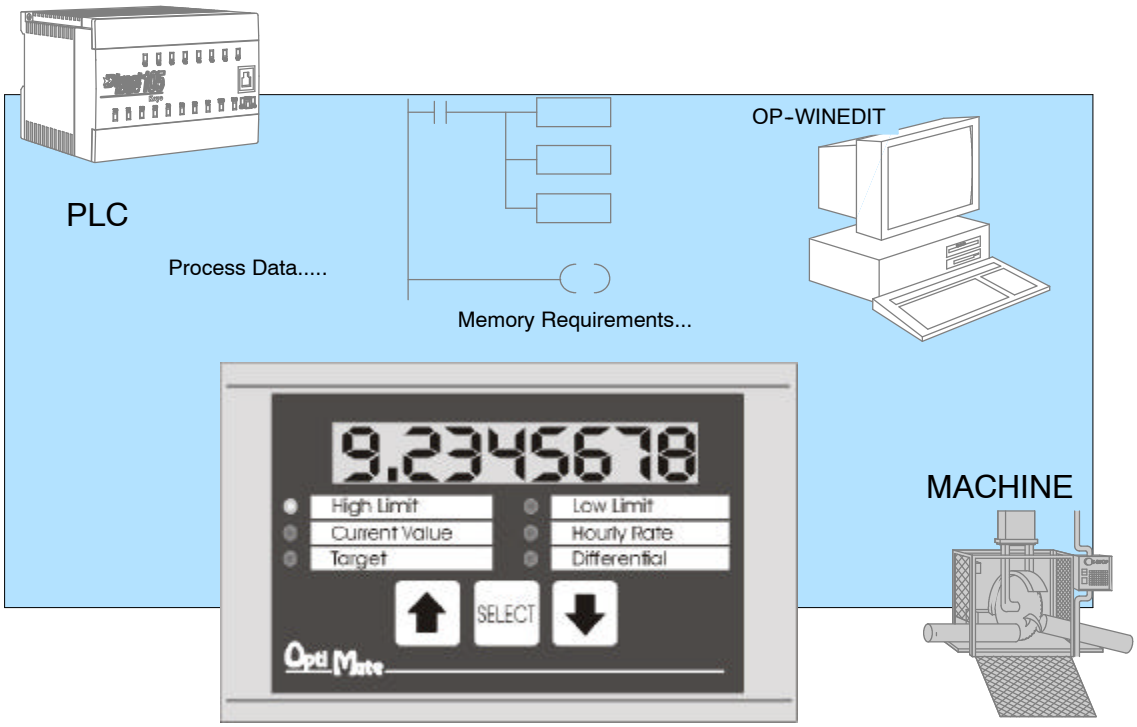
In This Chapter. . . .

- Learning the Features
- Display and Setpoint Operations
- Numerical Data Types
- Decimal Point
- PLC Registers
- *Direct*LOGIC User Memory Overview

Learning the Features

In this section, the subject of how to use the OP-414 features is described. We recommend that you study this chapter before attempting to configure and use the OP-panel. As you proceed through this chapter, relate the topics discussed with how your operator panel may be implemented. The concepts discussed in this chapter are applicable to all PLCs.

- Display and Setpoint Operations
- Numeric Data Types
- Decimal Point
- PLC Registers
- User Memory Overview

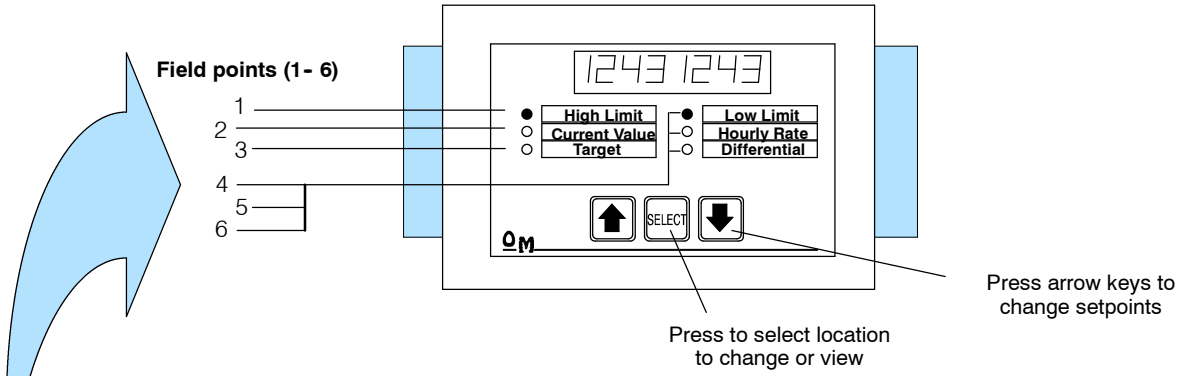


Display and Setpoint Operations

Display and Setpoint Data

The OP-414 has six LEDs with a label for each one. Each LED (with its label) refers to a user-defined field point. These field points are actually memory locations in the PLC where data is stored. You can make a field point a read only location–in which case, we refer to it as **display data**. Or you can designate a field point to store **setpoint data**–in which case, the field point is a read/write location. The panel allows you to either read the display data or read and write the setpoint data. When an LED is on, the corresponding field point (in the PLC) is displayed on the panel. Look at the illustrated example below.

Pressing the <SELECT> key scrolls through the field points, turning the LED on and displaying the data from the PLC. If you move to a label whose field point has been configured as **setpoint data**, then you can use the UP or DOWN ARROWS to change the value shown in the window. However, the UP or DOWN ARROWS have no effect on field points that have been configured as **display data**.



PLC Registers are mapped to Field points (1- 6)

OP-414 Panel PLC Register Map

PLC Register	Register Function
M+0	Field point 1 data cell
M+1	Field point 1 data cell 2 (long BCD)
M+2	Field point 2 data cell
M+3	Field point 2 data cell 2 (long BCD)
M+4	Field point 3 data cell
M+5	Field point 3 data cell 2 (long BCD)
M+6	Field point 4 data cell
M+7	Field point 4 data cell 2 (long BCD)
M+8	Field point 5 data cell
M+9	Field point 5 data cell 2 (long BCD)
M+10	Field point 6 data cell
M+11	Field point 6 data cell 2 (long BCD)
M+12	Field point force data cell
M+13	Field point force data cell 2 (long BCD)
M+14	Force control

Reading or Writing a Setpoint

Setpoint data is continually and transparently written to the associated PLC register(s). To access and use the setpoint data, reference the relevant PLC register(s) (M+0 through M+11) in your PLC program.

Reading a Display Point

When a value is written to a PLC register (M+0 through M+11) designated as display data, the OP-414 automatically retrieves and displays the data.

NOTE: The OP-414 can read and write setpoint data, but can only read display data.

Forcing a Setpoint

There are times when it is necessary for the PLC program to initialize or override a setpoint. The capability to do so is provided as the Force Setpoint function.

To force a setpoint to a given value, place the value in register M+12 (and M+13 for BCD long numbers). Next, set the bit(s) FP1-FP6 found in register M+14 corresponding to the setpoint(s) to be forced and set the FSP bit. Once the OP-414 has forced the setpoint(s) to the required value, it will clear registers M+12, M+13 and M+14.

NOTE: If the Force Setpoint option is not selected in the OP-WINEDIT configuration software, then setpoints cannot be forced and registers M+12, M+13 and M+14 cannot be used.

Numeric Data Types

There are two types of data that the OP-414 can display: BCD long (also known as BCD double) and Binary.

BCD Long Data

BCD long (or BCD double) data has a value range of 0-99999999.
To display a BCD long number, place the least significant four digits of the number into the field point data cell. Next, place the most significant four digits into the field point data cell 2.

To read a setpoint BCD long value, the OP-414 continuously places the least significant four digits into the corresponding field point data cell and the most significant four digits into the corresponding field point data cell 2. Simply reference both registers in your PLC program to display the value.

For example, if the displayed value or the setpoint value is 92345678, then the PLC register will display the following (shown in BCD/Hex format):

BCD Long Data	PLC Register
Field point data cell	5678
Field point data cell 2	9234

Binary Data

Binary data has a range of 0 – 65535 (0 – FFFF in Hex format).

To display a Binary number in a display point, simply place the Binary value in the appropriate data cell.

To read a Binary setpoint value, reference the PLC register in your PLC program. If the displayed value or the setpoint value is 40500, the PLC register will display the following (shown in BCD/Hex format):

Binary Data	PLC Register
Field point data cell	9E34
Field point data cell 2	XXXX (Don't care)

Decimal Point

The number of digits displayed after the decimal point is configured in the OP-WINEDIT Configuration Software. The decimal point location is configured separately for each field point.

The decimal point is for displaying purposes only and cannot be changed by or written to a PLC register for use in the PLC program. Once configured, it is fixed and can only be changed by reconfiguring the OP-414.

For BCD long numbers, the number of digits that can be displayed after the decimal varies from 0 to 7.

For Binary numbers, the number of digits that can be displayed after the decimal varies from 0 to 7 but the highest number that can be displayed is 65535 (that is, 0.0065535).

PLC Registers

PLC Register Overview

The OP400 panels communicate to the PLC through user defined PLC data registers. The starting or "Base" register is assigned during panel configuration and automatically occupies fifteen consecutive 16-bit data registers. In this manual the registers are identified as M+0, M+1, M+2, thru M+14. Force control register M+14 contains bit-of-word information to force a setpoint to a specified value. The term PLC register is used for the area of memory within the PLC used for data exchange with the OP-414. PLC registers (addresses) are sometimes known as data registers, internal registers or 16-bit (word) addresses.

PLC Register Map

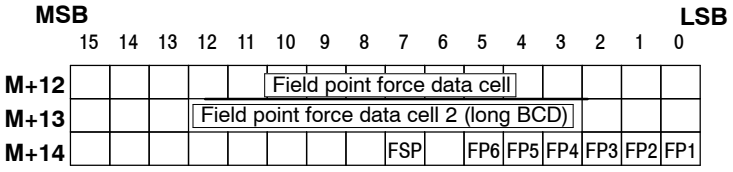
The OP-414 uses a bank of 15 contiguous PLC registers. The register set is shown in the table below.

OP-414 Panel PLC Register Map

PLC Register	Register Function
M+0	Field point 1 data cell
M+1	Field point 1 data cell 2 (long BCD)
M+2	Field point 2 data cell
M+3	Field point 2 data cell 2 (long BCD)
M+4	Field point 3 data cell
M+5	Field point 3 data cell 2 (long BCD)
M+6	Field point 4 data cell
M+7	Field point 4 data cell 2 (long BCD)
M+8	Field point 5 data cell
M+9	Field point 5 data cell 2 (long BCD)
M+10	Field point 6 data cell
M+11	Field point 6 data cell 2 (long BCD)
M+12	Field point force data cell
M+13	Field point force data cell 2 (long BCD)
M+14	Force control

Force Control Registers

Force Control Registers



Register Definition The following describes the function of each of the registers shown in the table.

- **Register M+0**– Field point 1 data. Either setpoint or display, as configured. Numeric data is either a Binary value or the four least significant digits of the BCD long number in field point 1.
- **Register M+1** – Field point 1 data cell 2 (for long BCD numbers only). Either setpoint or display, as configured. Numeric data is the four most significant digits of data for field point 1.
- **Register M+2** – Field point 2 data.
- **Register M+3** – Field point 2 data cell 2 (for long BCD numbers only).
- **Register M+4** – Field point 3 data.
- **Register M+5** – Field point 3 data cell 2 (for long BCD numbers only).
- **Register M+6** – Field point 4 data.
- **Register M+7** – Field point 4 data cell 2 (for long BCD numbers only).
- **Register M+8** – Field point 5 data.
- **Register M+9** – Field point 5 data cell 2 (for long BCD numbers only).
- **Register M+10** – Field point 6 data.
- **Register M+11** – Field point 6 data cell 2 (for long BCD numbers only).
- **Register M+12** – Field point force data. Value to force setpoint equal to when force operation is initiated by the PLC program.
- **Register M+13** – Field point force data cell 2 (for long BCD numbers only). Four most significant digits of BCD long value to force setpoint equal to when force operation is initiated by the PLC program.
- **Register M+14** – Force control. Controls the forcing of setpoints.
  > **FSP** bit: When set, the field point force data (M+12 and/or M+13) will be forced into the field points that are set to be forced selected by FP1–FP6. Once the force is finished, the OP–414 will clear M+12, M+13 and M+14.
  > **FP1–FP6** bits: Identifies the setpoints to be forced.

PLC Register Assignment Examples

Examine the address conventions for ***Automationdirect*** (***Direct***LOGIC) and Allen-Bradley. For example, the ***Direct***LOGIC address references are **octal**, and the Allen-Bradley's are **decimal**. The ***Direct***LOGIC DL05/DL105/DL205/D3-350/DL405 OP-panel address uses V-memory registers which are 16-bit registers. The DL305 family uses reference assignments with 8-bit registers. This means that the DL305 will require thirty 8 bit registers for data handling. The Allen-Bradley memory is defined with a reference **(Nx)** which represents the memory area, and **(:n)** which defines the word within the memory area. Please refer to the appropriate CPU User manual for the PLC product you are using.

DirectLOGIC DL05/DL105/DL205/D3-350/DL405

Example Address		Function
V2000	**M+0**	Field point 1 data cell
V2001	**M+1**	Field point 1 data cell 2 (long BCD)
V2002	**M+2**	Field point 2 data cell
V2003	**M+3**	Field point 2 data cell 2 (long BCD)
V2004	**M+4**	Field point 3 data cell
V2005	**M+5**	Field point 3 data cell 2 (long BCD)
V2006	**M+6**	Field point 4 data cell
V2007	**M+7**	Field point 4 data cell 2 (long BCD)
V2010	**M+8**	Field point 5 data cell
V2011	**M+9**	Field point 5 data cell 2 (long BCD)
V2012	**M+10**	Field point 6 data cell
V2013	**M+11**	Field point 6 data cell 2 (long BCD)
V2014	**M+12**	Field point force data cell
V2015	**M+13**	Field point force data cell 2 (long BCD)
V2016	**M+14**	Force control

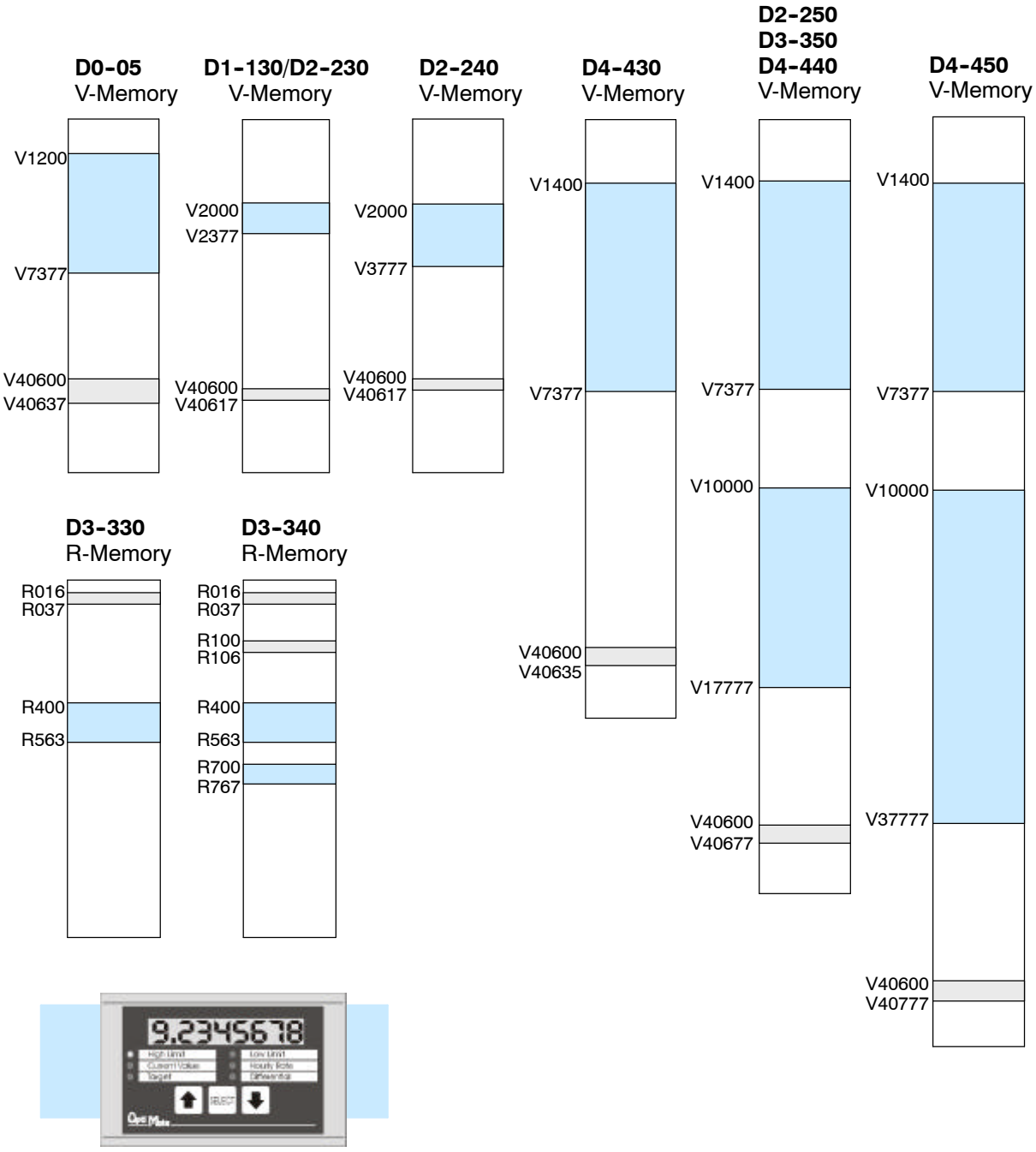
DirectLOGIC DL305 (D3-330 & D3-340)

Example Address		Function
R400/R401	**M+0**	Field point 1 data cell
R402/R403	**M+1**	Field point 1 data cell 2 (long BCD)
R404/R405	**M+2**	Field point 2 data cell
R406/R407	**M+3**	Field point 2 data cell 2 (long BCD)
R410/R411	**M+4**	Field point 3 data cell
R412/R413	**M+5**	Field point 3 data cell 2 (long BCD)
R414/R415	**M+6**	Field point 4 data cell
R416/R417	**M+7**	Field point 4 data cell 2 (long BCD)
R420/R421	**M+8**	Field point 5 data cell
R422/R423	**M+9**	Field point 5 data cell 2 (long BCD)
R424/R425	**M+10**	Field point 6 data cell
R426/R427	**M+11**	Field point 6 data cell 2 (long BCD)
R430/R431	**M+12**	Field point force data cell
R432/R433	**M+13**	Field point force data cell 2 (long BCD)
R434/R435	**M+14**	Force control

Allen-Bradley SLC 5/03, 5/04, and Micrologix

Example Address		Function
N7:0	M+0	Field point 1 data cell
N7:1	M+1	Field point 1 data cell 2 (long BCD)
N7:2	M+2	Field point 2 data cell
N7:3	M+3	Field point 2 data cell 2 (long BCD)
N7:4	M+4	Field point 3 data cell
N7:5	M+5	Field point 3 data cell 2 (long BCD)
N7:6	M+6	Field point 4 data cell
N7:7	M+7	Field point 4 data cell 2 (long BCD)
N7:8	M+8	Field point 5 data cell
N7:9	M+9	Field point 5 data cell 2 (long BCD)
N7:10	M+10	Field point 6 data cell
N7:11	M+11	Field point 6 data cell 2 (long BCD)
N7:12	M+12	Field point force data cell
N7:13	M+13	Field point force data cell 2 (long BCD)
N7:14	M+14	Force control

*Direct*LOGIC User Memory Overview



User Data Space available for OP-panels

Internal Relay Memory

DirectLOGIC PLCs use octal addressing, as indicated by the shaded areas.

4

Configuring Your Operator Panel

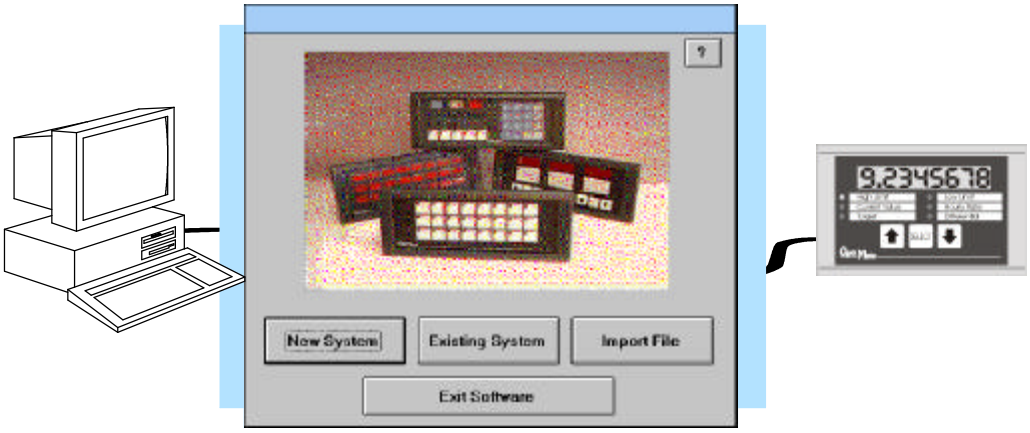
In This Chapter. . . .

— Preparing for Configuration
— How to Configure Your Panel

Preparing for Configuration

OP-WINEDIT Software

The OP-414 is configured with software running on a personal computer. This software is available through ***Automationdirect.com*** and is referred to as OP-WINEDIT configuration software.



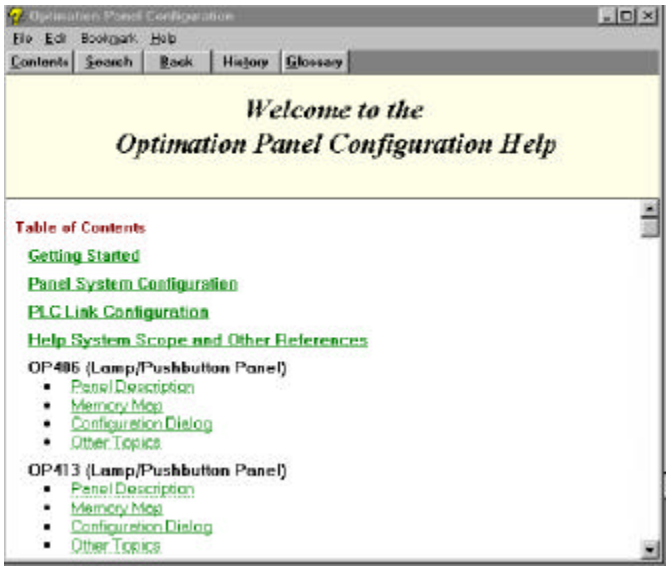
More about OP-WINEDIT

The OP-WINEDIT configuration software allows you to configure OP-panel applications, as well as download (write to panel) and upload (read from panel) the configurations. Use this software to configure your communication link, select pushbutton control, and enter operator display messages. Order the software from ***Automationdirect.com*** using part number OP-WINEDIT. The OP-414 panel requires version 2.3 or later.

HELP Screens

The OP-WINEDIT software provides **Help** windows which supply instructions for performing all necessary configuration tasks. Should you have problems understanding how to program your panel, refer to these built-in Help windows. To access the Help windows, point and click on the Help menu and choose Using help, or click on the [?] icon located near the top of the main configuration window.

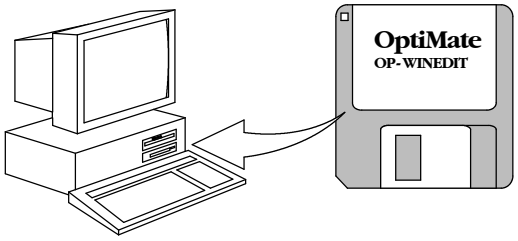
HELP Screen Menu



Computer System Requirements

Your personal computer must meet the following minimum requirements:

- ✓ IBM type 386 or above
- ✓ **Windows 3.1 or later, including Windows 95, 98 or NT**
- ✓ 1 meg of hard drive
- ✓ 1 meg of RAM



How to Configure Your Panel

Follow these steps to configure your OP-414 operator panel.

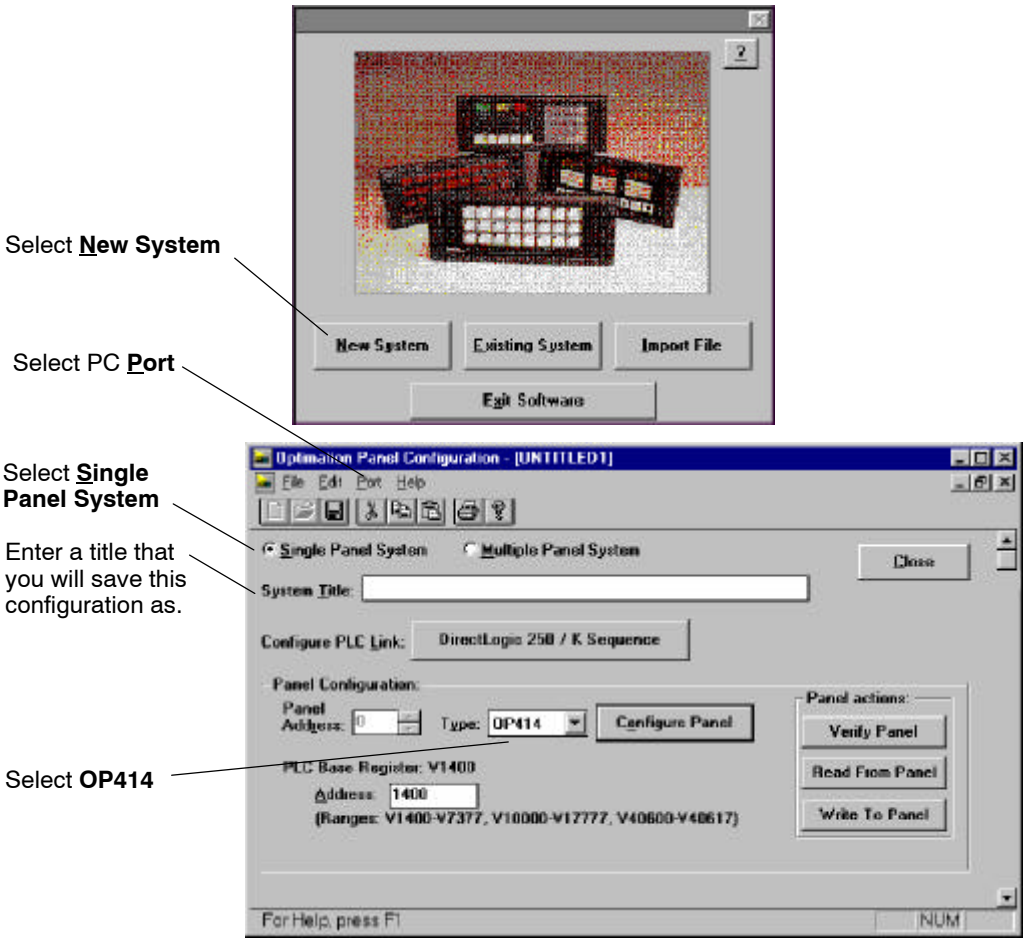
Step 1 **Load OP-WINEDIT** - If you are not already using the configuration software or have an older version, you must install version 2.3 or later (if you are using an older version of OP-WINEDIT you can obtain an upgrade at our web site). The software is provided on one 3-1/2 inch high-density diskette and comes with its own manual. Here are brief installation instructions.

- Place the installation disk into your computer's floppy drive (usually either drive A or drive B).
- Open Microsoft™ Windows (3.1 or above). For Microsoft Windows 95, 98 or NT the **Start**/**Run** program task bar is located at the bottom left portion of your screen. For Microsoft Windows 3.x versions select **File**/**Run** from the Program Manager screen.
- Select **Run**, and a pop-up window appears. Type in the path for the drive in which you have placed the setup disk and designate the file **setup**. Click on **OK** when you are finished.

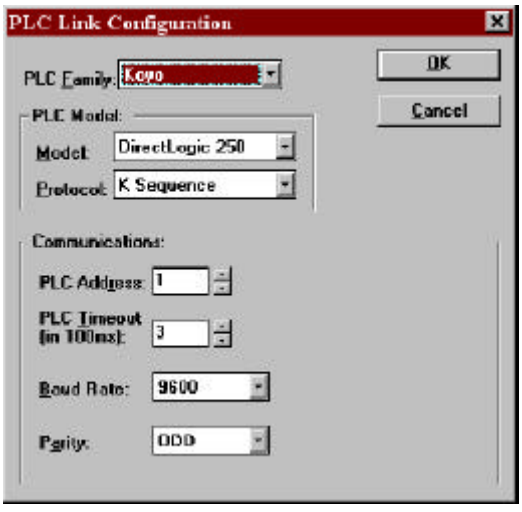
Step 2 **Connect Panel to PC** - Connect the OP-414 to a COM port on your personal computer using the OP-CCBL configuration cable. Make sure the OP-PS400 5VDC power supply is connected.

Step 3 **Open OP-WINEDIT** – Select New System.

Step 4 **Start Configuring Your Panel** – Start by filling in these parameters:



Step 5 **Select Configure PLC Link** – Here is where you define protocol items such as PLC address, baud rate and parity. Enter the appropriate parameters for your PLC. The following table provides the necessary information for most PLC***Direct*** controllers. For other PLC families, reference that product's user manual to determine the port communications capabilities.



During configuration, make sure that your address and communications parameters match the PLC port settings. The PLC Timeout works like this: When the panel sends a message to the PLC and does not receive a response or does not understand the response, it will wait the time-out period before resending the message.

You also have several ports which can be used to connect your communications cable. Some of these ports have fixed PLC address assignments, and some *do not*. The ports which allow configuring the PLC addresses can be set to a unique address, ranging from 1 through 90. **Refer to your User Manual for specific information on the ports of your PLC**.

NOTE: For Allen-Bradley, you will need to connect to Channel 0 (bottom serial port), using DF1 full duplex. Additionally, the Allen-Bradley software allows you to set the bottom port to a unique PLC address. The software default is PLC Address 1. You must select CRC error detection and make sure the address on the configuration screen matches the address you have assigned. This port must also be configured for either 4800 or 9600 baud. No other baud rates are supported for communicating between the OP-panels and an Allen-Bradley PLC. Since the Allen-Bradley software uses a default baud rate of 1200, you must change the settings.

PLC Model		Port/Baud Rates	Parity	Stop Bit
DL05	**Port 1**	9600	Odd	1
	Port 2	9600/19.2K	Odd/None	
DL105/D2-230/ D2-240	**Top**	9600	Odd	1
	Bottom (DL240 only)	9600/19.2k	Odd/None	
D2-250	**Top**	9600	Odd/None	1
	Bottom	9600/19.2K	Odd/None	
D3-330	*** DCU Only**	4800/9600/19.2k	Odd/None	1
D3-340	*** Bottom &Top**	4800/9600/19.2k	Odd/None	1
D3-350	*** Top**	9600	Odd/None	1
	*** Bottom**	4800/9600/19.2K	Odd	
D4-430/440	**Top**	9600	Odd	1
	*** Bottom**	9600/19.2k	Odd/None	
D4-450	**DB15**	9600	Odd	1
	*** DB25**	9600/19.2k	Odd/None	
	RJ12	9600/19.2k	Odd/None	

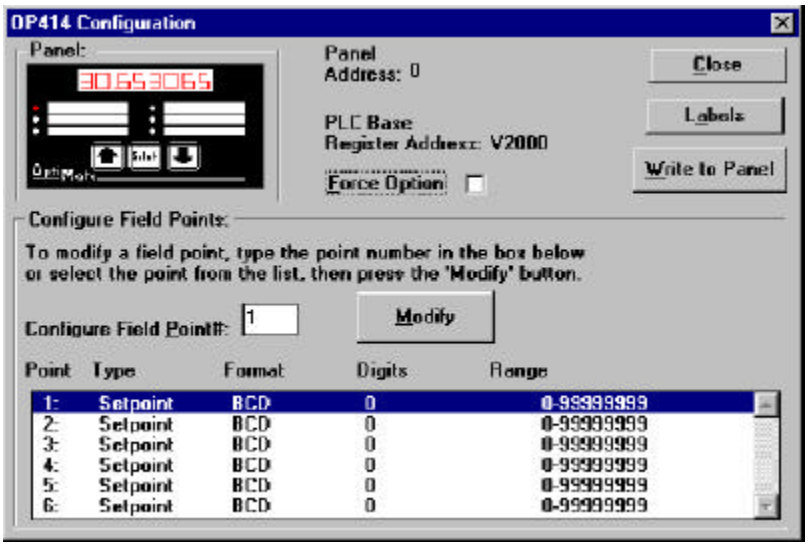
* These ports do not supply +5VDC. You must use the OP-PS400 external power supply.

Step 6 **Select the Base Register Address -** This step is very important because it establishes the link in your PLC memory to the panel. Chapter 3, Understanding the Features, describes the mapping process. Once you are familiar with the mapping process and you know which memory block in your PLC to use (refer to the user manual for your PLC), enter your selection.

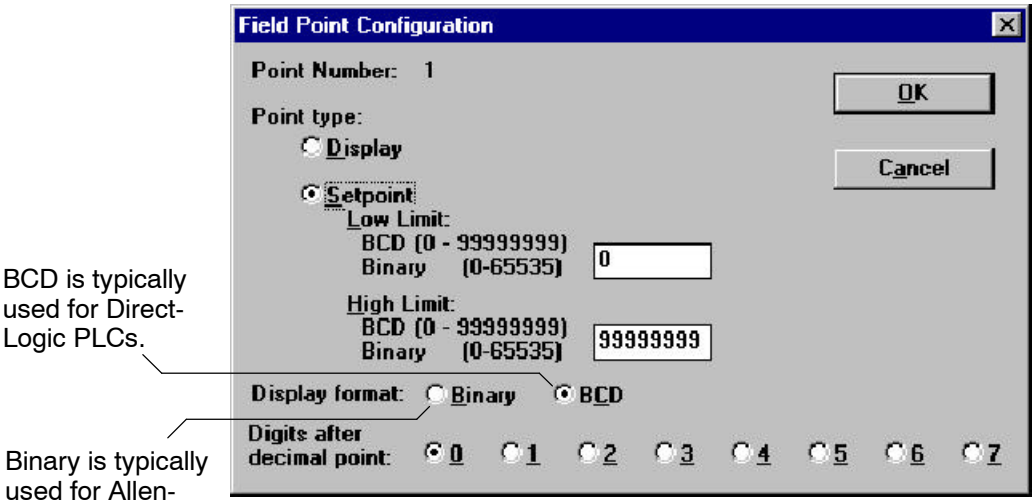
If you choose Allen-Bradley as your PLC Type, you must enter the PLC File Number in addition to a Base Register Address. You must expand the memory map in the Allen-Bradley PLC to include all registers being used by the OP-panel. The panel will only recognize integer file types N7 and user-defined file types N9 through N255. Enter the number only and not the prefix N. The Base Register Address is any number between 0 and 255.

Step 7 **Configure the Panel Features** – Select Configure Panel. These features are discussed in detail in Chapter 3, but include:

- **Field Point Configuration** – The field points can be configured as either Setpoint or Display. A Setpoint reads from (and displays) and writes to a PLC register and a Display only reads from (and displays) a PLC register.
- **Force Option** – Selecting this option allows the PLC ladder program itself to write to a setpoint location.



Open the Field Point Configuration window below by double-clicking on the Point selected or clicking Modify with the Point selected.



Step 8 **Save and Download** – Once you have completed your configuration, you can save it to disk and/or write (download) directly to the panel.

NOTE: Be sure to select the correct port on your PC (Com 1, 2, 3, 4) in order to Write to the Panel.

5

Programming Examples

In This Chapter. . . .

- Examples Using ***Direct***LOGIC PLCs
- DL05/105/DL205/D3–350/DL405 Application Examples
- D3–340 Application Example
- Allen-Bradley™ Application Examples
- Troubleshooting

Examples Using *Direct*LOGIC PLCs

Register Usage

The OP-WINEDIT configuration software allows you to configure a panel to use a block of registers at a starting value that you define. For a DL05 CPU, the recommended memory to use is the general purpose data words starting at V1200.

For a DL105, DL205, D3-350 or DL405 CPU the recommended memory to use is the general purpose data words starting at V2000. For the 305 family (except the D3-350) the recommended memory is the registers beginning at R400. Any block of registers within the data word range can be used.

The following table lists the data word registers for ***Direct***LOGIC CPUs.

Data Word Registers for *Direct*LOGIC™ PLCs		
Family	**CPU**	**Control Relay Registers**
DirectLOGIC™ DL05	D0-05	V1200-V7377
DirectLOGIC™ DL105	F1-130	V2000-V2377
DirectLOGIC™ DL205	D2-230	V2000-V2377
	D2-240	**V2000-V3777**
	D2-250	V1400-V7377 and V10000-V17777
DirectLOGIC™ DL305	D3-330/D3-330P	R400-R563
	D3-340	R400-R563 and R700-R767
	D3-350	V1400-V7377 and V10000-V17777
DirectLOGIC™ DL405	D4-430	V1400-V7377
	D4-440	V1400-V7377 and V10000-V17777
	D4-450	V1400-V7377 and V10000-V37777

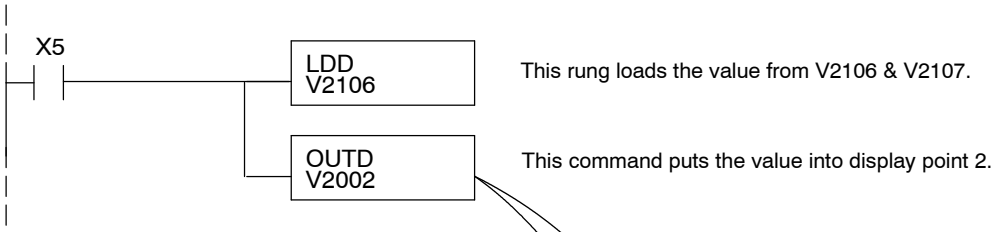
Examples Using DL05, DL105, DL205, D3-350 and DL405

Displaying Numeric Data

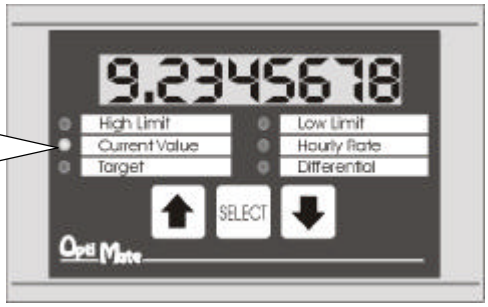
Displaying the numeric data in one of the six field points is a very simple process. During the initial configuration, make sure you define the point as a display point, not a setpoint. Displaying the numeric data requires that the PLC put the value to be displayed in the register(s) associated with the display data field.

The figure below illustrates a display application for a ***Direct***LOGIC 05, 105, 205, 350 or 405 PLC. *Notice that the base address is V2000, so V2002 is M+2.* Also, field point 2 is set for display in BCD format with 7 digits after the decimal. A BCD long value held in V2106 and V2107 will be written to V2002 and V2003 (and displayed as field point 2) as long as X5 is active.

To display a Binary number, configure the field point for display, Binary, and the required number of digits after the decimal. Then, use the LD and OUT instructions instead of LDD and OUTD, since the Binary data type only uses one register.



PLC Register	Example Address	Register Function
M+0	V2000	Field point 1 data cell
M+1	V2001	Field point 1 data cell 2 (long BCD)
M+2	V2002	**Field point 2 data cell**
M+3	V2003	**Field point 2 data cell 2 (long BCD)**
M+4	V2004	Field point 3 data cell
M+5	V2005	Field point 3 data cell 2 (long BCD)
M+6	V2006	Field point 4 data cell
M+7	V2007	Field point 4 data cell 2 (long BCD)
M+8	V2010	Field point 5 data cell
M+9	V2011	Field point 5 data cell 2 (long BCD)
M+10	V2012	Field point 6 data cell
M+11	V2013	Field point 6 data cell 2 (long BCD)
M+12	V2014	Field point force data cell
M+13	V2015	Field point force data cell 2 (long BCD)
M+14	V2016	Force control

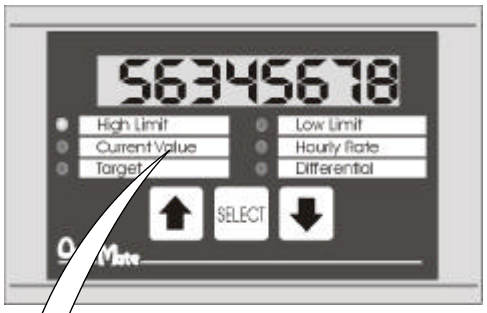


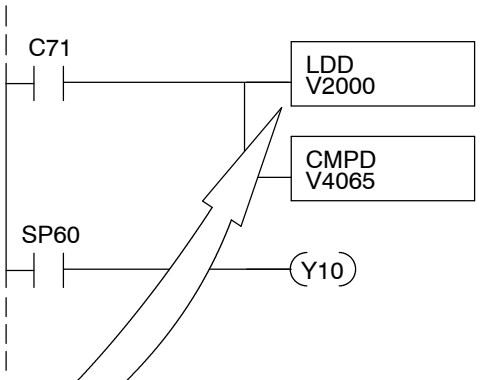
Reading a Setpoint

The OP-414 continuously updates the registers of all setpoints with each setpoint's current value. To read a setpoint, simply access the register(s) that correspond to each setpoint. The data can be copied to another register for manipulation or it can be accessed in its field point register(s).

Again, notice that the base address is V2000, so V2000 is M+0. Also, field point 1 has been configured as a setpoint in BCD format with no digits after the decimal. In this example, field point 1 is a High Limit setpoint. When C71 is active, the program below compares the setpoint 1 (BCD long value held in V2000 and V2001) with the value held in V4065 and V4066. If the value exceeds the setpoint, Y10 will be turned on.

To read a setpoint configured as Binary, configure the field point for setpoint, Binary, and the required number of digits after the decimal. Then, use the LD and CMP instructions instead of LDD and CMPD, since the Binary data type only uses one register. Be sure the CMP is a decimal value.





This rung loads the value from V2000 & V2001, and compares it to the value in V4065 & V4066.

If V4065 & V4066 is greater than setpoint 1, this rung turns on output Y10.

PLC Register	Example Address	Register Function
M+0	**V2000**	**Field point 1 data cell**
M+1	**V2001**	**Field point 1 data cell 2 (long BCD)**
M+2	**V2002**	Field point 2 data cell
M+3	**V2003**	Field point 2 data cell 2 (long BCD)
M+4	**V2004**	Field point 3 data cell
M+5	**V2005**	Field point 3 data cell 2 (long BCD)
M+6	**V2006**	Field point 4 data cell
M+7	**V2007**	Field point 4 data cell 2 (long BCD)
M+8	**V2010**	Field point 5 data cell
M+9	**V2011**	Field point 5 data cell 2 (long BCD)
M+10	**V2012**	Field point 6 data cell
M+11	**V2013**	Field point 6 data cell 2 (long BCD)
M+12	**V2014**	Field point force data cell
M+13	**V2015**	Field point force data cell 2 (long BCD)
M+14	**V2016**	Force control

Forcing Setpoints

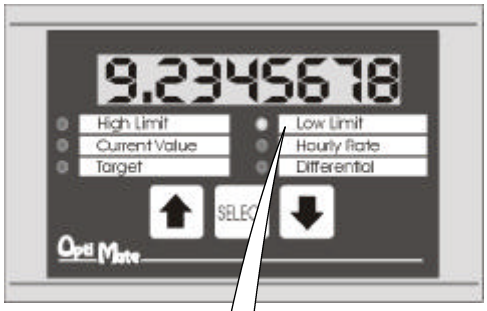
The OP-414 allows you to force a setpoint to a value from the PLC. In order to force a setpoint to a value, place the value into register XM+12 (and M+13 if BCD long). Then set the FSP and bit(s) corresponding to the setpoint(s) to be forced. When the panel has completed the force operation, it clears registers M+12, M+13 and M+14.

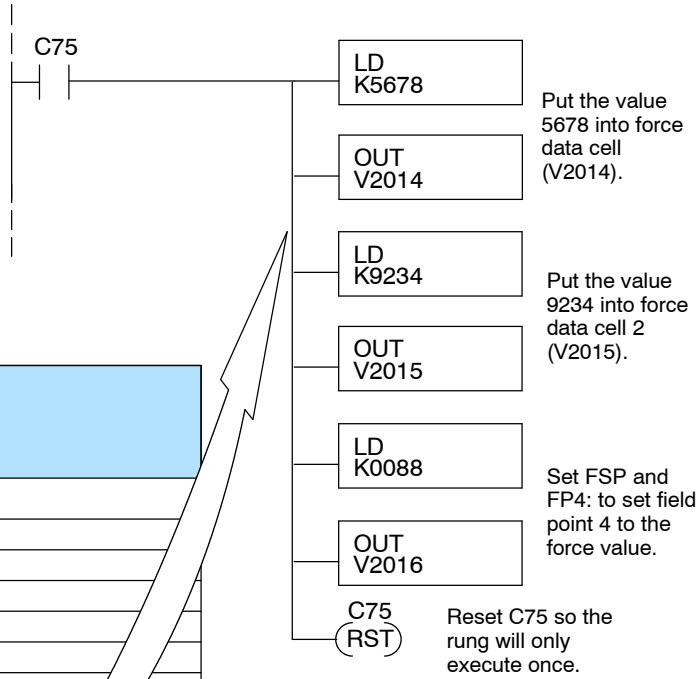
The example below shows setpoint 4 (FP4 is set), as a BCD long with 7 places after the decimal, being forced to 9.2345678 when C75 is active.

Notice that C75 is used as a set/reset type relay. The force command should be written to the force register once. The OP-414 will automatically clear this register when the force is complete. This will normally happen in less than a second. The PLC program can verify operation, if necessary, by checking the status of the registers to be cleared by the panel (M+12, M+13 and M+14).

To force a setpoint that is configured as Binary, only use the force data cell. The force data cell 2 is ignored by the panel.

NOTE: The Force Option must be selected (in OP-WINEDIT) in order to force setpoints.



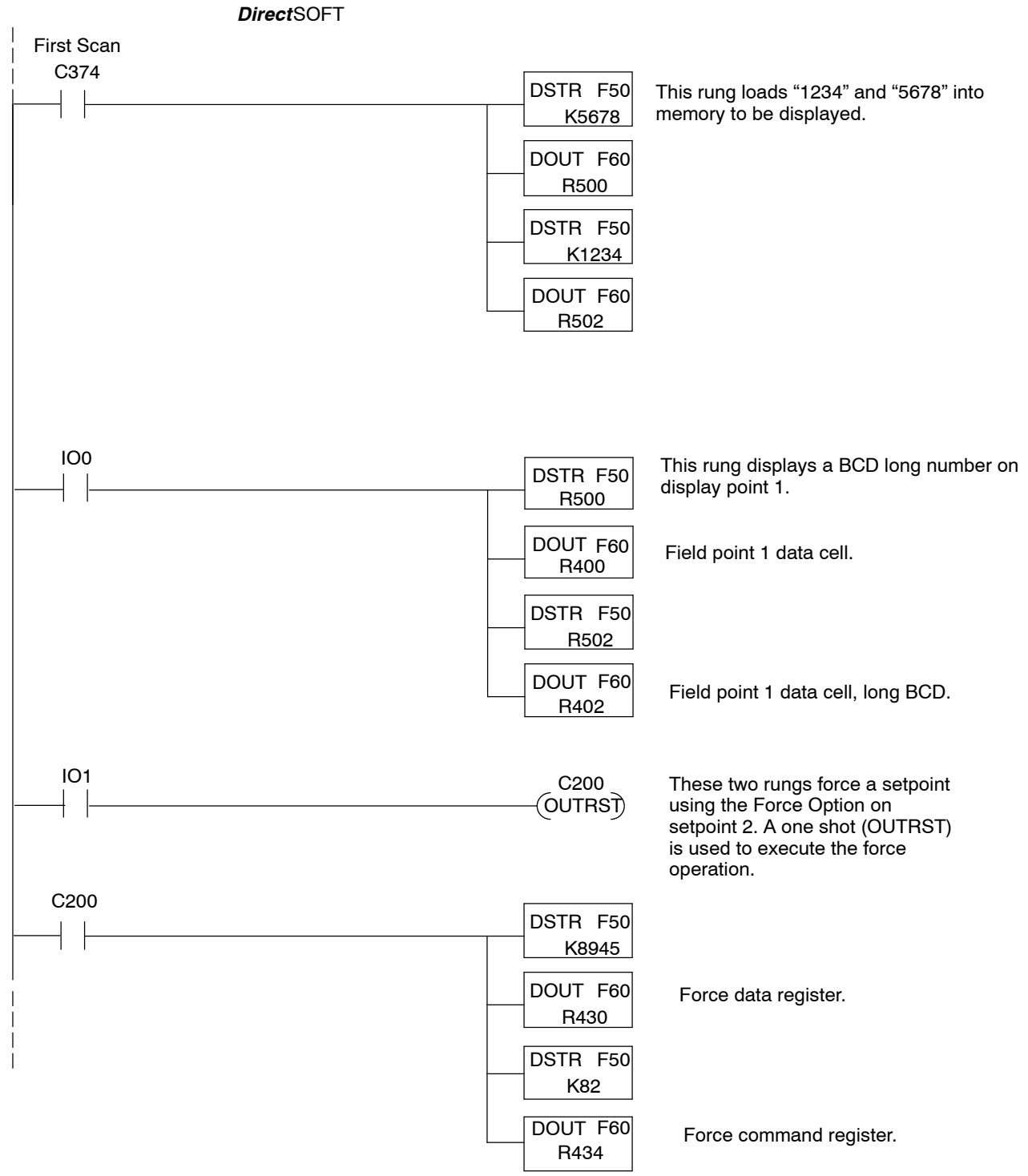


PLC Register (Example Address)	Register Function
M+0 (V2000)	eld point 1 data cell
M+1 (V2001)	eld point 1 data cell 2 (long BCD)
M+2 (V2002)	eld point 2 data cell
M+3 (V2003)	ield point 2 data cell 2 (long BCD)
M+4 (V2004)	ield point 3 data cell
M+5 (V2005)	ield point 3 data cell 2 (long BCD)
M+6 (V2006)	ield point 4 data cell
M+7 (V2007)	ield point 4 data cell 2 (long BCD)
M+8 (V2010	eld point 5 data cell
M+9 (V2011)	ield point 5 data cell 2 (long BCD)
M+10 (V2012	Field point 6 data cell
M+11 (V2013)	Field point 6 data cell 2 (long BCD)
M+12 (V2014)	**Field point force data cell**
M+13 (V2015)	**Field point force data cell 2 (long BCD)**
M+14 (V2016)	**FSP** FP6 FP5 **FP4** FP3 FP2 FP1

Force control bits (bold if set)

Example Using D3-330/340

Register Usage The following example assumes that the OP-414 is configured for a base address of R400/R401.



Examples Using Allen-Bradley™ SLC 5/03, 5/04 and Micrologix PLCs

Interfacing to A-B Memory

OptiMate panels interface to Allen-Bradley SLC 5/03, SLC 5/04 and Micrologix PLCs via integer file type N. The 5/03 and 5/04 have file type N7 as standard. Other "N" type files can be created. The Micrologix has a fixed file type N7. Please see A-B documentation for information on setting up and using "N" type files.

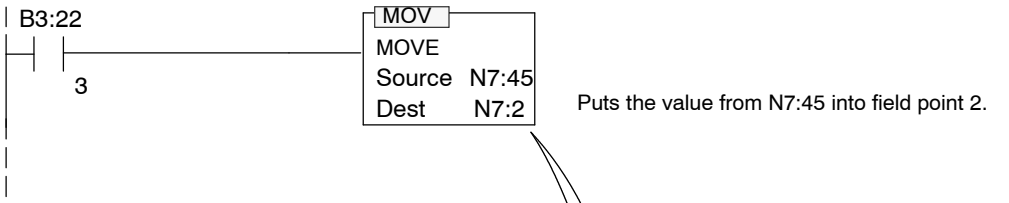
NOTE: When using an OP-414 with an Allen-Bradley PLC, always be sure that at least 15 words of memory are allocated to allow proper communications.

Displaying Numeric Data

Displaying the numeric data in one of the six field points is a very simple process. During the initial configuration, make sure you define the point as a display point, not a setpoint. Displaying the numeric data requires that the PLC put the value to be displayed in the register(s) associated with the display data field.

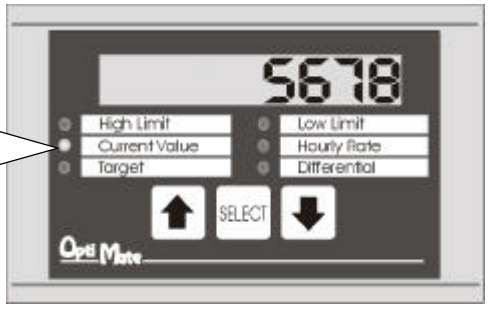
The figure below illustrates a display application for an A-B PLC. *Notice that the base address is N7:0, so N7:02 is M+2.* Also, field point 2 is set for display in BCD format. A value held in N7:45 will be written to N7:2 (and displayed as field point 2) as long as B2:22/3 is active.

To display a Binary number, configure the field point for display and binary, and use the MOV command to display the value.



Puts the value from N7:45 into field point 2.

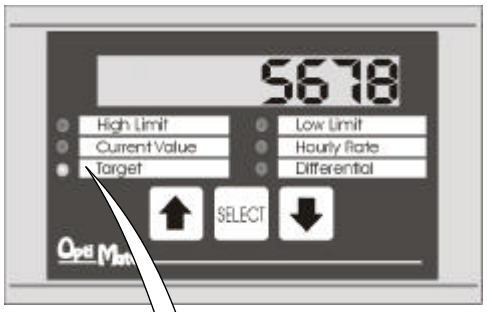
PLC Register (Example Address)	Register Function
M+0 (N7:0)	Field point 1 data cell
M+1 (N7:1)	Field point 1 data cell 2 (long BCD)
M+2 (N7:2)	**Field point 2 data cell**
M+3 (N7:3)	Field point 2 data cell 2 (long BCD)
M+4 (N7:4)	Field point 3 data cell
M+5 (N7:5)	Field point 3 data cell 2 (long BCD)
M+6 (N7:6)	Field point 4 data cell
M+7 (N7:7)	Field point 4 data cell 2 (long BCD)
M+8 (N7:8)	Field point 5 data cell
M+9 (N7:9)	Field point 5 data cell 2 (long BCD)
M+10 (N7:10)	Field point 6 data cell
M+11 (N7:11)	Field point 6 data cell 2 (long BCD)
M+12 (N7:12)	Field point force data cell
M+13 (N7:13)	Field point force data cell 2 (long BCD)
M+14 (N7:14)	FSP FP6 FP5 FP4 FP3 FP2 FP1



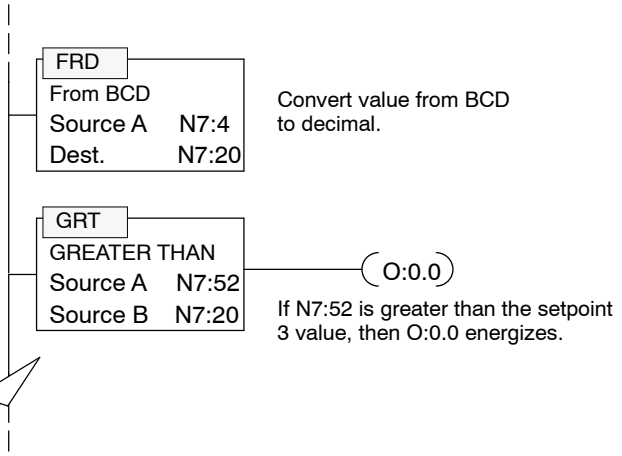
Force control bits

Reading a Setpoint The OP-414 continuously updates the registers of all setpoints with each setpoint's current value. To read a setpoint, simply access the register(s) that correspond to each setpoint. The data can be copied to another register for manipulation or it can be accessed in its field point register(s).

Again, notice that the base address is N7:0, so N7:4 is M+4. Also, field point 3 has been configured as a setpoint in BCD format with no digits after the decimal. In this example, field point 3 is a Target value setpoint. The program below compares the setpoint 3 with the value held in N7:52. Since the value in the compare is a decimal value, use the FRD instruction to convert the setpoint N7:4 from BCD to decimal. If the value exceeds the setpoint, O:0.0 will be turned on.



PLC Register (Example Address)	Register Function
M+0 (N7:0)	Field point 1 data cell
M+1 (N7:1)	Field point 1 data cell 2 (long BCD)
M+2 (N7:2)	Field point 2 data cell
M+3 (N7:3)	Field point 2 data cell 2 (long BCD)
M+4 (N7:4)	**Field point 3 data cell**
M+5 (N7:5)	Field point 3 data cell 2 (long BCD)
M+6 (N7:6)	Field point 4 data cell
M+7 (N7:7)	Field point 4 data cell 2 (long BCD)
M+8 (N7:8)	Field point 5 data cell
M+9 (N7:9)	Field point 5 data cell 2 (long BCD)
M+10 (N7:10)	Field point 6 data cell
M+11 (N7:11)	Field point 6 data cell 2 (long BCD)
M+12 (N7:12)	Field point force data cell
M+13 (N7:13)	Field point force data cell 2 (long BCD)
M+14 (N7:14)	Force control



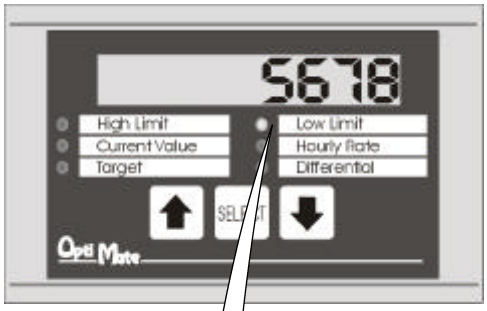
Forcing Setpoints

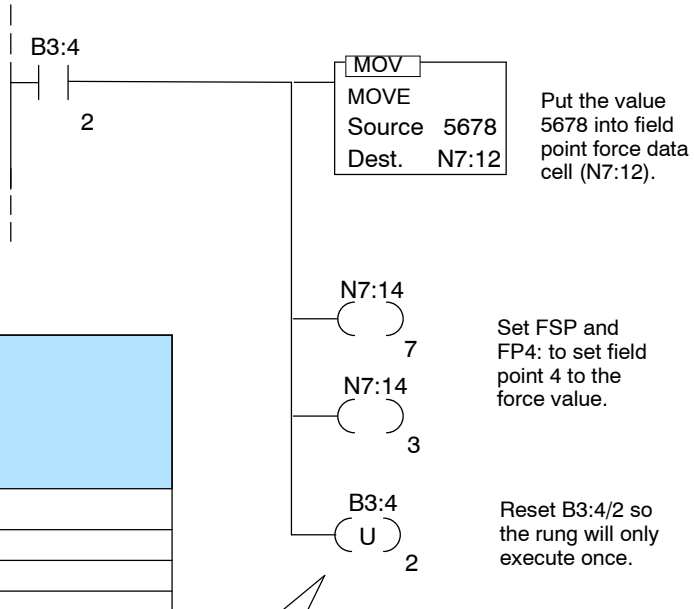
The OP-414 allows you to force a setpoint to a value from the PLC. In order to force a setpoint to a value, place the value into register M+12, then set the FSP and bit(s) corresponding to the setpoint(s) to be forced. When the panel has completed the force operation, it clears registers M+12, M+13 and M+14.

The example below shows setpoint 4 (FP4 is set) being forced to 5678 when B3:4/2 is active.

Notice that B3:4/2 is used as a latch/unlatch type relay. The force command should be written to the force register once. The OP-414 will automatically clear this register when the force is complete. This will normally happen in less than a second. The PLC program can verify operation, if necessary, by checking the status of the registers to be cleared by the panel (M+12, M+13 and M+14).

NOTE: The Force Option must be selected (in OP-WINEDIT) in order to force setpoints.





PLC Register (Example Address)	Register Function
M+0 (N7:0)	ield point 1 data cell
M+1 (N7:1)	ield point 1 data cell 2 (long BCD)
M+2 (N7:2)	ield point 2 data cell
M+3 (N7:3)	Field point 2 data cell 2 (long BCD)
M+4 (N7:4)	Field point 3 data cell
M+5 (N7:5)	Field point 3 data cell 2 (long BCD)
M+6 (N7:6)	Field point 4 data cell
M+7 (N7:7)	Field point 4 data cell 2 (long BCD)
M+8 (N7:8)	ield point 5 data cell
M+9 (N7:9)	Field point 5 data cell 2 (long BCD)
M+10 (N7:10)	Field point 6 data cell
M+11 (N7:11)	Field point 6 data cell 2 (long BCD)
M+12 (N7:12)	**Field point force data cell**
M+13 (N7:13)	Field point force data cell 2 (long BCD)
M+14 (N7:14)	**FSP** FP6 FP5 **FP4** FP3 FP2 FP1

Force control bits (bold if set)

Troubleshooting the OP-414 Panel

Troubleshooting

In this section, we explain how to isolate potential problems which may occur while using the OP-414. Because these panels have only a power supply connection and a communications connection, (no DIP switches or controls to set, and cannot be used in multiple panel arrangements), troubleshooting is very straightforward.

Power Supply Problems

If the panel LED display, the pushbutton indicators, and the RX and TX LEDs on the back of the panel do not illuminate, the panel is most likely not receiving input power. Carefully check your connections to make sure they are tight. If this does not help, see Chapter 2 and review the input power requirements.

Remember, all PLC's require that you use the OP-PS400 5V plug-in power supply (or equivalent) for configuration. Some PLC's also require that you use this power supply for operation. Make sure that the 120 VAC receptacle you plug the power supply into has power. Also, if you are using another 5V power supply, make sure that it has a center negative connector.

If using a PLC that supplies 5V for operation through the communications cable, check to make sure sure that pin 5 on the lead going into the panel has a 5V signal.

Configuration Problems

Make sure that you are using the proper configuration cable (OP-CCBL) and that it is securely connected. Check your configuration program and make sure the proper communications port is selected, such as COM1 or COM2. Review your configuration settings to make sure they are correct. Remember, the OP-WINEDIT Help screens provide a lot of valuable information.

Communication Problems

Observe the RX and TX LEDs on the rear panel. They should be steady flashing or glow (depending on the baud rate). If not, make sure that you are using the proper communications cable and that it is securely connected. Review your configuratiion settings and make sure that the communications information for your PLC, address number, baud rate, protocol type, etc. is correct. Check the user manual for your PLC for the proper settings.

Getting Help

See "Technical Support" in Chapter 1 for additional information.

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