

OP-609

Operator Panel

Manual Number OP-609-M



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Manual Revisions



If you contact us in reference to this manual, remember to include the revision number.

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Manual Number: OP-609-M

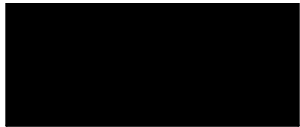
Issue	Date	Effective Pages	Description of Changes
Original	8/97	Cover/Copyright Contents	Original Issue
Rev. A	5/98	Manual Revisions Appendix A Appendix B Appendix A	Original Issue Incorporated changes per Errata 9/11/97 Added cable OP-2CBL-1

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EU Information



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NOTE: Products with CE marks perform their required functions safely and adhere to relevant standards as specified by EC 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 **PLC Direct** or its agents should be used. A listing of international affiliates is available at our Web site <http://www.plcdirect.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.

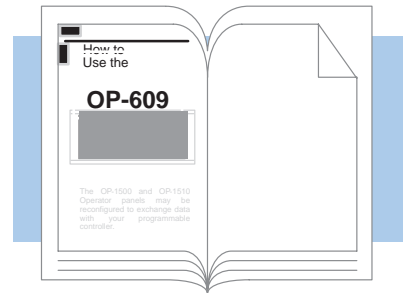
Introduction

The Purpose of this Manual

This User Manual provides user information on panel installation, panel configuration, and programming the OP-609. The purpose of this manual is to teach programming techniques which may be applied while implementing the OptiMate® panels. After reading the manual completely, load and run the example programs which are on the supplied diskette using the directions in Appendix A.

Contents of the Manual

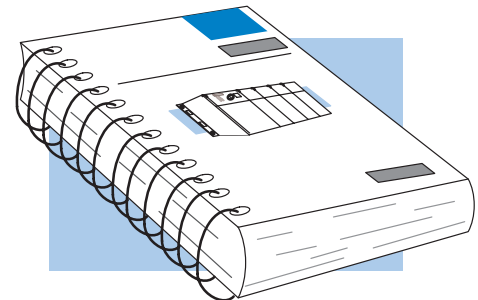
Inside this manual you will learn about planning, implementing, and utilizing the OptiMate OP-609 panel. Also included are application examples to improve the learning process and working knowledge of the OptiMate units.



Supplemental Manuals

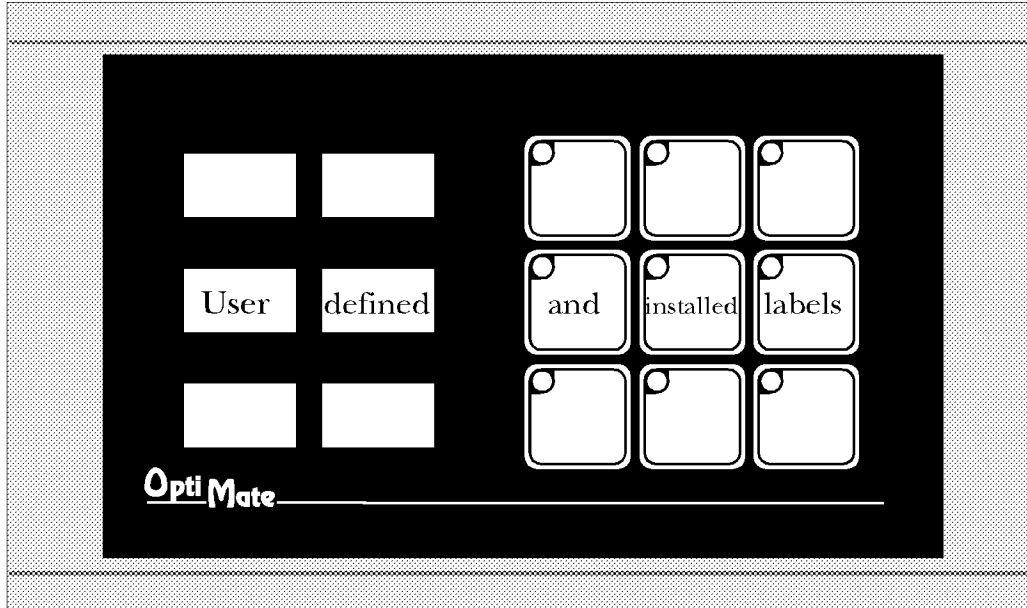
Reference the appropriate PLC/CPU User Manuals for the commands and address references required for your system. If you are using a **Direct**LOGIC PLC product, you will want to keep the **Direct**SOFT User Manual handy while programming your system. For *other* PLC brands you must reference their User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

For Multi-Panel applications utilizing the OP-9001 Communications Master please refer to the OP-9001 User Manual (Part Number OP-9001-M).



Technical Assistance

After completely reading this manual, including Appendix B, Troubleshooting the OP-609, if you are not successful with implementing the OP-609, you may call PLC**Direct** at (800) 633-0405, Monday through Friday from 9:00 A.M. to 6:00 P.M. Eastern Standard Time. Our technical support group will work with you in answering your application questions. If you have a comment or question about our products, services, or manuals which we provide, please fill out and return the suggestions card included with this manual.



General Overview

The OP-609 Combination Panel features 6 high intensity LED light bars and 9 pushbuttons. Each of the lamps can be individually controlled to be on, off, or flash. Each of the pushbuttons can be individually configured to operate as either a momentary or alternate action pushbutton.

Lamps and pushbuttons can be custom labeled by the user with plastic inserts. The inserts can be legended with text and/or graphics, and slip into protective pockets behind the faceplate.

The OP-609 Lamp/Pushbutton Panel is part of Optimization's **OptiMate**[®] series. Each OptiMate module is designed to connect to a PLC with a single cable connection. OptiMate modules can be used individually, or together with any combination of other OptiMate modules.

When used with a PLC, operation is transparent to the user. Lamps and buttons appear in the PLC ladder logic as coils and contacts. The OP-609 takes care of the rest.

Applications

- Machine control
- Process control
- Security systems
- HVAC
- Plant monitoring/control
- PLC applications

Features

- 6 Plug-In LED Light Bars
- 9 tactile snap membrane pushbuttons
- Independently configurable for momentary or alternate action
- User legenable
- PLC compatible
- RS232/RS422 communications
- Stand alone operation capable
- Multipanel operation capable

OP-609 Combination Panel

Contents

Configuration Options

Stand Alone
PLC Multi-Panel

Use with a PLC

Examples of Use with a PLC
Direct PLC

Examples of Use with an Allen-Bradley PLC Setup and Interconnect

Legending the Lamps and
Buttons

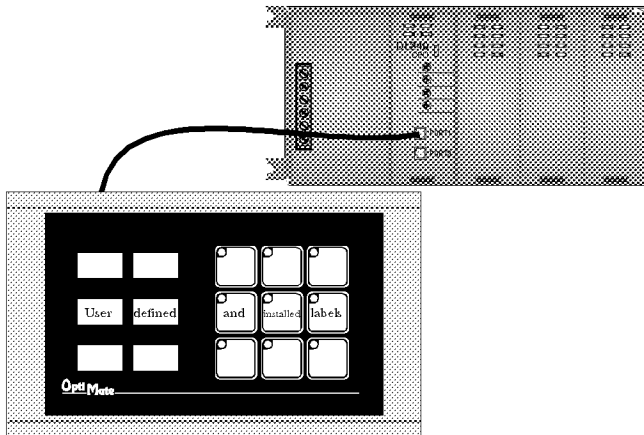
Connection to the System
Configuration

Configuration Selections Specifications

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Configuration Options

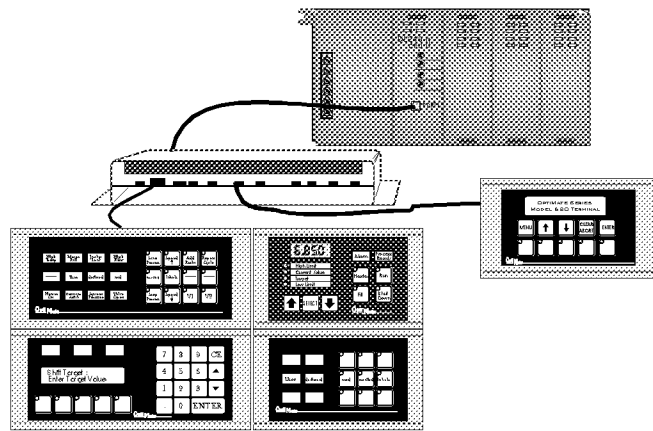


PLC Stand Alone

OptiMate panels plug directly into most PLCs. A simple cable connection allows you to interface and control the OptiMate module via PLC data registers.

The OP-609 Lamp/Pushbutton module uses a bank of four PLC registers to hold pushbutton state, control lights and force pushbutton states. The OP-609 continuously communicates with the PLC registers and updates lamp operation and button status on a real time basis.

PLCs are slave devices on their standard communications ports. This means that a panel attached to the standard port must control the transfer of information by reading and writing the PLC registers. OptiMate panels will perform this communications for most major PLC protocols. Configuration for particular PLC protocols and interconnect cabling is covered in the following pages.



PLC Multi Modules

Larger systems involving operator panels can be successfully addressed using OptiMate modules. These applications utilize the OP-9001 Communications Master to transfer data between the PLC and the individual OptiMate modules. OptiMate panels can be located together to form custom panels or they can be distributed anywhere within 4000 feet.

The OP-9001 Communications Master provides a transparent interface between the PLC and a group of OptiMate modules. The communication interface between modules requires only four wires.

System configuration is simple via OP-WINEDIT configuration software that runs on any IBM PC compatible computer with the Windows operating system. Downloading of the configuration to the module requires a cable connection between the panel and the serial port of the PC.

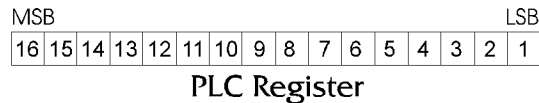
This modular approach to custom applications provides a nearly limitless number of possibilities.

Use with a PLC

Memory Mapping

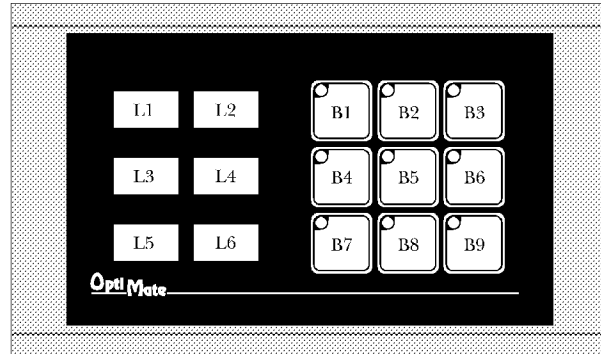
Memory mapping is a technique that “maps” the memory of an OptiMate module into the holding registers of the programmable controller. By knowing where the data of the specific OptiMate panel is mapped, this data can be moved, changed or monitored using ladder logic.

The term PLC register is used by for the area of memory within the programmable controller that can be used for data storage. PLC registers are sometimes know as data registers or internal registers.



The OP-609 Lamp/Pushbutton Module uses a bank of 4 contiguous holding registers. The register set definition is shown in the table below.

OP-609 Lamp/Pushbutton Panel PLC Register Map	
Holding Register	Register Function
X (first register of bank)	Indicator lamps and button LEDs on/off control
X+1	Indicator lamps and button LEDs flash control
X+2	Button on/off status
X+3	Force pushbutton data & commands



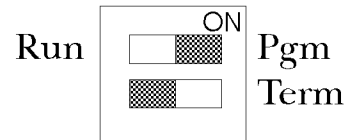
Configuration

Configuration of the OP-609 or system of OptiMate panels is performed via an IBM PC compatible computer. The OP-WINEDIT configuration software will allow you to select module configuration, system configuration and PLC protocol definition.

If the panel is to be operated in stand alone mode, with a PLC, the configuration selections must be made to select the proper PLC protocol information.

If the panel is part of a multi-panel system, the configuration editor will automatically set up communications with between the OP-9001 and the panel via OptiMate Hex. The OP-9001 Communications Master will talk the the module over this protocol and to the PLC over the PLC protocol you select.

Note : When configuring, always remember to set the Run/Pgm DIP switch to PGM (towards the “ON”) before applying power to the module.



When you are finished downloading configuration, power down the panel and switch to the “Run” position before connecting to the PLC.

Further configuration details are covered in the OP-WINEDIT help screens.

Register	MSB						LSB									
X	L6	L5	L4	L3	L2	L1	B9	B8	B7	B6	B5	B4	B3	B2	B1	Indicator Light/LED On/Off
X+1	L6	L5	L4	L3	L2	L1	B9	B8	B7	B6	B5	B4	B3	B2	B1	Indicator Light/LED Flash Control
X+2							B9	B8	B7	B6	B5	B4	B3	B2	B1	Button On/Off Status
X+3	F1	F2	F3				B9	B8	B7	B6	B5	B4	B3	B2	B1	Force Data & Commands

Register Bit Association

Reading Pushbutton Status

Once the panel is configured and connected to the PLC, reading a button's status simply entails reading the appropriate register bit. In typical applications, a pushbutton appears in PLC ladder logic as a contact. The register bit association is shown in the figure below. The panel will automatically place status into this register. A 1 indicates active or "on" condition.

Turning on a Lamp

When configured for PLC operation, turning on a lamp simply requires the writing of a 1 to the appropriate register bit. With most PLCs this is accomplished by activating a coil in the PLCs ladder logic. The OptiMate panel will automatically retrieve the register data and light any lamps whose bits are set.

A lamp must be turned on in order for the flash control bits to have any effect.

Flashing a Lamp

As shown in the table, the second register will initiate lamp flash. To flash a lamp, the lamp must be on and lamp flash bit must be set.

Lamp flash is approximately .5 seconds on and .25 seconds off.

Turning on the Inset Indicator Light

In most cases, the LED inset in each pushbutton simply provides a visual indication of the status of the pushbutton. However, if a module is configured for LED separation mode, the indicator light can be set directly from the PLC. In LED separation mode, turning on a lamp simply requires the writing of a 1 to the appropriate register bit. The register bit association is shown in the table on the previous page. The OptiMate panel will automatically retrieve the register data and illuminate any lamps whose bits are set.

LED separation is available only for momentary pushbuttons.

Flashing an Inset LED

As shown in the table, the second register will initiate inset LED flash. To flash an LED, the LED must be on and LED flash bit must be set. In normal mode, LED "on" status simply reflects pushbutton status. In LED separation mode, LED "on" status is set directly via PLC register bits.

Lamp flash is approximately .5 seconds on and .25 seconds off.

Register	MSB						LSB									
X	L6	L5	L4	L3	L2	L1									Indicator Light/LED On/Off	
X+1	L6	L5	L4	L3	L2	L1	B9	B8	B7	B6	B5	B4	B3	B2	B1	Indicator Light/LED Flash Control
X+2							B9	B8	B7	B6	B5	B4	B3	B2	B1	Button On/Off Status
X+3	F1	F2	F3				B9	B8	B7	B6	B5	B4	B3	B2	B1	Force Data & Commands

Register Bit Association

Force Commands

If the OP-609 panel is configured for force capability, the PLC can directly control button status when desired. This may be desirable for initialization purposes.

The force capability also may prove useful for functions initiated from the pushbutton panel. For example, consider a situation where an operator initiates a control process by pressing an alternate action panel button. The button status and inset LED would stay on and lighted to indicate that the function is still in process. At the end of the process, the PLC program could force the button status off.

There are three types of force functions available. These are described below.

Force function	Description
F1 (Force buttons status)	When the F1 bit is set, all buttons will be forced to the status set in the force data registers (x+3). Once these buttons are forced to the status set, the OP-609 will automatically clear F1.
F2 (Force buttons on)	When the F2 bit is set, all buttons matching the bits set in the force data registers (x+3) will be forced on. Once these buttons are forced on, the OP-609 will automatically clear F2.
F3 (Clear buttons)	When the F3 bit is set, all buttons matching the bits set in the force data registers (x+3) will be forced off. Once these buttons are forced off, the OP-609 will automatically clear F3.

Force applies only to alternate action pushbuttons.

Examples of Use with a PLC *Direct* PLC

Defining the Base Register Address

The simplest method of interfacing a PLC *Direct* PLC program to an OP-609 module is to configure the module base address in the PLC's control relay memory. This allows your program to treat pushbuttons as contacts and LEDs as coils. The following table lists these address for various PLC Direct PLCs.

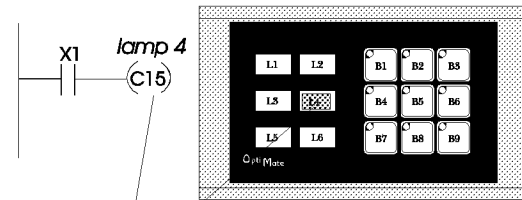
PLC Direct CPU	Control Relay Register address range
DL130	V40600-V40617
DL230	V40600-V40617
DL240	V40600-V40617
DL250	V40600-V40617
DL330	R016-R037
DL330P	R016-R017 and R020-R027
DL340	R016-R037 and R100-R106
DL350	V40600-V40617
DL430	V40600-V40635
DL440	V40600-V40677
DL450	V40600-V40777

The following examples are DL105, DL205, DL350 or DL405 programs with the OP-609 configured for address V40600. The table below shows the control relay correlation for an OP-609 configured for address V40600.

Device	Lamp/LED On/Off	Lamp/LED Flash	Button Status	Force
B1	C0	C20	C40	C60
B2	C1	C21	C41	C61
B3	C2	C22	C42	C62
B4	C3	C23	C43	C63
B5	C4	C24	C44	C64
B6	C5	C25	C45	C65
B7	C6	C26	C46	C66
B8	C7	C27	C47	C67
B9	C10	C30	C50	C70
L1	C12	C32		
L2	C13	C33		
L3	C14	C34		
L4	C15	C35		C75(F3)
L5	C17	C36		C76(F2)
L6	C17	C37		C77(F1)

Turning on a Lamp

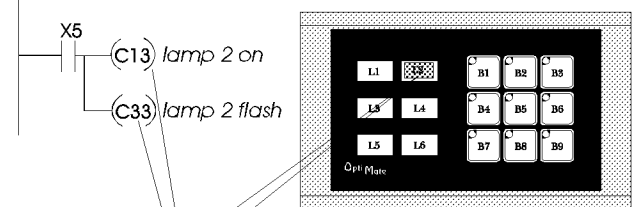
Turning on a lamp in the OP-609 simply requires activating its associated control relay coil. In the figure below, lamp 4 will be turned on whenever input X1 is active (energizing C15).



Register	MSB							LSB								
V40600	L6	L5	L4	L3	L2	L1	B9	B8	B7	B6	B5	B4	B3	B2	B1	Indicator Light/LED On/Off Status
V40601	L6	L5	L4	L3	L2	L1	B9	B8	B7	B6	B5	B4	B3	B2	B1	Indicator Light/LED Flash Control
V40602							B9	B8	B7	B6	B5	B4	B3	B2	B1	Button On/Off Status
V40603	F1	F2	F3				B9	B8	B7	B6	B5	B4	B3	B2	B1	Force Data & Commands

Flashing a Lamp

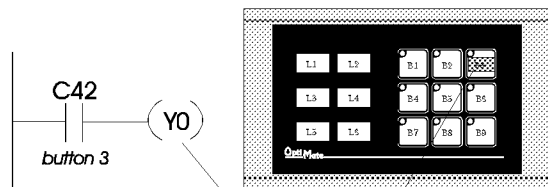
To flash a lamp, you simply need to both turn it on and set the associated flash bit. The example below shows a PLC program used to flash lamp 2 whenever X5 is energized.



Register	MSB							LSB								
V40600	L6	L5	L4	L3	L2	L1	B9	B8	B7	B6	B5	B4	B3	B2	B1	Indicator Light/LED On/Off Status
V40601	L6	L5	L4	L3	L2	L1	B9	B8	B7	B6	B5	B4	B3	B2	B1	Indicator Light/LED Flash Control
V40602							B9	B8	B7	B6	B5	B4	B3	B2	B1	Button On/Off Status
V40603	F1	F2	F3				B9	B8	B7	B6	B5	B4	B3	B2	B1	Force Data & Commands

Using a Pushbutton

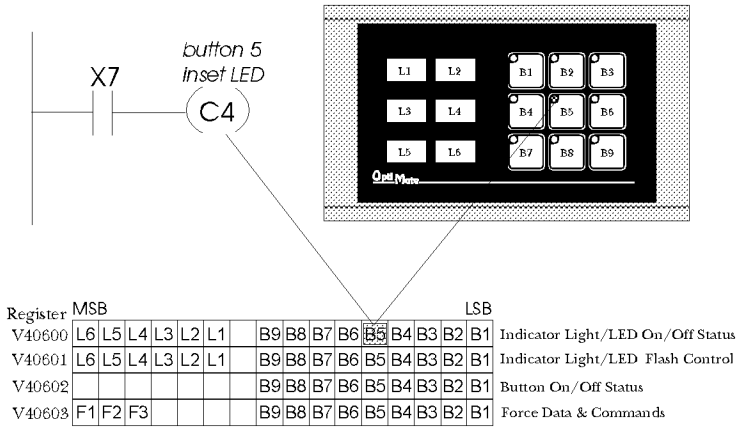
The following example illustrates the use of an OP-609 pushbutton in a program. When pushbutton 3 is activated, C42 will become active and turn on output Y0.



Register	MSB							LSB								
V40600	L6	L5	L4	L3	L2	L1	B9	B8	B7	B6	B5	B4	B3	B2	B1	Indicator Light/LED On/Off Status
V40601	L6	L5	L4	L3	L2	L1	B9	B8	B7	B6	B5	B4	B3	B2	B1	Indicator Light/LED Flash Control
V40602							B9	B8	B7	B6	B5	B4	B3	B2	B1	Button On/Off Status
V40603	F1	F2	F3				B9	B8	B7	B6	B5	B4	B3	B2	B1	Force Data & Commands

Lighting an Inset LED

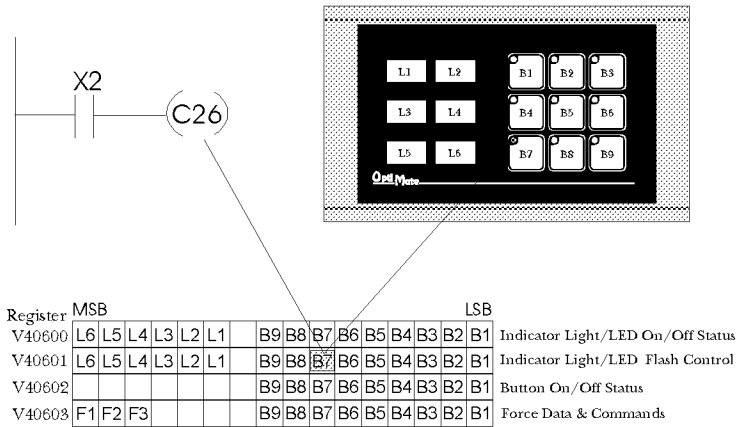
In LED separation mode, the LEDs in the corner of each momentary pushbutton may be directly controlled by the PLC program. The example on the right shows a segment of a program that will light button 5's inset LED whenever input X7 is energized. *In order for this to work, the panel must be configured for LED separation and button 5 must be a momentary pushbutton.*



Flashing an Inset LED

To flash an inset LED, you simply need to both turn it on and set the associated flash bit. If the panel is not set up for LED separation, status is simply the button state. For momentary buttons with LED separation enabled, the on/off state is controlled by the PLC as shown in the previous example. For alternate action buttons, on/off state is always the button state.

The example on the right shows a program used to set the LED inset in button 7 to flash whenever X2 is energized. If the panel has been configured with button 7 being an alternate action button, the LED will operate as shown in the table below.



Button State	X2 State	LED operation
Inactive	de-energized	Off
Inactive	energized	Off
Active	de-energized	On solid
Active	energized	Flashing

Forcing Button Status

One of the more advanced capabilities of the OP-609 panel is the ability to force button state from the PLC program. This may be desirable, for example, if an alternate action is used to start a function process. When it is pushed and while the function is active, the button will remain on. You may want the PLC program to clear the button at the end of the function process.

Another example is a system that has individual enable or on/off (alternate action) buttons for several different devices. You may also have other buttons (momentary) that enable a group of these same devices. You may want your program to force on the device enable buttons when the group enable button is pressed.

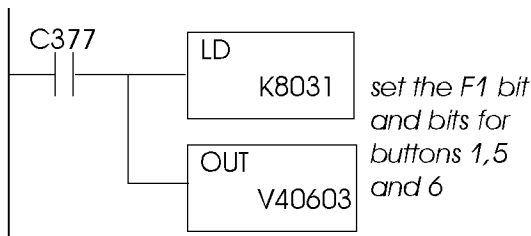
There are many other cases where button force capability can be useful in a system.

There are three types of force functions available for the OP-609 panel - force status, force on and force off. All three functions require moving appropriate data into the PLC registers defined as Force Data & Commands (see the table below).

Note : Force only applies to Alternate Action pushbuttons

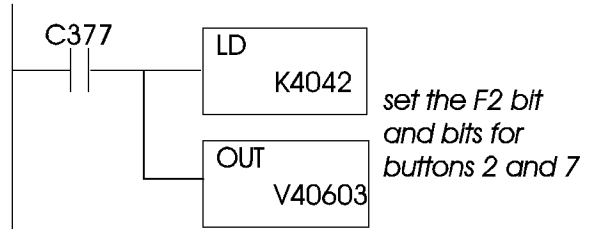
Force Button Status

This function is used to set the state (on or off) of every alternate action pushbutton in the panel. To use the "Force Button Status" function, simply set the F1 bit to 1 and all buttons that you want to be on to 1, while leaving all other bits off. The example below shows buttons 1,5, and 6 being forced on and all other buttons forced off when C377 is active.



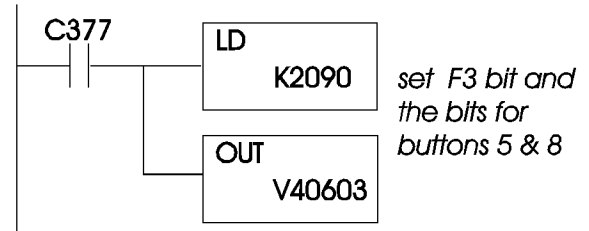
Force Button(s) On

This function is used to turn individual button(s) on without affecting the state of any other buttons. To use the "Force Buttons On" function, set the F2 bit to 1 and all buttons that you want to turn on to 1. Any buttons associated with bits that are left at '0' will not be affected. The following example shows buttons 2 and 7 being forced on when C377 is active.



Force Button(s) Off

This function is used to selectively turn individual button(s) off without affecting the state of any other buttons. To use the "Force Buttons Off" function, set the F3 bit to 1 and all buttons that you want to turn off to 1. Any buttons associated with bits that are left as '0' will not be affected. The example below shows buttons 5 and 8 being cleared when C377 is active.



Register	MSB						LSB									
X	L6	L5	L4	L3	L2	L1	B9	B8	B7	B6	B5	B4	B3	B2	B1	Indicator Light/LED On/Off
X+1	L6	L5	L4	L3	L2	L1	B9	B8	B7	B6	B5	B4	B3	B2	B1	Indicator Light/LED Flash Control
X+2							B9	B8	B7	B6	B5	B4	B3	B2	B1	Button On/Off Status
X+3	F1	F2	F3				B9	B8	B7	B6	B5	B4	B3	B2	B1	Force Data & Commands

Register Bit Association

Examples of Use with an Allen Bradley PLC

Interfacing to A/B Memory

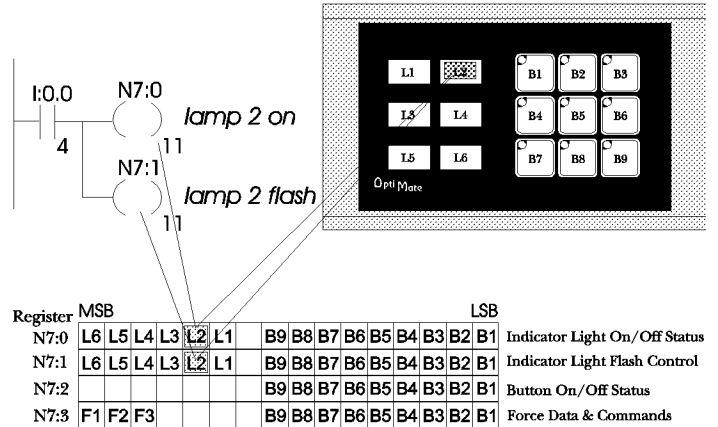
OptiMate modules interface to Allen Bradley SLC 5/03, SLC 5/04 and Micrologix PLCs via integer file type N. The 5/03 and 5/04 have file type N7 as standard. Other "N" type files can be created. The Micrologix has a fixed file type N7. Please refer to Allen Bradley programming documentation for information on setting up and using "N" type files. This allows your program to treat pushbuttons as contacts and LEDs as coils.

The following examples are SLC or Micrologix programs with the OP-609 configured for address N7:0. The table below shows the correlation for an OP-609 configured for address N7:00.

Device	Lamp/LED On/Off	Lamp/LED Flash	Button Status	Force
B1	N7:0/0	N7:1/0	N7:2/0	N7:3/0
B2	N7:0/1	N7:1/1	N7:2/1	N7:3/1
B3	N7:0/2	N7:1/2	N7:2/2	N7:3/2
B4	N7:0/3	N7:1/3	N7:2/3	N7:3/3
B5	N7:0/4	N7:1/4	N7:2/4	N7:3/4
B6	N7:0/5	N7:1/5	N7:2/5	N7:3/5
B7	N7:0/6	N7:1/6	N7:2/6	N7:3/6
B8	N7:0/7	N7:1/7	N7:2/7	N7:3/7
B9	N7:0/8	N7:1/8	N7:2/8	N7:3/8
L1	N7:0/10	N7:1/10		
L2	N7:0/11	N7:1/11		
L3	N7:0/12	N7:1/12		
L4	N7:0/13	N7:1/13		N7:3/13(F3)
L5	N7:0/14	N7:1/14		N7:3/14(F2)
L6	N7:0/15	N7:1/15		N7:3/15(F1)

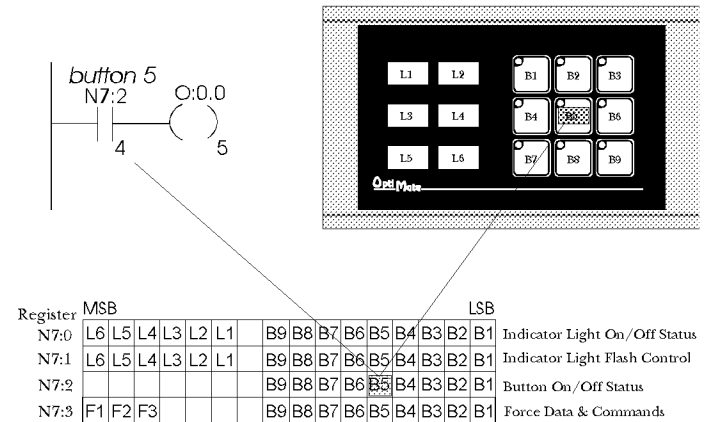
Flashing a Lamp

To flash a lamp, you need to both turn it on and set the associated flash bit. The example below shows a SLC or Micrologix program used to flash lamp 2 whenever I:0.0/4 is energized.



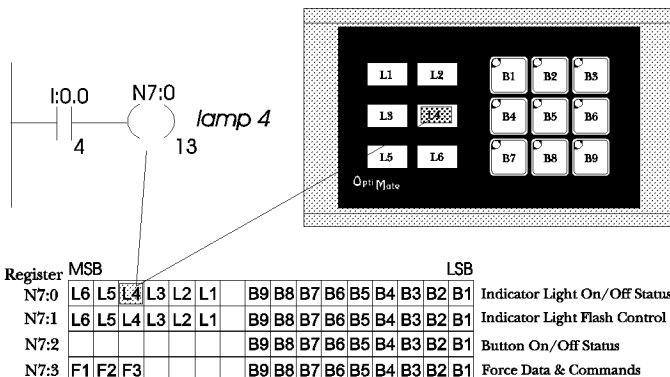
Using a Pushbutton

The following example illustrates the use of an OP-609 with a SLC or Micrologix PLC. When button 5 is activated, N7:2/4 will become active and turn on output O:0.0/5.



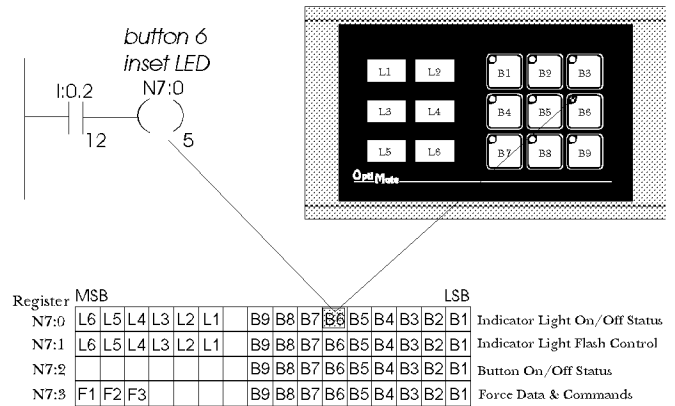
Turning on a Lamp

Turning on a lamp in the OP-609 simply requires activating its associated control relay coil. In the figure below, lamp 4 will be turned on whenever input I:0.0/4 is active (energizing N7:0/13).



Lighting an Inset LED

In LED separation mode, the LEDs in the corner of each momentary pushbutton may be directly controlled by the PLC program. The example on the right shows a segment of a SLC or Micrologix program that will light button 6's inset LED whenever input I0.2/12 is energized. *In order for this to work, the panel must be configured for LED separation and button 6 must be a momentary pushbutton.*

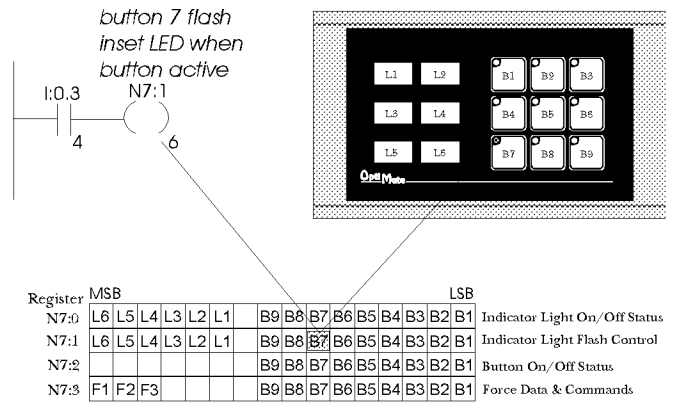


Flashing an Inset LED

To flash an inset LED, you need to both turn it on and set the associated flash bit. If the panel is not set up for LED separation, status is simply the button state. For momentary buttons with LED separation enabled, the on/off state is controlled by the PLC as shown in the previous example. For alternate action buttons, on/off state is always the button state.

The example on the right shows a SLC or Micrologix program used to set the LED inset in button 7 to flash whenever I0.3/4 is energized. If the panel has been configured with button 7 being an alternate action button, the LED will operate as shown in the table below.

Button State	I0.3/4 State	LED operation
Inactive	de-energized	Off
Inactive	energized	Off
Active	de-energized	On solid
Active	energized	Flashing



Forcing Button Status

One of the more advanced capabilities of the OP-609 panel is the ability to force button state from the PLC program. This may be desirable, for example, if an alternate action is used to start a function process. When it is pushed and while the function is active, the button will remain on. You may want the PLC program to clear the button at the end of the function process.

Another example is one of a system that has individual enable or on/off (alternate action) buttons for several different devices. You may also have other buttons (probably momentary) that enable a group of these same devices. You may want your program to force on the device enable buttons when the group enable button is pressed.

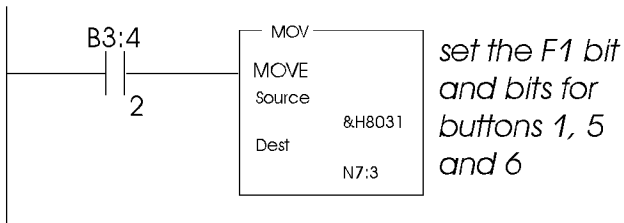
There are many other cases where button force capability can be useful in a system.

There are three types of force functions available for the OP-609 panel - force status, force on and force off. All three functions require moving appropriate data into the PLC registers defined as Force Data & Commands (see the table below).

Note : Force only applies to Alternate Action pushbuttons

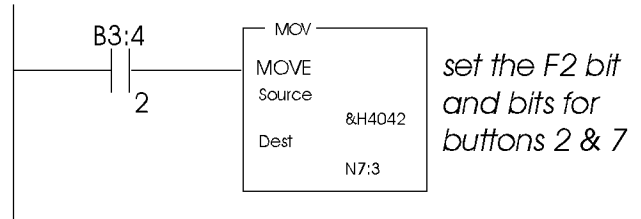
Force Button Status

This function is used to set the state (on or off) of every alternate action pushbutton in the panel. To use the "Force Button Status" function, simply set the F1 bit to 1 and all buttons that you want to be on to 1, while leaving all other bits off. The example below shows buttons 1, 5 and 6 being forced on and all other buttons forced off when B3:4/2 is active.



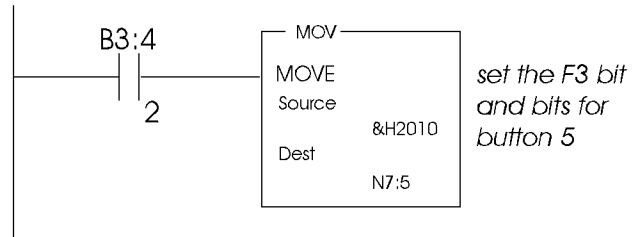
Force Button(s) On

This function is used to turn individual button(s) on without affecting the state of any other buttons. To use the "Force Buttons On" function, set the F2 bit to 1 and all buttons that you want to turn on to 1. Any buttons associated with bits that are left at '0' will not be affected. The following example shows buttons 2 and 7 being forced on when B3:4/2 is active.



Clear Button(s)

This function is used to selectively turn individual button(s) off without affecting the state of any other buttons. To use the "Clear Buttons" function, set the F3 bit to 1 and all buttons that you want to turn off to 1. Any buttons associated with bits that are left as '0' will not be affected. The example below shows button 5 being cleared when C377 is active.



Register	MSB						LSB									
X	L6	L5	L4	L3	L2	L1	B9	B8	B7	B6	B5	B4	B3	B2	B1	Indicator Light/LED On/Off
X+1	L6	L5	L4	L3	L2	L1	B9	B8	B7	B6	B5	B4	B3	B2	B1	Indicator Light/LED Flash Control
X+2							B9	B8	B7	B6	B5	B4	B3	B2	B1	Button On/Off Status
X+3	F1	F2	F3				B9	B8	B7	B6	B5	B4	B3	B2	B1	Force Data & Commands

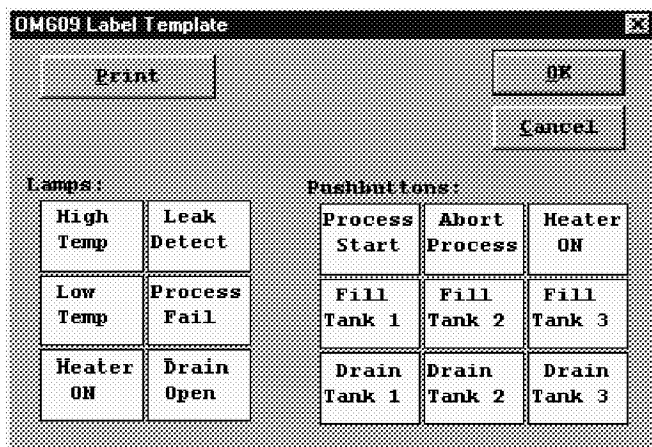
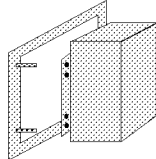
Register Bit Association

Set Up and Interconnect

Legending the Lamps and Buttons

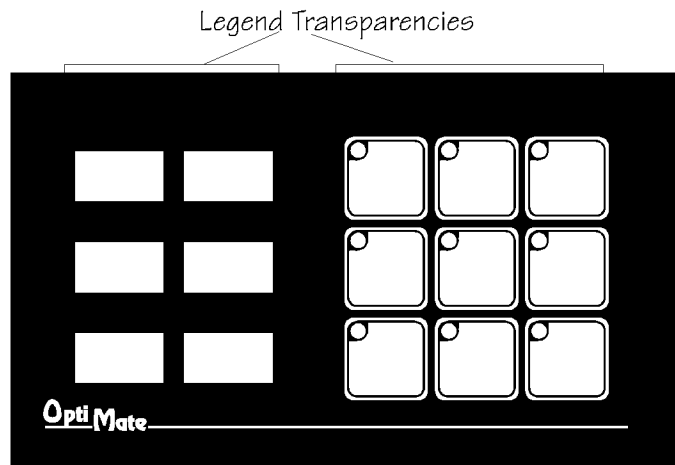
Legending the OP-609 module is a relatively simple process that basically involves sliding legend transparencies into a pocket in the panel overlay. Use the following procedure.

- Remove the bezel from the module. The bezel snaps to the module box along the top and bottom edges. Pull the bezel out and over the snaps to remove.
- Create a legend transparency. There are a number of available options for doing so. A pattern is provided on the specification sheet of this document.
 - > Use the built in label making capability of the OP-WINEDIT software to create labels. Either print on the transparency directly or print on paper and photocopy onto the transparency. The figure below is a screen from OP-WINEDIT which illustrates the process.



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

- Cut along outline. Place into overlay pocket. The OP-609 overlay is not glued to the faceplate. This facilitates changing of LED light bars. The legend transparency should be placed between the overlay and the faceplate. The faceplate and overlay are keyed on both ends to ensure proper alignment when reassembled. (If LED colors do not need to be changed, the overlay may be glued to the faceplate by pulling off the backing and pressing the overlay onto the faceplate).
- Re-attach bezel. Push bezel onto box until it snaps together.



Lamp Colors

OP-609 come with either all red LED light bars or with one row each of red, yellow and green light bars (the -1 option). All light bars are socketed. Light bars are available from Optimization in packets of four.

Replacing a light bar involves removing the bezel and overlay (as in the labeling procedure on the left). Once the bezel and overlay are removed, individual LED light bars may be extracted by use of needle nose pliers. Replacement light bars can be pushed into place. (The light bars are symmetrical, so orientation is not important.)

Configuration

Configuration Selections

OptiMate panels can be configured for the specific application by using the OP-WINEDIT Configuration Editor. The Configuration Editor runs on any IBM PC compatible computer with the Windows operating system. It allows the user to select the exact functionality to meet application requirements.

For the OP-609 panel, the following are important configuration parameters. Further configuration details are covered in the OP-WINEDIT help screens

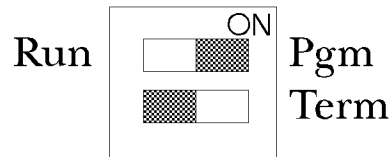
Single Panel PLC Based Systems

Decision	Selection
Single/Multi Panel	Choose single panel configuration
Configuration starting point	First time configuration start with defaults for module. Subsequent configurations can utilize disk files you create
PLC Type	Select appropriate PLC type
Protocol	Select appropriate baud rate, # data bits, # stop bits & parity. Note that if 8 data bits and even or odd parity selected, only 1 stop bit is available
Momentary/Alternate	Set as required for application
LED Separation	Enable LED separation only if all momentary button inset LEDs are to be controlled from the host PLC
Force Option	Set as required for application

Multi Panel PLC Applications (Uses OP9001 Communications Master)

Decision	Selection
Single/Multi Panel	Choose Multi Panel
PLC Type	This applies to the Communications Master. Choose appropriate type
Protocol	This applies to the Communications Master. Choose appropriate baud rate, # bits, # stop bits & parity. Note that if 8 data bits and even or odd parity are selected, only 1 stop bit is available.
Panel Protocol	Will be OptiMate Hex
Momentary/Alternate	Set as required for application
LED Separation	Enable LED separation only if all momentary buttons are to be controlled from host PLC
Force option	Set as required for application

Configuration must be downloaded from the IBM PC compatible to each panel. This is done over the serial link. Panel must be selected for "Pgm" (DIP switch in back of the module) prior to application of power for panel to accept configuration data. The panel must be powered down and the DIP switch changed from "Pgm" to "Run" before reapplying power for the module to operate with the selected host.



OP-609 Configuration

Panel Address: 0

PLC Base Register Address: V2000

Write to Panel

Close

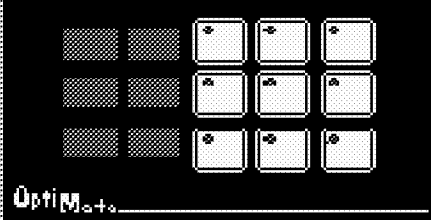
Labels

Pushbutton Options:

Force Option

LED Separation

Panel:



Pushbuttons

	A	M		A	M		A	M
#1:	<input type="radio"/>	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input type="radio"/>		<input checked="" type="radio"/>	<input type="radio"/>
#2:	<input type="radio"/>	<input checked="" type="radio"/>		<input type="radio"/>	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input type="radio"/>
#3:	<input type="radio"/>	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input type="radio"/>		<input checked="" type="radio"/>	<input type="radio"/>
#4:				<input checked="" type="radio"/>	<input type="radio"/>		<input checked="" type="radio"/>	<input type="radio"/>
#5:				<input type="radio"/>	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input type="radio"/>
#6:				<input checked="" type="radio"/>	<input type="radio"/>		<input checked="" type="radio"/>	<input type="radio"/>
#7:				<input checked="" type="radio"/>	<input type="radio"/>		<input checked="" type="radio"/>	<input type="radio"/>
#8:				<input type="radio"/>	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input type="radio"/>
#9:				<input checked="" type="radio"/>	<input type="radio"/>		<input checked="" type="radio"/>	<input type="radio"/>

[A = Alternate M = Momentary]

Addressing

Setting the panel address is performed through the OP-WINEDIT editor. The particular address selection for a panel connected directly to a PLC is not important (any address will work). For multi-panel systems, each panel in the system must be assigned a unique address.

Connection to the System

OptiMate panels are designed for communications connection to system devices. The panel can be connected to a computer, PLC or OP-9001 communication master over the serial port (RS232 or RS422).

Connection to a Computer or PLC

Connection of an OptiMate panel to a computer or PLC can be accomplished over either an RS232 or RS422 link. RS232 is limited to one OptiMate panel to one computer serial port. RS422 allows up to 31 panels to be connected to one computer port. Since PLCs are slave devices, the RS422 link for a PLC is limited to one OptiMate panel.

OptiMate Panel RS232		OptiMate Panel RS422	
Host Computer/PLC	OptiMate Panel DB-15 Male	Host Computer/PLC	OptiMate Panel DB-15 Male
TX	3 RS232 RX	TX+	9 RS422 RX+
RX	2 RS232 TX	TX-	10 RS422 RX-
Sig Gnd	5 Sig Gnd	RX+	11 RS422 TX+
		RX-	12 RS422 TX-

Refer to manufacturer's documentation for PLC or computer serial link connector pinouts.

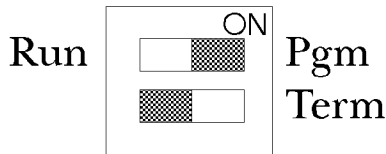
Standard interface cables are available for connection to several different PLCs as well as to IBM PCAT compatible ports.

Serial Connection to Communications Master

Connection to an OP-9001 Communications Master over a serial link is via RS422. The Communication master port connections are reversed from the module ports to enable direct pin to pin connection. For distances under 50 feet (in a low electrical noise environment), a ribbon cable connection works quite well. For longer distances or in noisy environments, a two pair shielded RS422 cable is recommended.

Termination

The termination DIP switch on the back of the module switches in a terminating resistor. This terminating resistor does not apply to an RS232 connection (and should be placed in the OFF position). In an RS422 connected system, the termination should be on in the last, and only the last, panel on the cable.

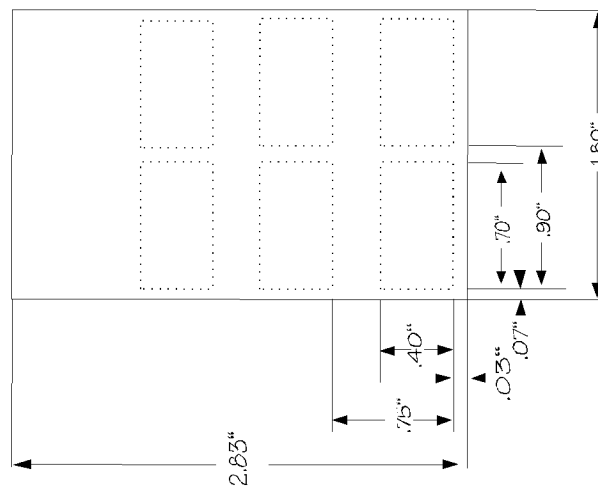
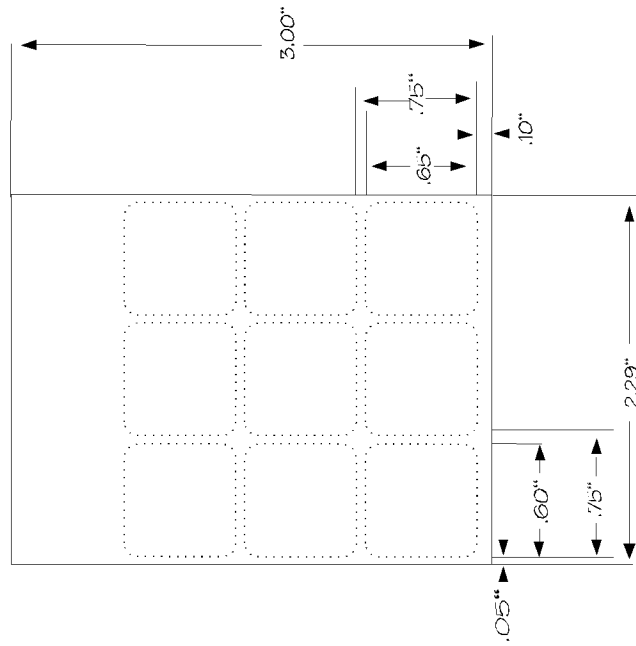


Power

OptiMate modules can operate on any voltage between 8 and 30 VDC. Power must be connected to the terminal plug located on the back of the module.

There is a brief (0.5 to 2 millisecond) power on surge to 2 amps. This is typical of nearly any type of electronic equipment and is due to the initial charging of power capacitors. This surge is not normally a problem for a commercial power supply.

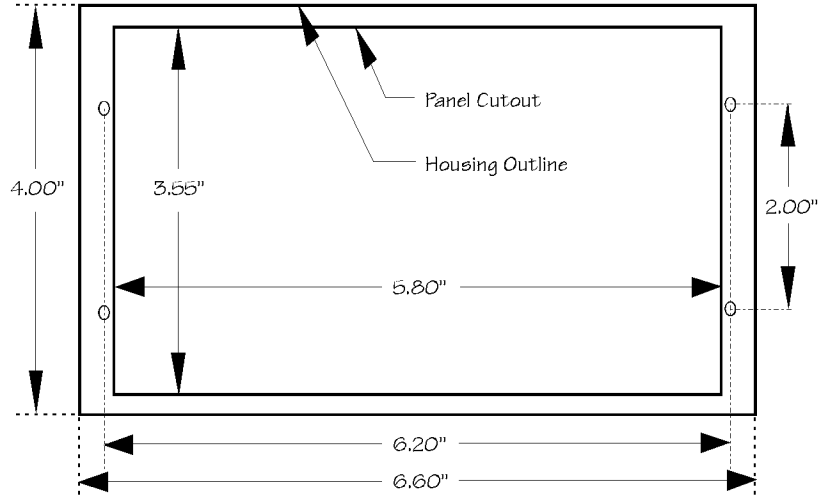
Label Templates



Specifications

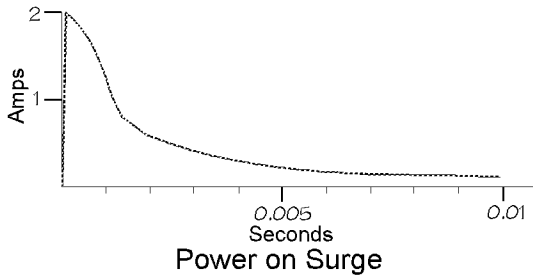
Physical

- Recessed Mount Housing 6.6"L x 4.0"H x 1.25"D
- Cutout size for above 3.55"Hx5.8"L
- Panel Fasteners : Four, 6x32 threaded studs, shown above (on ends, symmetrical about center line)
- Weight : 10 ounces
- Colors : Dark gray with black panel
- Pushbutton dimensions : .65 inches square on .75 inch centers
- Pushbutton life : 1,000,000 switch cycles
- Lamp Colors Available : Red, Green, Yellow
- Lamp window size .7" x .4"



Electrical

- Power (all lamps on) : 8 - 30VDC @ 2.4VA
200 mA @ 12VDC 100 mA @ 24VDC
- Power on surge (see figure below) : 2A for 2 millisecond maximum



- Power connector : Pluggable terminal block, 2 position

Communications

- RS232 and RS422
- 4800 to 19200 baud
- Compatible with major PLC protocols
- 15 pin female 'D' shell connector (screw terminal adapter available)

Communications Failure Operation

Should the panel (when not selected for configuration) ever fail to communicate successfully for a period of 12 seconds, all lamps and inset LEDs will flash rapidly.

Panel Mounting Dimensions

Environmental

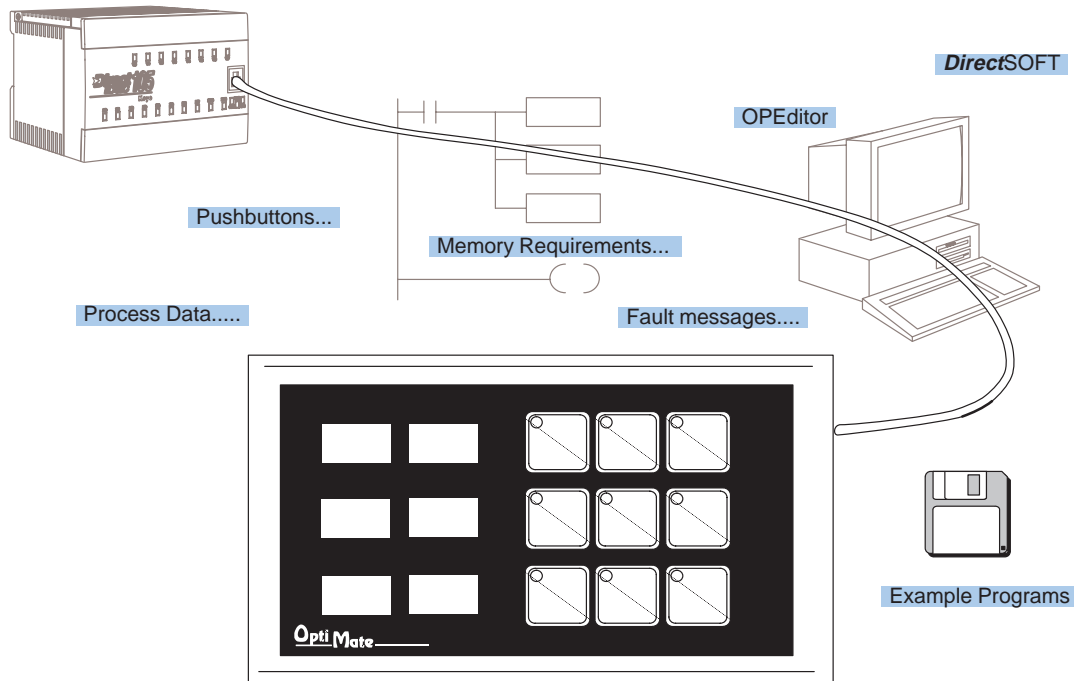
- Enclosure - NEMA 4 recessed mount
- Temperature - 0 to 50 C
- Humidity - 95% Non-condensing

Appendix A

Example Programs

In This Chapter. . . .

- Installing Example Programs
 - Selecting and Connecting Cables
 - Running Example Programs
 - Program Worksheets
-



Understanding the Example Programs

One of the best ways to learn how to use the OP-panel is to load the example programs which are on the supplied diskette, and run the program for your PLC. The example program provides ladder logic which demonstrates controlling pushbuttons, LEDs, lamps, and force operations. Use an understanding of this example program to help develop programs for your own applications.

Follow the instructions in this chapter for installing and running the example programs.

Software Requirements

The example programs require that you have two software packages loaded on your personal computer:

- **DirectSOFT** programming software, and
- OP-WINEDIT (OptiMate Editor) configuration software.

If you do not have these software packages, obtain and install them on your personal computer using the instructions in their user manuals.

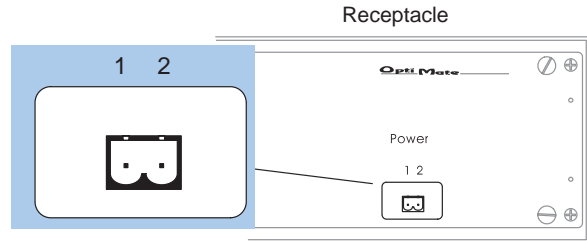
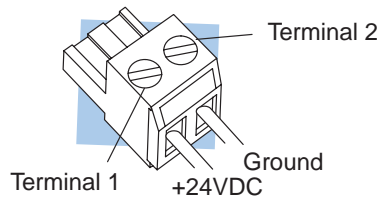
Once you have both programs installed on your personal computer you are ready to use the following step-by-step instructions for installing and using the example programs.

9 Steps to Using the Example Programs

Step 1: Power Supply Connections

An external power supply should be used to power the Optimization unit. The power supply must supply voltage of 8 to 30 VDC. Connect the power supply using the supplied terminal block connector. The connector is keyed to prevent reversing the polarity. Pin 1 is the positive connection (8 to 30VDC), while pin 2 is the common (0VDC) or ground connection.

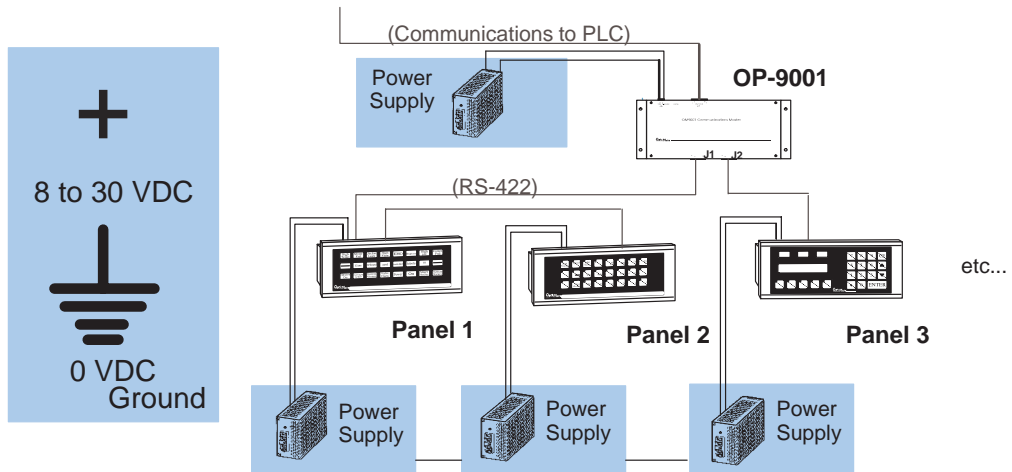
Use 18–24 AWG conductor wire and connect the power supply to the supplied connector block as follows: Connect the positive (+8 to 30 VDC) lead to terminal 1, and connect the common ground (0V) lead to terminal 2.



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

Step 1A: Multi-Panel Power Supply Connections (Optional)

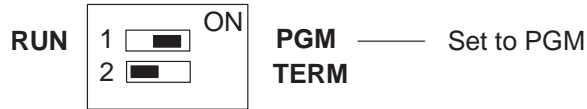
In multi-panel applications, if using separate power supplies, make sure the electrical ground commons do not have a great potential difference. When using a *single* power supply in a *multi-panel* application, the power supply must maintain the specified voltage and current consumption for each of the individual units under all conditions (including power-up). See individual panel power requirements.



Step 2: Setting the OP-Panel PGM/RUN DIP Switch to PGM

You may generate your OP-panel configuration off-line. To download your configuration, the PGM/RUN DIP switch located on the back of the OP-panel must be set to PGM (ON). The TERM switch should remain off.

NOTE: You must cycle power to the panel (turn power off, set DIP switch, and turn power back on) to activate the new switch settings.



For multi-panel configurations, see the section titled OP-9001 Multi-Panel Configurations towards the end of this chapter.

Step 3: Selecting Cables

Depending on which PLC you are using, you may require as many as three cables to use the example programs:

- An OP-ACBL-1 configuration cable to connect your personal computer to the OP-panel to load the configuration program into the panel. *All panels* use the OP-ACBL-1 for the configuration cable.
- A cable to connect your personal computer to the PLC to load the **DirectSOFT** example ladder programs into your PLC. See the **DirectSOFT** user manual for help in selecting the proper cable to use with your PLC.
- A cable to connect the OP-panel to the PLC. Use the information on the next two pages to select the proper cable to use with your PLC.

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 will 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 requires the solder-type or D-shell with screw terminal connectors. For distance of 30 feet or less, you can use ribbon cable. For ribbon cable, we recommend Belden 9L28015 or 3M 3365/15.

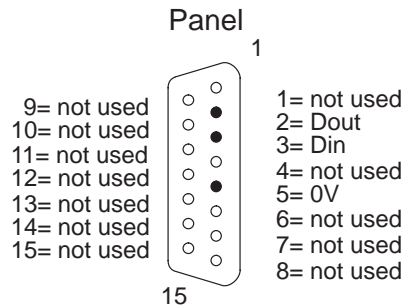
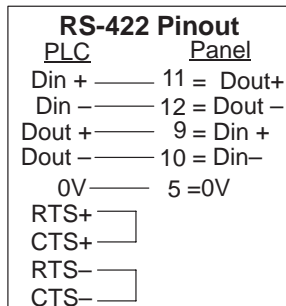
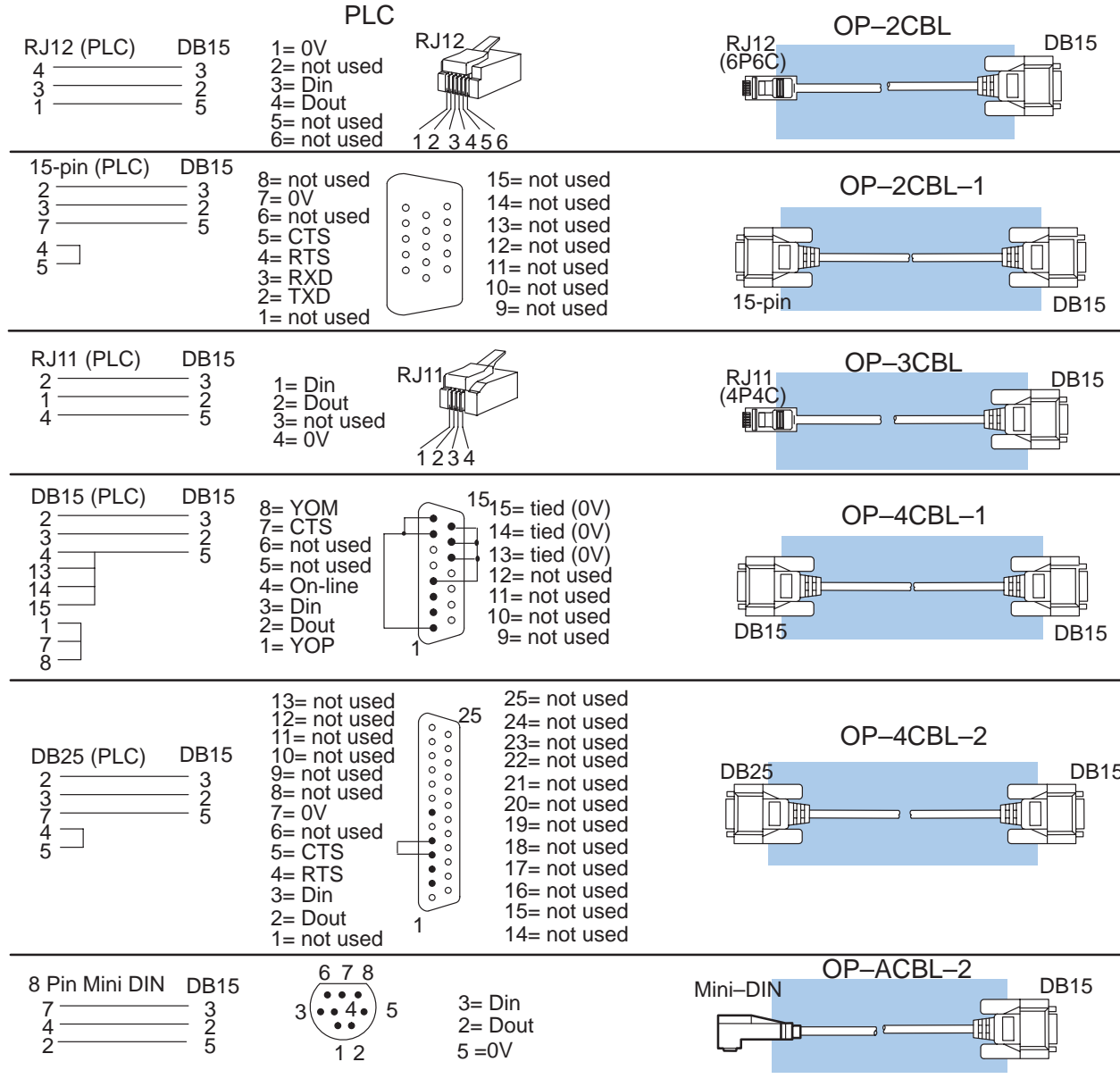
OptiMate Cables			
Family	CPU (or other device)	Port	Cable
DirectLOGIC-DL105	DL130	Only port	OP-2CBL
DirectLOGIC-DL205	DL230	Only port	OP-2CBL
		Top port	OP-2CBL
	DL240	Bottom port	OP-2CBL
		DL250	Top port
	Bottom port	OP-2CBL-1	
DirectLOGIC-DL305	D2-DCM (module)	Only port	OP-4CBL-2
	DL330	Requires DCU*	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	
DirectLOGIC-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

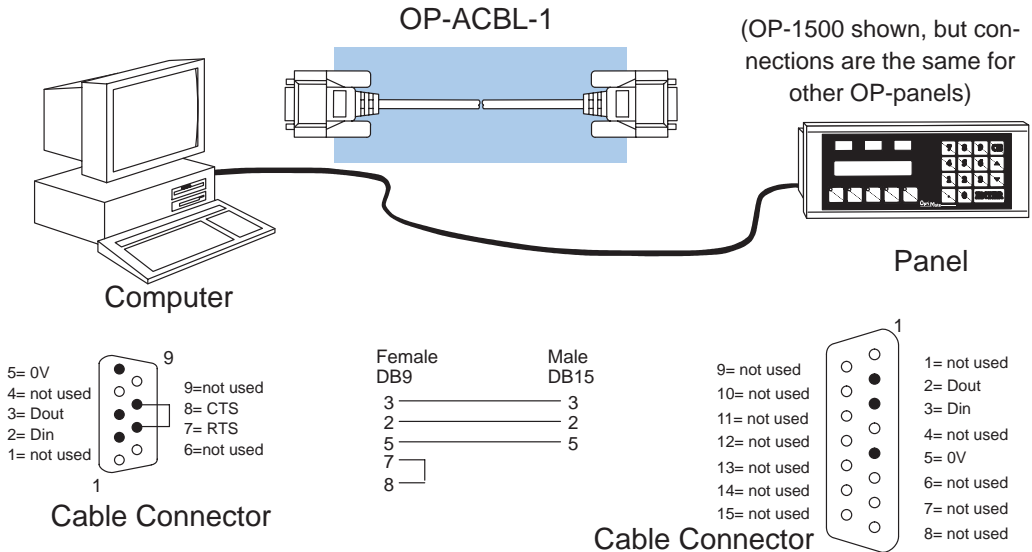
Connecting Cable Details

Connecting Cable The OP-609 connecting cable may vary depending on which CPU you use. Refer to the previous page to select the proper cable for connecting to your PLC.



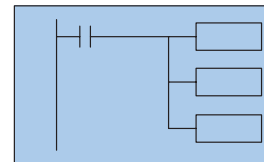
Step 4: Connecting Configuration Cable OP-ACBL-1

Once the example programs are loaded in your personal computer, the first step will be to load the configuration program from the computer into the OP-panel, so make this cable connection first. Connect the configuration cable between the serial port of the OP-panel and the serial port of the personal computer when configuring panels using the OP-WINEDIT software. The OP-WINEDIT software requires you to select the serial port number (com1, com2) being used for configuration. The figure below shows programming cable connectors and wiring specifications. Wiring diagrams refer to the cable connectors, *not* the communication ports.



Step 5: Installing the Example Programs on Your Personal Computer Hard Drive

It is possible to load the examples from the diskette; however, we recommend copying them to the hard drive in your computer and keeping the original diskette in a safe place.



To install the example programs if **using Windows 3.1**, follow these steps:

1. Call up the DOS Prompt. Make a new directory on the hard drive in your computer. For example, if the hard drive is drive C and you are using an OP-609 panel, type:

MD C:\OP-609

2. Copy all the files from the example program disk to the new directory. For example, if the diskette is in drive A: and the hard drive is drive C:, type:

COPY A:*. * C:\OP-609*. *

To install the example programs if **using WIN 95**, follow these steps:

1. Select the **Explorer** icon and open. If the hard drive is drive C, select the **(C:)** icon.
2. Make a new directory in the hard drive of your computer. For example, if you are using an OP-609 panel, Select the **File** menu, then select **New** and then **Folder**. Notice the **New Folder** icon that appears. Select the folder and name it "OP-609" by selecting the **File** menu and selecting **Rename**. Type in the new name.
3. Copy all the contents of the example program disk. Insert the diskette in drive A, and select and open the **3 1/2 Floppy (A)** icon. Notice the disk has numerous files of example programs. Select all the programs by opening the **Edit** menu and selecting **Select All**. Open the **Edit** menu again and select **Copy**.
4. Paste the program disk contents into the new C drive "OP-609" directory. Open the "OP-609" directory, open the **Edit** menu and select **Paste**.

The example programs are now loaded onto the hard drive of your computer. Remove the diskette from drive A.

**Step 6: Loading the
OP-WINEDIT
Example Program
into the OP-Panel**

The next step is to load the configuration program into the OP-panel as follows:

1. Open the OP-WINEDIT (also called OPEditor) software.
2. When the initial screen appears, select **Existing System**.
3. A **File Open** window appears. Open the example program file that you just loaded on your hard drive ("OP-609"). A list of files appears, all having ".ocf" after the file name. These are all configuration programs.
4. Select the configuration program for the OP-panel and PLC you are using. For example, if you are using an OP-609 panel with a DL205 PLC, select and open the file titled "609_205.ocf".
5. A screen appears having all the configuration parameters for running the example program using an OP-609 with a DL205 PLC. Make sure your OP-ACBL-1 cable is connected between your personal computer and the OP-panel, that the DIP switch slides are set to ON, and that the OP-panel power supply is on. Select **Configure Panel**.
6. When the next window appears, select **Write to Panel**. This loads the program into the OP-panel.
7. After the program is loaded, close the open windows and select **Exit Software**. This closes out the OP-WINEDIT software.

The OP-panel is now configured, and the OP-ACBL-1 cable can be disconnected.

Step 7: Setting the OP-Panel PRG/RUN DIP Switch to RUN

To run the example programs, set the RUN/PRG DIP switch to RUN.

NOTE: You must cycle power to the panel (turn power off, set DIP switch, and turn power back on) to activate new switch settings.

**Step 8: Loading the DirectSOFT Example Program into the PLC**

The next step is to load the *DirectSOFT* example program into the PLC as follows:

1. Connect the communications cable from your personal computer communications port to your PLC's programming port on the CPU.
2. Start *DirectSOFT* on your personal computer.
3. Select **Open Document**.
4. A dialog box appears. Open the example program file that you just loaded on your hard drive ("OP-609"). A list of files appears, all having ".prj" after the file name. These are the example program files. Notice that the program files are named for the OP-panel and PLC being used and end with ".prj".
5. Select the example program for the OP-panel and PLC you are using. For example, if you are using an OP-609 panel with a DL205 PLC, select and open the file titled "609_205.prj". When the program opens, its ladder rungs will appear on the monitor screen.
6. Select the **PLC** menu, then **Connect**, then select the link to use. All the program examples are saved without PLC link information, so you have to re-connect to your particular CPU. If a message appears which asks you to select the source of program to view, select **Disk**.
7. Make sure the CPU is in Program mode. Then download the program to the CPU. One method is to select the **File** menu, **Write Program...**, then select **To PLC**.
8. When the program download is complete, put the CPU in Run Mode. Select the **PLC** menu, **PLC Modes...**, then select **Run**. The program is now running.

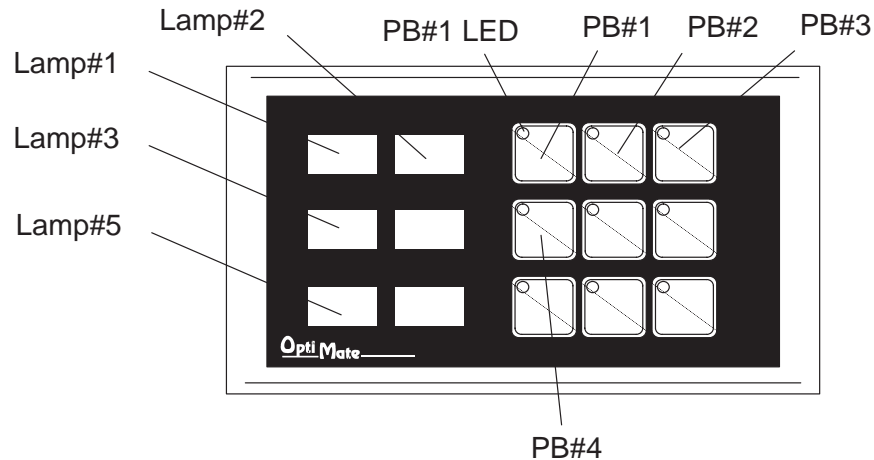
Step 9: Connecting the OP-Panel to the PLC and Running the Program

The next step is to connect the OP-panel to the PLC using the cable you selected earlier. Once the OP-panel is connected to the PLC you can run the example program. Read through the following section, Running The OP-609 Example Program, while at the same time actually running the program on your OP-panel. It would be helpful to print a hardcopy of the example program and study the ladder logic to see how the program operates.

Running the OP-609 Example Program

The example program demonstrates the main features of the OP-609 panel:

- Custom pushbutton configuration
- Custom pushbutton LED configuration
- Custom lamp configuration
- Force operations.



If you look at the pre-configured OP-WINEDIT program you loaded into the OP-panel earlier, notice that pushbuttons PB#1, PB#2, and PB#4 are set for momentary operation and that PB#5 through PB#9 are set for alternate (toggle) operation. Also, the Force Option and LED Separation features are both activated (see Configuration section for configuration details).

The example program operates as follows:

Notice that the pushbutton PB#1 LED is flashing and that Lamp#5 is on steady. The LED and lamp are programmed to do this at CPU powerup.

Press pushbutton PB#1. PB#1 LED and Lamp#5 go off, while Lamp#3 flashes for a short period of time and goes off. Lamp#1 goes on steady and PB#2 LED starts flashing.

Next, press pushbutton PB#2. Pushbutton PB#2 LED and Lamp#1 both go off, then Lamp#5 goes on steady while PB#1 LED starts flashing.

Press pushbutton PB#3. Lamp#5 and PB#1 LED stay on, and Lamp#2 and PB#3 LED go on steady.

Press pushbutton PB#3 again. Lamp#2 and PB#3 LED both go off. Lamp#5 and PB#1 LED stay on.

Press PB#4. This forces the status of pushbutton PB#3, which is that Lamp#2 and PB#3 LED go on steady. Lamp#5 and PB#1 LED stay on.

Print a hardcopy of the example program and study the ladder logic to see how the program operates. Hopefully this example will help you utilize the OP-panel for your own applications.

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, which the CPU communicates to for obtaining data from 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 a RS-422 link must have a unique address. A more detailed description of multiple panel configuration and installation is given in the OP-9001-M User Manual.

The Termination Resistor

The last panel must be terminated when using a RS-422 communications link by setting DIP switch 2 to the TERM (ON) position. Operator panels communicating more than 50 feet distance *must* use RS-422 and also be properly terminated.

NOTE: Only the *last* panel of each RS-422 link should have the termination DIP switch 2 set to the TERM position. All other panels should have the DIP switch set to the off (left) position. After changing the DIP switch settings, remember to cycle power on panel to activate the new switch settings.

Appendix B

Troubleshooting the OP-609

In This Chapter. . . .

- Troubleshooting
 - Panel Configuration Problems
 - Panel to PLC Communications
 - A–B Panel to PLC Communications
-

Troubleshooting the OP-609 Panel

Troubleshooting

In this section, we explain how to isolate potential problems which may occur while using the OP-609. If you are unable to troubleshoot and correct your problem using these procedures, please contact our technical product support team between the hours of 9:00 AM and 6:00 PM (EST) Monday through Friday. Call **1-800-633-0405** or fax **(770) 889-7876**.

We have organized the troubleshooting section into two categories:

- Panel configuration problems
- Panel and PLC communications failures

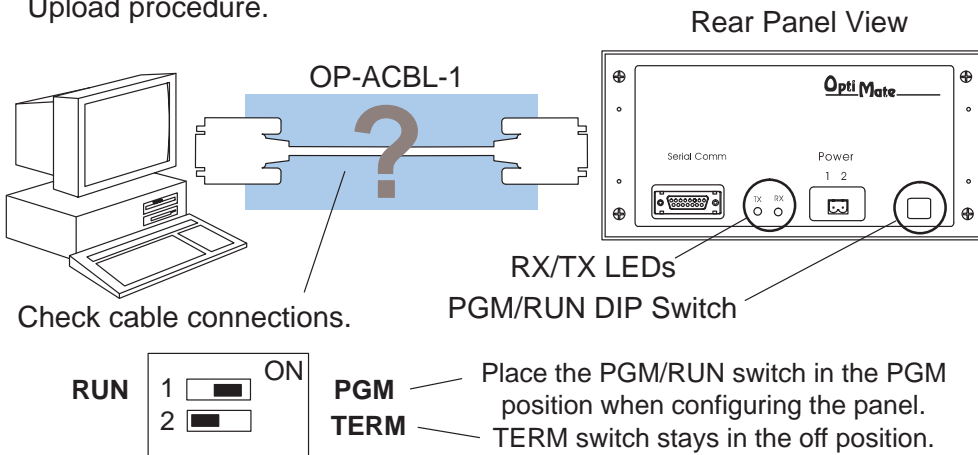
Panel Configuration Problems

We explained in previous sections that the OP-WINEDIT configuration software is used to create OP-panel applications and to download and upload your OP-panel programs. If you are online with the panel and communications fails, the following error message is displayed:

“Could not communicate with panel” (OP-WINEDIT)

If this occurs, check the following in the order given:

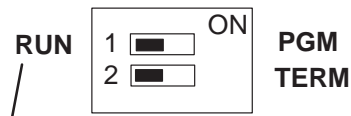
1. Check the rear panel RX/TX LEDs while attempting the Upload or Download operation. Both LEDs should be giving slow alternating flash signals, indicating the PC and OP-panel are connected. If *only* the TX (transmitter) LED is flashing, or if the TX/RX LEDs are *not* alternating between flashes, check that the OP-panel is set to the configuration mode by setting the RUN/PGM DIP switch to the PGM position. Remember to cycle the power.
2. Check to make sure the configuration cable (**OP-ACBL-1**) is properly connected. For cable details, refer to the Appendix A, Connecting the Configuration Cable OP-ACBL-1 section.
3. Make sure the correct communications port is selected with the software, such as COM1, COM2, COM3, COM4. If **DirectSOFT** is open, close it down while you are configuring the panel.
4. Check the 24VDC power source and connections.
5. After checking the above items, repeat the online panel Download or Upload procedure.



Panel to PLC Communications Problems

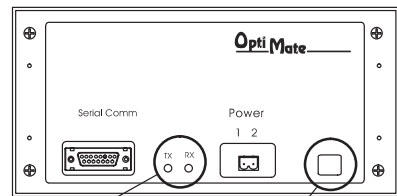
If you experience communications difficulties between the OP-panel and PLC for a period of twelve seconds, all lamps and inset LEDs will flash rapidly.

1. Observe the TX and RX LEDs on the rear of the panel. Both LEDs should be a steady flash or glow (depending on baud rate). If not, check and make sure you are using the proper communications cable and that it is securely connected.
2. Examine the RUN/PGM DIP switch to make sure it is placed in the RUN position to load and run the ladder program. You must cycle OP-panel power for address switch changes to take effect.



Place the PGM/RUN switch in the RUN position when running the program.

Rear Panel View



RX/TX LEDs

RUN/PGM DIP Switch

3. Examine the communications information for the proper PLC type, protocol type, baud rate, parity, stop bit, address number. Use the user manual for the PLC product you are using to determine the proper settings.
4. If you are using an OP cable, verify cable pinout. For RS422 connections use a Belden 9729 or equivalent cable.
5. Check 24VDC power source and connections.



DirectLOGIC PLCs : If you are using the secondary communications port such as **DirectLOGIC** PLC port 2, ensure the communications port address and protocol setting match.

PLC Model	Port/Baud Rates	Parity	Stop Bit
DL105/230/240	Top	9600	Odd
	Bottom	Bottom (DL240 only) 9600/19.2k	Odd/None
DL250	Top	9600	Odd/None
	Bottom	9600/19.2K	1
DL330	DCU only	4800/9600/19.2k	Odd/None
DL340	Bottom & Top	4800/9600/19.2k	Odd/None
DL350	Top	9600	Odd
	Bottom	4800/9600/19.2K	1
DL430/440	Top	Top 9600	Odd
	Bottom	9600/19.2k	Odd/None
DL450	DB15	9600	Odd
	DB25	9600/19.2k	Odd/None
	RJ12	9600/19.2k	Odd/None

Allen-Bradley Panel to PLC Communications Problems

For Allen-Bradley, you may connect to Channel 0 (bottom serial port), using DF1 in full duplex mode. Additionally, the Allen-Bradley software allows the bottom port to a unique PLC address. The Allen-Bradley software default is PLC address one. You must ensure the OP-panel configuration address matches the PLC address you have assigned. The Allen-Bradley port only communicates using either 4800 or 9600 baud. No other baud rates are supported between the OP-panel and Allen-Bradley PLC. For example, on Allen-Bradley PLC's the serial port baud rate defaults to 1200 baud and must be changed. The baud rate for channel 0 must be set to 4800 or 9600 baud to match the OP-WINEDIT configuration. Also the base memory area must be expanded to include the full range of registers such as N7:0 through N7:7.



OTHER PLCs : Regardless of which PLC brand you are implementing, the communications parameters should be reviewed and properly configured. Please check the appropriate manual for your PLC product to ensure proper communications port and panel type settings.