5

Programming Examples

In This Chapter. . . .

— Examples Using ***Direct***LOGIC PLCs
— Examples Using DL05, DL105, DL205, D3–350 and DL405
— Example Using D3–330/340
— Examples Using Allen-Bradley™ SLC 5/03, 5/04 and Micrologix
— 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, 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.

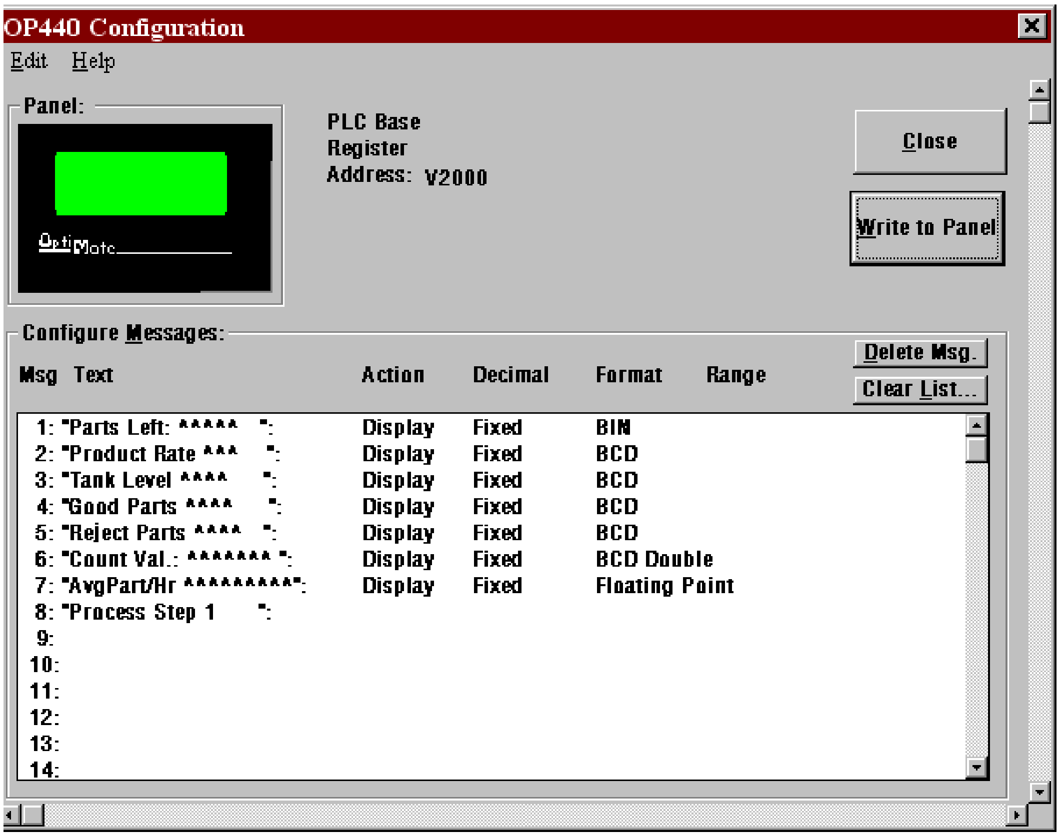
Data Word Registers for ***Direct***LOGIC™ PLCs		
Family	**CPU**	**Control Relay Registers**
DirectLOGIC™ DL05	D0–05	V1200–V7377
DirectLOGIC™ DL105	F1–130	V2000–V2377
DirectLOGIC™ DL205	D2–230	V2000–V2377
	D2–240	V2000–V3777
	D2–250	V1400–V7377 and V10000–V17777
DirectLOGIC™ DL305	D3–330/D3–330P	R400–R563
	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

Defining the Status Register

The following examples assume that the OP–440 is configured for a base address of V2000. When configuring the panel, use the configuration data and messages shown in the following figure. Also, assume that message #140 consists of all blanks.

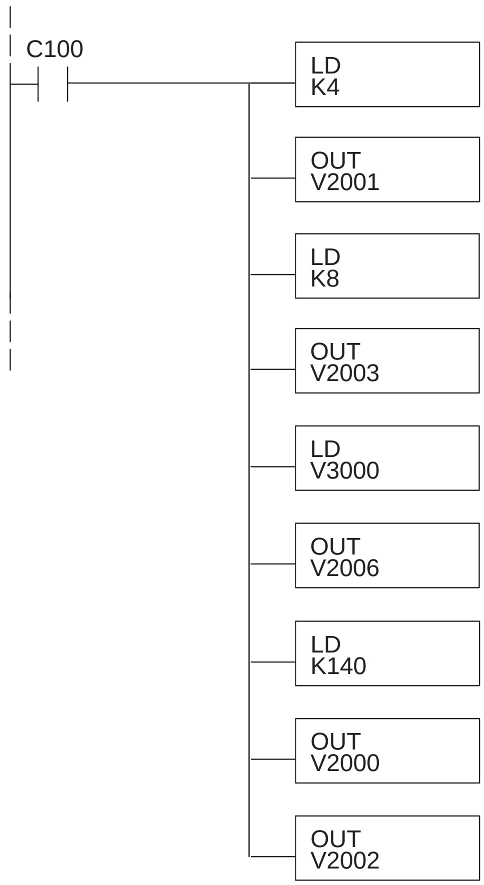
NOTE: The Example Worksheet in Appendix A also has the configuration data and messages needed for these examples. The example uses an F1–130 CPU, but enter the PLC parameters for your PLC. The example shows how you can use the worksheets to help plan your configurations.



Enter the above messages to run the example programs.

Displaying Messages

The following example shows two messages being displayed. The second line is displaying message #4 and the bottom line is displaying message #8. The top and third lines use data display message #140, which has been configured as a blank text message.

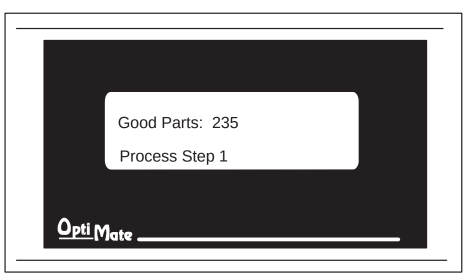


This selects message #4 to be displayed in the second line.

This selects message #8 to be displayed in the bottom line.

This puts data from V3000 into the second line data field.

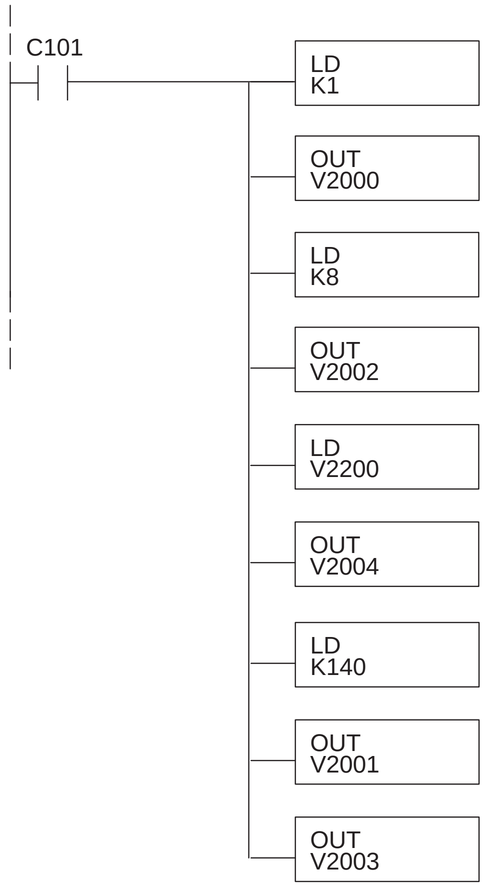
Select message #140 to blank the top and third lines.



V2000	Top line message selection
V2001	Second line message selection
V2002	Third line message selection
V2003	Bottom line message selection
V2004	Top line data
V2005	Top line data 2
V2006	Second line data
V2007	Second line data 2
V2010	Third line data
V2011	Third line data 2
V2012	Bottom line data
V2013	Bottom line data 2

Displaying Binary Numbers

This example is similar to the previous example, except that it uses a binary number in the top line display. The top line uses data display message #1, which has been configured as a binary display message. The data for the data field is coming from memory location V2200. The third line is text message #8. The second and bottom lines use message #140 which has been configured as a blank text message.

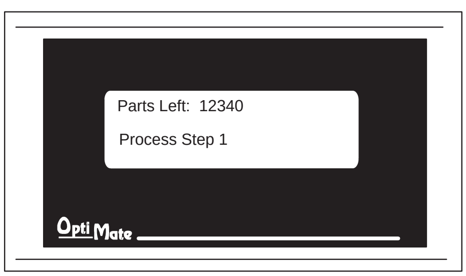


This selects message #1 to be displayed in the top line.

This selects message #8 to be displayed in the third line.

This puts data from V2200 into top line data field.

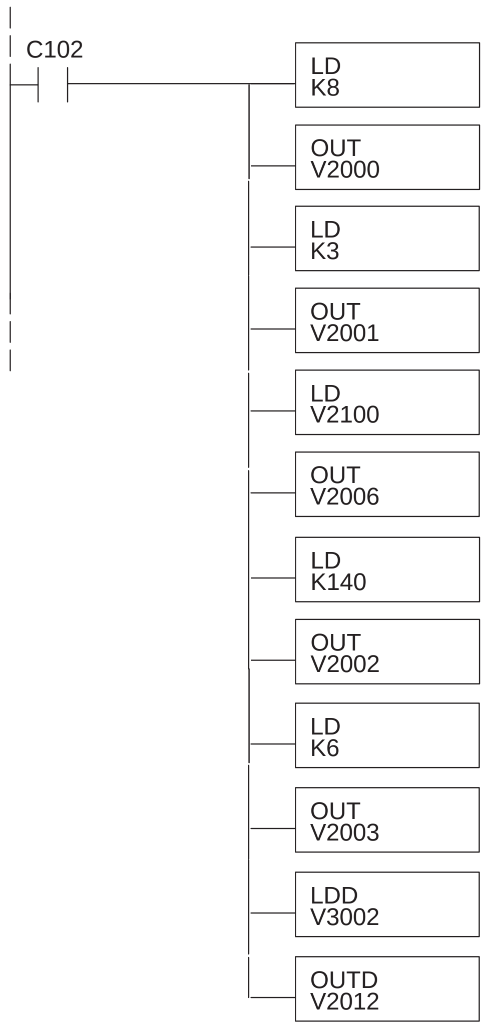
This selects message #140 to be displayed in the second and bottom lines.



V2000	Top line message selection
V2001	Second line message selection
V2002	Third line message selection
V2003	Bottom line message selection
V2004	Top line data
V2005	Top line data 2
V2006	Second line data
V2007	Second line data 2
V2010	Third line data
V2011	Third line data 2
V2012	Bottom line data
V2013	Bottom line data 2

Displaying BCD Double Numbers

This example is similar to the previous example, except that it uses a BCD Double number in the bottom line display. The bottom line uses data display message #6, which has been configured as a BCD Double display message. The data for the data field is from V3002 and V3003. V3002 contains the four least significant digits while V3003 contains the four most significant digits. The second line is text message #3. The data for the second line BCD message comes from register V2100. The third line uses message #140 which has been configured as a blank text message.



This selects message #8 to be displayed in the top line.

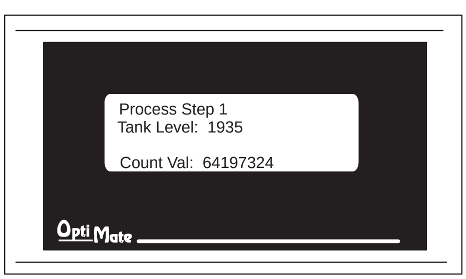
This selects message #3 to be displayed in the second line.

This puts data from V2100 into the second line data field.

This selects message #140 to blank the third line.

This selects message #6 to be displayed in the bottom line.

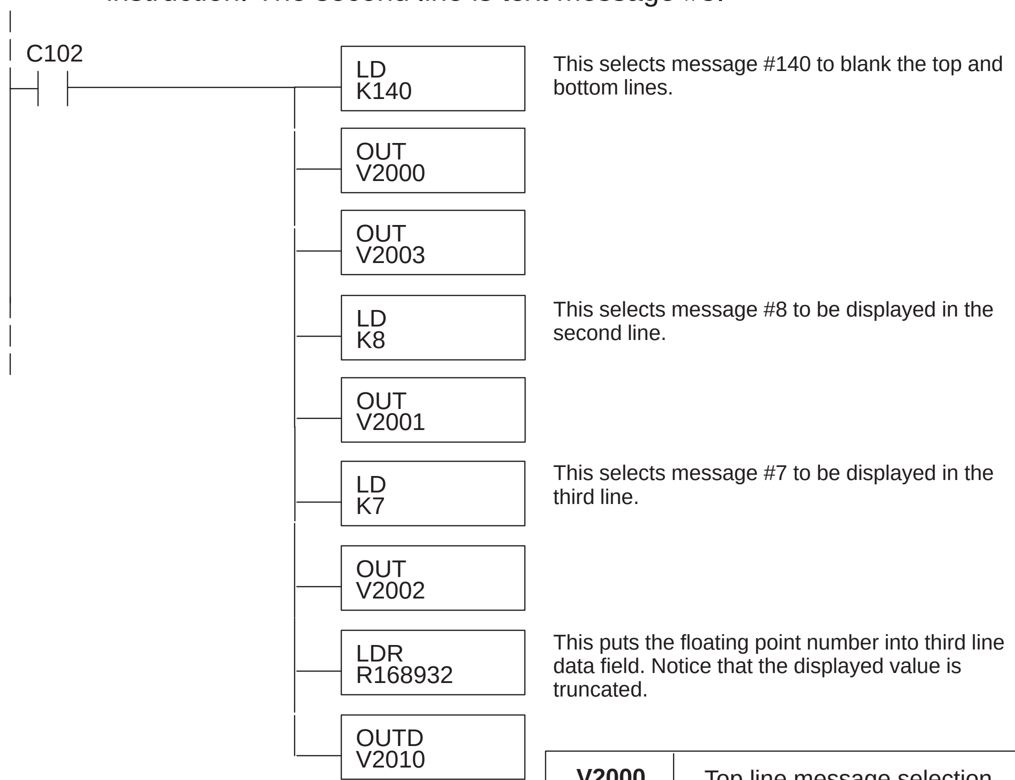
This puts the BCD Double number from V3002/V3003 into the bottom line data field.

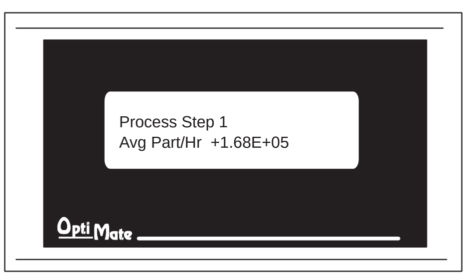


V2000	Top line message selection
V2001	Second line message selection
V2002	Third line message selection
V2003	Bottom line message selection
V2004	Top line data
V2005	Top line data 2
V2006	Second line data
V2007	Second line data 2
V2010	Third line data
V2011	Third line data 2
V2012	Bottom line data
V2013	Bottom line data 2

Displaying Floating Point Numbers Example 1

This example uses a floating point number in the third line display. The bottom line uses data display message #7, which has been configured as a floating point display message. Since the data is a floating point number, it uses two 16-bit registers. The two registers have to be looked at together, not individually, for the data to be understandable. In this example, the data is a constant number (168932) which is loaded into the bottom line data display registers using an LDR (load real number) instruction. The second line is text message #8.

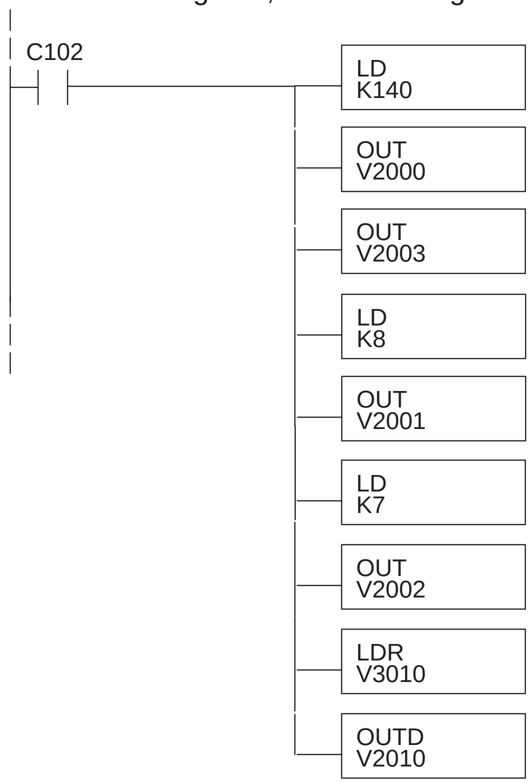




V2000	Top line message selection
V2001	Second line message selection
V2002	Third line message selection
V2003	Bottom line message selection
V2004	Top line data
V2005	Top line data 2
V2006	Second line data
V2007	Second line data 2
V2010	Third line data
V2011	Third line data 2
V2012	Bottom line data
V2013	Bottom line data 2

Displaying Floating Point Numbers Example 2

This example is similar to the previous example, except that it gets its value from two PLC registers instead of a constant value. The third line uses data display message #7, which has been configured as a floating point display message. Remember, floating point numbers require two 16-bit registers. In this example, the data is loaded from V3010 and V3011 using an LDR (load real number) instruction to the third line display registers V2010 and V2011. The top and bottom lines use message #140 which has been configured as a blank text message. The second line uses message #8, a text message.

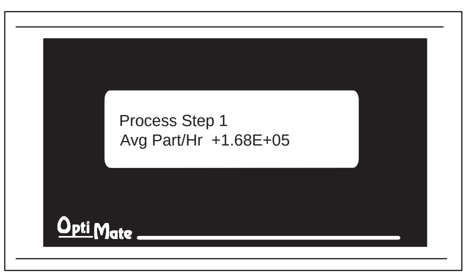


This selects message #140 to blank the top and bottom lines.

This selects message #8 to be displayed in the second line.

This selects message #7 to be displayed in the third line.

This puts the floating point number from V3010 and V3011 into the third line display registers V2010 and V2011.

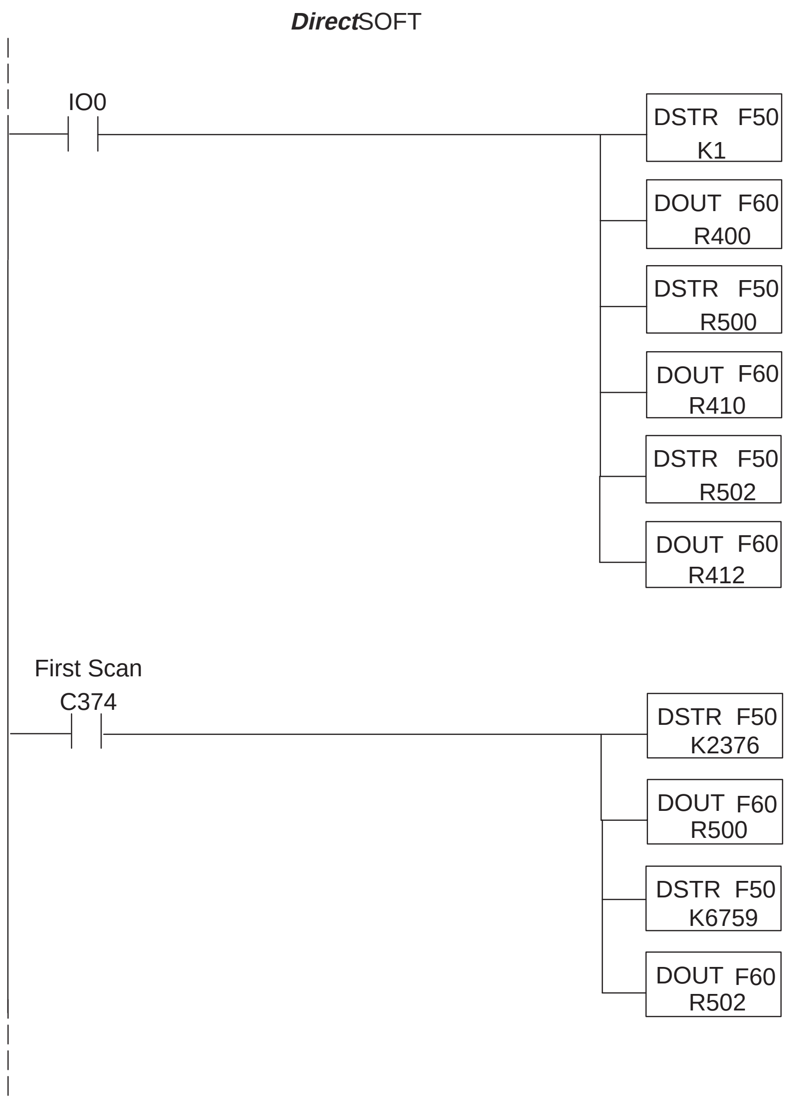


V2000	Top line message selection
V2001	Second line message selection
V2002	Third line message selection
V2003	Bottom line message selection
V2004	Top line data
V2005	Top line data 2
V2006	Second line data
V2007	Second line data 2
V2010	Third line data
V2011	Third line data 2
V2012	Bottom line data
V2013	Bottom line data 2

Example Using D3–330/340

Defining the Status Register

The following example assumes that the OP–440 is configured for a base address of R400/R401. When configuring the panel, enter the messages shown in the previous section for the DL05, DL105, DL205, D3–350 and DL405 examples.



Displaying Messages

This rung displays message #1 on the top line and displays the top line data as a BCD Double number.

Top line data.

Top line data BCD Double.

This rung loads an arbitrary value (2376) at memory locations to be displayed as data values.

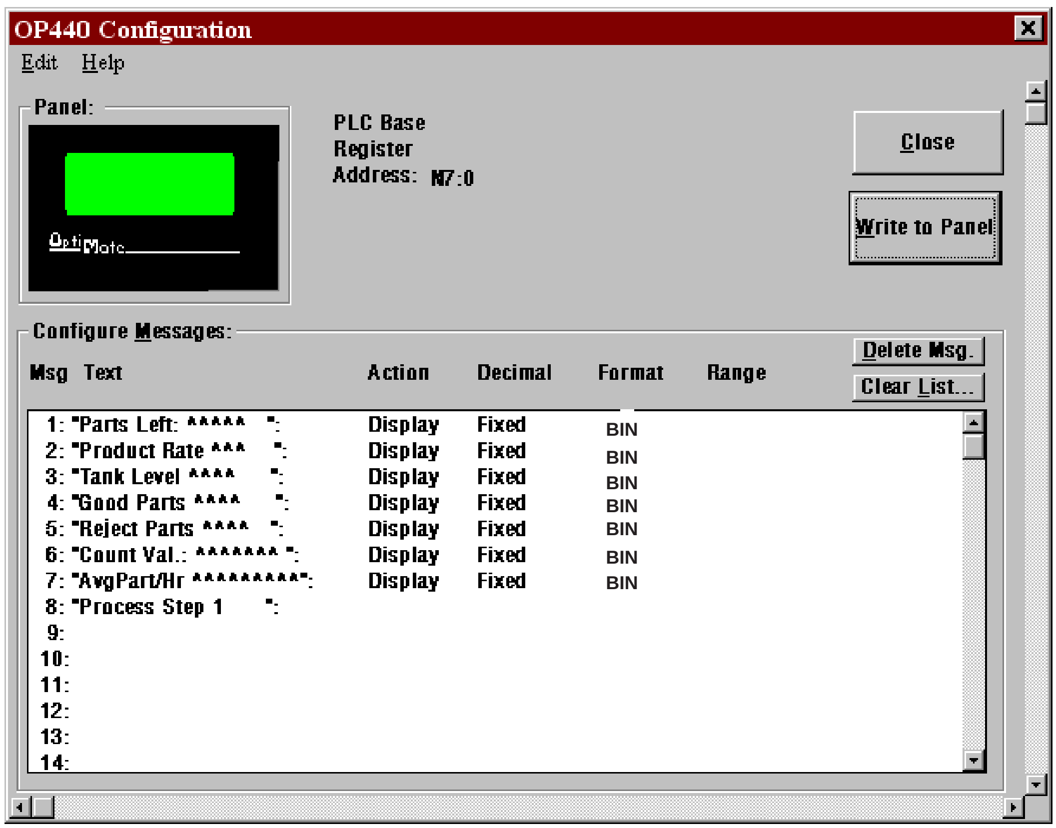
Examples Using Allen-Bradley SLC 5/03, 5/04 and Micrologix

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–440 with an Allen-Bradley PLC, always be sure that at least 12 words of memory are allocated to allow proper communications.

All of the examples shown assume the OP–440 has been configured as shown below (using OP–WINEDIT) with a file number N7 and base register address 0. Assume that message #140 consists of all blanks.



Displaying Floating Point Numbers

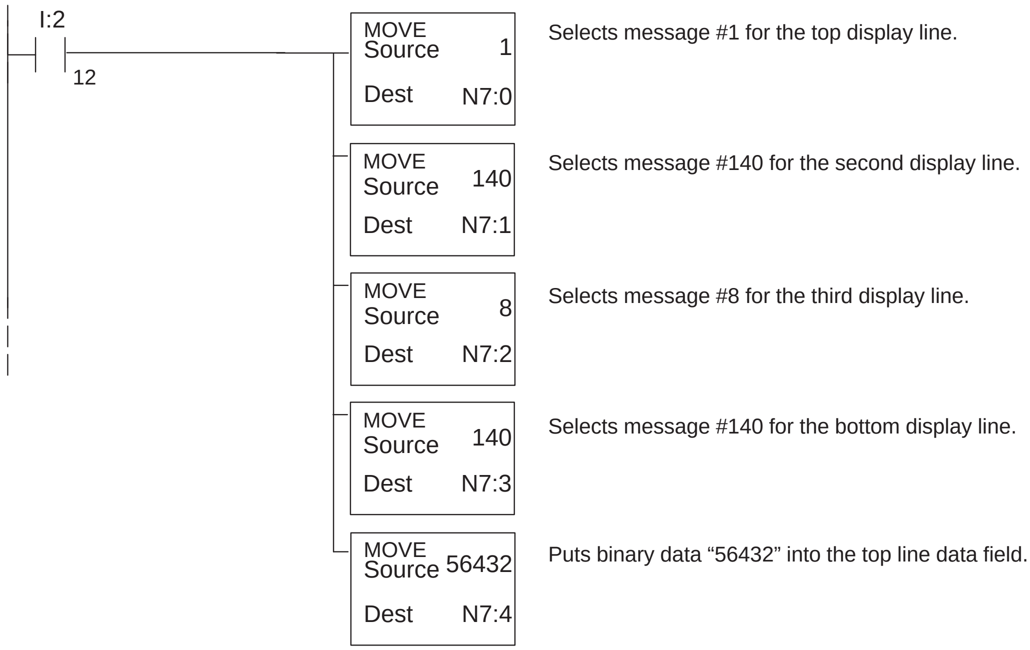
While the OP–440 can display floating point numbers, the A–B SLC PLCs *do not* have a means of handling floating point numbers.

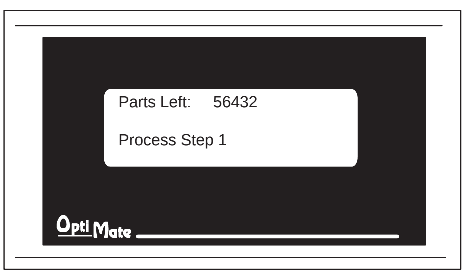
Displaying BCD Numbers

A–B deals with its registers in binary, not BCD. For this reason, during configuration be sure to indicate Binary when setting up for A–B.

Displaying Binary Numbers

This example uses the configuration shown earlier, and shows two messages being displayed. The top line uses data display message #1, which has been configured as a binary display message. The data for the data field is a constant number 56432. The data can also be moved to the data register from another register. The third line is text message #8. Message #140 is selected for the second and bottom lines.





N7:0	Top line message selection
N7:1	Second line message selection
N7:2	Third line message selection
N7:3	Bottom line message selection
N7:4	Top line data
N7:5	Top line data 2 (not used)
N7:6	Second line data
N7:7	Second line data 2 (not used)
N7:8	Third line data
N7:9	Third line data 2 (not used)
N7:10	Bottom line data
N7:11	Bottom line data 2 (not used)

Troubleshooting

Troubleshooting

In this section, we explain how to isolate potential problems which may occur while using the OP–440. 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 a very straightforward operation.

Power Supply Problems

If the panel LED display 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.