

Understanding the Features

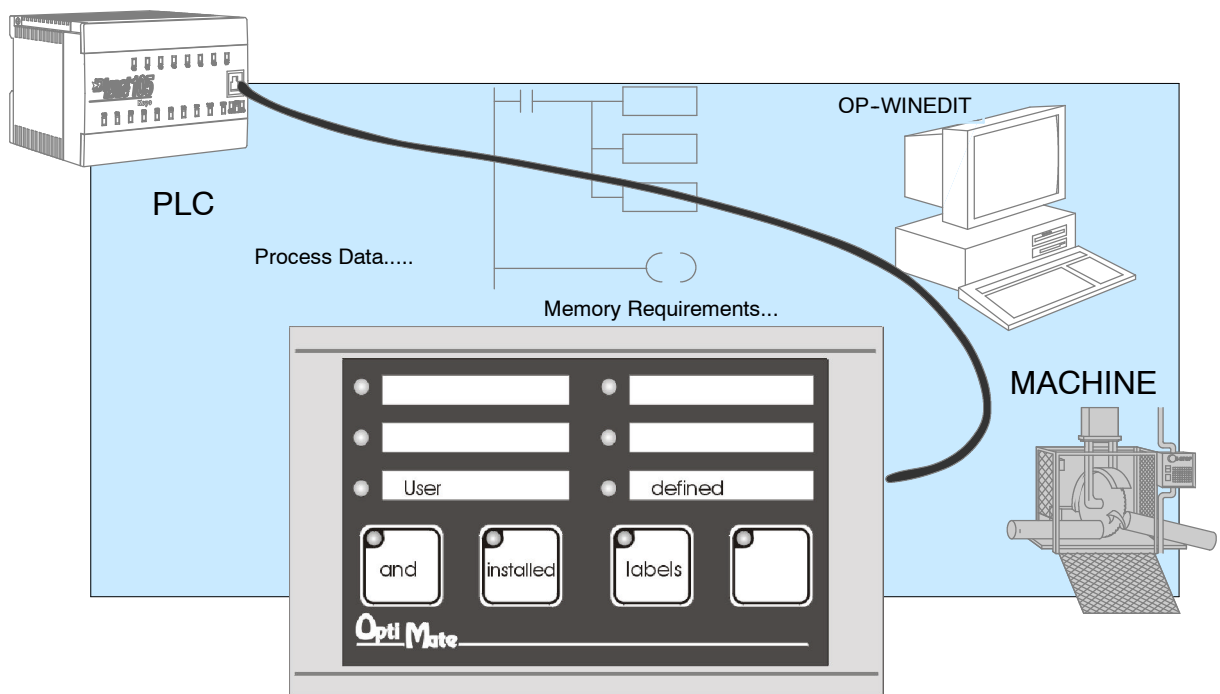
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- Learning the Features
 - Indicator Lamp and Pushbutton Operations
 - PLC Registers
 - *Direct*LOGIC User Memory Overview
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Learning the Features

In this section, the subject of how to use the OP-406 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.

- Indicator Lamp and Pushbutton Operations
- Turning On a Lamp
- Flashing a Lamp
- PLC Registers
- User Memory Overview



Indicator Lamp and Pushbutton Operations

Reading Pushbutton Status Once the panel is configured and connected to the PLC, reading a pushbutton's status is done by reading the appropriate PLC register bit. The pushbutton normally appears in PLC ladder logic as a contact.

Turning on a Lamp When configured for PLC operation, you must write a 1 to the register bit (L1-L6) to turn on the corresponding lamp. The OP-406 will automatically retrieve the register data and light any lamp whose bit is set.

Flashing a Lamp The X+1 register contains the flash control bits. The lamp will flash only if both the LED bit is set and the flash control bit is set.
The lamp flash is approximately 0.5 seconds on and 0.25 seconds off.



NOTE: A lamp must be turned on in order for the flash control bits to work.

Turning on the Inset LED

Normally the LED inset in each pushbutton indicates the status of the pushbutton. However, if the panel is configured for LED Separation, the LED can be set directly from the PLC, by writing a 1 to its register bit (B1-B4). The OP-406 will automatically retrieve the register data and light any LED whose bit is set.

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 four consecutive 16-bit data registers. In this manual the registers are identified as M+0, M+1, M+2, and M+3. Force control register M+3 is used 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-406. PLC registers (addresses) are sometimes known as data registers, internal registers or 16-bit (word) addresses.

PLC Register Map

The OP-406 uses a bank of 4 contiguous PLC registers. The register set is shown in the table below.

OP-406 Panel PLC Register Map

PLC Register	Register Function
M+0	Indicator lamps and pushbutton LEDs on/off control
M+1	Indicator lamps and pushbutton LEDs flash control
M+2	Pushbutton on/off status
M+3	Force pushbutton data and commands

Register Bit Association

	MSB								LSB								
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
M+0			L6	L5	L4	L3	L2	L1					B4	B3	B2	B1	Indicator Lamp/LED Pushbutton On/Off Control
M+1			L6	L5	L4	L3	L2	L1					B4	B3	B2	B1	Indicator Lamp/LED Pushbutton Flash Control
M+2													B4	B3	B2	B1	Pushbutton On/Off Status
M+3	F1	F2	F3										B4	B3	B2	B1	Force Data and Commands

Force Commands

If the OP406 panel is configured for force capability (using the Force Option), the PLC can directly control button status when desired. This may be useful for initialization purposes.

PLC Register Assignment Examples

Examine the address conventions for **Automationdirect (DirectLOGIC)** and Allen-Bradley. For example, the **DirectLOGIC** address references are **octal**, and the Allen-Bradley's are **decimal**. The **DirectLOGIC** 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 eight 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 DL05/105/DL205/D3-350/DL405

Example Address		Function
V40600	M+0	Indicator lamps and pushbutton LEDs on/off control
V40601	M+1	Indicator lamps and pushbutton LEDs flash control
V40602	M+2	Pushbutton on/off status
V40603	M+3	Force pushbutton data and commands

DirectLOGIC DL305 (D3-340)

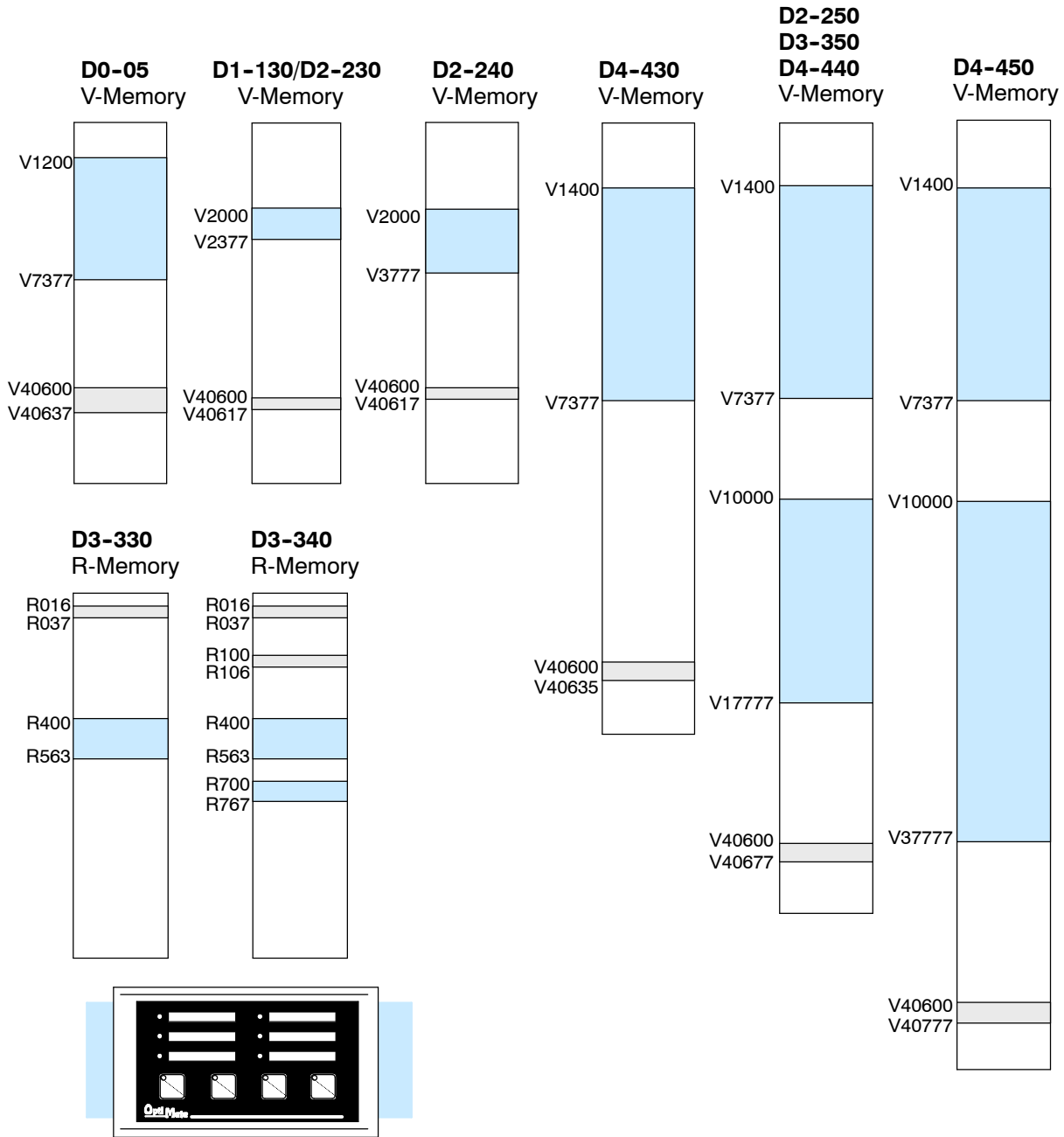
Example Address		Function
R20/R21	M+0	Indicator lamps and pushbutton LEDs on/off control
R22/R23	M+1	Indicator lamps and pushbutton LEDs flash control
R24/R25	M+2	Pushbutton on/off status
R26/R27	M+3	Force pushbutton data and commands

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

Example Address		Function
N7:0	M+0	Indicator lamps and pushbutton LEDs on/off control
N7:1	M+1	Indicator lamps and pushbutton LEDs flash control
N7:2	M+2	Pushbutton on/off status
N7:3	M+3	Force pushbutton data and commands

DirectLOGIC User Memory Overview

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- User Data Space available for OP-panels
- Internal Relay Memory

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