

# Choosing I/O Type

The DL05 and DL06 product families offer a number of different I/O configurations. Choose the configuration that is right for your application. Also, keep in mind that both the DL05 and the DL06 PLCs offer the ability to add I/O with the use of option modules.

## Fixed discrete I/O

All DL05 micro PLCs have eight built-in inputs and six built-in outputs on the base unit. The DL06 micro PLCs have 20 built-in inputs and 16 built-in outputs on the base unit. We offer the most common I/O types for your convenience, including AC inputs and outputs, DC sinking and sourcing inputs and outputs, and relay outputs. Refer to the tables to the right to see the I/O combinations available and their voltage ranges.

## Option module slots

The DL05 has one option module slot and the DL06 has four option module slots. Check out the discrete and analog I/O you can add by purchasing inexpensive option modules. Specialty modules are also available and are discussed later in this section.

## Automatically assigned addresses

The DL05 uses automatic addressing, so for the vast majority of applications, there is no setup required. We use octal addressing for these products, which means there are no 8s or 9s. The DL05's eight input points use addresses X0-X7, and the six output points use addresses Y0-Y5. Similarly, the DL06 uses addresses X0-X23 and Y0-Y17.

## Review the I/O specs and wiring diagrams

The Base Unit I/O tables give a brief description of the I/O combinations offered for the DL05 and DL06 PLCs. The I/O specifications are discussed in more detail later in this section.

**DL05 Base Unit I/O Table**

| Part Number             | Inputs               |                   |                   | Outputs              |                   |                                                          | Price    |
|-------------------------|----------------------|-------------------|-------------------|----------------------|-------------------|----------------------------------------------------------|----------|
|                         | I/O type/<br>commons | Sink or<br>source | Voltage<br>ranges | I/O type/<br>commons | Sink or<br>source | Voltage/current<br>ratings                               |          |
| <b><u>D0-05AR</u></b>   | AC/2                 | N/A               | 90–120<br>VAC     | Relay/2              | N/A               | 6–27 VDC, 2A<br>6–240 VAC, 2A                            | \$273.00 |
| <b><u>D0-05DR</u></b>   | DC/2                 | Sink or<br>Source | 12–24 VDC         | Relay/2              | N/A               | 6–27 VDC, 2A<br>6–240 VAC, 2A                            | \$242.00 |
| <b><u>D0-05AD</u></b>   | AC/2                 | N/A               | 90–120<br>VAC     | DC/1                 | Sink              | 6–27 VDC, 0.5 A<br>(Y0-Y1)<br>6–27 VDC, 1.0 A<br>(Y2-Y5) | \$277.00 |
| <b><u>D0-05DD</u></b>   | DC/2                 | Sink or<br>Source | 12–24 VDC         | DC/1                 | Sink              | 6–27 VDC, 0.5 A<br>(Y0-Y1)<br>6–27 VDC, 1.0 A<br>(Y2-Y5) | \$244.00 |
| <b><u>D0-05AA</u></b>   | AC/2                 | N/A               | 90–120<br>VAC     | AC/2                 | N/A               | 17–240 VAC<br>47–63 Hz 0.5 A                             | \$269.00 |
| <b><u>D0-05DA</u></b>   | DC/2                 | Sink or<br>Source | 12–24 VDC         | AC/2                 | N/A               | 17–240 VAC<br>47–63 Hz 0.5 A                             | \$263.00 |
| <b><u>D0-05DR-D</u></b> | DC/2                 | Sink or<br>Source | 12–24 VDC         | Relay/2              | N/A               | 6–27 VDC, 2A<br>6–240 VAC, 2A                            | \$273.00 |
| <b><u>D0-05DD-D</u></b> | DC/2                 | Sink or<br>Source | 12–24 VDC         | DC/1                 | Sink              | 6–27 VDC, 0.5 A<br>(Y0-Y1)<br>6–27 VDC, 1.0 A<br>(Y2-Y5) | \$277.00 |

## Sinking/sourcing

If you are using a DC field device, you should consider whether that device requires a sinking or sourcing PLC I/O configuration. For more information on sinking and sourcing concepts, please refer to the Appendix of this catalog.

**Sink/source inputs** — All built-in DC inputs on the DL05 and DL06 micro PLCs can be wired in a sinking or sourcing configuration. However, all inputs on a single common must use the same configuration. In some cases, the DC inputs on option modules are fixed as sinking or sourcing. Refer to the table on the next page.

**Sinking outputs** — All built-in DC outputs on the DL05 are sinking. The DL06 family offers two PLCs with sinking DC outputs, and two with sourcing outputs.

**Sourcing outputs** — The DL06 PLC family includes the **D0-06DD2(-D)** with sourcing outputs. If a sourcing output is required, you might also consider using the **D0-xxTD2** option module with sourcing outputs, which can also be installed in a DL05 or DL06 PLC.

## High-speed inputs and pulse outputs

DL05s and DL06s with DC inputs offer high-speed input features, and DC output units offer pulse output features. The first three DC inputs on the DL05 PLCs are set up by default as filtered inputs with a 10 ms filter. Likewise, the first four DC inputs on the DL06 PLCs are set to the same default value. By entering a setup code in a special V-memory location, you can choose other features. In some modes of operation, you have a choice as to how you use each point. For example, if you use X0 as an up counter, you can use X2 as a reset input for the counter or as a filtered discrete input. If these features interest you, take a look at the detailed high-speed I/O descriptions found later in this section.

# Choosing I/O Type

| DL06 Base Unit I/O Table          |                      |                   |                   |                      |                   |                                                             |          |
|-----------------------------------|----------------------|-------------------|-------------------|----------------------|-------------------|-------------------------------------------------------------|----------|
| Part Number                       | Inputs               |                   |                   | Outputs              |                   |                                                             | Price    |
|                                   | I/O Type/<br>Commons | Sink or<br>source | Voltage<br>Ranges | I/O Type/<br>Commons | Sink or<br>Source | Voltage/Current<br>Ratings                                  |          |
| <a href="#"><u>D0-06AA</u></a>    | AC/5                 | N/A               | 90–120<br>VAC     | AC/4                 | N/A               | 17–240 VAC, 0.5 A<br>50/60 Hz                               | \$513.00 |
| <a href="#"><u>D0-06AR</u></a>    | AC/5                 | N/A               | 90–120<br>VAC     | Relay/4              | N/A               | 6–27 VDC, 2A<br>6–240 VAC, 2A                               | \$487.00 |
| <a href="#"><u>D0-06DA</u></a>    | DC/5                 | Sink or<br>source | 12–24 VDC         | AC/4                 | N/A               | 17–240 VAC, 0.5 A<br>50–60 Hz                               | \$487.00 |
| <a href="#"><u>D0-06DD1</u></a>   | DC/5                 | Sink or<br>source | 12–24 VDC         | DC/4                 | Sink              | 6–27 VDC, 0.5 A (Y0-Y1)<br>6–27 VDC, 1.0 A (Y2-Y17)*        | \$452.00 |
| <a href="#"><u>D0-06DD2</u></a>   | DC/5                 | Sink or<br>source | 12–24 VDC         | DC/4                 | Source            | 12–24 VDC, 0.5 A<br>(Y0-Y1)<br>12–24 VDC, 1.0 A<br>(Y2-Y17) | \$456.00 |
| <a href="#"><u>D0-06DR</u></a>    | DC/5                 | Sink or<br>source | 12–24 VDC         | Relay/4              | N/A               | 6–27 VDC, 2A<br>6–240 VAC, 2A                               | \$474.00 |
| <a href="#"><u>D0-06DD1-D</u></a> | DC/5                 | Sink or<br>source | 12–24 VDC         | DC/4                 | Sink              | 6–27 VDC, 0.5 A (Y0-Y1)<br>6–27 VDC, 1.0 A (Y2-Y17)*        | \$454.00 |
| <a href="#"><u>D0-06DD2-D</u></a> | DC/5                 | Sink or<br>source | 12–24 VDC         | DC/4                 | Source            | 12–24 VDC, 0.5 A<br>(Y0-Y1)<br>12–24 VDC, 1.0 A<br>(Y2-Y17) | \$458.00 |
| <a href="#"><u>D0-06DR-D</u></a>  | DC/5                 | Sink or<br>source | 12–24 VDC         | Relay/4              | N/A               | 6–27 VDC, 2A<br>6–240 VAC, 2A                               | \$468.00 |

\* These outputs must be derated to 0.6 A for EN61131-2 compliance.

| Discrete I/O Option Modules      |                                 |                   |                             |                                 |                   |                               |          |
|----------------------------------|---------------------------------|-------------------|-----------------------------|---------------------------------|-------------------|-------------------------------|----------|
| Part Number                      | Inputs                          |                   |                             | Outputs                         |                   |                               | Price    |
|                                  | I/O Type/<br>Number/<br>Commons | Sink or<br>source | Voltage<br>Ranges           | I/O Type/<br>Number/<br>Commons | Sink or<br>Source | Voltage/Current<br>Ratings    |          |
| <a href="#"><u>D0-07CDR</u></a>  | DC/4/1                          | Sink or<br>source | 12–24 VDC                   | Relay/3/1                       | N/A               | 6–27 VDC, 1A<br>6–240 VAC, 1A | \$96.00  |
| <a href="#"><u>D0-08CDD1</u></a> | DC/4/2                          | Sink or<br>source | 12–24 VDC                   | DC/4/2                          | Sink              | 6–27 VDC, 0.3 A               | \$96.00  |
| <a href="#"><u>D0-08TR</u></a>   | N/A                             | N/A               | N/A                         | Relay/8/2                       | N/A               | 6–27 VDC, 1A<br>6–240 VAC, 1A | \$114.00 |
| <a href="#"><u>D0-10ND3</u></a>  | DC/10/2                         | Sink or<br>source | 12–24 VDC                   | N/A                             | N/A               | N/A                           | \$85.00  |
| <a href="#"><u>D0-10ND3F</u></a> | DC/10/2                         | Sink or<br>source | 12–24 VDC                   | N/A                             | N/A               | N/A                           | \$96.00  |
| <a href="#"><u>D0-10TD1</u></a>  | N/A                             | N/A               | N/A                         | DC/10/2                         | Sink              | 6–27 VDC, 0.3 A               | \$101.00 |
| <a href="#"><u>D0-10TD2</u></a>  | N/A                             | N/A               | N/A                         | DC/10/2                         | Source            | 12–24 VDC, 0.3 A              | \$104.00 |
| <a href="#"><u>D0-16ND3</u></a>  | DC/16/4                         | Sink or<br>source | 20–28 VDC                   | N/A                             | N/A               | N/A                           | \$87.00  |
| <a href="#"><u>D0-16TD1</u></a>  | N/A                             | N/A               | N/A                         | DC/16/2                         | Sink              | 6–27 VDC, 0.1A                | \$95.00  |
| <a href="#"><u>D0-16TD2</u></a>  | N/A                             | N/A               | N/A                         | DC/16/2                         | Source            | 12–24 VDC, 0.1A               | \$86.00  |
| <a href="#"><u>F0-04TRS</u></a>  | N/A                             | N/A               | N/A                         | Relay/4/4                       | N/A               | 5–30 VDC, 3A<br>5–125 VAC, 3A | \$73.00  |
| <a href="#"><u>F0-08NA-1</u></a> | AC/8/2                          | N/A               | 80–132 VAC<br>90–150<br>VDC | N/A                             | N/A               | N/A                           | \$89.00  |
| <a href="#"><u>F0-08SIM</u></a>  | 8-pt. Input simulator           |                   |                             |                                 |                   |                               | \$62.00  |

| Communications and Specialty Option Modules |                                            |          |
|---------------------------------------------|--------------------------------------------|----------|
| Part Number                                 | Description                                | Price    |
| <a href="#">H0-ECOM100</a>                  | Ethernet Communications Module 10/100 Mbit | \$304.00 |
| <a href="#">D0-DEVNETS</a>                  | DeviceNET Server Module                    | \$176.00 |
| <a href="#">H0-CTRIO2</a>                   | High Speed Counter I/O Module              | \$298.00 |
| <a href="#">D0-DCM</a>                      | Serial Communications Module               | \$262.00 |
| <a href="#">F0-CP128</a>                    | ASCII CoProcessor Module                   | \$345.00 |

## Analog I/O

By using option modules, you can add analog inputs or outputs to your DL05 or DL06 PLC. The table below shows the input and output types at a glance. Detailed specifications are provided later in this section.

| Analog I/O Option Modules                 |        |                         |         |                     |          |
|-------------------------------------------|--------|-------------------------|---------|---------------------|----------|
| Part Number                               | Inputs |                         | Outputs |                     | Price    |
|                                           | No.    | Input Type              | No.     | Output Type         |          |
| <a href="#"><b><i>F0-04AD-1</i></b></a>   | 4      | 0-20 mA or 4-20 mA      | 0       | N/A                 | \$139.00 |
| <a href="#"><b><i>F0-04AD-2</i></b></a>   | 4      | 0-5 VDC or 0-10 VDC     | 0       | N/A                 | \$204.00 |
| <a href="#"><b><i>F0-08ADH-1</i></b></a>  | 8      | 0-20 mA                 | 0       | N/A                 | \$235.00 |
| <a href="#"><b><i>F0-08ADH-2</i></b></a>  | 8      | 0-5 VDC or 0-10 VDC     | 0       | N/A                 | \$248.00 |
| <a href="#"><b><i>F0-04DAH-1</i></b></a>  | 0      | N/A                     | 4       | 4-20 mA             | \$251.00 |
| <a href="#"><b><i>F0-08DAH-1</i></b></a>  | 0      | N/A                     | 8       | 4-20 mA             | \$330.00 |
| <a href="#"><b><i>F0-04DAH-2</i></b></a>  | 0      | N/A                     | 4       | 0-10 VDC            | \$236.00 |
| <a href="#"><b><i>F0-08DAH-2</i></b></a>  | 0      | N/A                     | 8       | 0-10 VDC            | \$314.00 |
| <a href="#"><b><i>F0-4AD2DA-1</i></b></a> | 4      | 0-20 mA or 4-20 mA      | 2       | 0-20 mA or 4-20 mA  | \$336.00 |
| <a href="#"><b><i>F0-2AD2DA-2</i></b></a> | 2      | 0-5 VDC or 0-10 VDC     | 2       | 0-5 VDC or 0-10 VDC | \$264.00 |
| <a href="#"><b><i>F0-4AD2DA-2</i></b></a> | 4      | 0-5 VDC or 0-10 VDC     | 2       | 0-5 VDC or 0-10 VDC | \$372.00 |
| <a href="#"><b><i>F0-04RTD</i></b></a>    | 4      | RTD                     | 0       | N/A                 | \$345.00 |
| <a href="#"><b><i>F0-04THM*</i></b></a>   | 4      | Thermo-couple / Voltage | 0       | N/A                 | \$364.00 |

\* See module specifications page for thermocouple types and voltage input ranges supported

## Power budgeting

No power budgeting is necessary for the DL05. The built-in power supply is sufficient for powering the base unit, any of the option modules, the handheld programmer, and even a [DV1000](#) operator interface.

Power budgeting is necessary for the DL06. With four option module slots and an optional LCD display, it is necessary to verify that sufficient power is available for all optional devices. Power budgeting is described in detail on page 2-29 and in the DL06 User Manual.