

# DL05/06 Option Modules

**F0-04RTD**      **\$207.00**

**4-channel RTD input module**

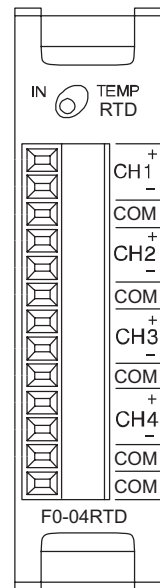
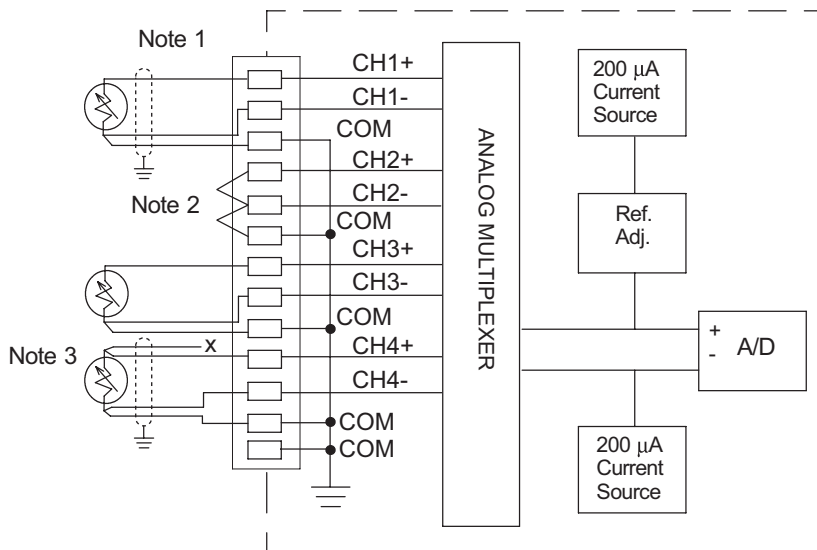
| F0-04RTD Input Specifications   |   |
|---------------------------------|---|
| <b>Number of Channels</b>       | 4   |
| <b>Input Ranges</b>             | Type Pt100: -200.0/850.0°C, -328/1562°F<br>Type Pt1000: -200.0/595.0°C, -328/1103°F<br>Type jPt100: -38.0/450.0°C, -36/842°F<br>Type CU-10/25: -200.0/260.0°C, -328/500°F<br>Type NI-120: -80.0/260.0°C, -112/500°F |
| <b>Resolution</b>               | 16 bit (1 in 65535)   |
| <b>Display Resolution</b>       | ±0.1°C, ±0.1°F (±3276.7)  |
| <b>RTD Excitation Current</b>   | 200 µA  |
| <b>Notch Filter</b>             | > 50 db notches at 50/60 Hz   |
| <b>Maximum Setting Time</b>     | 100 ms (full-scale step input)  |
| <b>Common Mode Range</b>        | 0-5 VDC   |
| <b>Absolute Maximum Ratings</b> | Fault protected inputs to ±50 VDC   |
| <b>Sampling Rate</b>            | 140 ms per channel  |

| F0-04RTD Input Specifications (cont'd) |  |
|--|--|
| <b>Terminal Type (included)</b>        | Removable: D0-ACC-4                                |
| <b>Converter Type</b>                  | Charge Balancing                                   |
| <b>Linearity Error</b>                 | ±0.05°C maximum, ±0.1°C typical                    |
| <b>Maximum Inaccuracy</b>              | ±1°C   |
| <b>PLC Update Rate</b>                 | 4 channel/scan                                     |
| <b>Digital Input Points Required</b>   | None; uses special V-memory location based on slot |
| <b>Base Power Required 5VDC</b>        | 70 mA  |
| <b>Operating Temperature</b>           | 32° to 140°F (0° to 60°C)                          |
| <b>Storage Temperature</b>             | -4° to 158°F (-20° to 70°C)                        |
| <b>Temperature Drift</b>               | 15 ppm / °C max                                    |
| <b>Relative Humidity</b>               | 5 to 95% (non-condensing)                          |
| <b>Environmental Air</b>               | No corrosive gases permitted                       |
| <b>Vibration</b>                       | MIL STD 810C 514.2                                 |
| <b>Shock</b>                           | MIL STD 810C 516.2                                 |
| <b>Noise Immunity</b>                  | NEMA ICS3-304                                      |

| CPU         | Firmware Required     | DirectSOFT Required                         |
|-------------|-----------------------|---|
| <b>DL05</b> | Version 4.70 or later | DirectSOFT32 Version 3.0c or later          |
| <b>DL06</b> | Version 1.50 or later | DirectSOFT32 Version 4.0, Build 16 or later |

**Notes:**

1. The three wires connecting the RTD to the module must be the same type and length. Do not use the shield or drain wire for the third connection.
2. Unused channels require shorting wires (jumpers) installed from terminals CH+ to CH- to COM to prevent possible noise from influencing active channels. This should be done even if the unused channel is not enabled in the V-memory configuration.
3. If an RTD sensor has four wires, the plus sense wire should be left unconnected as shown.
4. This module is not compatible with the ZIPLink wiring system.



# Power Budgeting for the DL06

The DL06 has four option module slots. To determine whether the combination of modules you select will have sufficient power, you will need to perform a power budget calculation.

## Power supplied

Power is supplied from two sources: the internal base unit power supply and, if required, an external supply (customer furnished). The D0-06xx (AC powered) PLCs supply a limited amount of 24VDC power. The 24VDC output can be used to power external devices.

For power budgeting, start by considering the power supplied by the base unit. All DL06 PLCs supply the same amount of 5VDC power. Only the AC units offer 24VDC auxiliary power.

Be aware of the trade-off between 5VDC power and 24VDC power. The amount of 5 VDC power available depends on the amount of 24VDC power being used, and the amount of 24VDC power available depends on the amount of 5VDC power consumed. Determine the amount of internally supplied power from the table to the right.

## Power required by base unit

Because of the different I/O configurations available in the DL06 family, the power consumed by the base unit itself varies from model to model. Subtract the amount of power required by the base unit from the amount of power supplied by the base unit. Be sure to subtract 5VDC and 24VDC amounts.

## Power required by option modules

Next, subtract the amount of power required by the option modules you are planning to use. Again, remember to subtract both 5VDC and 24VDC.

If your power budget analysis shows surplus power available, you should have a workable configuration.

| DL06 Power Supplied by Base Units |            |             |
|-----------------------------------|------------|-------------|
| Part Number                       | 5 VDC (mA) | 24 VDC (mA) |
| D0-06xx                           | 1500mA     | 300mA       |
|                                   | 2000mA     | 200mA       |
| D0-06xx-D                         | 1500mA     | none        |

| DL06 Base Unit Power Required |            |             |
|-------------------------------|------------|-------------|
| Part Number                   | 5 VDC (mA) | 24 VDC (mA) |
| D0-06AA                       | 800mA      | none        |
| D0-06AR                       | 900mA      | none        |
| D0-06DA                       | 800mA      | none        |
| D0-06DD1                      | 600mA      | 280mA*      |
| D0-06DD2                      | 600mA      | none        |
| D0-06DR                       | 950mA      | none        |
| D0-06DD1-D                    | 600mA      | none        |
| D0-06DD2-D                    | 600mA      | none        |
| D0-06DR-D                     | 950mA      | none        |

\* Only if auxiliary 24VDC power is connected to V+ terminal.

| DL06 Power Consumed by Other Devices |            |             |
|--------------------------------------|------------|-------------|
| Part Number                          | 5 VDC (mA) | 24 VDC (mA) |
| D0-06LCD                             | 50mA       | none        |
| D2-HPP                               | 200mA      | none        |
| DV-1000                              | 150mA      | none        |
| C-more<br>Micro-Graphic              | 210mA      | none        |

| Power Budgeting Example         |                        |                         |
|---------------------------------|------------------------|-------------------------|
| Power Source                    | 5VDC power (mA)        | 24VDC power (mA)        |
| D0-06DD1<br>(select row A or B) | A                      | 1500mA                  |
|                                 | B                      | 2000mA                  |
| <b>Current Required</b>         | <b>5VDC power (mA)</b> | <b>24VDC power (mA)</b> |
| D0-06DD1                        | 600mA                  | 280mA*                  |
| D0-16ND3                        | 35mA                   | 0                       |
| D0-10TD1                        | 150mA                  | 0                       |
| D0-08TR                         | 280mA                  | 0                       |
| F0-4AD2DA-1                     | 100mA                  | 0                       |
| D0-06LCD                        | 50mA                   | 0                       |
| <b>Total Used</b>               | <b>1215mA</b>          | <b>280mA</b>            |
| <b>Remaining</b>                | A                      | 285mA                   |
|                                 | B                      | 785mA                   |

\* Auxiliary 24 VDC used to power V+ terminal of D0-06DD1 sinking outputs.

**Note 1: If the PLC's auxiliary 24 VDC power source is used to power the sinking outputs, use power choice A, above.**

| DL05/06 Power Consumed by Option Modules |            |             |
|--|------------|-------------|
| Part Number                              | 5 VDC (mA) | 24 VDC (mA) |
| D0-07CDR                                 | 130mA      | none        |
| D0-08CDD1                                | 100mA      | none        |
| D0-08TR                                  | 280mA      | none        |
| D0-10ND3                                 | 35mA       | none        |
| D0-10ND3F                                | 35mA       | none        |
| D0-10TD1                                 | 150mA      | none        |
| D0-10TD2                                 | 150mA      | none        |
| D0-16ND3                                 | 35mA       | none        |
| D0-16TD1                                 | 200mA      | none        |
| D0-16TD2                                 | 200mA      | none        |
| F0-04TRS                                 | 250mA      | none        |
| F0-08NA-1                                | 5mA        | none        |
| F0-04AD-1                                | 50mA       | none        |
| F0-04AD-2                                | 75mA       | none        |
| F0-08ADH-1                               | 25mA       | 25mA        |
| F0-08ADH-2                               | 25mA       | 25mA        |
| F0-04DAH-1                               | 25mA       | 150mA       |
| F0-08DAH-1                               | 25mA       | 220mA       |
| F0-04DAH-2                               | 25mA       | 30mA        |
| F0-08DAH-2                               | 25mA       | 30mA        |
| F0-2AD2DA-2                              | 50mA       | 30mA        |
| F0-4AD2DA-1                              | 100mA      | 40mA        |
| F0-4AD2DA-2                              | 100mA      | none        |
| F0-04RTD                                 | 70mA       | none        |
| F0-04THM                                 | 30mA       | none        |
| D0-DEVNETS                               | 45mA       | none        |
| H0-PSCM                                  | 530mA      | none        |
| H0-CTRIO2                                | 250mA      | none        |
| H0-ECOM100                               | 300mA      | none        |
| F0-08SIM                                 | 1mA        | none        |
| D0-DCM                                   | 250 mA     | none        |
| F0-CP128                                 | 150 mA     | none        |
| F0-08SIM                                 | 1 mA       | none        |