

# Analog Voltage Input Modules

| F2-08AD-2 8-Channel Voltage Analog In <---->                    |  |
|---|--|
| <b>Number of Channels</b>                                       | 8, single ended (1 common)   |
| <b>Input Ranges</b>   | 0 to 5V, 0 to 10 V, $\pm 5V$ , $\pm 10$ VDC  |
| <b>Resolution</b>   | 12 bit (1 in 4095) uni-polar<br>13 bit (-4095 to 4095) bi-polar  |
| <b>Active Low-pass Filtering</b>                                | -3dB at 200 Hz,<br>(-6dB per octave)   |
| <b>Input Impedance</b>  | >20 M $\Omega$   |
| <b>Absolute Maximum Ratings</b>                                 | -75 to +75 VDC   |
| <b>Converter Type</b>   | Successive approximation   |
| <b>Conversion Time (PLC Update Rate)</b>                        | 1 channel per scan maximum (D2-230 CPU)<br>8 channels per scan maximum (D2-240,<br>D2-250(-1) and D2-260 CPUs) |
| <b>Linearity Error (End to End)</b>                             | $\pm 1$ count (0.025% of full scale) maximum   |
| <b>Input Stability</b>  | $\pm 1$ count  |
| <b>Full Scale Calibration Error (offset error not included)</b> | $\pm 3$ counts maximum   |
| <b>Offset Calibration Error</b>                                 | $\pm 1$ count maximum (0V input)   |
| <b>Step Response</b>  | 1 ms to 95% of F.S. change   |

|                                      |   |
|--------------------------------------|---|
| <b>Maximum Inaccuracy</b>            | $\pm 1\%$ @ 77°F (25°C)<br>$\pm 3\%$ 32° to 140°F (0° to 60°C)                                    |
| <b>Accuracy vs. Temperature</b>      | $\pm 50$ ppm/°C maximum full scale<br>(including max. offset change of 2 counts)                  |
| <b>Digital Input Points Required</b> | 16 (X) input points,<br>(12 binary data bits, 3 channel ID bits, 1 sign bit,<br>1 diagnostic bit) |
| <b>Base Power Required 5VDC</b>      | 100 mA  |
| <b>External Power Supply</b>         | 5 mA maximum, +10 to +30 VDC  |
| <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>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   |
| <b>Terminal Type (included)</b>      | Removable; D2-810CON  |

One count in the specification table is equal to one least significant bit of the analog data value (1 in 4096). Includes circuitry to automatically detect broken or open transmitters.

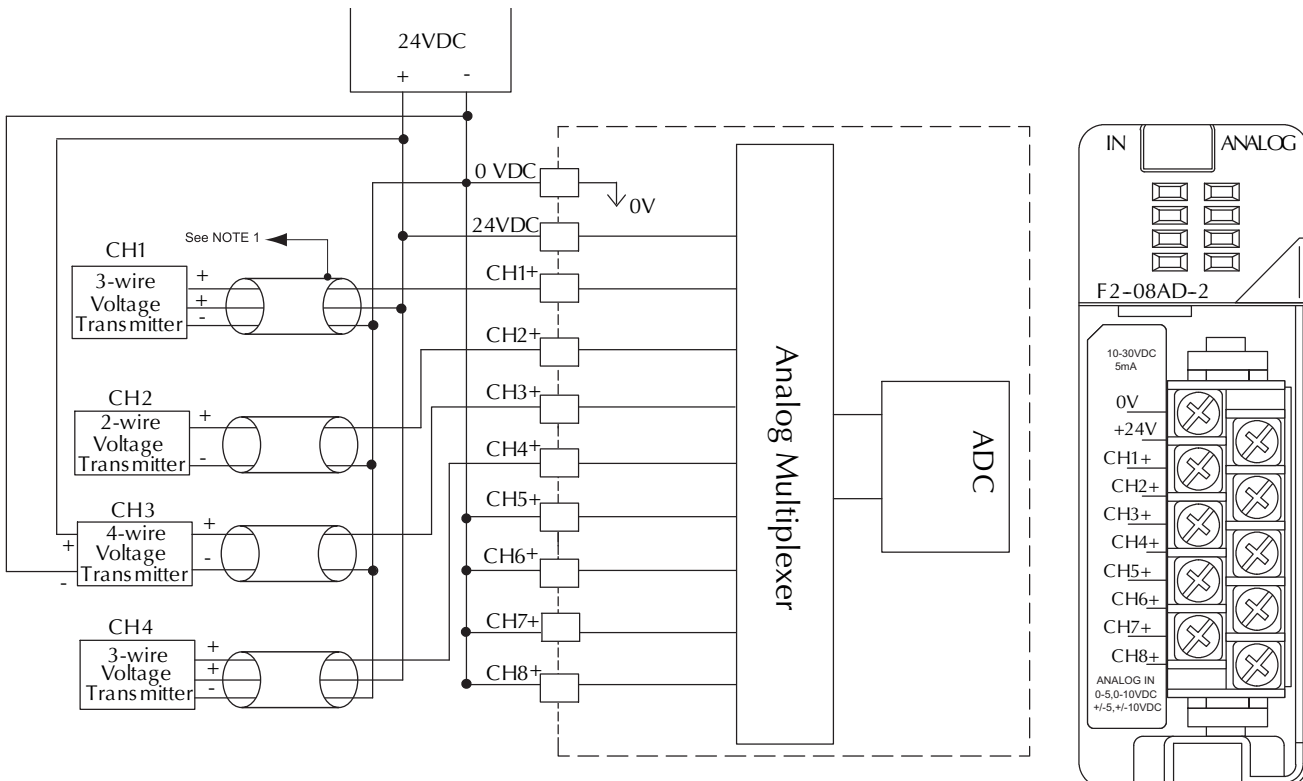


See page 4-78 for part numbers of ZIPLink cables and connection modules compatible with this I/O module.

**Note 1:** Shields should be grounded at the signal source.

**Note 2:** Connect all external power supply commons.

**Note 3:** Connect unused channels (CH5+, CH6+, CH7+, CH8+ in this example) to 0VDC.



|  |   |
|--|---|
| <b>Step 1</b>  | Locate the I/O module part number.  |
| <b>Step 2</b>  | Locate Connector Module Type. (Feedthrough Module, Fuse Module, etc...)                                 |
| <b>Step 3</b>  | Select the cable length by replacing the # symbol with: Blank = 0.5m, -1 = 1.0m, -2 = 2.0m <sup>1</sup> |
| <sup>1</sup> Note: Cable part number denotes compatibility between Connector Module and I/O Modules. |   |

| ZIPLink Wiring System Compatibility Matrix for DL205 PLCs Continued |                     |                     |              |              |          |               |                      |             |               |
|---|---------------------|---------------------|--------------|--------------|----------|---------------|----------------------|-------------|---------------|
| Step 2: Connector Module Type                                       |                     | Feedthrough Modules |              | Fuse Modules |          | Relay Modules | Sensor Input Modules |             | Pigtail Cable |
| Step 1: I/O Module  | Number of Terminals | ZL-RTB20            | ZL-RTB40     | ZL-RFU20     | ZL-RFU40 | ZL-RRL16-24   | ZL-LTB16-24          | ZL-LTB32-24 |               |
| <b>Step 3: Cables</b>   |                     |                     |              |              |          |               |                      |             |               |
| <b>Analog</b>   |                     |                     |              |              |          |               |                      |             |               |
| <b>I/O Module</b>   | <b>F2-04AD-1</b>    | 10                  | ZL-D2-CBL10# |              |          |               |                      |             |               |
|   | <b>F2-04AD-1L</b>   | 10                  | ZL-D2-CBL10# |              |          |               |                      |             |               |
|   | <b>F2-08AD-1</b>    | 10                  | ZL-D2-CBL10# |              |          |               |                      |             |               |
|   | <b>F2-04AD-2</b>    | 10                  | ZL-D2-CBL10# |              |          |               |                      |             |               |
|   | <b>F2-04AD-2L</b>   | 10                  | ZL-D2-CBL10# |              |          |               |                      |             |               |
|   | <b>F2-08AD-2</b>    | 10                  | ZL-D2-CBL10# |              |          |               |                      |             |               |
|   | <b>F2-02DA-1</b>    | 10                  | ZL-D2-CBL10# |              |          |               |                      |             |               |
|   | <b>F2-02DA-1L</b>   | 10                  | ZL-D2-CBL10# |              |          |               |                      |             |               |
|   | <b>F2-02DAS-1</b>   | 10                  | ZL-D2-CBL10# |              |          |               |                      |             |               |
|   | <b>F2-08DA-1</b>    | 19                  | ZL-D2-CBL19# |              |          |               |                      |             | ZL-D2-CBL19#P |
|   | <b>F2-02DA-2</b>    | 10                  | ZL-D2-CBL10# |              |          |               |                      |             |               |
|   | <b>F2-02DA-2L</b>   | 10                  | ZL-D2-CBL10# |              |          |               |                      |             |               |
|   | <b>F2-02DAS-2</b>   | 10                  | ZL-D2-CBL10# |              |          |               |                      |             |               |
|   | <b>F2-08DA-2</b>    | 10                  | ZL-D2-CBL10# |              |          |               |                      |             |               |
|   | <b>F2-4AD2DA</b>    | 10                  | ZL-D2-CBL10# |              |          |               |                      |             |               |
|   | <b>F2-8AD4DA-1</b>  | 19                  | ZL-D2-CBL19# |              |          |               |                      |             | ZL-D2-CBL19#P |
|   | <b>F2-8AD4DA-2</b>  | 19                  | ZL-D2-CBL19# |              |          |               |                      |             | ZL-D2-CBL19#P |
|   | <b>F2-04RTD*</b>    |                     |              |              |          |               |                      |             |               |
| <b>F2-04THM*</b>  |                     |                     |              |              |          |               |                      |             |               |

\*The F2-04RTD and F2-04THM modules are not supported by the ZIPLink wiring system. These modules require wire specific to the signal type.

ZIPLink Connector Module and Cable specifications found in Terminal Blocks and Wiring section

# Power Requirements

## These charts help determine your power requirements

This section shows the amount of power supplied by each of the base power supplies and the amount of power consumed by each DL205 device. The Power Consumed charts list how much INTERNAL power from each power source is required for the DL205 devices. Use this information when calculating the power budget for your system.

In addition to the internal power sources, the DL205 bases offer a 24 VDC auxiliary power supply with external power connections. This auxiliary power supply can power external devices.

## Use ZIPLinks to reduce power requirements

If your application requires a lot of relay outputs, consider using the ZIPLink AC or DC relay output modules. These modules can switch high current (10A) loads without putting a load on your base power budget. Refer to the Terminal Blocks and Wiring Solutions section in this catalog for more information.

This logo is placed next to the I/O modules that are supported by the ZIPLink connection systems. See the I/O module specifications at the end of this section.



| Power Consumed            |        |               |
|---------------------------|--------|---------------|
| Device                    | 5V(mA) | 24V Auxiliary |
| <b>Operator Interface</b> |        |               |
| DV-1000                   | 150    | 0             |
| C-more Micro-Graphic      | 210    | 0             |

| Power Supplied |       |        |               |              |       |        |               |
|----------------|-------|--------|---------------|--------------|-------|--------|---------------|
| Device         | Price | 5V(mA) | 24V Auxiliary | Device       | Price | 5V(mA) | 24V Auxiliary |
| <b>Bases</b>   |       |        |               | <b>Bases</b> |       |        |               |
| D2-03B-1       | <---> | 2600   | 300           | D2-06BDC1-1  | <---> | 2600   | None          |
| D2-03BDC1-1    | <---> | 2600   | None          | D2-06BDC2-1  | <---> | 2600   | 300           |
| D2-04B-1       | <---> | 2600   | 300           | D2-09B-1     | <---> | 2600   | 300           |
| D2-04BDC1-1    | <---> | 2600   | None          | D2-09BDC1-1  | <---> | 2600   | None          |
| D2-06B-1       | <---> | 2600   | 300           | D2-09BDC2-1  | <---> | 2600   | 300           |

| Power Consumed                   |        |               |
|----------------------------------|--------|---------------|
| Device                           | 5V(mA) | 24V Auxiliary |
| <b>CPUs</b>                      |        |               |
| D2-230                           | 120    | 0             |
| D2-240                           | 120    | 0             |
| D2-250-1                         | 330    | 0             |
| D2-260                           | 330    | 0             |
| H2-WPLC**                        | 680    | 0             |
| <b>DC Input Modules</b>          |        |               |
| D2-08ND3                         | 50     | 0             |
| D2-16ND3-2                       | 100    | 0             |
| D2-32ND3                         | 25     | 0             |
| D2-32ND3-2                       | 25     | 0             |
| <b>AC Input Modules</b>          |        |               |
| D2-08NA-1                        | 50     | 0             |
| D2-08NA-2                        | 100    | 0             |
| D2-16NA                          | 100    | 0             |
| <b>Input Simulator Module</b>    |        |               |
| F2-08SIM                         | 50     | 0             |
| <b>DC Output Modules</b>         |        |               |
| D2-04TD1                         | 60     | 20            |
| D2-08TD1                         | 100    | 0             |
| D2-08TD2                         | 100    | 0             |
| D2-16TD1-2                       | 200    | 80            |
| D2-16TD2-2                       | 200    | 0             |
| F2-16TD1P                        | 70     | 50            |
| F2-16TD2P                        | 70     | 50            |
| D2-32TD1                         | 350    | 0             |
| D2-32TD2                         | 350    | 0             |
| <b>AC Output Modules</b>         |        |               |
| D2-08TA                          | 250    | 0             |
| F2-08TA                          | 250    | 0             |
| D2-12TA                          | 350    | 0             |
| <b>Relay Output Modules</b>      |        |               |
| D2-04TRS                         | 250    | 0             |
| D2-08TR                          | 250    | 0             |
| F2-08TR(S)                       | 670    | 0             |
| D2-12TR                          | 450    | 0             |
| <b>Combination In/Out Module</b> |        |               |
| D2-08CDR                         | 200    | 0             |

| Power Consumed             |            |                   |
|----------------------------|------------|-------------------|
| Device                     | 5V(mA)     | 24V Auxiliary     |
| <b>Analog Modules</b>      |            |                   |
| F2-04AD-1                  | 100        | 5                 |
| F2-04AD-2                  | 110        | 5                 |
| F2-08AD-1                  | 100        | 5                 |
| F2-08AD-2                  | 100        | 5                 |
| F2-02DA-1                  | 40         | 60 (note 1)       |
| F2-02DA-1L                 | 40         | 70 @ 12V (note 1) |
| F2-02DA-2                  | 40         | 60                |
| F2-02DA-2L                 | 40         | 70 @ 12V          |
| F2-02DAS-1                 | 100        | 50 / channel      |
| F2-02DAS-2                 | 100        | 60 / channel      |
| F2-08DA-1                  | 30         | 50 (note 1)       |
| F2-08DA-2                  | 60         | 140               |
| F2-4AD2DA                  | 60         | 80 (note 1)       |
| F2-8AD4DA-1                | 35         | 100 (note 1)      |
| F2-8AD4DA-2                | 35         | 80 (note 1)       |
| F2-04RTD                   | 90         | 0                 |
| F2-04THM                   | 110        | 60                |
| <b>Specialty Modules</b>   |            |                   |
| D2-CTRINT                  | 50*        | 0                 |
| D2-CM / D2-EM              | 100/130    | 0                 |
| H2-CTRIO                   | 400        | 0                 |
| D2-DCM                     | 300        | 0                 |
| F2-DEVNETS                 | 160        | 0                 |
| F2-SDS-1                   | 160        | 0                 |
| H2-PBC                     | 530        | 0                 |
| H2-EBC(-F)                 | 450, (640) | 0                 |
| H2-ECOM(-F)                | 450, (640) | 0                 |
| H2-ECOM100                 | 300        | 0                 |
| F2-CP128                   | 235        | 0                 |
| <b>Remote I/O</b>          |            |                   |
| H2-ERM(-F)                 | 320, (450) | 0                 |
| D2-RMSM                    | 200        | 0                 |
| D2-RSSS                    | 150        | 0                 |
| <b>Programming Devices</b> |            |                   |
| D2-HPP                     | 200        | 0                 |

\*requires external 5VDC for outputs  
Note 1: Add an additional 20 mA per output loop.