

# Analog Current Input Modules

## F2-04AD-1 4-Channel 4-20mA Analog In

This module can be powered by either a 12VDC or 24VDC power supply, and is a direct replacement for F2-04AD-1L modules.

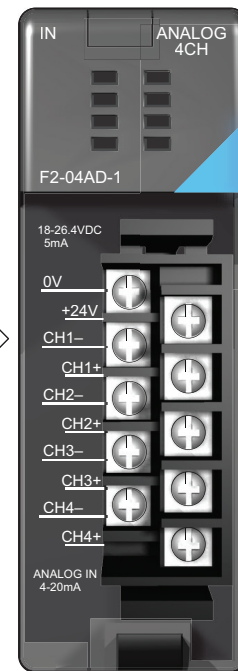
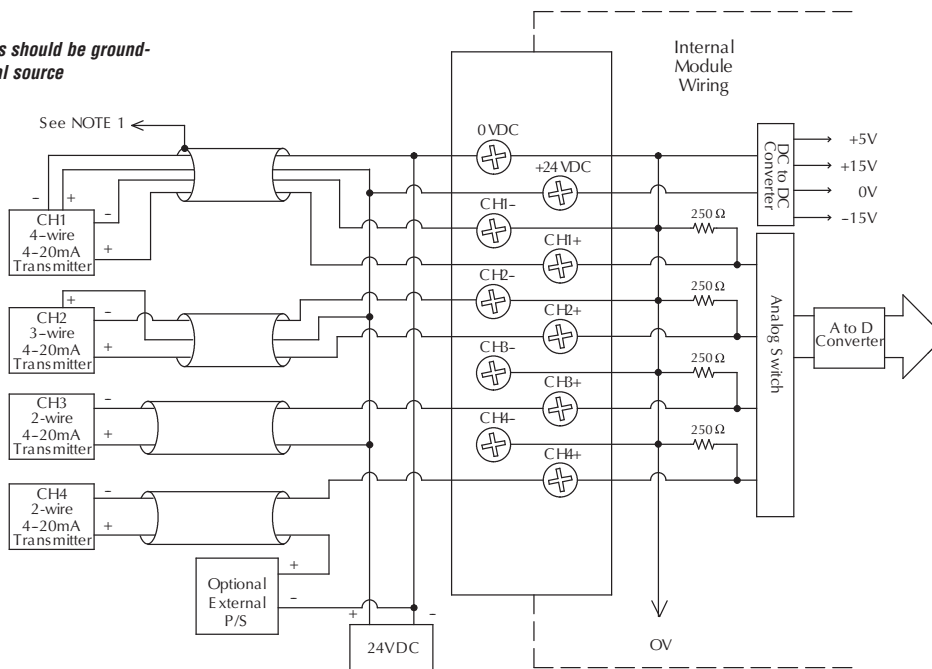
<b>Number of Channels</b>	4, single ended (1 common)
<b>Input Ranges</b>	4 to 20 mA current
<b>Resolution</b>	12-bit (1 in 4096)
<b>Active Low-pass Filtering</b>	-3 dB at 120Hz, 2 poles (-12dB per octave)
<b>Input Impedance</b>	250Ω ±0.1%, 1/2 W current input
<b>Absolute Maximum Ratings</b>	-40mA to +40mA, current input
<b>Converter Type</b>	Successive approximation
<b>Conversion Time (PLC Update Rate)</b>	4 channels per scan maximum (D2-250-1 and D2-262 CPUs)
<b>Linearity Error (End to End)</b>	±1 count (0.025% of full scale) maximum
<b>Input Stability</b>	±1 count
<b>Full Scale Calibration Error (offset error not included)</b>	±12 counts max., @ 20mA current input
<b>Offset Calibration Error</b>	±7 counts max., @ 4mA current input
<b>Step Response</b>	4.9 ms to 95% of F.S. change

<b>Maximum Inaccuracy</b>	±.5% @ 77°F (25°C) ±.65% 32° to 140°F (0° to 60°C)
<b>Accuracy vs. Temperature</b>	±50 ppm/°C maximum full scale (including max. offset change)
<b>Recommended Fuse</b>	0.032 A, Series 217 fast-acting, current inputs
<b>Digital Input Points Required</b>	16 (X) input points (12 binary data bits, 2 channel ID bits, 2 diagnostic bits)
<b>Base Power Required 5 VDC</b>	100mA
<b>External Power Supply</b>	5mA 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; D2-8IOCON

See Wiring Solutions 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**



More than one external power supply can be used provided all the power supply commons are connected. A Series 217, 0.032 A, fast-acting fuse is recommended for 4-20 mA current loops. If the power supply common of an external power supply is not connected to 0VDC on the module, then the output of the external transmitter must be isolated. To avoid "ground loop" errors, recommended 4-20 mA transmitter types are:

2 or 3 wire: Isolation between input signal and power supply.

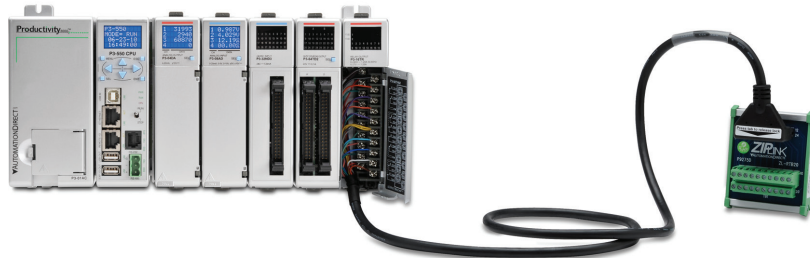
4 wire: Isolation between input signal, power supply, and 4-20 mA output

## Wiring Solutions using the ZIPLink Wiring System

ZIPLinks eliminate the normally tedious process of wiring between devices by utilizing prewired cables and DIN rail mount connector modules. It's as simple as plugging in a cable connector at either end or terminating wires at only one end. Prewired cables keep installation clean and efficient, using half the space at a fraction of the cost of standard terminal blocks. There are several wiring solutions available when using the ZIPLink System ranging from PLC I/O-to-ZIPLink Connector Modules that are ready for field termination, options for connecting to third party devices, GS, DuraPulse and SureServo Drives, as well as special relay, transorb and communications modules. Pre-printed I/O-specific adhesive label strips for quick marking of ZIPLink modules are provided with ZIPLink cables. See the following solutions to help determine the best ZIPLink system for your application.

### Solution 1: Do-more, DirectLOGIC, CLICK and Productivity Series I/O Modules to ZIPLink Connector Modules

When looking for quick and easy I/O-to-field termination, a ZIPLink connector module used in conjunction with a prewired ZIPLink cable, consisting of an I/O terminal block at one end and a multi-pin connector at the other end, is the best solution.



Using the PLC I/O Modules to ZIPLink Connector Modules selector tables located in this section,

1. Locate your I/O module/PLC
2. Select a ZIPLink Module
3. Select a corresponding ZIPLink Cable.

### Solution 2: Do-more, DirectLOGIC, CLICK and Productivity Series I/O Modules to 3rd Party Devices

When wanting to connect I/O to another device within proximity of the I/O modules, no extra terminal blocks are necessary when using the ZIPLink Pigtail Cables. ZIPLink Pigtail Cables are prewired to an I/O terminal block with color-coded pigtail with soldered-tip wires on the other end.



Using the I/O Modules to 3rd Party Devices selector tables located in this section,

1. Locate your PLC I/O module
2. Select a ZIPLink Pigtail Cable that is compatible with your 3rd party device.

### Solution 3: GS Series and DuraPulse Drives Communication Cables

Need to communicate via Modbus RTU to a drive or a network of drives?

ZIPLink cables are available in a wide range of configurations for connecting to PLCs and SureServo, SureStep, Stellar Soft Starter and AC drives. Add a ZIPLink communications module to quickly and easily set up a multi-device network.



Using the Drives Communication selector tables located in this section,

1. Locate your Drive and type of communications
2. Select a ZIPLink cable and other associated hardware.

## Solution 4: Serial Communications Cables

ZIPLink offers communications cables for use with **Direct**.LOGIC, CLICK, and Productivity CPUs, that can also be used with other communications devices. Connections include a 6-pin RJ12 or 9-pin, 15-pin and 25-pin D-sub connectors which can be used in conjunction with the RJ12 or D-Sub feedthrough modules.

Using the Serial Communications Cables selector table located in this section,

1. Locate your connector type
2. Select a cable.



## Solution 5: Specialty ZIPLink Modules

For additional application solutions, ZIPLink modules are available in a variety of configurations including stand-alone relays, 24VDC and 120VAC transorb modules, D-sub, RJ12 and RJ45 feedthrough modules, communication port adapter and distribution modules, and SureServo 50-pin I/O interface connection.

Using the ZIPLink Specialty Modules selector table located in this section,

1. Locate the type of application
2. Select a ZIPLink module.



## Solution 6: ZIPLink Connector Modules to 3rd Party Devices

If you need a way to connect your device to terminal blocks without all that wiring time, then our pigtail cables with color-coded soldered-tip wires are a good solution. Used in conjunction with any compatible ZIPLink Connector Modules, a pigtail cable keeps wiring clean and easy and reduces troubleshooting time.

Using the Universal Connector Modules and Pigtail Cables table located in this section,

1. Select module type
2. Select the number of pins
3. Select cable.





# PLC I/O Modules to ZIPLink Connector Modules – Do-more!/DL205

Do-more / DL205 PLC Input Module ZIPLink Selector				
PLC	ZIPLink			
Input Module	# of Terms	Component	Module Part No.	Cable Part No. †
D2-08ND3	10	Feedthrough	ZL-RTB20 (-1)	ZL-D2-CBL10 *
D2-16ND3-2	19	Feedthrough		ZL-D2-CBL19
		Sensor	ZL-LTB16-24-1	ZL-D2-CBL19-1 ZL-D2-CBL19-2
D2-32ND3 <sup>1</sup>	40	Feedthrough	ZL-RTB40 (-1)	180 deg conn: ZL-D24-CBL40 ZL-D24-CBL40-1 ZL-D24-CBL40-2
		Sensor	ZL-LTB32-24-1	
D2-32ND3-2 <sup>1</sup>	40	Feedthrough	ZL-RTB40 (-1)	45 deg conn: ZL-D24-CBL40-X ZL-D24-CBL40-1X ZL-D24-CBL40-2X
		Sensor	ZL-LTB32-24-1	
D2-08NA-1	10	Feedthrough	ZL-RTB20 (-1)	ZL-D2-CBL10
D2-08NA-2	10			ZL-D2-CBL10-1
D2-16NA	19			ZL-D2-CBL10-2
		Feedthrough		ZL-D2-CBL19 *

† X in the part number represents a 45° angle.

Do-more/DL205 PLC Combo In/Out Module ZIPLink Selector				
PLC	ZIPLink			
Combo Module	# of Terms	Component	Module Part No.	Cable Part No.
D2-08CDR	10	Feedthrough	ZL-RTB20 (-1)	ZL-D2-CBL10 *

Do-more/DL205 PLC Analog Module ZIPLink Selector							
PLC	ZIPLink						
Analog Module	# of Terms	Component	Module	Cable			
F2-04AD-1	10	Feedthrough	ZL-RTB20 (-1)	ZL-D2-CBL10 ZL-D2-CBL10-1 ZL-D2-CBL10-2			
F2-04AD-1L							
F2-08AD-1							
F2-04AD-2							
F2-04AD-2L							
F2-08AD-2							
F2-02DA-1				19			ZL-D2-CBL19 ZL-D2-CBL19-1 ZL-D2-CBL19-2
F2-02DAS-1							
F2-08DA-1							
F2-02DA-2							
F2-02DAS-2							
F2-08DA-2							
F2-4AD2DA				19			ZL-D2-CBL10 ZL-D2-CBL10-1 ZL-D2-CBL10-2
F2-8AD4DA-1							
F2-8AD4DA-2				Matched Only	These modules are not supported by the ZIPLink wiring system		ZL-D2-CBL19 ZL-D2-CBL19-1 ZL-D2-CBL19-2
F2-04RTD							
F2-04THM							



Do-more/ DL205 PLC Output Module ZIPLink Selector					
PLC	ZIPLink				
Output Module	# of Terms	Component	Module Part No.	Cable Part No. †	
D2-04TD1 <sup>2</sup>	10	Feedthrough	ZL-RTB20 (-1)	ZL-D2-CBL10 ZL-D2-CBL10-1 ZL-D2-CBL10-2	
D2-08TD1					
D2-08TD2					
D2-16TD1-2	19	Feedthrough	ZL-RTB20 (-1)	ZL-D2-CBL19 ZL-D2-CBL19-1 ZL-D2-CBL19-2	
		Fuse			ZL-RFU20 <sup>4</sup>
		Feedthrough			ZL-RTB20 (-1)
		Fuse			ZL-RFU20 <sup>4</sup>
		Relay			ZL-RR16-24-2 ZL-RR16W-24-2 ZL-RR16F-24-2 ZL-RR16HDF-24-2
		Feedthrough			ZL-RTB20 (-1)
F2-16TD1P	40	Feedthrough	ZL-RTB20 (-1)	180 deg conn: ZL-D24-CBL40 ZL-D24-CBL40-1 ZL-D24-CBL40-2	
F2-16TD2P					
D2-32TD1 <sup>1</sup>	40	Feedthrough	ZL-RTB40 (-1)	45 deg conn: ZL-D24-CBL40-X ZL-D24-CBL40-1X ZL-D24-CBL40-2X	
		Fuse	ZL-RFU40 <sup>4</sup>		
		Feedthrough	ZL-RTB40 (-1)		
		Fuse	ZL-RFU40 <sup>4</sup>		
D2-32TD2 <sup>1</sup>	10	Feedthrough	ZL-RTB20 (-1)	ZL-D2-CBL10 ZL-D2-CBL10-1 ZL-D2-CBL10-2	
D2-08TA	19	Feedthrough	ZL-RTB20 (-1)	ZL-D2-CBL19 ZL-D2-CBL19-1 ZL-D2-CBL19-2	
F2-08TA		Fuse			ZL-RFU20 <sup>4</sup>
D2-12TA	10	Feedthrough	ZL-RTB20 (-1)	ZL-D2-CBL10 ZL-D2-CBL10-1 ZL-D2-CBL10-2	
		Fuse			ZL-RFU20 <sup>4</sup>
D2-04TRS <sup>2</sup>	19	Feedthrough	ZL-RTB20 (-1)	ZL-D2-CBL10 ZL-D2-CBL10-1 ZL-D2-CBL10-2	
D2-08TR					
F2-08TRS <sup>2</sup>					
F2-08TR <sup>3</sup>	19	Feedthrough	ZL-RTB20 (-1)	ZL-D2-CBL19 *	
D2-12TR	19	Feedthrough	ZL-RFU20 <sup>4</sup>	ZL-D2-CBL19 ZL-D2-CBL19-1 ZL-D2-CBL19-2	
		Fuse			

† X in the part number represents a 45° angle plug

\* Select the cable length by replacing the \* with: Blank = 0.5 m, -1 = 1.0 m, or -2 = 2.0 m.

1 To make a custom cable for the 32-point modules, use: Solder-style 180° connector ZL-D24-CON or Solder-style 45° connector ZL-D24-CON-X

2 Caution: The D2-04TD1, D2-04TRS, and F2-08TRS outputs are derated not to exceed module specs 2A per point and 2A per common when used with the ZIPLink wiring system.

3 The F2-08TR outputs are derated not to exceed 2A per point and 4A per common when used with the ZIPLink wiring system.

4 Fuses (5 x 20 mm) are not included. See Edison Electronic Fuse section for (5 x 20 mm) fuse. S500 and GMA electronic circuit protection for fast-acting maximum protection. S506 and GMC electronic circuit protection for time-delay performance. Ideal for inductive circuits.

To ensure proper operation, do not exceed the voltage and current rating of ZIPLink module. ZL-RFU20 = 2A per circuit; ZL-RFU40 = 400mA per circuit.

NOTE: ZIPLINK CONNECTOR MODULE SPECIFICATIONS FOLLOW THE COMPATIBILITY MATRIX TABLES. ZIPLINK CABLES SPECIFICATIONS ARE AT THE END OF THIS ZIPLINK SECTION.



# Dimensions and Installation

Understanding the installation requirements for your DL205 system will help ensure that the DL205 products operate within their environmental and electrical limits.

## Plan for safety

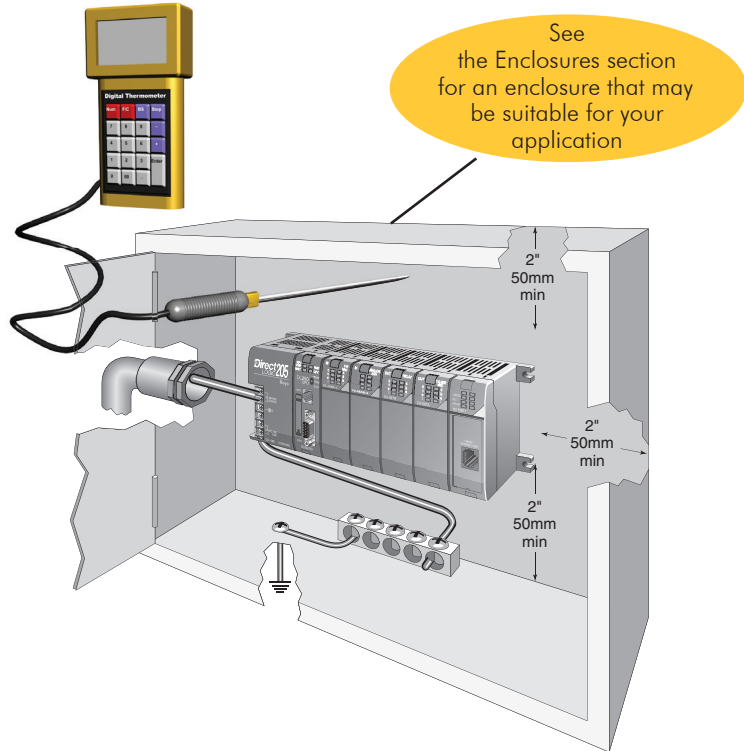
This catalog should never be used as a replacement for the user manual. The user manual, D2-USER-M (downloadable online), contains important safety information that must be followed. The system installation should comply with all appropriate electrical codes and standards.

## Environmental specifications

The Environmental Specifications table at the right lists specifications that apply globally to the DL205 system (CPUs, bases, and I/O modules). Be sure that the DL205 system is operated within these environmental specifications.

## Base dimensions and mounting

Use the diagrams below to make sure the DL205 system can be installed in your application. To ensure proper airflow for cooling purposes, DL205 bases must be mounted horizontally. It is important to check these dimensions against the conditions required for your application. For example, it is recommended that approximately 3" of space is left in front PLC surface for ease of access and cable clearances. Also, check the installation guidelines for recommended cabinet clearances.



Environmental Specification	Rating
<b>Storage Temperature</b>	-4°F to 158°F (-20°C to 70°C)
<b>Ambient Operating Temperature</b>	32°F to 131°F (0°C to 55°C)
<b>Ambient Humidity</b>	30% to 95% relative humidity (non-condensing)
<b>Vibration Resistance</b>	MIL STD 810C, Method 514.2
<b>Shock Resistance</b>	MIL STD 810C, Method 516.2
<b>Noise Immunity</b>	NEMA (ICS3-304)
<b>Atmosphere</b>	No corrosive gases

Base	A	B	C	D				
<b>D2-03B-1, D2-03BDC1-1</b>	6.77"	172mm	6.41"	163mm	5.8"	148mm	7.24"	184mm
<b>D2-04B-1, D2-04BDC1-1</b>	7.99"	203mm	7.63"	194mm	7.04"	179mm	8.46"	215mm
<b>D2-06B-1, D2-06BDC1-1, D2-06BDC2-1</b>	10.43"	265mm	10.07"	256mm	9.48"	241mm	10.90"	277mm
<b>D2-09B-1, D2-09BDC1-1, D2-09BDC2-1</b>	14.09"	358mm	13.74"	349mm	13.14"	334mm	14.56"	370mm

