

# Analog Current Input Modules

F2-04AD-1 4-Channel 4-20mA Analog In <--->	
This module can be powered by either a 12 VDC or 24 VDC 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 120 Hz, 2 poles (-12 dB per octave)
<b>Input Impedance</b>	250Ω ±0.1%, 1/2W current input
<b>Absolute Maximum Ratings</b>	-40 mA to +40 mA, current input
<b>Converter Type</b>	Successive approximation
<b>Conversion Time (PLC Update Rate)</b>	1 channel per scan maximum (D230 CPU); 4 channels per scan maximum (D2-240, D2-250(-1) and D2-260 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., @ 20 mA 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

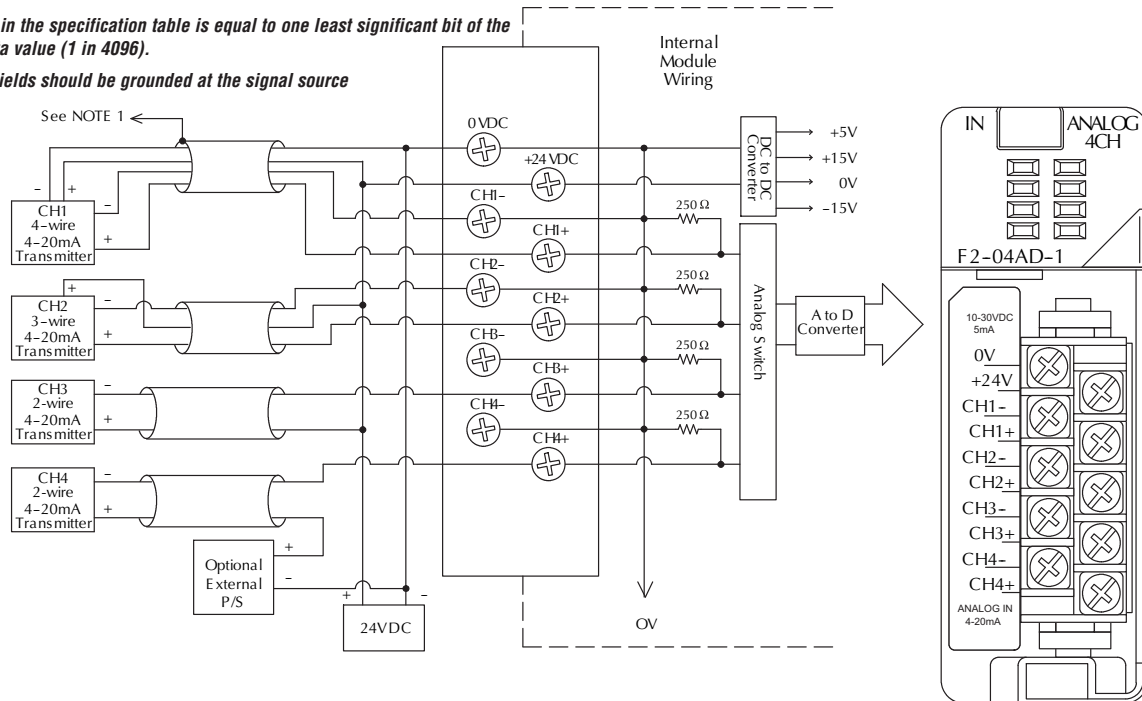
<b>Maximum Inaccuracy</b>	±.5% @ 77°F (25°C) ±.65% 32° to 140°F (0° to 60°C)
<b>Accuracy vs. Temperature</b>	±50 ppm/°C maximum full scale (including max. offset change)
<b>Recommended Fuse</b>	0.032 A, Series 217 fast-acting, current inputs
<b>Digital Input Points Required</b>	16 (X) input points (12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

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



One count in the specification table is equal to one least significant bit of the analog data value (1 in 4096).

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, 0.032A, 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

<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> <b>Note: Cable part number denotes compatibility between Connector Module and I/O Modules.</b>	

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.