

# Temperature Input Modules

## F2-04THM 4-Channel Thermocouple In <---->

General Specifications	
<b>Number of Channels</b>	4, differential
<b>Common Mode Range</b>	±5 VDC
<b>Common Mode Rejection</b>	90 dB min. @ DC, 150 dB min. @ 50/60 Hz.
<b>Input Impedance</b>	1 MΩ
<b>Absolute Maximum Ratings</b>	Fault-protected inputs to ±50 VDC
<b>Accuracy vs. Temperature</b>	±5 ppm/°C maximum full scale calibration (including maximum offset change)
<b>PLC Update Rate</b>	4 channels per scan max. D2-240/250(-1)/D2-260 CPU, H2-EBC(-F); 1 chan. per scan max. D2-230 CPU
<b>Digital Input Points Required</b>	32 (X) input points (16 binary data bits, 2 channel ID bits, 4 diagnostic bits)
<b>External Power Supply</b>	60 mA maximum, 18 to 26.4 VDC
<b>Base Power Required 5VDC</b>	110 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>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>	Non-removable

## CPU Firmware Required

CPU	Firmware Required
D2-230	V1.06
D2-240	V2.5
D2-250	V1.06
D2-250-1, D2-260	All firmware versions work

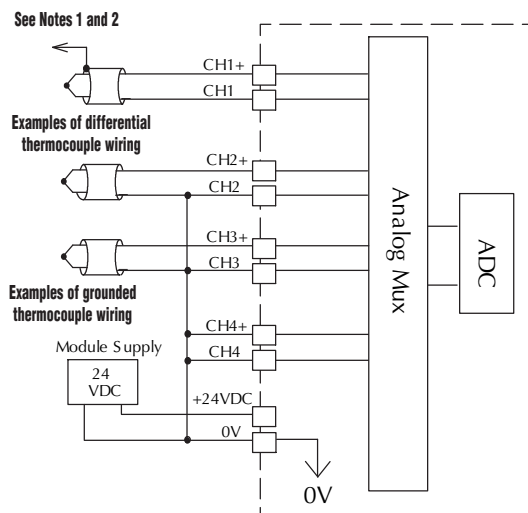
## Thermocouple Specifications

<b>Input Ranges</b>	Type J -190 to 760°C	-310 to 1400°F
	Type E -210 to 1000°C	-346 to 1832°F
	Type K -150 to 1372°C	-238 to 2502°F
	Type R 65 to 1768°C	149 to 3214°F
	Type S 65 to 1768°C	149 to 3214°F
	Type T -230 to 400°C	-382 to 752°F
	Type B 529 to 1820°C	984 to 3308°F
	Type N -70 to 1300°C	-94 to 2372°F
Type C 65 to 2320°C	149 to 4208°F	
<b>Display Resolution</b>	±0.1°C or ±0.1°F	
<b>Cold Junction Compensation</b>	Automatic	
<b>Conversion Time</b>	100 ms per channel	
<b>Warm-Up Time</b>	30 minutes typically ± 1°C repeatability	
<b>Linearity Error (End to End)</b>	±0.05°C maximum, ±0.01°C typical	
<b>Maximum Inaccuracy</b>	±3°C (excluding thermocouple error)	
Voltage Input Specifications		
<b>Voltage Ranges</b>	0-5V, ±5V, 0-156.25 mV, ±156.25 mVDC	
<b>Resolution</b>	16 bit (1 in 65535)	
<b>Full Scale Calibration Error (Offset Error Included)</b>	±13 counts typical ±33 maximum	
<b>Offset Calibration Error</b>	±1 count maximum, @ 0V input	
<b>Linearity Error (End to End)</b>	±1 count maximum	
<b>Maximum Inaccuracy</b>	±0.02% @ 25°C (77°F)	

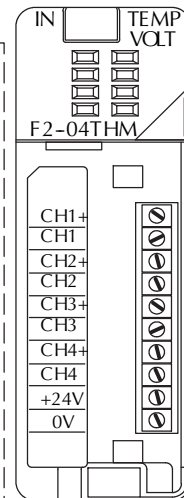
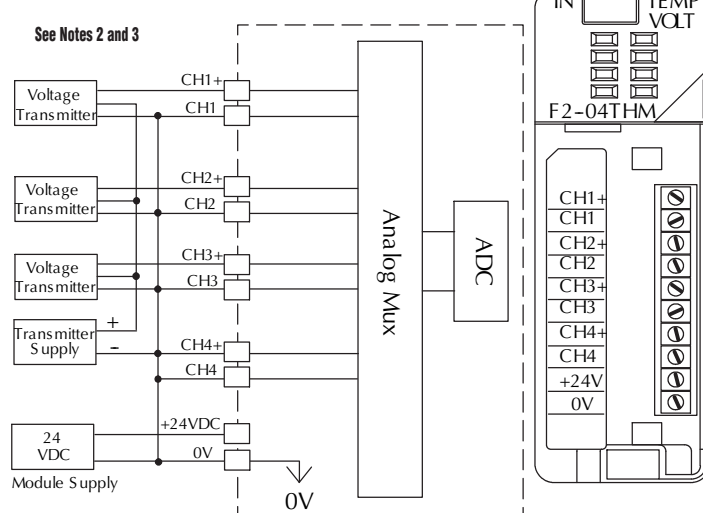
### Notes:

1. Terminate shields at the respective signal source.
2. Connect unused channels to a common terminal (0V, CH4+, CH4).
3. When using 0-156 mV and 5V ranges, connect (-) or (0) volts terminal to 0V to ensure common mode range acceptance.
4. This module is not compatible with the ZIPLink wiring system.

Thermocouple input wiring diagram



Voltage input wiring diagram



# 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.