# Temperature Input Modules

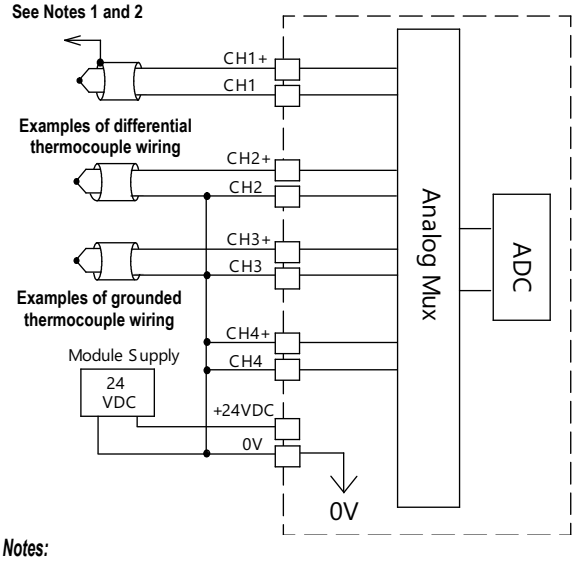
## F2-04THM 4-Channel Thermocouple In $529.00

| General Specifications | |
|---|---|
| Number of Channels | 4, differential |
| Common Mode Range | ±5VDC |
| Common Mode Rejection | 90dB min. @ DC, 150dB min. @ 50/60 Hz. |
| Input Impedance | 1 MΩ |
| Absolute Maximum Ratings | Fault-protected inputs to ±50 VDC |
| Accuracy vs. Temperature | ±5 ppm/ºC maximum full scale calibration (including maximum offset change) |
| PLC Update Rate | 4 channels per scan max. D2-262 CPU |
| Digital Input Points Required | 32 (X) input points (16 binary data bits, 2 channel ID bits, 4 diagnostic bits) |
| External Power Supply | 60mA maximum, 18 to 26.4 VDC |
| Base Power Required 5VDC | 110mA |
| Operating Temperature | 32º to 140ºF (0º to 60ºC) |
| Storage Temperature | -4º to 158ºF (-20º to 70ºC) |
| Relative Humidity | 5 to 95% (non-condensing) |
| Environmental Air | No corrosive gases permitted |
| Vibration | MIL STD 810C 514.2 |
| Shock | MIL STD 810C 516.2 |
| Noise Immunity | NEMA ICS3-304 |
| Terminal Type (included) | Non-removable |

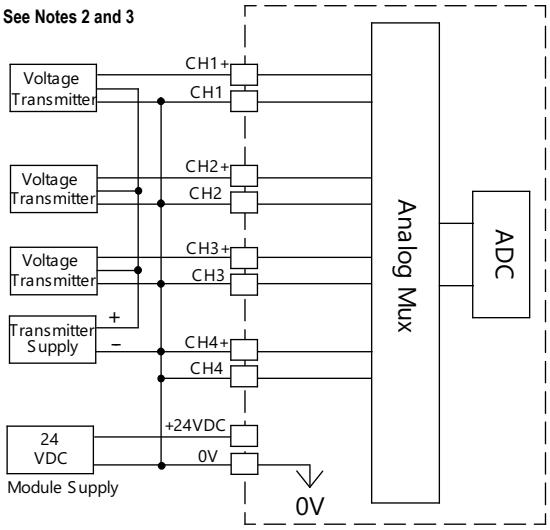
| Thermocouple Specifications | | |
|---|---|---|
| Input Ranges | Type J -190 to 760ºC<br>Type E -210 to 1000ºC<br>Type K -150 to 1372ºC<br>Type R 65 to 1768ºC<br>Type S 65 to 1768ºC<br>Type T -230 to 400ºC<br>Type B 529 to 1820ºC<br>Type N -70 to 1300ºC<br>Type C 65 to 2320ºC | -310 to 1400ºF<br>-346 to 1832ºF<br>-238 to 2502ºF<br>149 to 3214ºF<br>149 to 3214ºF<br>-382 to 752ºF<br>984 to 3308ºF<br>-94 to 2372ºF<br>149 to 4208ºF |
| Display Resolution | ±0.1ºC or ±0.1ºF | |
| Cold Junction Compensation | Automatic | |
| Conversion Time | 100ms per channel | |
| Warm-Up Time | 30 minutes typically ± 1ºC repeatability | |
| Linearity Error (End to End) | ±.05ºC maximum, ±.01ºC typical | |
| Maximum Inaccuracy | ±3ºC (excluding thermocouple error) | |
| **Voltage Input Specifications** | | |
| Voltage Ranges | 0-5V, ±5V, 0-156.25 mV, ±156.25 mVDC | |
| Resolution | 16-bit (1 in 65535) | |
| Full Scale Calibration Error (Offset Error Included) | ±13 counts typical ±33 maximum | |
| Offset Calibration Error | ±1 count maximum, @ 0V input | |
| Linearity Error (End to End) | ±1 count maximum | |
| Maximum Inaccuracy | ±.02% @ 25ºC (77ºF) | |

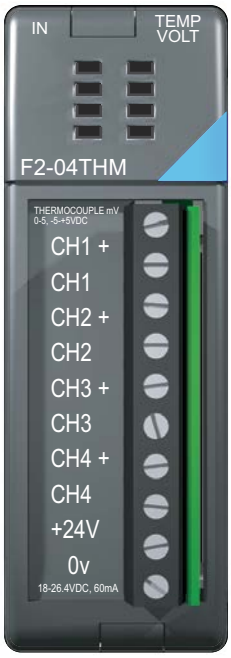
| CPU Firmware Required | |
|---|---|
| CPU | Firmware Required |
| D2-250 | V1.06 |
| D2-250-1 | All firmware versions work |
| D2-262 | Version 1.0 or later |

**Thermocouple input wiring diagram**




**Voltage input wiring diagram**




*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.*

# Analog Current Output Modules

## F2-02DA-1 2-Channel 4-20mA Analog Output $282.00

This module requires a 24VDC user power supply for operation.

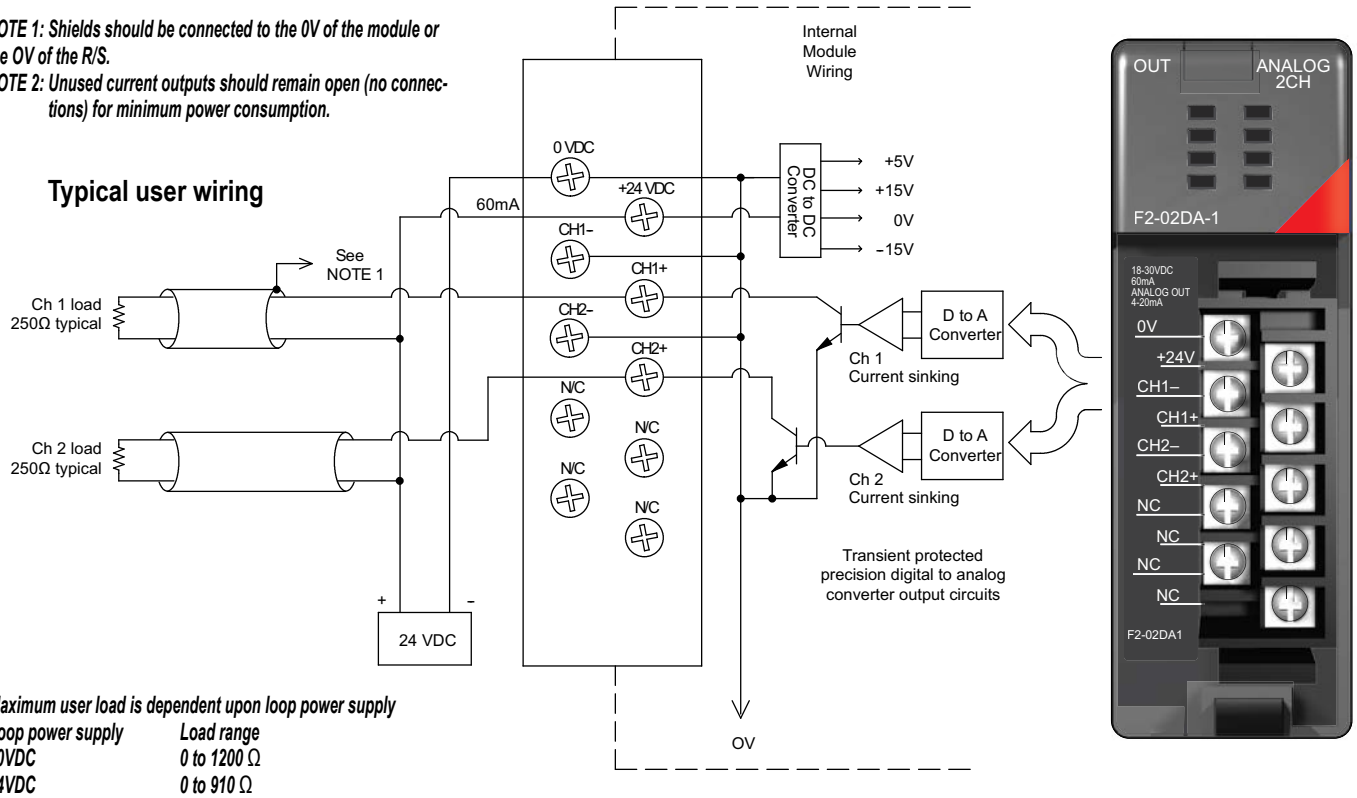
| | |
|---|---|
| ***Number of Channels*** | 2 |
| ***Output Ranges*** | 4 to 20 mA |
| ***Resolution*** | 12-bit (1 in 4096) |
| ***Output Type*** | Single ended, one common |
| ***Digital Output Points Required*** | 16 (Y) output points<br>(12 binary data bits, 2 channel ID bits) |
| ***Maximum Loop Supply*** | 30VDC |
| ***Peak Output Voltage*** | 40VDC<br>(clamped by transient voltage suppressor) |
| ***Load Impedance*** | Zero Ω minimum |
| ***Maximum Load/Power Supply*** | 620Ω/18V, 910Ω/24V, 1200Ω/ 30V |
| ***PLC Update Rate*** | 2 channels per scan maximum<br>(D2-262 CPU) |
| ***Linearity Error (end to end)*** | ±1 count (±0.025% of full scale) maximum |
| ***Conversion Settling Time*** | 100µs maximum (full scale change) |
| ***Full Scale Calibration Error (offset error included)*** | ± 5 counts max., 20mA @77ºF (25ºC) |
| ***Offset Calibration Error*** | ± 3 counts max., 4mA @ 77ºF (25Cº) |

| | |
|---|---|
| ***Accuracy vs. Temperature*** | ±50 ppm/ºC full scale calibration change (including maximum offset change of 2 counts) |
| ***Maximum Inaccuracy*** | 0.1% @ 77ºF (25ºC)<br>0.3% @ 32º to 140ºF (0º to 60ºC) |
| ***Base Power Required 5VDC*** | 40mA |
| ***External Power Supply*** | 24VDC, 60mA.<br>(add 20mA for each current loop used) |
| ***Operating Temperature*** | 32º to 140ºF (0º to 60ºC) |
| ***Storage Temperature*** | -4 to 158ºF(-20 to 70ºC) |
| ***Relative Humidity*** | 5% to 95% (non-condensing) |
| ***Environmental Air*** | No corrosive gases permitted |
| ***Vibration*** | MIL STD 810C 514.2 |
| ***Shock*** | MIL STD 810C 516.2 |
| ***Noise Immunity*** | NEMA ICS3-304 |
| ***Terminal Type (included)*** | Removable; D2-8IOCON |

See Wiring Solutions for part numbers of ***ZIP***Link cables and connection modules compatible with this I/O module.


***NOTE 1: Shields should be connected to the 0V of the module or the OV of the R/S.***
***NOTE 2: Unused current outputs should remain open (no connections) for minimum power consumption.***

### Typical user wiring




***Maximum user load is dependent upon loop power supply***

| ***Loop power supply*** | ***Load range*** |
|---|---|
| ***30VDC*** | ***0 to 1200 Ω*** |
| ***24VDC*** | ***0 to 910 Ω*** |
| ***18VDC*** | ***0 to 620 Ω*** |