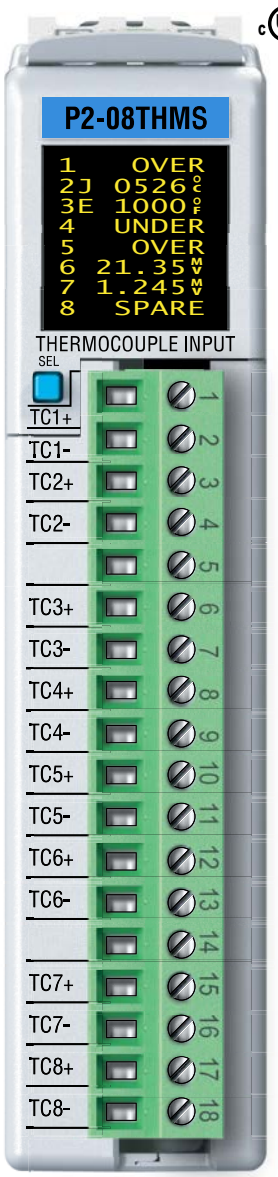
Analog Input Modules

P2-08THMS $475.00

Thermocouple Analog Input

The P2-08THMS Thermocouple Input Module provides eight differential channels for receiving thermocouple and voltage input signals.



Terminal block included

Thermocouple Input Specifications	
Input Channels	8 Differential channels (4 isolated pairs)
Data Format	Floating Point
Common Mode Range	±1.25V
Common Mode Rejection	100 dB @ DC and 130 dB @ 60 Hz
Input Impedance	>5 MΩ
Maximum Ratings	Fault protected inputs to ±50V
Resolution	16-bit, ±0.1 °C or °F
Thermocouple Input Ranges	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);
Cold Junction Compensation	Automatic
Thermocouple Linearization	Automatic
Accuracy vs. Temperature	±50 ppm per °C (maximum)
Linearity Error	±1 °C maximum (±0.5 °C typical) Monotonic with no missing codes.
Maximum Inaccuracy	±3°C maximum (including temperature drift but excluding thermocouple error).
Warm-up Time	30 minutes for ±1% repeatability 2 minutes to reach voltage specifications
Sample Duration Time	380 ms
All Channel Update Rate	3.04 s
Open Circuit Detection Time	Within 2s
Conversion Method	Sigma-Delta
External DC Power Required	None

Removable Terminal Block Specifications		
Part Number	***P2-RTB (included)***	***P2-RTB-1***
Number of positions	18 screw terminals	18 spring clamp terminals
Wire Range*	30–16 AWG (0.051–1.31mm²) Solid / stranded conductor 3/64in (1.2mm) insulation maximum 1/4in (6–7mm) strip length	28–16 AWG (0.081–1.31mm²) Solid / stranded conductor 3/64in (1.2mm) insulation maximum 19/64in (7–8mm) strip length
Conductors*	Use Thermocouple Extension wire for thermocouples. Use copper conductors, 75 °C or equivalent for millivolt inputs.	
Screw Driver Width	0.1in (2.5mm) maximum	
Screw Size	M2	N/A
Screw Torque	2.5 lb·in (0.28 N·m)	N/A

** Use shielded, twisted thermocouple wire that matches the thermocouple type.*

Analog Input Modules

P2-08THMS (cont'd)

General Specifications	
Operating Temperature	0 to 60 ºC (32 to 140 ºF)
Storage Temperature	-20 to 70 ºC (-4 to +158 ºF)
Humidity	5 to 95% (non-condensing)
Altitude	2,000 meters max.
Pollution Degree	2
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Overvoltage Category	II
Field to Logic Side Isolation	1750 VDC applied for 5s or 420 VDC applied for 1 minute
Input to Input Isolation	1750 VDC applied for 5s or 420 VDC applied for 1 minute
Heat Dissipation	559 mW
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity2000 system
Field Wiring	Removable terminal block (included). The P2-08THMS module is not compatible with the ZIPLink wiring system.
Connector Type (included)	18-position removable terminal block
Weight	108g (3.81 oz)
Agency Approvals	UL 61010-1 and UL 61010-2-201 File E139594, Canada and USA CE (EN 61131-2 EMC, EN 61010-1 and EN 61010-2-201 Safety)*

**Meets EMC and Safety requirements. See the Declaration of Conformity for details.*

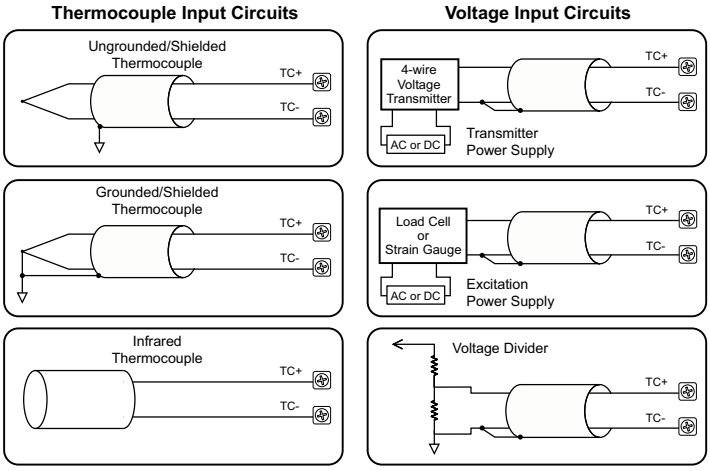
Configuration/Diagnostics	
Burn-out Detection: High Side/Disable	1 bit per module
°C/°F (T/C Only)	1 bit per module
Module Diagnostics Failure	1 bit per module
Burn-out (on if T/C input is open – no connection between TCn+ and TCn-)	1 bit per channel
Channel Under-range	1 bit per channel
Channel Over-range	1 bit per channel

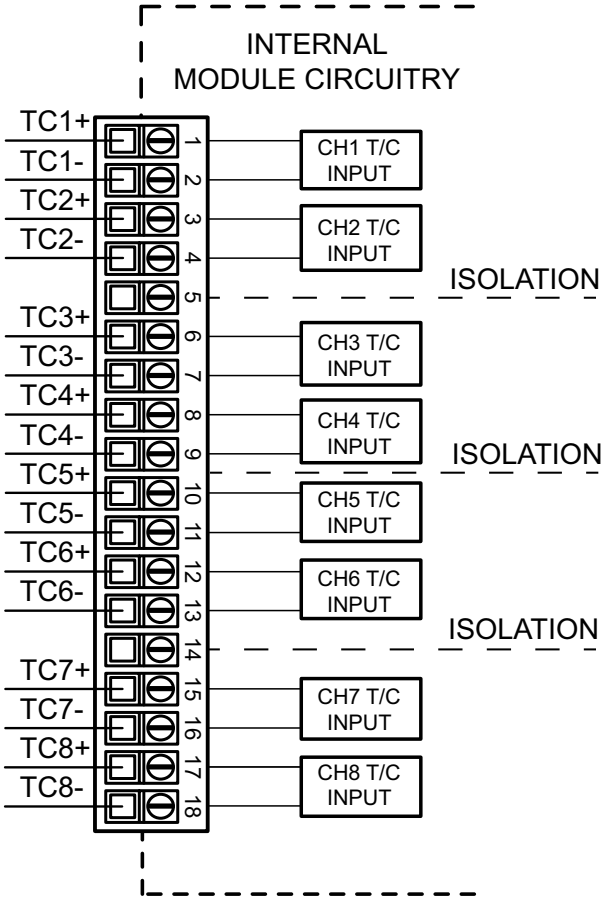
Voltage Input Specifications	
Linear mV Device Input Ranges	0–39.0625 mVDC, ±39.0625 mVDC, ±78.125 mVDC, 0–156.25 mVDC, ±156.25 mVDC, 0–1250 mVDC
Max Voltage Input Offset Error	0.05% @ 0–60 °C, typical 0.04% @ 25 °C
Max Voltage Input Gain Error	0.06% @ 25 °C
Max Voltage Input Linearity Error	0.05% @ 0–60 °C, typical 0.03% @ 25 °C
Max Voltage Input Impedance	0.2% @ 0–60 °C, typical 0.06% @ 25 °C

Analog Input Modules

P2-08THMS (cont'd)

Wiring Diagrams

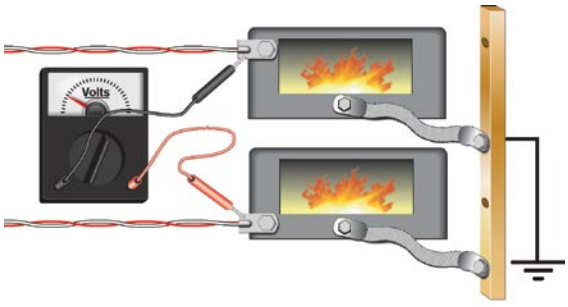




NOTES:

1. Connect shield to thermocouple signal/ground only. Do not connect to both ends.
2. Install jumper wire on each unused input, TC+ to TC-

3. With grounded thermocouples, take precautions to prevent having a voltage potential between thermocouple tips. A voltage of 1.25V or greater between tips will skew measurements.
4. Use shielded, twisted thermocouple extension wire that matches the thermocouple type. Use thermocouple-compatible junction blocks.
5. Four separate isolations in the field side. Each isolation consists of a pair of channels.



I/O Modules

A variety of discrete, analog and specialty I/O modules are available for use in a Productivity2000 system. Specifications for each module are on the following pages.

A filler module is available for unused I/O module slots (part number P2-FILL).

Discrete Input Modules

Productivity2000 Discrete Input Modules

Part Number	Number of Inputs	Description	Price
P2-08SIM	8	Input Simulator Module	$69.00
P2-08ND3-1	8	Sinking/Sourcing 12–24 VDC	$72.00
P2-16ND-TTL	16	Sinking/Sourcing	$101.00
P2-16ND3-1	16	Sinking/Sourcing 24V AC/DC	$100.00
P2-32ND3-1	32	Sinking/Sourcing 12–24 VDC	$148.00
P2-08NE3	8	Sinking/Sourcing 24V AC/DC	$59.00
P2-16NE3	16	Sinking/Sourcing 12–24 VDC	$101.00
P2-32NE3	32	Sinking/Sourcing 24V AC/DC	$148.00
P2-08NAS	8	AC Isolated 100-120 VAC	$113.00
P2-16NA	16	AC 100-240 VAC	$154.00

Specialty Modules

Productivity2000 Specialty Modules

Part Number	Number of Channels	Description	Price
P2-HSI	2	High-Speed Input	$288.00
P2-HSO**	2	High-Speed Output	$288.00
P2-02HSC	2	High-Speed Counter	$120.00
P2-04PWM	4	Pulse-Width Modulation	$132.00
P2-SCM	4 ports	Serial Communications Module	$242.00

*** ZIPLink required.*

Analog Output Modules

Productivity2000 Analog Output Modules

Part Number	Number of Channels	Description	Price
P2-04DA	4	Analog Output (Voltage/Current)	$286.00
P2-04DA-1	4	Analog Output (Current)	$217.00
P2-04DA-2	4	Analog Output (Voltage)	$212.00
P2-04DAL-1*	4	Analog Output (Current)	$162.00
P2-04DAL-2*	4	Analog Output (Voltage)	$151.00
P2-08DA-1	8	Analog Output (Current)	$398.00
P2-08DA-2	8	Analog Output (Voltage)	$365.00
P2-08DAL-1*	8	Analog Output (Current)	$297.00
P2-08DAL-2*	8	Analog Output (Voltage)	$288.00
P2-16DA-1	16	Analog Output (Current)	$521.00
P2-16DA-2	16	Analog Output (Voltage)	$499.00
P2-16DAL-1*	16	Analog Output (Current)	$371.00
P2-16DAL-2*	16	Analog Output (Voltage)	$355.00

** Low resolution analog modules without OLED display.*

Discrete Output Modules

Productivity2000 Discrete Output Modules

Part Number	Number of Outputs	Description	Price
P2-08TD1S	8	Isolated Sinking	$70.00
P2-08TD2S	8	Isolated Sourcing	$70.00
P2-15TD1	15	Sinking	$97.00
P2-15TD2	15	Sourcing	$95.00
P2-08TD1P	8	Sinking Protected	$60.00
P2-08TD2P	8	Sourcing Protected	$60.00
P2-16TD-TTL	16	Sourcing	$116.00
P2-16TD1P	16	Sinking Protected	$101.00
P2-16TD2P	16	Sourcing Protected	$101.00
P2-32TD1P	32	Sinking Protected	$148.00
P2-32TD2P	32	Sourcing Protected	$148.00
P2-08TAS	8	Isolated AC	$154.00
P2-16TA	16	100-240 VAC Output	$190.00
P2-06TRS	6	Isolated Relay	$111.00
P2-08TRS	8	Isolated Relay	$73.00
P2-08TEPS	8	Isolated SS Relay	$160.00
P2-16TR	16	Relay	$137.00

Analog Input Modules

Productivity2000 Analog Input Modules

Part Number	Number of Channels	Description	Price
P2-04AD	4	Analog Input (Voltage/Current)	$288.00
P2-04AD-1	4	Analog Input (Current)	$217.00
P2-04AD-2	4	Analog Input (Voltage)	$224.00
P2-08AD-1	8	Analog Input (Current)	$303.00
P2-08AD-2	8	Analog Input (Voltage)	$333.00
P2-08ADL-1*	8	Analog Input (Current)	$212.00
P2-08ADL-2*	8	Analog Input (Voltage)	$230.00
P2-16AD-1	16	Analog Input (Current)	$366.00
P2-16AD-2	16	Analog Input (Voltage)	$406.00
P2-16ADL-1*	16	Analog Input (Current)	$261.00
P2-16ADL-2*	16	Analog Input (Voltage)	$289.00
P2-06RTD	6	Analog RTD Input	$476.00
P2-08NTC	8	Analog Thermocouple Input	$424.00
P2-08THM	8	Analog Thermistor Input	$468.00
P2-08THMS	8	Analog Thermocouple Input	$475.00

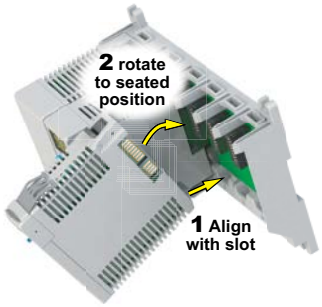
Productivity2000 Analog Input/Output Modules

Part Number	Number of Channels	Description	Price
P2-8AD4DA-1	8/4	Analog Input/Output (Current)	$456.00
P2-8AD4DA-2	8/4	Analog Input/Output (Voltage)	$456.00

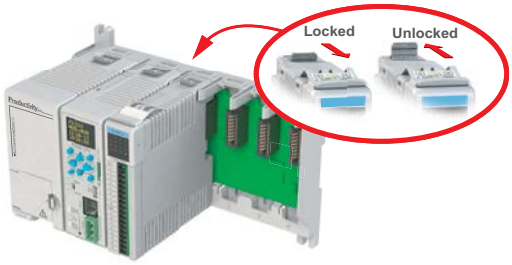
I/O Module Installation Procedure

WARNING: ***DO NOT APPLY FIELD POWER UNTIL THE FOLLOWING STEPS ARE COMPLETED. SEE HOT-SWAP PROCEDURE FOR EXCEPTIONS.***

Step One: Align module catch with base slot and module into connector.



Step Two: Pull top locking tab toward module face. Click indicates lock is en- gaged.



Step Three: Attach field wiring using removable terminal block or ZIPLink wiring system.

WARNING: ***EXPLOSION HAZARD – DO NOT CONNECT OR DISCONNECT CONNECTORS OR OPERATE SWITCHES WHILE CIRCUIT IS LIVE UNLESS THE AREA IS KNOWN TO BE NON-HAZARDOUS. DO NOT HOT-SWAP MODULES UNLESS THE AREA IS KNOWN TO BE NON-HAZARDOUS.***