Analog Input Modules

Please note: $US prices shown
For current $AUD visit www.directautomation.com.au

P3-08THM $448.00

Thermocouple Analog Input
The P3-08THM Thermocouple Input Module provides eight differential channels for receiving thermocouple and voltage input signals.

Patent-pending LCD gives access to field signal values, as well as module and signal faults.

Terminal Block P3-RTB and Cover included. Not compatible with *ZIP*Link.

Removable Terminal Block Specifications	
Description	Part No. P3-RTB; 20 screw terminals
Wire Range	22–14 AWG (0.324 to 2.08 sq. mm) Solid / stranded conductor 3/64 in. (1.2 mm) insulation maximum USE COPPER CONDUCTORS , 60°C or equivalent.
Screw Driver Width	1/4 inch (6.5 mm) maximum
Screw Size	M3 size
Screw Torque	Field terminals - 7–9 in·lb (0.882–1.02 N·m) Self-jacking screws - 2.7–3.6 in·lb (0.3–0.4 N·m). Do not overtighten screws when installing terminal block.

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

T/C Input Specifications	
Input channels	8 differential
Data Format	Floating point
Common Mode Range	± 1.25 V
Common Mode Rejection	100dB @ DC and 130dB @ 60Hz
Input Impedance	>5M ohms
Maximum Ratings	Fault-protected inputs to ±50VDC
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	±50PPM / °C maximum
Linearity Error	±1°C maximum (±0.5 °C typical), Monotonic with no missing codes
Maximum Inaccuracy	±3°C Max (excluding thermocouple error) (including temperature drift)
Warm-up Time	30 Minutes for ±1°C Repeatability 2 minutes to reach voltage specifications
Sample Duration Time	270ms
All Channel Update Rate	2.16 s
Open Circuit Detection Time	10–15 secs, 20 secs max.
Conversion Method	Sigma-Delta
External DC Power	NONE

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 Inaccuracy	0.2% @ 0° - 60°C, typical 0.06% @ 25°C

Configuration/Diagnostics	
Burn-out Detection Enable/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 (T/C only)	1 bit per channel
Channel Over-range (T/C only)	1 bit per channel

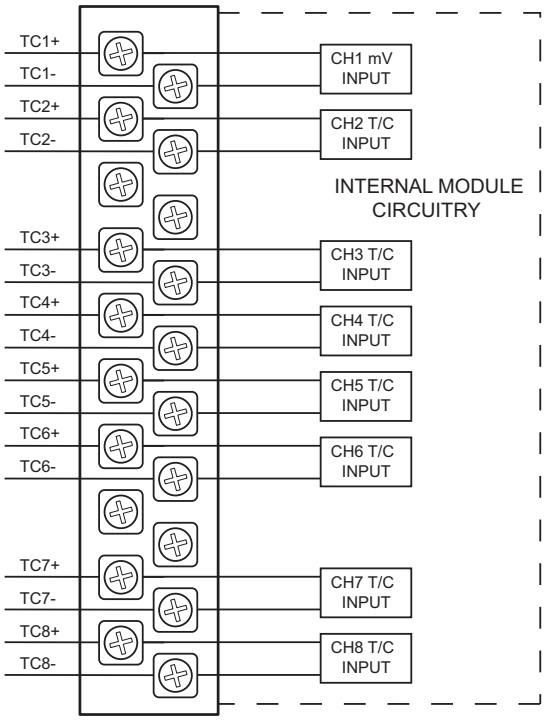
Analog Input Modules

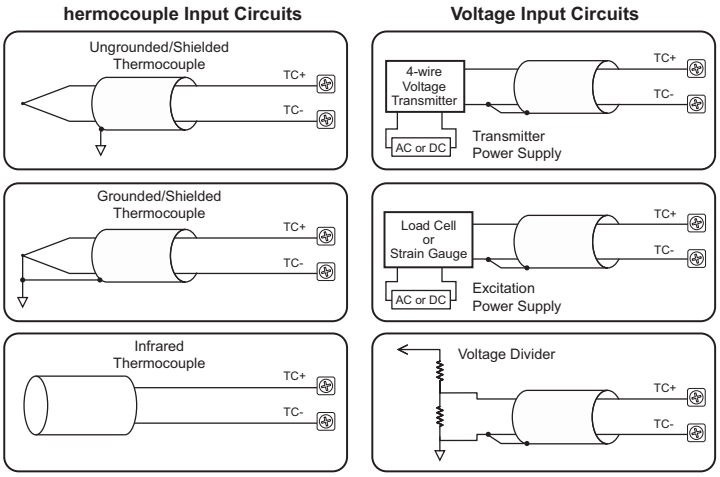
P3-08THM (cont'd)

General Specifications	
Operating Temperature	0°C– 60°C (32°F–140°F),
Storage Temperature	-20ºC–70ºC (-4ºF–158ºF)
Humidity	5 to 95% (non-condensing)
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1s
Insulation Resistance	>10MΩ @ 500VDC
Heat Dissipation	0.36 W
Enclosure Type	Open equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in any local, expansion, or remote base in a Productivity3000 system.
Field Wiring	Removable terminal block (included). The P3-08THM module is not compatible with the ***ZIP***Link wiring system.
Terminal Type	20-position removable terminal block (included)
Weight	150g (5.3 oz)
Agency Approvals	UL508 file E157382, Canada & USA UL1604 file E200031, Canada & USA CE (EN61131-2*) This equipment is suitable for use in Class 1, Division 2, Groups A, B, C and D or non-hazardous locations only.

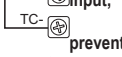
***Meets EMC and Safety requirements. See the Declaration of Conformity for details.**

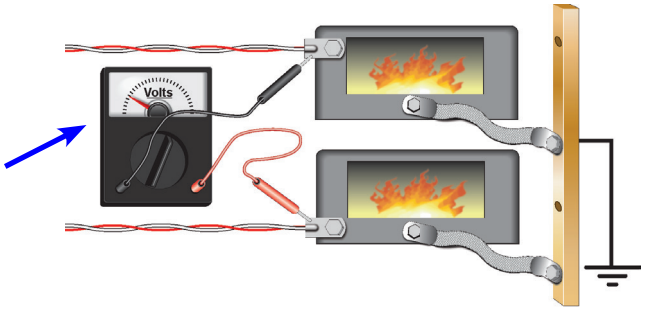
WARNING: *EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.*





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 1.25 V or greater between tips will skew measurements.**
4. **Use shielded, twisted thermocouple extension wire that matches the thermocouple type. Use thermocouple-compatible junction blocks.**



Wiring Solutions

Wiring Solutions using the *ZIP*Link wiring system

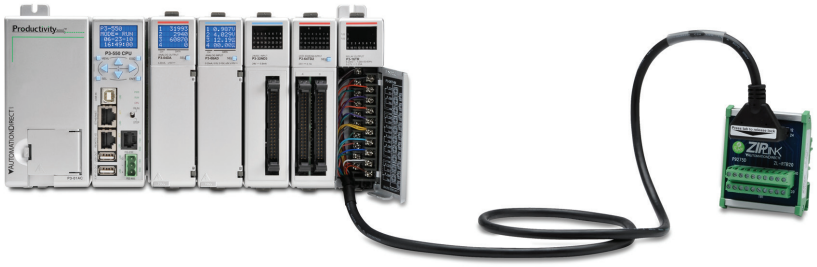
ZIPLinks eliminate the normally tedious process of wiring between devices by utilizing prewired cables and DIN rail mount connector modules. It's as simple as plugging in a cable connector at either end or terminating wires at only one end. Prewired cables keep installation clean and efficient, using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

Solution 1: Productivity Series I/O Modules to ZIPLink Connector Modules

When looking for quick and easy I/O-to-field termination, a ***ZIP***Link connector module used in conjunction with a prewired ***ZIP***Link 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 ***ZIP***Link Connector Modules selector tables located in this section,

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

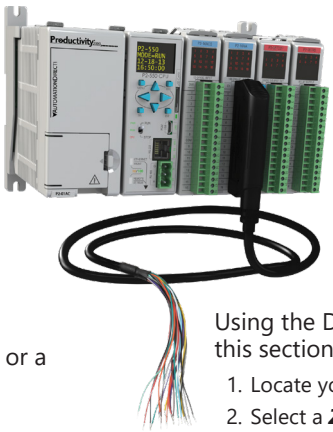


Solution 2: Productivity Series I/O Modules to ZIPLink Connector Modules

When wanting to connect I/O to another device within close proximity of the I/O modules, no extra terminal blocks are necessary when using the ***ZIP***Link Pigtail Cables. ***ZIP***Link 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 ***ZIP***Link 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 ***ZIP***Link 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 ***ZIP***Link cable and other associated hardware.

Wiring Solutions

Solution 4: Serial Communications Cables

ZIPLink offers communications cables for use with DirectLOGIC, CLICK, and Productivity3000 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, ***ZIP***Link modules are available in a variety of configurations including stand-alone relays, 24VDC and 120VAC transorb modules, D-sub and RJ12 feedthrough modules, communication port adapter and distribution modules, and SureServo 50-pin I/O interface connection.

Using the ***ZIP***Link Specialty Modules selector table located in this section,

1. Locate the type of application.
2. Select a ***ZIP***Link 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 ***ZIP***Link 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.

CPU I/O Modules to ZIPLink Connector Modules - Productivity3000®

Productivity3000 CPU Input Module *ZIP*Link Selector

CPU		ZIPLink		
Input Module	# of Terms	Component	Module Part No.	Cable Part No.
P3-08NAS	20	Feedthrough	ZL-RTB20	ZL-P3-CBL20 *
P3-08ND3S	20	Feedthrough		
P3-16NA	20	Feedthrough		ZL-P3-CBL20-1L ZL-P3-CBL20-2L
P3-16ND3	20	Feedthrough		
		Sensor	ZL-LTB16-24-1	
P3-32ND3	40	Feedthrough	ZL-RTB40	ZL-CBL40 ZL-CBL40-1 ZL-CBL40-2
		Sensor	ZL-LTB32-24-1	
P3-64ND31	40	Feedthrough	ZL-RTB40	
		Sensor	ZL-LTB32-24-1	

Productivity3000 CPU Analog In Module *ZIP*Link Selector

CPU		ZIPLink		
Analog Module	# of Terms	Component	Module	Cable
P3-04ADS	20	Feedthrough	ZL-RTB20	ZL-P3-CBL20 ZL-P3-CBL20-1L
P3-08AD	20	Feedthrough		
P3-16AD-1	20	Feedthrough		
P3-16AD-2	20	Feedthrough		
P3-08RTD[2]	Matched Only	See Note 2		
P3-08THM[2]	T/C Wire Only	See Note 2		
P3-04DA	20	Feedthrough	ZL-RTB20	ZL-P3-CBL20-1L ZL-P3-CBL20-2L
P3-08DA-1	20	Feedthrough		
P3-08DA-2	20	Feedthrough		
P3-16DA-1	20	Feedthrough		
P3-16DA-2	20	Feedthrough		
P3-8AD4DA-1	20	Feedthrough		
P3-8AD4DA-2	20	Feedthrough		

Productivity3000 CPU Specialty Module *ZIP*Link Selector

CPU		ZIPLink		
Input Module	# of Terms	Component	Module Part No.	Cable Part No.
P3-HSI	40	Feedthrough	ZL-RTB40	ZL-CBL40-S ZL-CBL40-1S ZL-CBL40-2S
P3-HSO				

Note: ***ZIP***Link Connector Modules specifications follow the Compatibility Matrix tables. ***ZIP***Link Cables specifications are at the end of this ***ZIP***Link section.

Productivity3000 CPU Output Module *ZIP*Link Selector

CPU		ZIPLink		
Output Module	# of Terms	Component	Module Part No.	Cable Part No.
P3-08TAS	20	Feedthrough	ZL-RTB20	ZL-P3-CBL20 *
P3-08TD1S	20	Feedthrough		ZL-P3-CBL20-1L ZL-P3-CBL20-2L
P3-08TD2S	20	Feedthrough		
P3-08TRS	20	Feedthrough		ZL-P3-CBL20 ZL-P3-CBL20-1 ZL-P3-CBL20-2
P3-16TA	20	Feedthrough		
		Fuse		
P3-16TD1	20	Feedthrough		
		Fuse	ZL-RFU20[4]	
		Relay (sinking)	ZL-RRL16-24-1	
P3-16TD2	20	Feedthrough	ZL-RTB20	
		Fuse	ZL-RFU20[4]	
		Relay (sourcing)	ZL-RRL16-24-2	
P3-16TR	20	Feedthrough	ZL-RTB20	
		Fuse	ZL-RFU20[4]	
P3-08TRS-1[3]	20	Feedthrough	ZL-RTB20	
		Fuse	ZL-RFU20[4]	
P3-32TD1	40	Feedthrough	ZL-RTB40	ZL-CBL40 ZL-CBL40-1 ZL-CBL40-2
		Fuse	ZL-RFU40[4]	
P3-32TD2	40	Feedthrough	ZL-RTB40	
		Fuse	ZL-RFU40[4]	
P3-64TD1[1]	40	Feedthrough	ZL-RTB40	
		Fuse	ZL-RFU40[4]	
P3-64TD2[1]	40	Feedthrough	ZL-RTB40	
		Fuse	ZL-RFU40[4]	

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

1 The P3-64ND3, P3-64TD1 and P3-64TD2 modules have two 32-point connectors and require two ZIPLink cables and two ZIPLink connector modules.

2 These modules are not supported by the ZIPLink wiring system.

3 The P3-08TRS-1 output module is derated not to exceed 2A per point maxiumum when used with the ZIPLink wiring system.

4 Note: 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 = 400 mA per circuit.

I/O Modules

A variety of discrete, analog and specialty I/O modules are available for use in local, expansion, and remote I/O bases. Specifications for each module are on the following pages.

A filler module is available for unused I/O module slots (part number P3-FILL).

Discrete Input Modules

Productivity3000 Discrete Input Modules			
Part Number	**Number of Inputs**	**Description**	**Price**
P3-16SIM	16	Input Simulator Module	$197.00
P3-08ND3S	8	Isolated Sinking/Sourcing DC Input	$99.00
P3-16ND3	16	Sinking/Sourcing DC Input	$152.00
P3-32ND3	32	Sinking/Sourcing DC Input	$208.00
P3-64ND3	64	Sinking/Sourcing DC Input	$260.00
P3-08NAS	8	Isolated AC Input	$126.00
P3-16NA	16	AC Input	$159.00

*ZIPLink required.

Analog I/O Modules

Productivity3000 Analog Input Modules			
Part Number	**Number of Channels**	**Description**	**Price**
P3-04ADS	4	Isolated Analog Input	$724.00
P3-08AD	8	Analog Input	$393.00
P3-16AD-1	16	Analog Input (Current)	$535.00
P3-16AD-2	16	Analog Input (Voltage)	$524.00
P3-08RTD	8	Analog RTD Input	$581.00
P3-08THM	8	Analog Thermocouple Input	$736.00

Productivity3000 Analog Output Modules			
Part Number	**Number of Channels**	**Description**	**Price**
P3-04DA	4	Analog Output	$449.00
P3-08DA-1	8	Analog Output (Current)	$779.00
P3-08DA-2	8	Analog Output (Voltage)	$725.00
P3-16DA-1	16	Analog Output (Current)	$929.00
P3-16DA-2	16	Analog Output (Voltage)	$911.00

Productivity3000 Analog Input/Output Modules			
Part Number	**Number of Channels**	**Description**	**Price**
P3-8AD4DA-1	8/4	Analog Input/Output (Current)	$598.00
P3-8AD4DA-2	8/4	Analog Input/Output (Voltage)	$617.00

Specialty Modules

Productivity3000 Specialty Modules			
Part Number	**Number of Channels**	**Description**	**Price**
P3-HSI	2	High-Speed Pulse Input	$563.00
P3-HSO*	2	High-Speed Output	$587.00
P3-SCM	4 ports	Serial Communications Module	$475.00

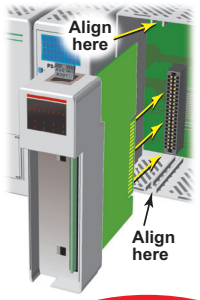
*ZIPLink required.

Discrete Output Modules

Productivity3000 Discrete Output Modules			
Part Number	**Number of Outputs**	**Description**	**Price**
P3-08TD1S	8	Isolated Sinking Output	$135.00
P3-08TD2S	8	Isolated Sourcing Output	$141.00
P3-16TD1	16	Sinking Output	$162.00
P3-16TD2	16	Sourcing Output	$167.00
P3-32TD1*	32	Sinking Output	$208.00
P3-32TD2*	32	Sourcing Output	$208.00
P3-64TD1*	*64	Sinking Output	$280.00
P3-64TD2*	*64	Sourcing Output	$265.00
P3-08TAS	8	Isolated AC Output	$177.00
P3-16TA	16	AC Output	$210.00
P3-08TRS	8	Isolated Relay Output	$159.00
P3-08TRS-1	8	Isolated Relay Output	$194.00
P3-16TR	16	Relay Output	$177.00

*ZIPLink required.

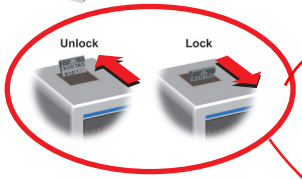
Module Installation Procedure

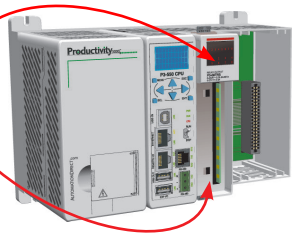


WARNING: *DO NOT APPLY FIELD POWER UNTIL THE FOLLOWING STEPS ARE COMPLETED. SEE HOT-SWAPPING PROCEDURE FOR EXCEPTIONS.*

Step One: Align circuit card with slot and press firmly to seat module into connector.

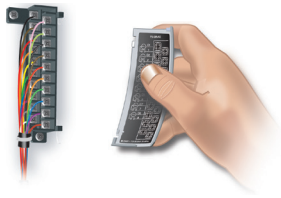
Step Two: Pull top and bottom locking tabs toward module face. Click indicates lock is engaged.





Step Three: Attach field wiring using optional terminal block or ***ZIP***Link wiring system and install cover.

To install or remove terminal block cover, press middle to flex cover.



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.*