General Specifications

Operating Temperature	0° to 60°C (32° to 140°F),
Storage Temperature	-20° to 70°C (-4° to 158°F)
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 1 second
Insulation Resistance	>10MΩ @ 500 VDC
Heat Dissipation	0.36 W
Enclosure Type	Open Equipment
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.
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 ZIPLink wiring system.
EU Directive	See the "EU Directive" topic in the Productivity3000 Help File. Information can also be obtained at: www.automationdirect.com/P3000
Terminal Type	20-position removable terminal block (included)
Weight	150g (5.3 oz)

*Meets EMC and Safety requirements. See the D.O.C. for details.

P3-08THM Analog Input

The P3-08THM Thermocouple Input Module provides 8 differential channels for receiving thermocouple and voltage input signals for use with the Productivity3000 Programmable Automation Controller.

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Removable Terminal Block Specifications 8

Terminal Block and Cover included. Not compatible with ZIPLink.

Warranty: Thirty-day money-back guarantee. Two-year limited replacement. (See www.automationdirect.com/P3000 for details).

T/C Input Specifications

Input channels	8 differential
Data Format	Floating point
Common Mode Range	± 1.25V
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	2.16s
Open Circuit Detection Time	10-15s Typical, 20s Maximum
Conversion Method	Sigma-Delta
External DC Power	NONE

WARNING: Explosion hazard – Substitution of components may impair suitability for Class I, Division 2.

AVERTISSEMENT: Risque d'explosion : la substitution de composants peut compromettre la convenance pour la Classe I, Zone 2 ou pour la Classe I, Division 2.

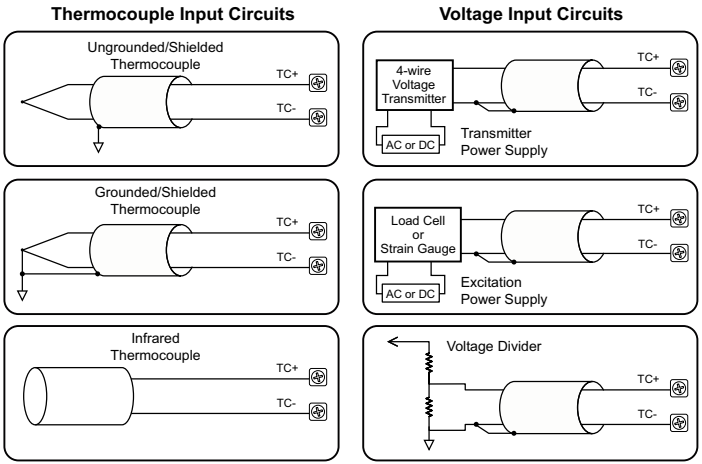
Voltage Input Specifications

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: 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 (T/C only)	1 bit per channel
Channel Over-range (T/C only)	1 bit per channel

Wiring Diagram

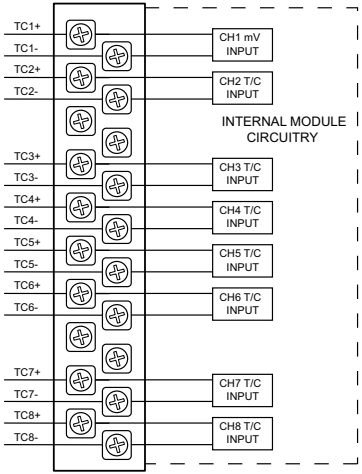


NOTES:

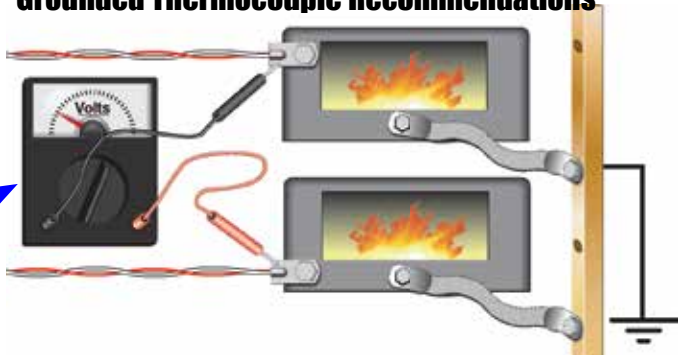
1. Connect shield to thermocouple signal/ground only. Do not connect to both ends.
2. Install jumper wire on each unused input, TC+ to TC-.

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.

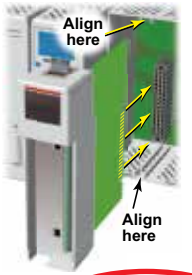
Schematic



Grounded Thermocouple Recommendations



Module Installation Procedure



WARNING: Do not apply field power until the following steps are completed. See hot-swapping procedure for exceptions.

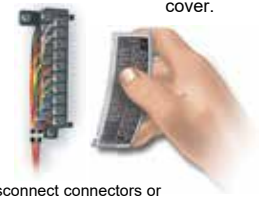
AVERTISSEMENT: Ne pas appliquer la puissance de champ avant l'exécution des étapes qui suivent. Consultez la procédure de remplacement à chaud pour les exceptions.

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 ZIPLink wiring system and install cover.**

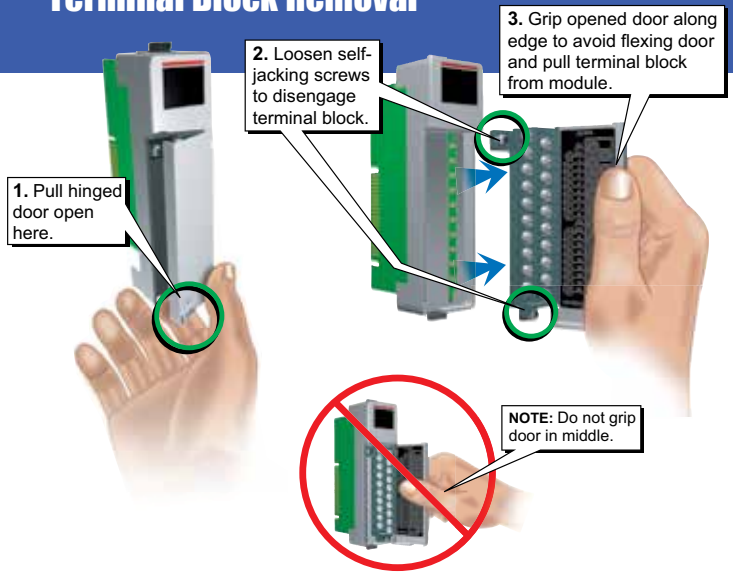
To install or remove terminal block cover, press middle to flex cover.



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.

AVERTISSEMENT: Risque d'explosion : ne pas connecter ou déconnecter les connecteurs ni actionner les commutateurs alors que le circuit est sous tension, à moins que la zone ne soit reconnue non dangereuse. Ne pas remplacer à chaud les modules à moins que la zone ne soit reconnue non dangereuse.

Terminal Block Removal



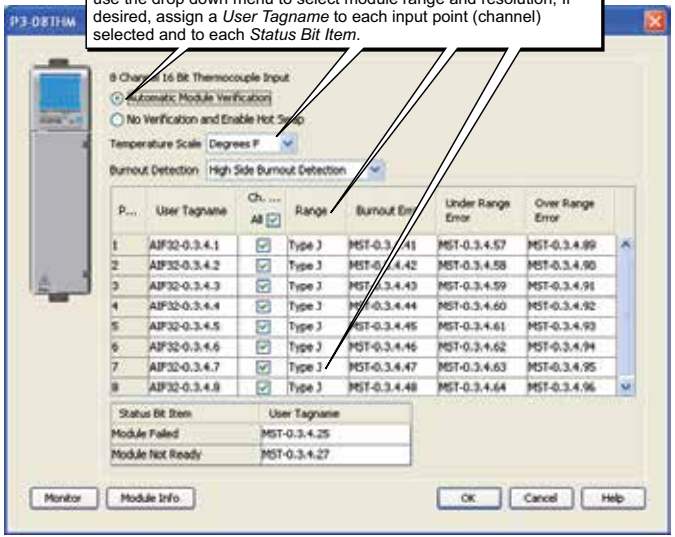
Important Hot-Swap Information

The Productivity3000 PAC supports hot-swap! Individual modules, expansion bases, and entire remote base groups can be taken offline, removed, and replaced while the rest of the PAC system continues controlling your process. Before attempting to use the hot-swap feature, be sure to read the hot-swap topic in the programming software's help file or our online documentation at AutomationDirect.com for details on how to plan your installation for use of this powerful feature.

Module Configuration

Using the Hardware Configuration tool in the Productivity Suite programming software, drag and drop the P3-08THM module into the base configuration.

Select *Automatic Module Verification* or *No Verification and Enable Hot Swap*. Specify *Temperature Scale* and *Burnout Detection*, and use the drop down menu to select module range and resolution, If desired, assign a *User Tagname* to each input point (channel) selected and to each *Status Bit Item*.

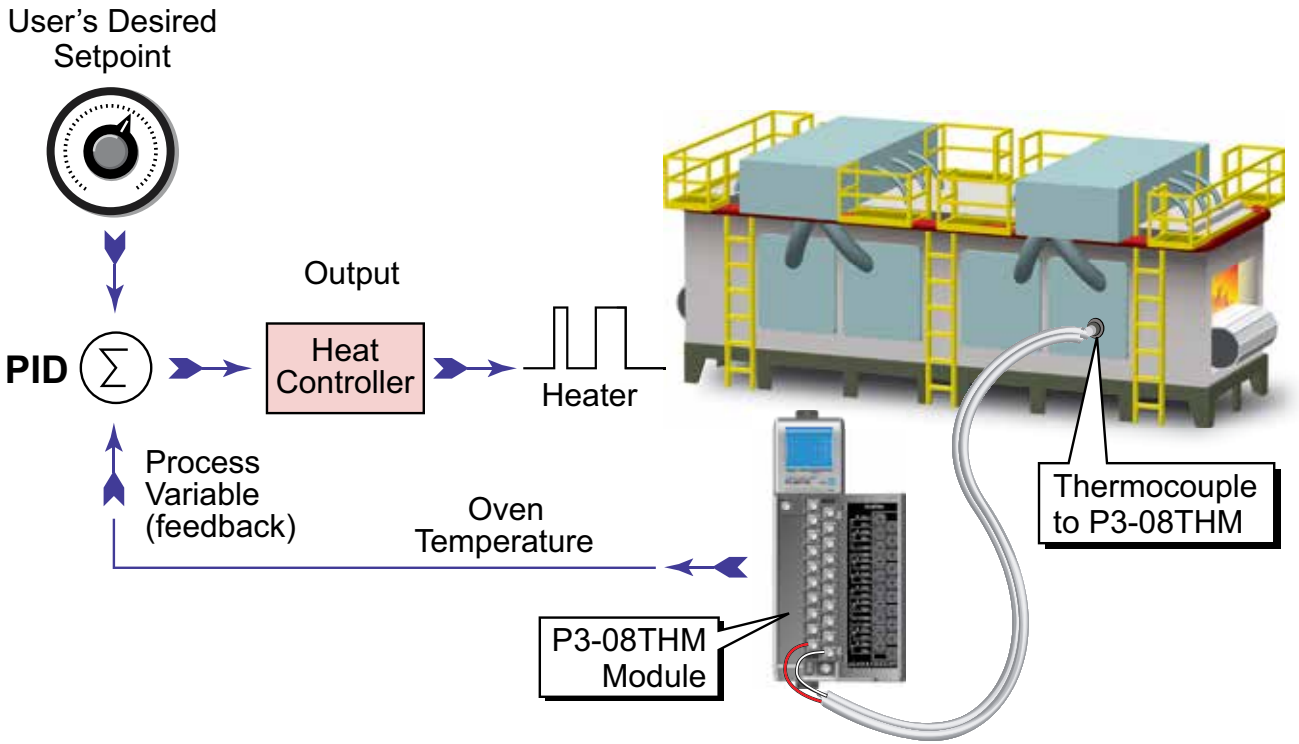


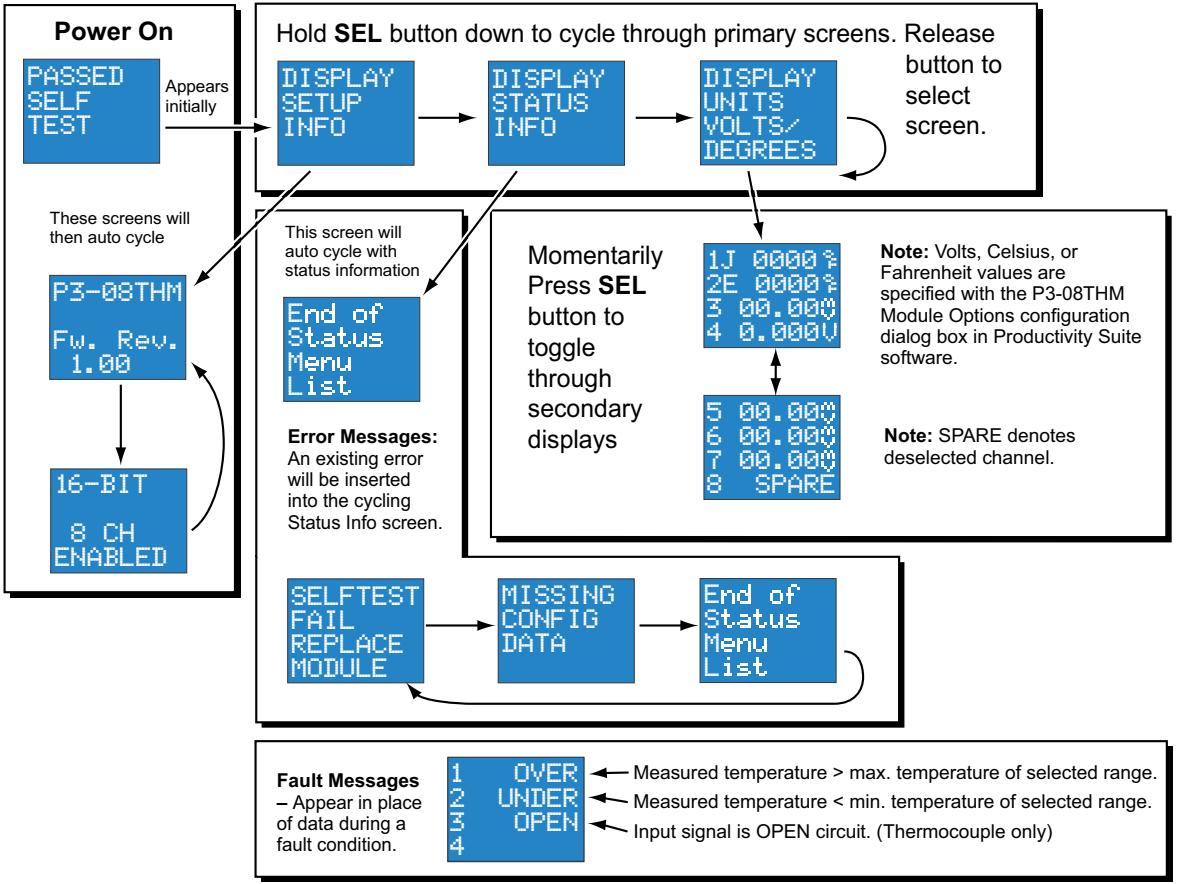
Wiring Options

Terminal Block only

P3-RTB
(Quantity 1)

Typical Application Example




Power On
PASSED SELF TEST
Appears initially
These screens will then auto cycle
P3-08THM Fw. Rev. 1.00
16-BIT 8 CH ENABLED
Hold SEL button down to cycle through primary screens. Release button to select screen.
DISPLAY SETUP INFO
DISPLAY STATUS INFO
DISPLAY UNITS VOLTS/ DEGREES
This screen will auto cycle with status information
End of Status Menu List
Error Messages: An existing error will be inserted into the cycling Status Info screen.
Momentarily Press SEL button to toggle through secondary displays
1J 0000°F
2E 0000°F
3 00.00V
4 0.000V
5 00.00V
6 00.00V
7 00.00V
8 SPARE
Note: Volts, Celsius, or Fahrenheit values are specified with the P3-08THM Module Options configuration dialog box in Productivity Suite software.
Note: SPARE denotes deselected channel.
SELFTEST FAIL REPLACE MODULE
MISSING CONFIG DATA
End of Status Menu List
Fault Messages – Appear in place of data during a fault condition.
1 OVER
2 UNDER
3 OPEN
4
Measured temperature > max. temperature of selected range.
Measured temperature < min. temperature of selected range.
Input signal is OPEN circuit. (Thermocouple only)

To minimize the risk of potential safety problems, you should follow all applicable local and national codes that regulate the installation and operation of your equipment. These codes vary from area to area and it is your responsibility to determine which codes should be followed, and to verify that the equipment, installation, and operation are in compliance with the latest revision of these codes.

Equipment damage or serious injury to personnel can result from the failure to follow all applicable codes and standards. We do not guarantee the products described in this publication are suitable for your particular application, nor do we assume any responsibility for your product design, installation, or operation.

If you have any questions concerning the installation or operation of this equipment, or if you need additional information, please call Technical Support at 770-844-4200.

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Removable Terminal Block Specifications

Number of Positions	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 Nm) Self-jacking screws – 2.7 - 3.6 in./lb (0.3 - 0.4 Nm). Do not overtighten screws when installing terminal block.

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

Document Name	Edition/Revision	Date
P3-08THM-M	1st Ed. Rev. D	12/07/2017

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