

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.

This publication is based on information that was available at the time it was printed. At AutomationDirect.com® we constantly strive to improve our products and services, so we reserve the right to make changes to the products and/or publications at any time without notice and without any obligation. This publication may also discuss features that may not be available in certain revisions of the product.

## Removable Terminal Block Specifications

|                     |   |
|---------------------|---|
| Number of Positions | 20 screw terminals  |
| Wire Range          | 22-14 AWG (0.324 to 2.08 sq. mm)<br>solid / stranded conductor<br>3/64 in. (1.2 mm) insulation maximum<br>"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 (.0882 - 1.02 Nm)<br>Self-jacking screws – 2.7 - 3.6 in./lb (0.3 - 0.4 Nm).<br>Do not overtighten screws when installing terminal block. |

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

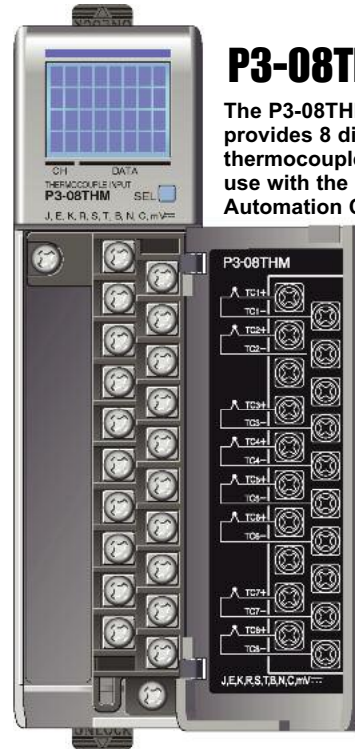
|               |                  |           |
|---------------|------------------|-----------|
| Document Name | Edition/Revision | Date      |
| P3-08THM-M    | 1st Ed. Rev. C   | 6/10/2016 |

Copyright 2014, AutomationDirect.com Incorporated/All Rights Reserved Worldwide

## 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<br>UL1604 file E200031, Canada & USA<br>CE (EN61131-2*)<br>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).<br>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: <a href="http://www.productivitypac.com">www.productivitypac.com</a>                                    |
| 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.

|   |   |
|---|---|
| General Specifications . . . . .                  | 1 |
| T/C Input Specifications . . . . .                | 2 |
| Voltage Input Specifications . . . . .            | 2 |
| Configuration/Diagnostics . . . . .               | 2 |
| Schematic and Wiring Diagram . . . . .            | 3 |
| Module Installation Procedure . . . . .           | 4 |
| Terminal Block Removal . . . . .                  | 4 |
| Hot Swap Information . . . . .                    | 4 |
| Wiring Options . . . . .                          | 5 |
| Module Configuration . . . . .                    | 5 |
| Typical Application Example . . . . .             | 6 |
| LCD Panel Display Menus . . . . .                 | 7 |
| Safety Information . . . . .                      | 8 |
| 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.productivitypac.com](http://www.productivitypac.com) 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);<br>Type E -210° to 1000°C (-346° to 1832°F);<br>Type K -150° to 1372°C (-238° to 2502°F);<br>Type R 65° to 1768°C (149° to 3214°F);<br>Type S 65° to 1768°C (149° to 3214°F);<br>Type T -230° to 400°C (-382° to 752°F);<br>Type B 529° to 1820°C (984° to 3308°F);<br>Type N -70° to 1300°C (-94° to 2372°F);<br>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),<br>Monotonic with no missing codes   |
| Maximum Inaccuracy          | ±3°C Max (excluding thermocouple error)<br>(including temperature drift)  |
| Warm-up Time                | 30 Minutes for ±1°C Repeatability<br>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.

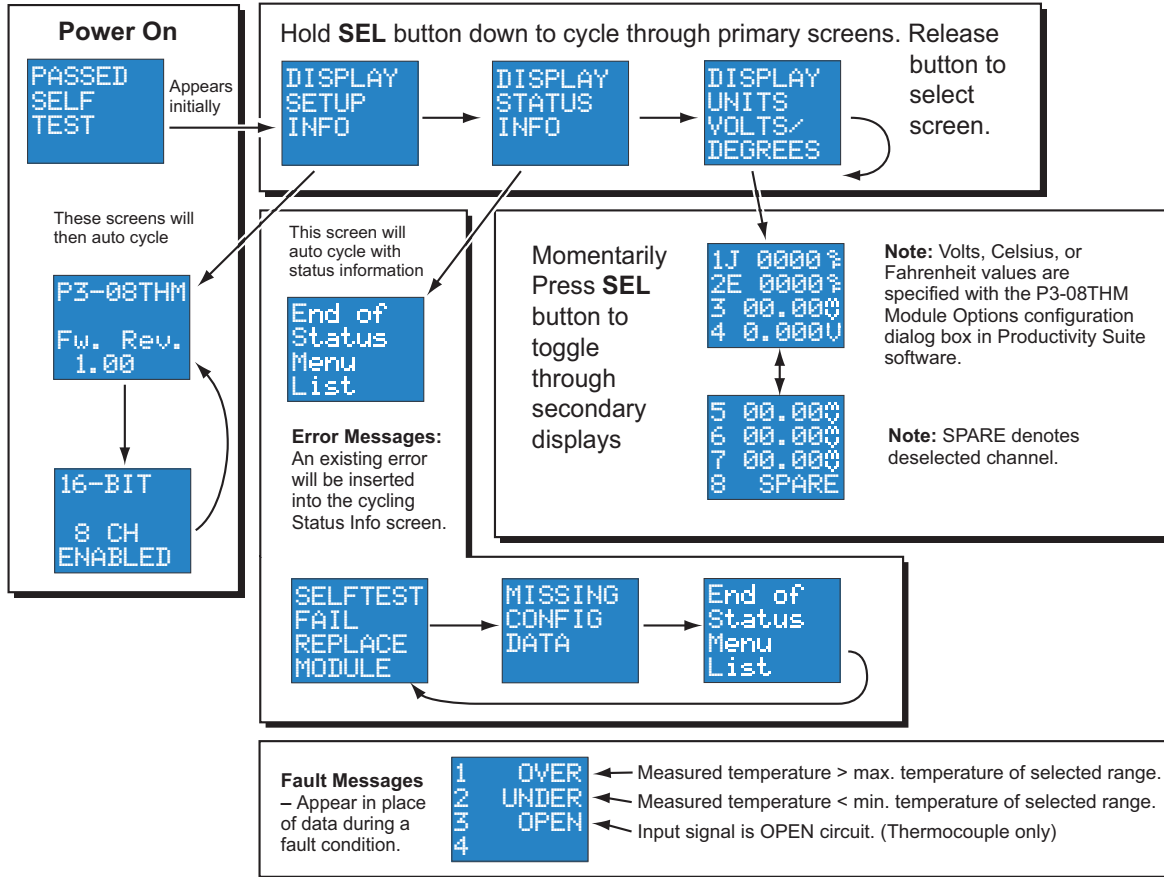
## Voltage Input Specifications

|                                   |  |
|-----------------------------------|--|
| Linear mV Device Input Ranges     | 0-39.0625 mVDC,<br>+/-39.0625 mVDC,<br>+/-78.125 mVDC,<br>0-156.25 mVDC,<br>+/-156.25 mVDC,<br>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   |

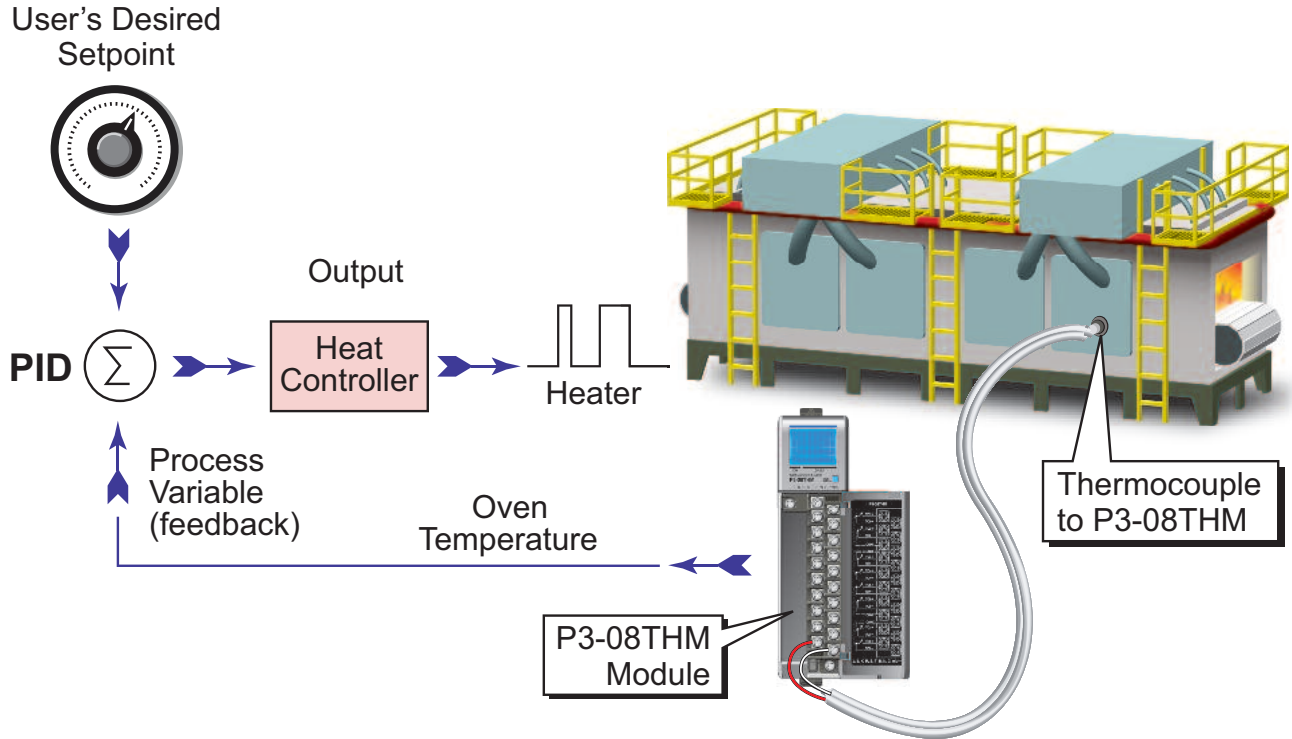
## Configuration/Diagnostics

|  |                   |
|--|-------------------|
| 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 |

# LCD Panel Display

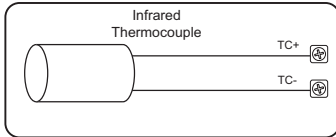
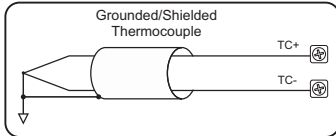
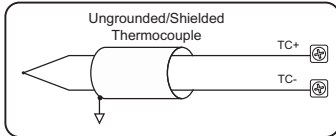


# Typical Application Example

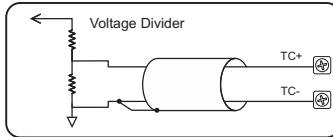
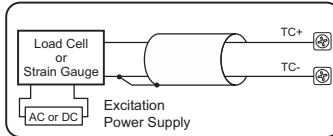
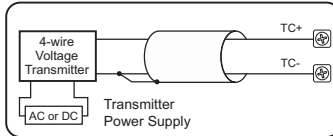


# Wiring Diagram

## Thermocouple Input Circuits



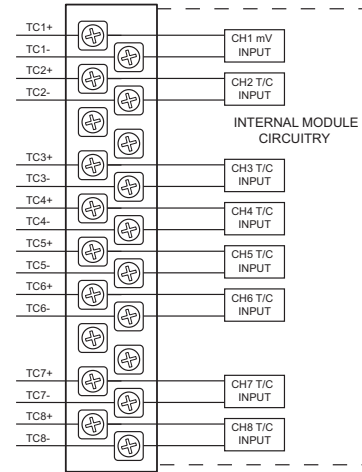
## Voltage Input Circuits



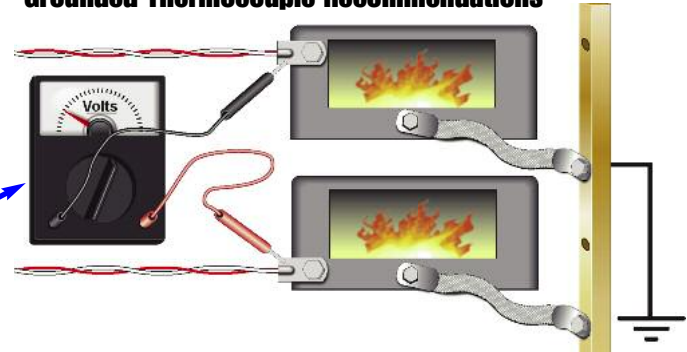
### NOTES:

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.

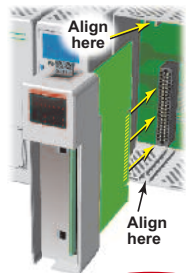
# Schematic



## Grounded Thermocouple Recommendations



# Module Installation Procedure

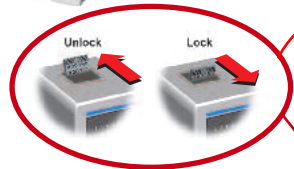


**WARNING:** Do not apply field power until the following steps are completed. See hot-swapping procedure for exceptions.

**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.

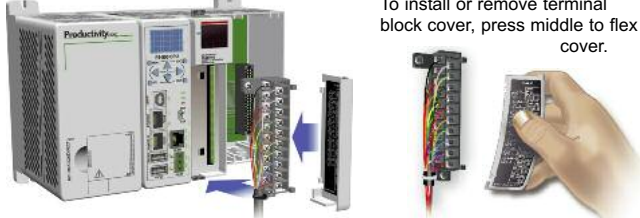
**Step One:** Align circuit card with slot and press firmly to seat module into connector.

**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.

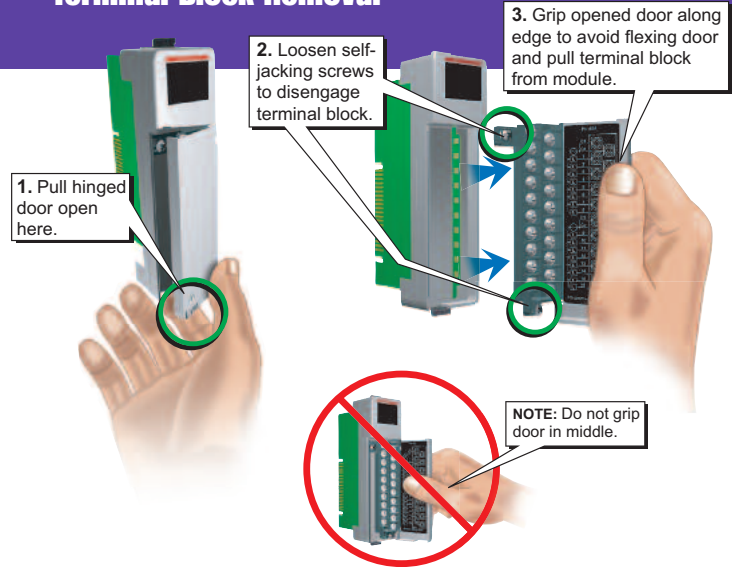
To install or remove terminal block cover, press middle to flex cover.



**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](http://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)

8 Channel 16 Bit Thermocouple Input

Automatic Module Verification

No Verification and Enable Hot Swap

Temperature Scale: Degrees F

Burnout Detection: High Side Burnout Detection

| P... | User Tagname  | Ch. ...                                 | Range  | Burnout Error | Under Range Error | Over Range Error |
|------|---------------|---|--------|---------------|-------------------|------------------|
| 1    | AIF32-0.3.4.1 | <input checked="" type="checkbox"/> All | Type J | MST-0.3.4.41  | MST-0.3.4.57      | MST-0.3.4.89     |
| 2    | AIF32-0.3.4.2 | <input checked="" type="checkbox"/>     | Type J | MST-0.3.4.42  | MST-0.3.4.58      | MST-0.3.4.90     |
| 3    | AIF32-0.3.4.3 | <input checked="" type="checkbox"/>     | Type J | MST-0.3.4.43  | MST-0.3.4.59      | MST-0.3.4.91     |
| 4    | AIF32-0.3.4.4 | <input checked="" type="checkbox"/>     | Type J | MST-0.3.4.44  | MST-0.3.4.60      | MST-0.3.4.92     |
| 5    | AIF32-0.3.4.5 | <input checked="" type="checkbox"/>     | Type J | MST-0.3.4.45  | MST-0.3.4.61      | MST-0.3.4.93     |
| 6    | AIF32-0.3.4.6 | <input checked="" type="checkbox"/>     | Type J | MST-0.3.4.46  | MST-0.3.4.62      | MST-0.3.4.94     |
| 7    | AIF32-0.3.4.7 | <input checked="" type="checkbox"/>     | Type J | MST-0.3.4.47  | MST-0.3.4.63      | MST-0.3.4.95     |
| 8    | AIF32-0.3.4.8 | <input checked="" type="checkbox"/>     | Type J | MST-0.3.4.48  | MST-0.3.4.64      | MST-0.3.4.96     |

Status Bit Item: User Tagname

Module Failed: MST-0.3.4.25

Module Not Ready: MST-0.3.4.27

Buttons: Monitor, Module Info, OK, Cancel, Help