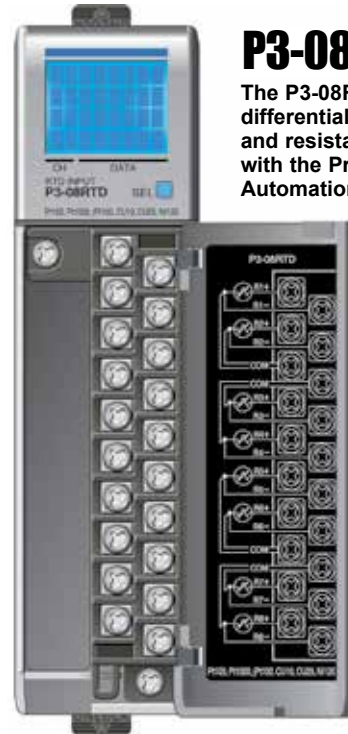# General Specifications

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)
Heat Dissipation	0.33 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 P3-08RTD 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	107.8g (3.79 oz)

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

AUTOMATIONDIRECT.com

Productivity3000™

P3-08RTD Analog Input

The P3-08RTD input module provides 8 differential channels for receiving RTD and resistance input signals for use with the Productivity3000 Programmable Automation Controller.

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).

RTD Input Specifications

Input Channels	8 Differential
Max. Common Mode Voltage	5VDC
Data Format	Floating Point
Common Mode Rejection	-90dB min. @ DC, -150dB min. @ 50/60Hz
Absolute Maximum Ratings	Fault protected input, ±50V
Internal Resolution	16-bit, ± 0.1°C or °F (up to 100 Hz filter)
Input Ranges (RTD Types)	Pt100 -200°C/850°C (-328°F/1562°F) Pt1000 -200°C/595°C (-328°F/1103°F) JPt100 -100°C/450°C (-148°F/ 842°F) 10Ω Cu. -200°C/260°C (-328°F/ 500°F) 25Ω Cu. -200°C/260°C (-328°F/ 500°F) 120Ω Ni. -80°C/260°C (-112°F/ 500°F)
RTD Linearization	Automatic
Excitation Current (all ranges)	200µA
Accuracy vs. Temperature	±5ppm per °C (maximum)
Full Scale Calibration	±1°C
Offset Calibration Error	±1 count (negligible)
Linearity Error (end to end)	±0.5°C maximum, ±0.01°C typical, Monotonic with no missing codes
Maximum Inaccuracy	±1°C maximum (excluding RTD error) (including temperature drift)
Warm-up Time	2 minutes for ±0.2% repeatability
Sample Duration (Single channel update rate)	Dependent on Digital Filter Settings -- 488ms @ 10Hz, 88ms @ 50 Hz, 75ms @ 60Hz, 56ms @ 100Hz, 48ms @ 250Hz
Filter Characteristics	Digital filter cutoff frequencies: 10Hz, 50Hz, 60Hz, 100Hz, or 250Hz
All Channel Update Rate	Single channel update rate times the number of enabled channels
Open Circuit Detection Time	Positive full scale reading within 2s
Conversion Method	Sigma-Delta
External DC Power Required	None

Resistance Input Specifications

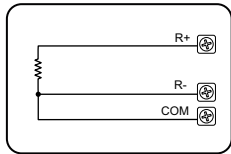|	
Internal Resolution	16 bit, .0015% of full scale range in ohms (up to 100Hz filter)
Resistance Input Ranges and PAC Resolution	0-10,000Ω, Resolution 1Ω 0-6,250Ω, Resolution 0.1Ω 0-3,125Ω, Resolution 0.1Ω 0-1,562.5Ω, Resolution 0.1Ω 0-781.25Ω, Resolution 0.1Ω 0-390.625Ω, Resolution .01Ω 0-195.3125Ω, Resolution .01Ω
Accuracy vs. Temperature	±25ppm per °C (maximum)
Full Scale Calibration	± .02% of full scale range
Offset Calibration Error	± .0015% of full scale range in ohms
Linearity Error (end to end)	± .0015% of full scale range maximum at 25°C, Monotonic with no missing codes
Maximum Inaccuracy	± 0.10% of full scale range

Diagnostics

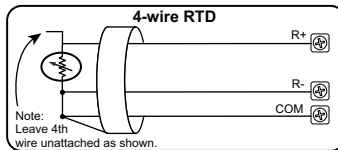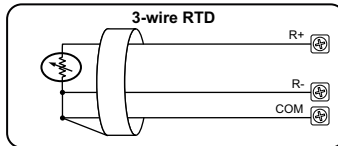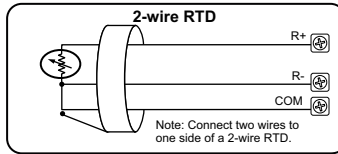|	
Module Diagnostics Failure	1 bit per module
Module Not Ready	1 bit per module
Channel Burn-out (RTD only)	1 bit per channel
Under-range (RTD only)	1 bit per channel
Over-range	1 bit per channel

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.

Resistance Input

RTD Input Circuits

2-wire RTD

R+
R-
COM

Note: Connect two wires to one side of a 2-wire RTD.

3-wire RTD

R+
R-
COM

4-wire RTD

R+
R-
COM

Note: Leave 4th wire unattached as shown.

Notes for maximum accuracy:
1. For 2-wire RTD, attach a third wire to module common.
2. R+, R-, and COM wires to an RTD must be equal length and type. Refer to RTD manufacturer's recommendations.
3. Do not use cable shield as sensing wire.
4. When applicable, connect shield to RTD common only, otherwise connect to module common only. Do not connect shield to both ends.
5. Jumper unused inputs to common.

R+
R-
COM

INTERNAL MODULE CIRCUITRY

R1+		CH1 RTD INPUT
R1-		
R2+		CH2 RTD INPUT
R2-		
COM		
COM		
R3+		CH3 RTD INPUT
R3-		
R4+		CH4 RTD INPUT
R4-		
R5+		CH5 RTD INPUT
R5-		
R6+		CH6 RTD INPUT
R6-		
COM		
COM		
R7+		CH7 RTD INPUT
R7-		
R8+		CH8 RTD INPUT
R8-		

ANALOG CIRCUIT COMMON
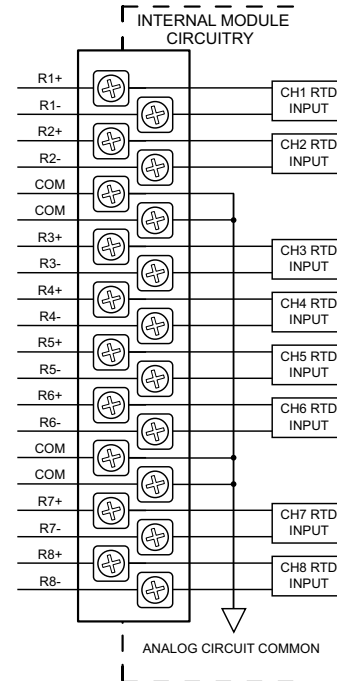
Module Installation Procedure

Align here

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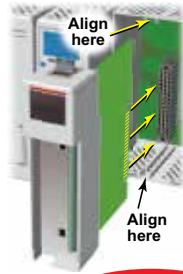
WARNING: Do not apply field power until the following steps are completed. See hot-swapping procedure for exceptions.

**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.

Unlock   Lock

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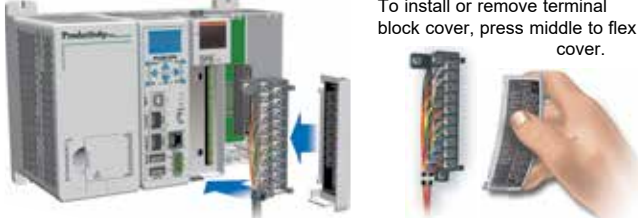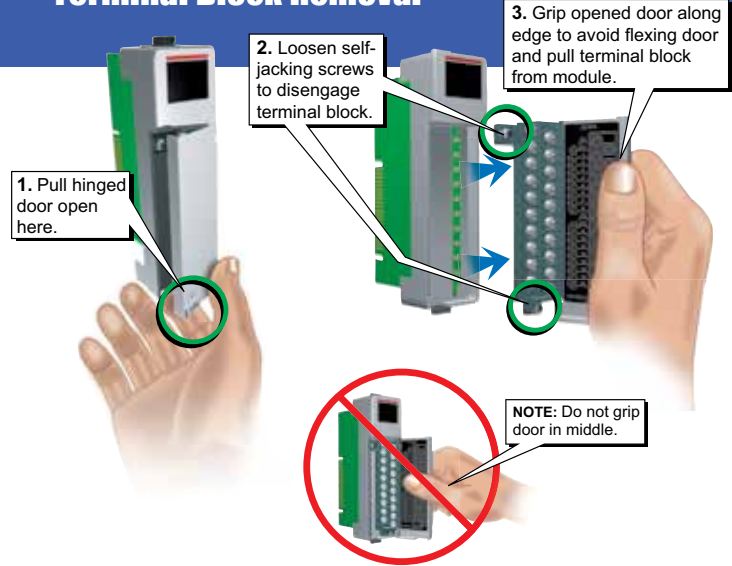

To install or remove terminal block cover, press middle to flex cover.

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

1. Pull hinged door open here.

2. Loosen self-jacking screws to disengage terminal block.

3. Grip opened door along edge to avoid flexing door and pull terminal block from module.

NOTE: Do not grip door in middle.

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.

Wiring Options

Terminal Block only

P3-RTB
(Quantity 1)

Using the Hardware Configuration tool in the Productivity Suite programming software, drag and drop the P3-08RTD module into the base configuration.
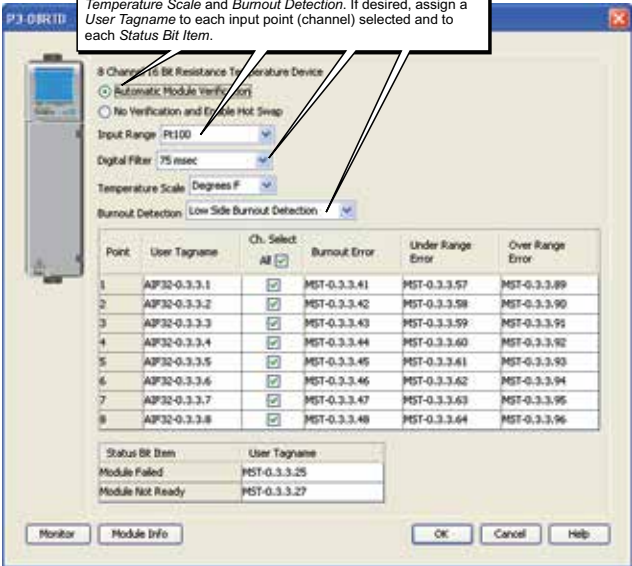
Select *Automatic Module Verification* or *No Verification and Enable Hot Swap.* Then select *Input Range*, *Digital Filter*, *Temperature Scale* and *Burnout Detection*. If desired, assign a *User Tagname* to each input point (channel) selected and to each *Status Bit Item*.

P3-08RTD

8 Channel 16 Bit Resistance Temperature Device

- ⦿ Automatic Module Verification
- ○ No Verification and Enable Hot Swap

Input Range: Pt100
Digital Filter: 75 msec
Temperature Scale: Degrees F
Burnout Detection: Low Side Burnout Detection

Point	User Tagname	Ch. Select All ☑	Burnout Error	Under Range Error	Over Range Error
1	AIF32-0.3.3.1	☑	MST-0.3.3.41	MST-0.3.3.57	MST-0.3.3.89
2	AIF32-0.3.3.2	☑	MST-0.3.3.42	MST-0.3.3.58	MST-0.3.3.90
3	AIF32-0.3.3.3	☑	MST-0.3.3.43	MST-0.3.3.59	MST-0.3.3.91
4	AIF32-0.3.3.4	☑	MST-0.3.3.44	MST-0.3.3.60	MST-0.3.3.92
5	AIF32-0.3.3.5	☑	MST-0.3.3.45	MST-0.3.3.61	MST-0.3.3.93
6	AIF32-0.3.3.6	☑	MST-0.3.3.46	MST-0.3.3.62	MST-0.3.3.94
7	AIF32-0.3.3.7	☑	MST-0.3.3.47	MST-0.3.3.63	MST-0.3.3.95
8	AIF32-0.3.3.8	☑	MST-0.3.3.48	MST-0.3.3.64	MST-0.3.3.96

Status Bit Item	User Tagname
Module Failed	MST-0.3.3.25
Module Not Ready	MST-0.3.3.27

Monitor   Module Info   OK   Cancel   Help

User's Desired
Setpoint

Output

PID $\left(\sum\right)$

Heat
Controller

Heater

Process
Variable
(feedback)

P3-08RTD
Module

Oven
Temperature

Resistance
Temperature
Device
for P3-08RTD

Power On

PASSED
SELF
TEST

Appears initially

These screens will then auto cycle

P3-08RTD
Fw. Rev.
1.00

RTD
Resistor
Module
°/%/Ω

Cu10/25
(J)Pt100
Pt1000
Ni120

Channels
AND
BOEnable
Control

Dig.Filt
10/50/60
100/250
Hz

End of
Setup
Menu
List

Hold **SEL** button down to cycle through primary screens. Release button to select screen.

DISPLAY
SETUP
INFO
→
DISPLAY
STATUS
INFO
→
DISPLAY
UNITS

°C/°F/Ω

These screens will then auto cycle

Channels
Enabled:
7

↓

Range
Resistor
0-10000

OR

Range
jPt100

Software Configuration
Resistor Range also includes 0-6250, 0-3125, 0-1562.5, 0-781.25, 0-390.625, and 0-195.3125.

RTD range also includes Pt100, Pt1000, Ni120, Cu10 or Cu25.

Burnout
L
Output
%

Digital
Filter
60Hz

Burnout detection may be set for H (high side) or L (low side).

Data output can also be represented by °C, °F, or Ω.

Digital Filter can be also be set to 50Hz, 60Hz, 100Hz and 250Hz

---

Momentarily Press **SEL** button to toggle this secondary display.

1 123.4%
2 56.7%
3 1152%
4 - 8.4%

↓

5 238.6%
6 200.1%
7   8.4%
8 SPARE

Note: SPARE denotes deselected channel

Error Messages:
An existing error will be inserted into the cycling Status Info screen.

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

Measured temp. > max. or resistance >= max. of selected range

Measured temp. < min. of selected range or resistance is 0

If open circuit between differential input (Rn+ and Rn-)

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.