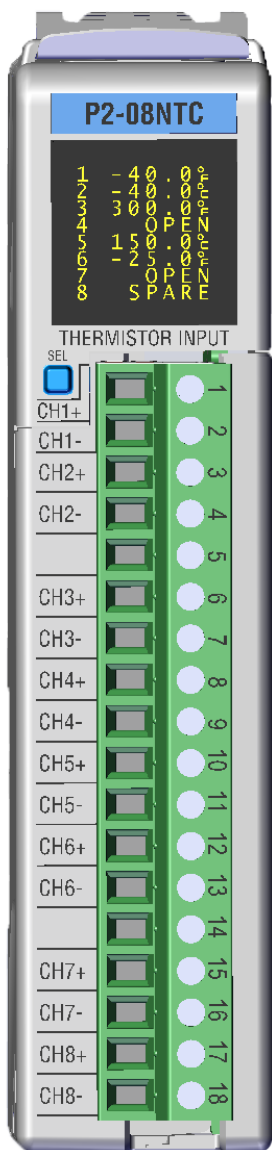


# Analog Input Modules

## P2-08NTC \$410.00

### Thermistor Analog Input

The P2-08NTC Thermistor Input Module provides eight Thermistor input channels.



Terminal block included



**NOTE:** The most recent Productivity Suite software and firmware versions may be required to support new modules and new features.

### NTC Input Specifications

|                                                          |                                                                                                                                 |                               |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| <b>Input Channels</b>                                    | 8 Single Ended (Temperature only)                                                                                               |                               |
| <b>Data Format</b>                                       | Floating Point                                                                                                                  |                               |
| <b>Common Mode Rejection</b>                             | -97dB @ DC, >50dB @ 50/60Hz*                                                                                                    |                               |
| <b>Input Impedance</b>                                   | >5MΩ                                                                                                                            |                               |
| <b>Maximum Ratings</b>                                   | Fault protected inputs to ±50V                                                                                                  |                               |
| <b>Resolution</b>                                        | 16-bit, ±0.1°C or °F                                                                                                            |                               |
| <b>Thermistor Input Ranges</b>                           | 2252<br>10K-AN Type 3<br>10K-CP Type 2<br>5K<br>3K<br>1.8K                                                                      | -40° to 150°C (-40° to 302°F) |
| <b>Thermistor Linearization</b>                          | Automatic                                                                                                                       |                               |
| <b>Maximum Inaccuracy</b>                                | ±0.5°C maximum (8, 16 and 33Hz)<br>±1°C maximum (123 and 470Hz)<br>(Excluding thermistor error;<br>Including temperature drift) |                               |
| <b>Excitation Current</b>                                | 10uA–210uA autoscaling                                                                                                          |                               |
| <b>Accuracy vs. Temperature</b>                          | ±35PPM per °C (maximum)                                                                                                         |                               |
| <b>Linearity Error</b>                                   | Non-linear                                                                                                                      |                               |
| <b>Warm-up Time</b>                                      | 30 minutes for ±1°C repeatability                                                                                               |                               |
| <b>Sample Duration Time (Single channel update rate)</b> | Dependent on digital filter settings<br>61ms @ 33Hz, 16ms @123Hz, 4ms @ 470Hz                                                   |                               |
| <b>File Characteristics**</b>                            | Digital filter cutoff frequencies:<br>33Hz, 123Hz, or 470Hz.                                                                    |                               |
| <b>All Channel Update Rate</b>                           | 2.2 s @ 33Hz                                                                                                                    |                               |
| <b>Open Circuit Detection Time</b>                       | Within 2s @33Hz                                                                                                                 |                               |
| <b>Conversion Method</b>                                 | Sigma-Delta                                                                                                                     |                               |
| <b>External DC Power Required</b>                        | None                                                                                                                            |                               |

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

\*\* Frequencies <123Hz, Display push button may need to be pressed/hold >2 seconds.

† To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific component part number web page.

### Removable Terminal Block Specifications

| Part Number                | P2-RTB                                                                                                                                  | P2-RTB-1                                                                                                                                  |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Number of positions</b> | 18 screw terminals                                                                                                                      | 18 push release terminals                                                                                                                 |
| <b>Wire Range</b>          | 30–16 AWG (0.051–1.31 mm <sup>2</sup> )<br>Solid/stranded conductor<br>3/64 in (1.2 mm) insulation max.<br>1/4 in (6–7 mm) strip length | 28–16 AWG (0.081–1.31 mm <sup>2</sup> )<br>Solid/stranded conductor<br>3/64 in (1.2 mm) insulation max.<br>19/64 in (7–8 mm) strip length |
| <b>Conductors</b>          | USE COPPER CONDUCTORS, 75°C or equivalent.                                                                                              |                                                                                                                                           |
| <b>Screw Driver Width</b>  | 0.1 in. (2.5 mm) maximum                                                                                                                | NA                                                                                                                                        |
| <b>Screw Size</b>          | M2                                                                                                                                      | N/A                                                                                                                                       |
| <b>Screw Torque</b>        | 2.5 lb·in (0.28 N·m)                                                                                                                    | N/A                                                                                                                                       |

\* Recommended screw driver: P/N TW-SD-MSL-1.

# Analog Input Modules

## P2-08NTC (cont'd)

| General Specifications               |                                                                                                               |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <b>Operating Temperature</b>         | 0° to 60°C (32° to 140°F)                                                                                     |
| <b>Storage Temperature</b>           | -20° to 70°C (-4° to 158°F)                                                                                   |
| <b>Humidity</b>                      | 5 to 95% (non-condensing)                                                                                     |
| <b>Environmental Air</b>             | No corrosive gases permitted                                                                                  |
| <b>Vibration</b>                     | IEC60068-2-6 (Test Fc)                                                                                        |
| <b>Shock</b>                         | IEC60068-2-27 (Test Ea)                                                                                       |
| <b>Field to Logic Side Isolation</b> | 1000VDC                                                                                                       |
| <b>Heat Dissipation</b>              | 500mW                                                                                                         |
| <b>Enclosure Type</b>                | Open equipment                                                                                                |
| <b>Module Keying to Backplane</b>    | Electronic                                                                                                    |
| <b>Module Location</b>               | Any I/O slot in a Productivity2000 system                                                                     |
| <b>Field Wiring</b>                  | Removable terminal block (included).<br>The P2-08NTC module is not compatible with the ZIPLink wiring system. |
| <b>Connector Type (included)</b>     | 18-position removable terminal block                                                                          |
| <b>Weight</b>                        | 136g (4.8 oz)                                                                                                 |
| <b>Agency Approvals**</b>            | UL 508 File E139594, Canada & USA<br>CE (EN61131-2*)                                                          |

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

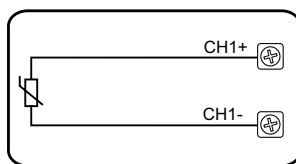
\*\*To obtain the most current agency approval information, see the Agency Approval Checklist section on the specific component part number web page.

| Diagnostics                                  |                   |
|----------------------------------------------|-------------------|
| <b>Module Diagnostics Failure</b>            | 1 bit per module  |
| <b>Module Not Ready</b>                      | 1 bit per module  |
| <b>Channel Burn-out (Thermistor only)</b>    | 1 bit per channel |
| <b>Channel Under-range (Thermistor only)</b> | 1 bit per channel |
| <b>Channel Over-range</b>                    | 1 bit per channel |

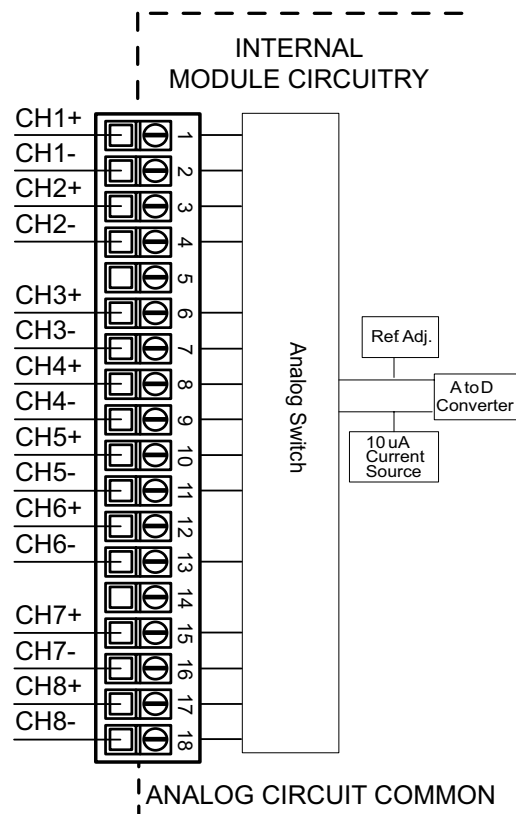
**NOTE: At module power-up Channel 1 must have a functional Thermistor connected so internal automatic calibration is performed.**

## Wiring Diagrams

### Thermistor Input



NOTE: Install jumper wire on each unused input. CH1+ to CH1-



# 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    |
| <a href="#">P2-08SIM</a>                | 8                | Input Simulator Module     | \$67.00  |
| <a href="#">P2-08ND3-1</a>              | 8                | Sinking/Sourcing 12-24 VDC | \$70.00  |
| <a href="#">P2-16ND-TTL</a>             | 16               | Sinking/Sourcing           | \$98.00  |
| <a href="#">P2-16ND3-1</a>              | 16               | Sinking/Sourcing 24V AC/DC | \$98.00  |
| <a href="#">P2-32ND3-1</a>              | 32               | Sinking/Sourcing 12-24 VDC | \$141.00 |
| <a href="#">P2-08NE3</a>                | 8                | Sinking/Sourcing 24V AC/DC | \$57.00  |
| <a href="#">P2-16NE3</a>                | 16               | Sinking/Sourcing 12-24 VDC | \$98.00  |
| <a href="#">P2-32NE3</a>                | 32               | Sinking/Sourcing 24V AC/DC | \$141.00 |
| <a href="#">P2-08NAS</a>                | 8                | AC Isolated 100-120 VAC    | \$109.00 |
| <a href="#">P2-16NA</a>                 | 16               | AC 100-240 VAC             | \$149.00 |

## Specialty Modules

| Productivity2000 Specialty Modules |                    |                              |          |
|------------------------------------|--------------------|------------------------------|----------|
| Part Number                        | Number of Channels | Description                  | Price    |
| <a href="#">P2-HSI</a>             | 2                  | High-Speed Input             | \$278.00 |
| <a href="#">P2-HSO**</a>           | 2                  | High-Speed Output            | \$278.00 |
| <a href="#">P2-02HSC</a>           | 2                  | High-Speed Counter           | \$116.00 |
| <a href="#">P2-04PWM</a>           | 4                  | Pulse-Width Modulation       | \$128.00 |
| <a href="#">P2-SCM</a>             | 4 ports            | Serial Communications Module | \$234.00 |

\*\* ZIPLink required.

## Analog Output Modules

| Productivity2000 Analog Output Modules |                    |                                 |          |
|----------------------------------------|--------------------|---------------------------------|----------|
| Part Number                            | Number of Channels | Description                     | Price    |
| <a href="#">P2-04DA</a>                | 4                  | Analog Output (Voltage/Current) | \$276.00 |
| <a href="#">P2-04DA-1</a>              | 4                  | Analog Output (Current)         | \$210.00 |
| <a href="#">P2-04DA-2</a>              | 4                  | Analog Output (Voltage)         | \$205.00 |
| <a href="#">P2-04DAL-1*</a>            | 4                  | Analog Output (Current)         | \$157.00 |
| <a href="#">P2-04DAL-2*</a>            | 4                  | Analog Output (Voltage)         | \$146.00 |
| <a href="#">P2-08DA-1</a>              | 8                  | Analog Output (Current)         | \$385.00 |
| <a href="#">P2-08DA-2</a>              | 8                  | Analog Output (Voltage)         | \$353.00 |
| <a href="#">P2-08DAL-1*</a>            | 8                  | Analog Output (Current)         | \$287.00 |
| <a href="#">P2-08DAL-2*</a>            | 8                  | Analog Output (Voltage)         | \$278.00 |
| <a href="#">P2-16DA-1</a>              | 16                 | Analog Output (Current)         | \$503.00 |
| <a href="#">P2-16DA-2</a>              | 16                 | Analog Output (Voltage)         | \$482.00 |
| <a href="#">P2-16DAL-1*</a>            | 16                 | Analog Output (Current)         | \$358.00 |
| <a href="#">P2-16DAL-2*</a>            | 16                 | Analog Output (Voltage)         | \$343.00 |

\* Low resolution analog modules without OLED display.

## Discrete Output Modules

| Productivity2000 Discrete Output Modules |                   |                    |          |
|------------------------------------------|-------------------|--------------------|----------|
| Part Number                              | Number of Outputs | Description        | Price    |
| <a href="#">P2-08TD1S</a>                | 8                 | Isolated Sinking   | \$68.00  |
| <a href="#">P2-08TD2S</a>                | 8                 | Isolated Sourcing  | \$68.00  |
| <a href="#">P2-15TD1</a>                 | 15                | Sinking            | \$94.00  |
| <a href="#">P2-15TD2</a>                 | 15                | Sourcing           | \$92.00  |
| <a href="#">P2-08TD1P</a>                | 8                 | Sinking Protected  | \$58.00  |
| <a href="#">P2-08TD2P</a>                | 8                 | Sourcing Protected | \$58.00  |
| <a href="#">P2-16TD-TTL</a>              | 16                | Sourcing           | \$112.00 |
| <a href="#">P2-16TD1P</a>                | 16                | Sinking Protected  | \$98.00  |
| <a href="#">P2-16TD2P</a>                | 16                | Sourcing Protected | \$98.00  |
| <a href="#">P2-32TD1P</a>                | 32                | Sinking Protected  | \$141.00 |
| <a href="#">P2-32TD2P</a>                | 32                | Sourcing Protected | \$141.00 |
| <a href="#">P2-08TAS</a>                 | 8                 | Isolated AC        | \$149.00 |
| <a href="#">P2-16TA</a>                  | 16                | 100-240 VAC Output | \$184.00 |
| <a href="#">P2-06TRS</a>                 | 6                 | Isolated Relay     | \$107.00 |
| <a href="#">P2-08TRS</a>                 | 8                 | Isolated Relay     | \$71.00  |
| <a href="#">P2-16TR</a>                  | 16                | Relay              | \$134.00 |

## Analog Input Modules

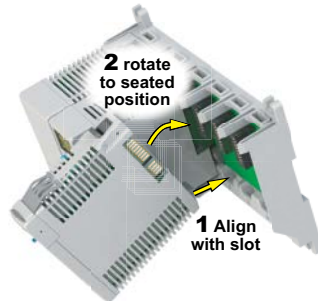
| Productivity2000 Analog Input Modules |                    |                                |          |
|---------------------------------------|--------------------|--------------------------------|----------|
| Part Number                           | Number of Channels | Description                    | Price    |
| <a href="#">P2-04AD</a>               | 4                  | Analog Input (Voltage/Current) | \$278.00 |
| <a href="#">P2-04AD-1</a>             | 4                  | Analog Input (Current)         | \$210.00 |
| <a href="#">P2-04AD-2</a>             | 4                  | Analog Input (Voltage)         | \$216.00 |
| <a href="#">P2-08AD-1</a>             | 8                  | Analog Input (Current)         | \$293.00 |
| <a href="#">P2-08AD-2</a>             | 8                  | Analog Input (Voltage)         | \$322.00 |
| <a href="#">P2-08ADL-1*</a>           | 8                  | Analog Input (Current)         | \$205.00 |
| <a href="#">P2-08ADL-2*</a>           | 8                  | Analog Input (Voltage)         | \$222.00 |
| <a href="#">P2-16AD-1</a>             | 16                 | Analog Input (Current)         | \$354.00 |
| <a href="#">P2-16AD-2</a>             | 16                 | Analog Input (Voltage)         | \$392.00 |
| <a href="#">P2-16ADL-1*</a>           | 16                 | Analog Input (Current)         | \$252.00 |
| <a href="#">P2-16ADL-2*</a>           | 16                 | Analog Input (Voltage)         | \$279.00 |
| <a href="#">P2-06RTD</a>              | 6                  | Analog RTD Input               | \$460.00 |
| <a href="#">P2-08NTC</a>              | 8                  | Analog Thermocouple Input      | \$410.00 |
| <a href="#">P2-08THM</a>              | 8                  | Analog Thermistor Input        | \$452.00 |

| Productivity2000 Analog Input/Output Modules |                    |                               |          |
|----------------------------------------------|--------------------|-------------------------------|----------|
| Part Number                                  | Number of Channels | Description                   | Price    |
| <a href="#">P2-8AD4DA-1</a>                  | 8/4                | Analog Input/Output (Current) | \$441.00 |
| <a href="#">P2-8AD4DA-2</a>                  | 8/4                | Analog Input/Output (Voltage) | \$441.00 |

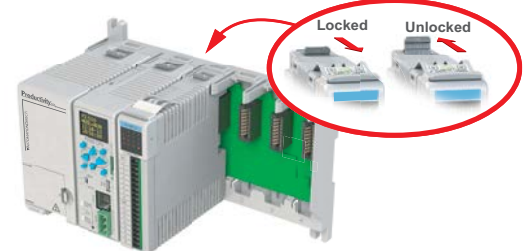
# I/O Module Installation Procedure

**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 engaged.



**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.