WARNING: 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 obligation. This publication may also discuss features that may not be available in certain revisions of the product.

Removable Terminal Block Specifications

<table>
<thead>
<tr>
<th>Part Number</th>
<th>P2-RTB</th>
<th>P2-RTB-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of positions</td>
<td>18 Screw Terminals</td>
<td>18 Spring Clamp Terminals</td>
</tr>
<tr>
<td>Wire Range</td>
<td>28–16 AWG (0.081–1.31 mm²)</td>
<td>0.051–1.31 mm²</td>
</tr>
<tr>
<td></td>
<td>Solid / Stranded Conductor</td>
<td>Solid / Stranded Conductor</td>
</tr>
<tr>
<td></td>
<td>3/64 in (1.2 mm) Insulation Maximum</td>
<td>1/4 in (6–7 mm) Strip Length</td>
</tr>
<tr>
<td>Conductors</td>
<td>&quot;USE COPPER CONDUCTORS, 75ºC&quot; or equivalent.</td>
<td></td>
</tr>
<tr>
<td>Screw Driver Width</td>
<td>1/8 in (3.8 mm) Maximum</td>
<td></td>
</tr>
<tr>
<td>Screw Size</td>
<td>M2 N/A</td>
<td></td>
</tr>
<tr>
<td>Screw Torque</td>
<td>2.5 lb·in (0.28 N·m) N/A</td>
<td></td>
</tr>
</tbody>
</table>

Terminal Block sold separately. (see wiring options on page 5).

Removable Terminal Block Specifications

General Specifications

Input Specifications

Wiring Diagram and Schematic

Module Installation Procedure

QR Code

Hot Swap Information

Wiring Options

Module Configuration

Linear Scaling

Non-Linear Scaling

OLED Panel Display Menus

Productivity2000.com

Tech Support 770-844-4200

Sales 800-633-0405

www.productivity2000.com
# General Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>0º to 60ºC (32º to 140ºF)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>0º to 60ºC (32º to 140ºF)</td>
</tr>
<tr>
<td>Humidity</td>
<td>5 to 95% (non-condensing)</td>
</tr>
<tr>
<td>Environmental Air</td>
<td>No corrosive gases permitted</td>
</tr>
<tr>
<td>Vibration</td>
<td>EC60068-2-6 (Test F)</td>
</tr>
<tr>
<td>Shock</td>
<td>EC60068-2-27 (Test E)</td>
</tr>
<tr>
<td>Read-to-Logic State isolation</td>
<td>1800VAC applied for 1 second</td>
</tr>
<tr>
<td>Insulation Resistance</td>
<td>&gt; 10MΩ @ 500VDC</td>
</tr>
<tr>
<td>Heat Dissipation</td>
<td>110W</td>
</tr>
<tr>
<td>Enclosure Type</td>
<td>Open Equipment</td>
</tr>
<tr>
<td>Module Location</td>
<td>Any I/O slot in a Productivity2000 System</td>
</tr>
<tr>
<td>Field Wiring</td>
<td>Use ZIP Link Wiring System or removable terminal block (not included). See “Wiring Options” on page 5.</td>
</tr>
<tr>
<td>Connector Type (not included)</td>
<td>18-position removable terminal block</td>
</tr>
<tr>
<td>Weight</td>
<td>90g (3.2 oz)</td>
</tr>
<tr>
<td>Agency Approvals</td>
<td>UL 61010-1 and UL 61010-2-201 File E139594, Canada and USA</td>
</tr>
<tr>
<td>CE (EN 61131-2 EMC, EN 61010-1 and EN 61010-2-201 Safety)*</td>
<td></td>
</tr>
</tbody>
</table>

# Input Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Channel</td>
<td>4</td>
</tr>
<tr>
<td>Input Range</td>
<td>0–10VDC</td>
</tr>
<tr>
<td>Signal/Resistive</td>
<td>50Ω</td>
</tr>
<tr>
<td>Resolution (digital bits)</td>
<td>0–10VDC +10µV per count</td>
</tr>
<tr>
<td>Data Range</td>
<td>0 to 65535 counts</td>
</tr>
<tr>
<td>Input Type</td>
<td>Single-ended (2 common)</td>
</tr>
<tr>
<td>Maximum Differential</td>
<td>150V</td>
</tr>
<tr>
<td>Input Impedance</td>
<td>250kΩ (typical)</td>
</tr>
<tr>
<td>Hardware Filter Characteristics</td>
<td>Low Pass, -3dB @ 100Hz</td>
</tr>
<tr>
<td>Sample Duration Time</td>
<td>7ms per channel (does not include ladder scan time)</td>
</tr>
<tr>
<td>All Channel Update Rate</td>
<td>80ms</td>
</tr>
<tr>
<td>Open Circuit Detection Time</td>
<td>Zero reading within 1s</td>
</tr>
<tr>
<td>Conversion Method</td>
<td>Successive approximation</td>
</tr>
<tr>
<td>Accuracy vs. Temperature</td>
<td>±25PPM / ºC maximum</td>
</tr>
<tr>
<td>Maximum Inaccuracy</td>
<td>0.1% of range including temperature drift</td>
</tr>
<tr>
<td>Linearity Error</td>
<td>±0.015% of range</td>
</tr>
<tr>
<td>Monotonicity</td>
<td>±0.015% of range</td>
</tr>
<tr>
<td>Input Stability and Repeatability</td>
<td>±0.015% of range (after 10 min warm-up)</td>
</tr>
<tr>
<td>Maximum Full Scale Calibration Error</td>
<td>±0.015% of range maximum</td>
</tr>
<tr>
<td>Input Resistance</td>
<td>100Ω to 10kΩ</td>
</tr>
<tr>
<td>Maximum Current</td>
<td>20mA</td>
</tr>
</tbody>
</table>

# OLED Panel Display

- **Power On**: SEL button down to cycle through primary screens. Release button to select screen.
- **Hold SEL button down to cycle through primary screens. Release button to select screen.**
- **End of Status Menu**: Momentarily Press SEL button to log through secondary displays.
- **Error Messages**: An existing error will be inserted into the cycling Status Info screen.
- **Fault Messages**: Appears in place of data during a fault condition.

- **Input voltage > 10V.**
- **Input voltage = 0.**
- **MISSING EXTERNAL 24VDC SELFTEST FAIL REPLACE MODULE**
- **OVER**
- **UNDER**
- **0 OVER 4 UNDER**

---

*Meets EMC and Safety requirements. See the D.O.C. for details.*
Select the Input and Output tags appropriate for the application. Convert raw input signals to engineering units for use in the program, or convert engineering units to output signals for control purposes.

The Scale (Linear) function can be used to:

- Convert analog field input signals from the range which is native to the analog input module to an application specific range.
- Make other linear conversions in ranges appropriate to the application.

The Scale (Non-Linear) function can be used for Non-Linear applications.

Notes for maximum accuracy:
1. Jumper unused inputs to common.

Select the minimum and maximum values of the raw input signal. These values will relate to the minimum and maximum scaled signals.

Linear Scaling  Non-Linear Scaling  Wiring Diagram  Schematic

The Scale (Linear) function can be used to:

- Convert analog field input signals from the range which is native to the analog input module to an application specific range.
- Make other linear conversions in ranges appropriate to the application.

The Scale (Non-Linear) function can be used for Non-Linear applications.

Notes for maximum accuracy:
1. Jumper unused inputs to common.

Select the minimum and maximum values of the raw input signal. These values will relate to the minimum and maximum scaled signals.

Linear Scaling  Non-Linear Scaling  Wiring Diagram  Schematic

The Scale (Linear) function can be used to:

- Convert analog field input signals from the range which is native to the analog input module to an application specific range.
- Make other linear conversions in ranges appropriate to the application.

The Scale (Non-Linear) function can be used for Non-Linear applications.

Notes for maximum accuracy:
1. Jumper unused inputs to common.

Select the minimum and maximum values of the raw input signal. These values will relate to the minimum and maximum scaled signals.

Linear Scaling  Non-Linear Scaling  Wiring Diagram  Schematic

The Scale (Linear) function can be used to:

- Convert analog field input signals from the range which is native to the analog input module to an application specific range.
- Make other linear conversions in ranges appropriate to the application.

The Scale (Non-Linear) function can be used for Non-Linear applications.

Notes for maximum accuracy:
1. Jumper unused inputs to common.

Select the minimum and maximum values of the raw input signal. These values will relate to the minimum and maximum scaled signals.

Linear Scaling  Non-Linear Scaling  Wiring Diagram  Schematic

The Scale (Linear) function can be used to:

- Convert analog field input signals from the range which is native to the analog input module to an application specific range.
- Make other linear conversions in ranges appropriate to the application.

The Scale (Non-Linear) function can be used for Non-Linear applications.

Notes for maximum accuracy:
1. Jumper unused inputs to common.

Select the minimum and maximum values of the raw input signal. These values will relate to the minimum and maximum scaled signals.

Linear Scaling  Non-Linear Scaling  Wiring Diagram  Schematic

The Scale (Linear) function can be used to:

- Convert analog field input signals from the range which is native to the analog input module to an application specific range.
- Make other linear conversions in ranges appropriate to the application.

The Scale (Non-Linear) function can be used for Non-Linear applications.

Notes for maximum accuracy:
1. Jumper unused inputs to common.

Select the minimum and maximum values of the raw input signal. These values will relate to the minimum and maximum scaled signals.

Linear Scaling  Non-Linear Scaling  Wiring Diagram  Schematic

The Scale (Linear) function can be used to:

- Convert analog field input signals from the range which is native to the analog input module to an application specific range.
- Make other linear conversions in ranges appropriate to the application.

The Scale (Non-Linear) function can be used for Non-Linear applications.

Notes for maximum accuracy:
1. Jumper unused inputs to common.

Select the minimum and maximum values of the raw input signal. These values will relate to the minimum and maximum scaled signals.

Linear Scaling  Non-Linear Scaling  Wiring Diagram  Schematic

The Scale (Linear) function can be used to:

- Convert analog field input signals from the range which is native to the analog input module to an application specific range.
- Make other linear conversions in ranges appropriate to the application.

The Scale (Non-Linear) function can be used for Non-Linear applications.

Notes for maximum accuracy:
1. Jumper unused inputs to common.

Select the minimum and maximum values of the raw input signal. These values will relate to the minimum and maximum scaled signals.

Linear Scaling  Non-Linear Scaling  Wiring Diagram  Schematic

The Scale (Linear) function can be used to:

- Convert analog field input signals from the range which is native to the analog input module to an application specific range.
- Make other linear conversions in ranges appropriate to the application.

The Scale (Non-Linear) function can be used for Non-Linear applications.

Notes for maximum accuracy:
1. Jumper unused inputs to common.

Select the minimum and maximum values of the raw input signal. These values will relate to the minimum and maximum scaled signals.

Linear Scaling  Non-Linear Scaling  Wiring Diagram  Schematic

The Scale (Linear) function can be used to:

- Convert analog field input signals from the range which is native to the analog input module to an application specific range.
- Make other linear conversions in ranges appropriate to the application.

The Scale (Non-Linear) function can be used for Non-Linear applications.

Notes for maximum accuracy:
1. Jumper unused inputs to common.

Select the minimum and maximum values of the raw input signal. These values will relate to the minimum and maximum scaled signals.

Linear Scaling  Non-Linear Scaling  Wiring Diagram  Schematic

The Scale (Linear) function can be used to:

- Convert analog field input signals from the range which is native to the analog input module to an application specific range.
- Make other linear conversions in ranges appropriate to the application.

The Scale (Non-Linear) function can be used for Non-Linear applications.

Notes for maximum accuracy:
1. Jumper unused inputs to common.

Select the minimum and maximum values of the raw input signal. These values will relate to the minimum and maximum scaled signals.

Linear Scaling  Non-Linear Scaling  Wiring Diagram  Schematic

The Scale (Linear) function can be used to:

- Convert analog field input signals from the range which is native to the analog input module to an application specific range.
- Make other linear conversions in ranges appropriate to the application.

The Scale (Non-Linear) function can be used for Non-Linear applications.

Notes for maximum accuracy:
1. Jumper unused inputs to common.

Select the minimum and maximum values of the raw input signal. These values will relate to the minimum and maximum scaled signals.
Important Hot-Swap Information

The Productivity2000 System supports hot-swap! Individual modules can be taken offline, removed, and replaced while the rest of the 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 Installation

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

**Step One:** Align module catch with base slot and rotate module into connector.

**Step Two:** Pull top locking tab toward module face. Click indicates lock is engaged.

**Step Three:** Attach field wiring using the removable terminal block or ZIPLink wiring system.

**CAUTION:** If possible, remove field power prior to proceeding. If not, then EXTREME care MUST be taken to prevent damage to the module, even personal injury due to a short circuit from the live terminal block.

Wiring Options

1. ZIPLink Feed Through Modules and Cables¹

<table>
<thead>
<tr>
<th>ZIPLink Feed Through Modules and Cables¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 m (1.6 ft) cable</td>
</tr>
<tr>
<td>1.0 m (3.3 ft) cable</td>
</tr>
<tr>
<td>2.0 m (6.6 ft) cable</td>
</tr>
</tbody>
</table>

2. Terminal block with pigtail cable

   | 1.0 m (3.3 ft) cable                  |
   | 2.0 m (6.6 ft) cable                  |

3. Screw Terminal Block only

   | 1.0 m (3.3 ft) cable                  |
   | 2.0 m (6.6 ft) cable                  |

4. Spring Clamp Terminal Block only

   | 1.0 m (3.3 ft) cable                  |
   | 2.0 m (6.6 ft) cable                  |

5. Accessory²

   | ZipLink Connector                   |

   Using the Hardware Configuration tool in the Productivity Suite programming software, drag the P2-04AD-2 module into the base configuration. Select Automatic Module Verification or No Verification and Enable Hot Swap. If desired, assign a User Tagname to each input point (channel) selected and to each Status Bit Item.

Module Configuration

Using the Hardware Configuration tool in the Productivity Suite programming software, drag the P2-04AD-2 module into the base configuration. Select Automatic Module Verification or No Verification and Enable Hot Swap. If desired, assign a User Tagname to each input point (channel) selected and to each Status Bit Item.

1. Cable + ZIPLink Module = Complete System
2. ZL-RTB-COM provides a common connection point for power or ground

¹ ZIPLink Feed Through Modules and Cables
² Accessory

QR Code

Use any QR Code reader application to display the module’s product insert.

www.productivity2000.com
Tech Support 770-844-4200
Sales 800-633-0405

www.productivity2000.com