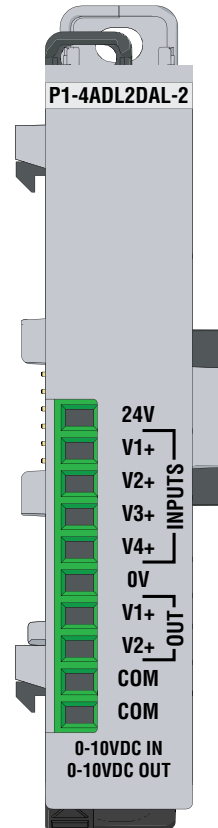


General Specifications	
<b>Operating Temperature</b>	0° to 60°C (32° to 140°F)
<b>Storage Temperature</b>	-20° to 70°C (-4° to 158°F)
<b>Humidity</b>	5 to 95% (non-condensing)
<b>Environmental Air</b>	No corrosive gases permitted
<b>Vibration</b>	IEC60068-2-6 (Test Fc)
<b>Shock</b>	IEC60068-2-27 (Test Ea)
<b>Field to Logic Side Isolation</b>	1800VAC applied for 1 second
<b>Insulation Resistance</b>	> 10MΩ @ 500VDC
<b>Heat Dissipation</b>	1950mW
<b>Enclosure Type</b>	Open Equipment
<b>Module Location</b>	Any I/O position in a Productivity1000 System
<b>Field Wiring</b>	Removable terminal block (sold separately). Use ZIPLink Wiring System optional See "Wiring Options" on page 5.
<b>EU Directive</b>	See the "EU Directive" topic in the Productivity Suite Help File. Information can also be obtained at: <a href="http://www.productivity1000.com">www.productivity1000.com</a>
<b>Terminal Type (sold separately)</b>	10-position Removable Terminal Block
<b>Weight</b>	60g (2.1 oz)
<b>Agency Approvals</b>	UL 61010-1 and UL 61010-2-201 File E139594, Canada and USA CE (EN 61131-2 EMC, EN 61010-1 and EN 61010-2-201 Safety)*

\*See CE Declaration of Conformance for details.



## P1-4ADL2DAL-2 Analog Input/Output

The P1-4ADL2DAL-2 Voltage Analog Input/Output Module provides four 13 bit input channels at 0-10 VDC and two 12 bit output channels at 0-10VDC for use with the Productivity1000 system.

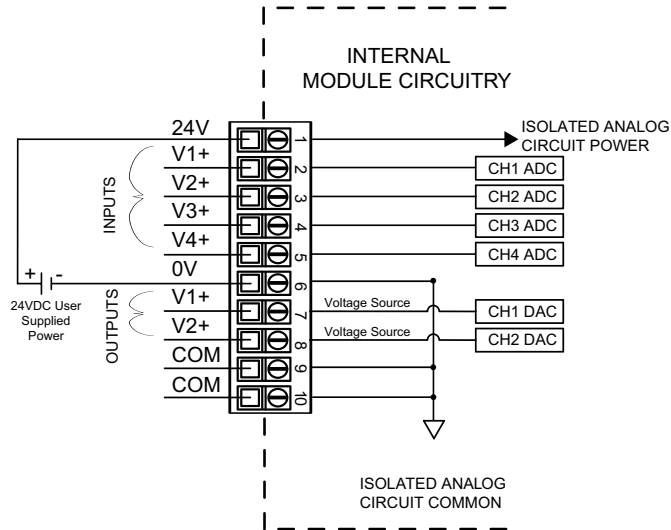
General Specifications . . . . .	1
Input Specifications . . . . .	2
Output Specifications . . . . .	2
Wiring Diagram and Schematic. . . . .	3
Module Installation Procedure. . . . .	4
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Wiring Options. . . . .	5
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Linear Scaling . . . . .	6
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Terminal Block Specifications . . . . .	8

**Terminal Block sold separately, (see wiring options on page 5).**  
 Warranty: Thirty-day money-back guarantee. Two-year limited replacement. (See [www.productivity1000.com](http://www.productivity1000.com) for details).

Input Specifications	
<b>Inputs per Module</b>	4
<b>Input Range</b>	0–10 VDC
<b>Signal Resolution</b>	13-bit
<b>Resolution Value of LSB (least significant bit)</b>	0–10 VDC = 1.22 mV per count (1LSB = 1 count)
<b>Data Range</b>	0–8191 counts
<b>Input Type</b>	Single-ended (1 common)
<b>Maximum Continuous Overload</b>	±100VDC
<b>Input Impedance</b>	200kΩ
<b>Hardware Filter Characteristics</b>	Low Pass, -3dB @ 100Hz
<b>Sample Duration Time</b>	4ms per channel (does not include ladder scan time)
<b>All Channel Update Rate</b>	20ms
<b>Open Circuit Detection Time</b>	Zero reading within 100ms
<b>Conversion Method</b>	Successive approximation
<b>Accuracy vs. Temperature</b>	±75PPM / °C maximum
<b>Maximum Inaccuracy</b>	0.5% of range (including temperature drift)
<b>Linearity Error</b>	±0.036% of range Monotonic with no missing codes
<b>Input Stability and Repeatability</b>	±0.03% of range
<b>Full Scale Calibration Error (including offset)</b>	±0.097% of range
<b>Offset Calibration Error</b>	±0.097% of range
<b>Max Crosstalk at DC, 50Hz and 60Hz</b>	±0.049% of range
<b>External Power Supply Required</b>	24VDC (-20% / + 25%), 100mA

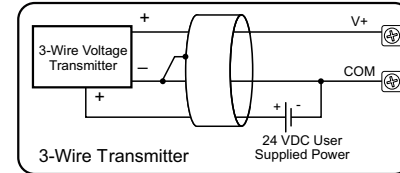
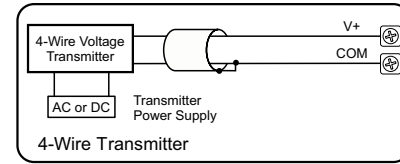
Output Specifications	
<b>Outputs per Module</b>	2
<b>Output Range</b>	0–10 VDC
<b>Signal Resolution</b>	12-bit
<b>Resolution Value of LSB (least significant bit)</b>	0–10 VDC = 2.44 mV / count 1 LSB = 1 count
<b>Data Range</b>	0–4095 counts
<b>Output Type</b>	Voltage @ 10mA
<b>Output Value in Fault Mode</b>	0V
<b>Load Impedance</b>	≥1000Ω
<b>Maximum Capacitive Load</b>	0.01 μF
<b>Allowed Load Type</b>	Grounded
<b>Maximum Inaccuracy</b>	0.5% of range
<b>Full Scale Calibration Error</b>	±0.2% of range
<b>Offset Calibration Error</b>	±0.2% of range
<b>Accuracy vs. Temperature</b>	±75 PPM / °C maximum full-scale calibration change (±0.0025% of range / °C)
<b>Max Crosstalk at DC, 50/60Hz</b>	-72dB, 1 LSB
<b>Linearity Error (End to End)</b>	±4 LSB max., (±0.1% of full scale) Monotonic with no missing codes
<b>Output Stability and Repeatability</b>	±2% LSB after 10 min. warm up (typical)
<b>Output Ripple</b>	±0.2% of full scale
<b>Output Settling Time</b>	0.3 ms max., 5μs min. (full scale range)
<b>All Channel Update Rate</b>	4ms
<b>Maximum Continuous Overload</b>	Outputs current limited to 40mA typical Continuous overloads on multiple outputs can damage the module.
<b>Type of Output Protection</b>	0.1 μs Transient Suppressor
<b>Output Signal at Power Up and Power Down</b>	0V

# P1-4ADL2DAL-2 Schematic

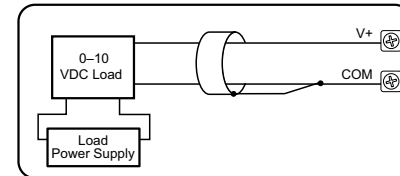


# P1-04ADL2DAL-2 Wiring Diagram

## Voltage Input Circuits



## Voltage Output Circuits



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

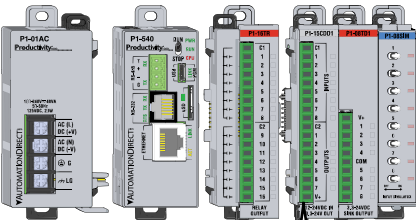


# Module Installation

# QR Code

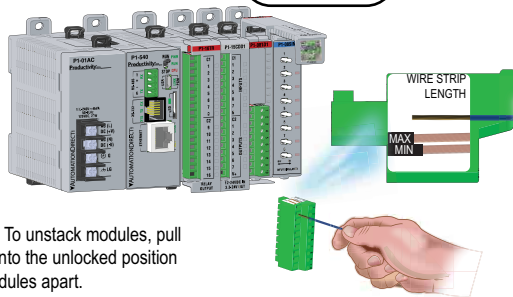
**WARNING:** Do not add or remove modules with field power applied.

**Step One:** With latch in "locked" position, align connectors on the side of each module and stack by pressing together. Click indicates lock is engaged.

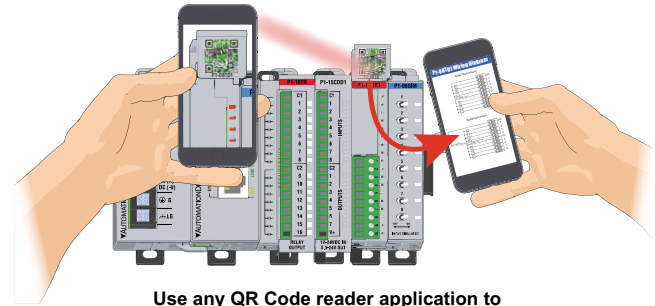
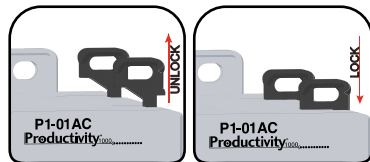


**Step Two:** Attach field wiring using the removable terminal block or ZIPLink wiring system.

Check all latches are secure after modules are connected.



**Step Three:** To unstack modules, pull locking latch up into the unlocked position and then pull modules apart.

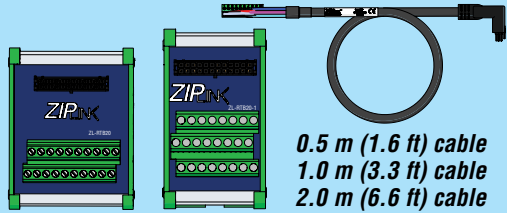


Use any QR Code reader application to display the module's product insert.

# Module Configuration

## Wiring Options

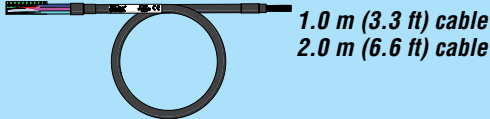
### 1 ZIPLink Feed Through Modules and Cables<sup>1</sup>



ZL-RTB20  
ZL-RTB20-1

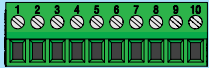
ZL-P1-CBL10  
ZL-P1-CBL10-1  
ZL-P1-CBL10-2

### 2 Terminal Block with pigtail cable



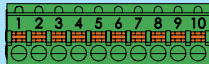
ZL-P1-CBL10-1P  
ZL-P1-CBL10-2P

### 3 Screw Terminal Block only



P1-10RTB  
(Quantity 1)

### 4 Spring Clamp Terminal Block only



P1-10RTB-1  
(Quantity 1)

### 5 Accessories<sup>2</sup>



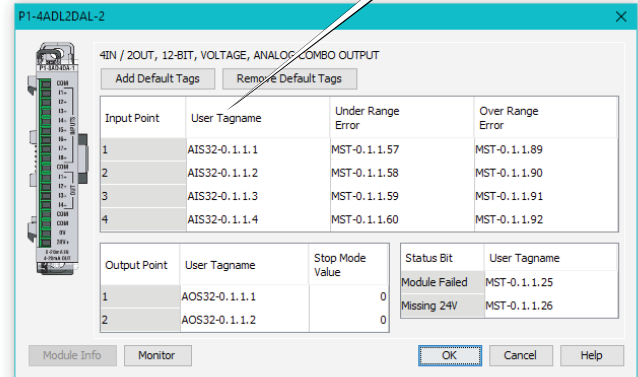
ZL-RTB-COM

TW-SD-SL-1

TW-SD-MSL-1

Using the Hardware Configuration tool in the Productivity Suite programming software, drag and drop the P1-4ADL2DAL-2 module into the configuration.

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

# Linear Scaling

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.

Scale (Linear) (SCL)

Input: Level Transmitter    Output: Tank Level

In Min: 0    In Max: 8191    Out Min: 220    Out Max: 1045

Show Instruction Comment

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.

max

min

min    max

# Non-Linear Scaling

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

Scale (Non-Linear) (SCLN)

Input: Level Transmitter    Output: Tank Level

Input value	Desired Output
0	0
1	5
2	1
3	1.55
4	2.25
5	3
6	4.55
6.5	6.75
7	7
0	0
0	0
0	0
0	0
0	0

Show Instruction Comment

OK    Cancel    Help

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



**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 .

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### Terminal Block Specifications

Part Number	P1-10RTB	P1-10RTB-1
<b>Positions</b>	10 Screw Terminals	10 Spring Clamp Terminals
<b>Wire Range</b>	30–16 AWG (0.051–1.31 mm <sup>2</sup> ) Solid / Stranded Conductor 3/64 in (1.2 mm) Insulation Max. 1/4 in (6–7 mm) Strip Length	28–16 AWG (0.081–1.31 mm <sup>2</sup> ) Solid / Stranded Conductor 3/64 in (1.2 mm) Insulation Max. 19/64 in (7–8 mm) Strip Length
<b>Conductors</b>	*USE COPPER CONDUCTORS, 75°C* or equivalent.	
<b>Screw Driver</b>	0.1 in (2.5 mm) Maximum*	
<b>Screw Size</b>	M2	N/A
<b>Screw Torque</b>	2.5 lb-in (0.28 N-m)	N/A

\*Recommended Screw Driver TW-SD-MSL-1

Document Name	Edition/Revision	Date
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