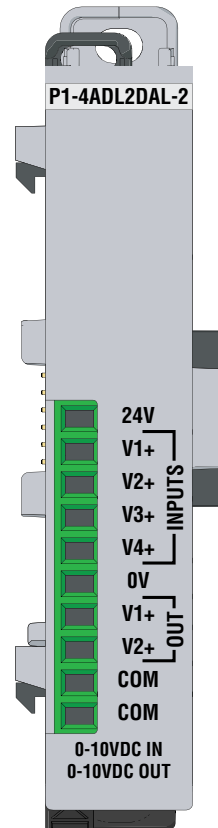


General Specifications	
Operating Temperature	0° to 60°C (32° to 140°F)
Storage Temperature	-20° to 70°C (-4° to 158°F)
Humidity	5 to 95% (non-condensing)
Altitude	2,000 meters max
Pollution Degree	2
Environmental Air	No corrosive gases permitted
Vibration	IEC60068-2-6 (Test Fc)
Shock	IEC60068-2-27 (Test Ea)
Field to Logic Side Isolation	1800VAC applied for 1 second
Insulation Resistance	> 10MΩ @ 500VDC
Heat Dissipation	1950mW
Overvoltage Category	II
Enclosure Type	Open Equipment
Module Location	Any I/O position in a Productivity1000 System
Field Wiring	Removable terminal block (sold separately). Use ZIPLink Wiring System optional See "Wiring Options" on page 5.
Terminal Type (sold separately)	10-position Removable Terminal Block
Weight	60g (2.1 oz)
Agency Approvals	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.

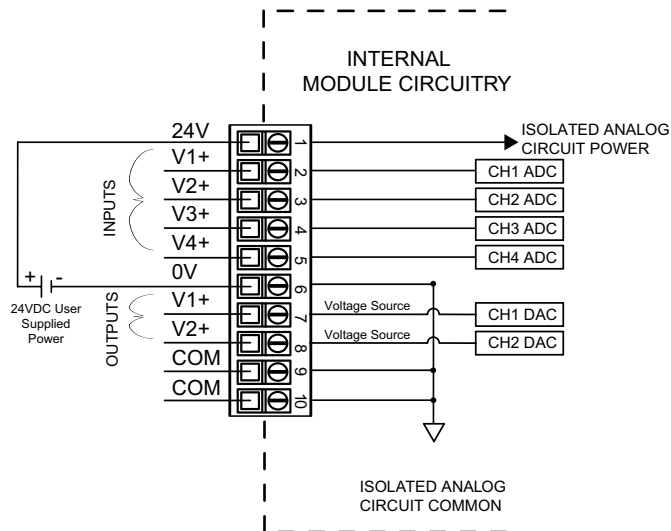
General Specifications	1
Input Specifications	2
Output Specifications	2
Wiring Diagram and Schematic	3
Module Installation Procedure	4
QR Code	4
Wiring Options	5
Module Configuration	5
Linear Scaling	6
Non-Linear Scaling	6
Warning	8
Terminal Block Specifications	8

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

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

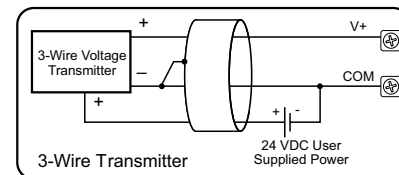
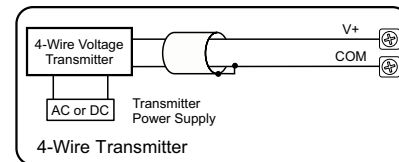
Output Specifications	
Outputs per Module	2
Output Range	0–10 VDC
Signal Resolution	12-bit
Resolution Value of LSB (least significant bit)	0–10 VDC = 2.44 mV / count 1 LSB = 1 count
Data Range	0–4095 counts
Output Type	Voltage @ 10mA
Output Value in Fault Mode	0V
Load Impedance	≥1000 Ω
Maximum Capacitive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

P1-4ADL2DAL-2 Schematic

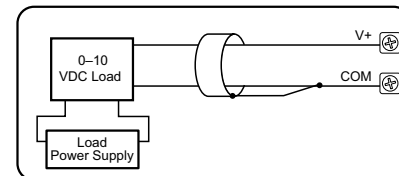


P1-04ADL2DAL-2 Wiring Diagram

Voltage Input Circuits



Voltage Output Circuits



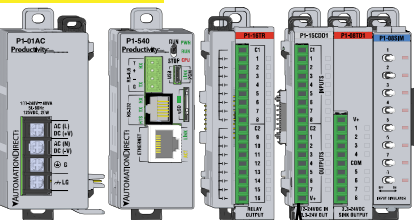
Notes for maximum accuracy:
1. Jumper unused inputs to common.



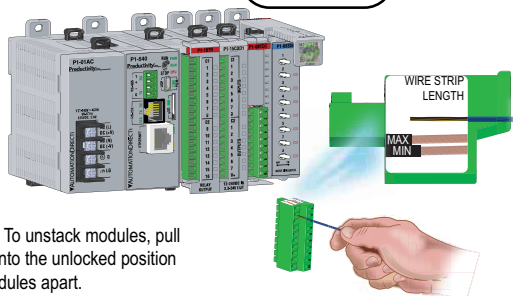
Module Installation

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

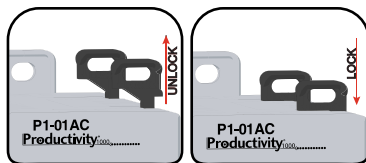
Step One: With latch in "locked" position, align connectors on the side of each module and stack by pressing together. Click indicates lock is engaged.



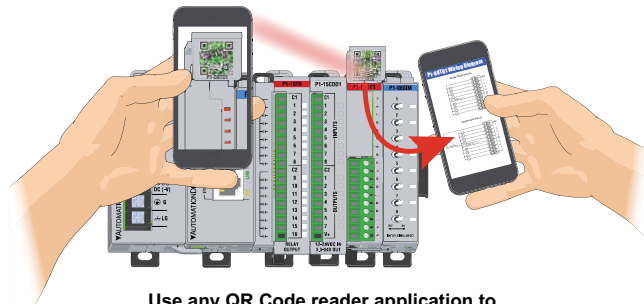
Step Two: Attach field wiring using the removable terminal block or ZIPLink wiring system.



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



QR Code

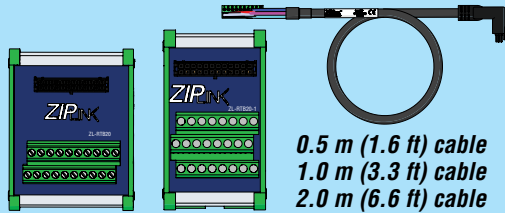


Use any QR Code reader application to display the module's product insert.

Module Configuration

Wiring Options

1 ZIPLink Feed Through Modules and Cables¹

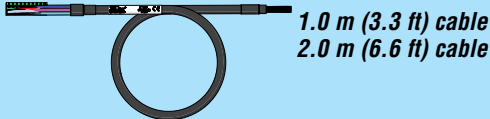


ZIPLINK
AUTOMATIONDIRECT

ZL-RTB20
ZL-RTB20-1

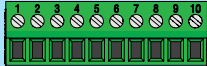
ZL-P1-CBL10
ZL-P1-CBL10-1
ZL-P1-CBL10-2

2 Terminal Block with pigtail cable



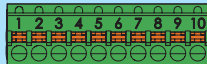
ZL-P1-CBL10-1P
ZL-P1-CBL10-2P

3 Screw Terminal Block only



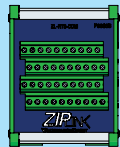
P1-10RTB
(Quantity 1)

4 Spring Clamp Terminal Block only



P1-10RTB-1
(Quantity 1)

5 Accessories²



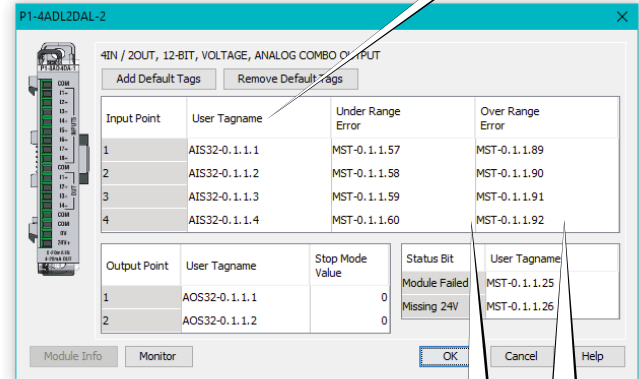
ZL-RTB-COM

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*.



The "Under Range Error" bit for each channel activates for a signal around 0V ± offset error.

The "Over Range Error" bit for each channel activates for a signal around 10V ± gain error.

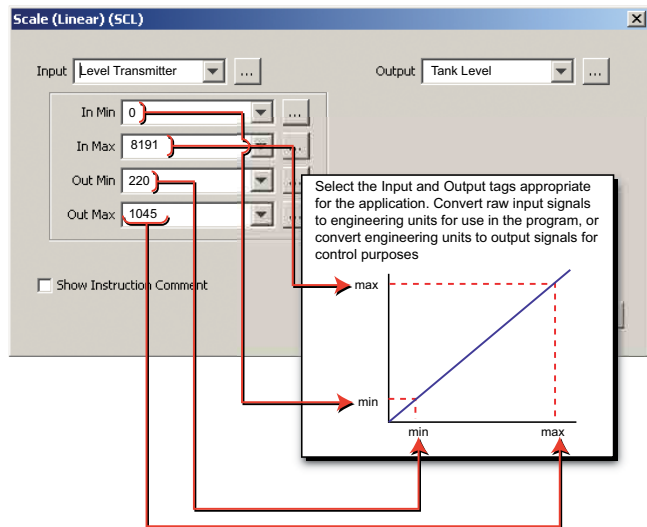
1. Cable + ZIPLink Module = Complete System

2. ZL-RTB-COM provides a common connection point for power or ground

Linear Scaling

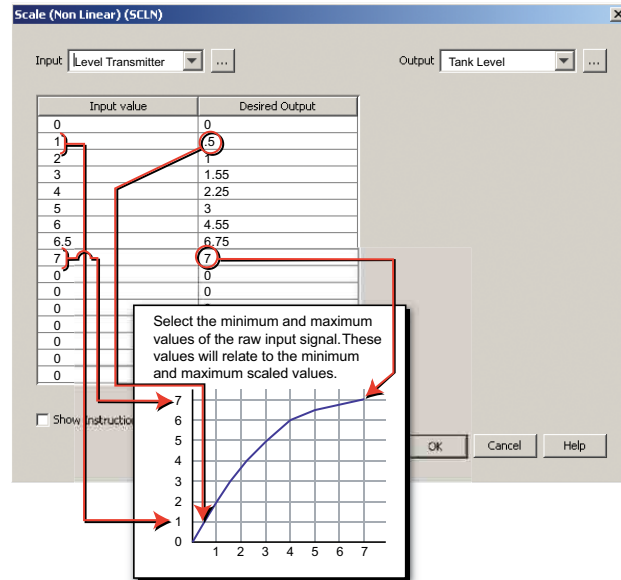
The Scale (Linear) function can be used to:

- 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.



Non-Linear Scaling

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



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

Diagnostic/Status

Under Range Error	1 bit per channel
Over Range Error	1 bit per channel
Module Failed	1 bit per module
Missing 24V	1 bit per module

Terminal Block Specifications

Part Number	P1-10RTB	P1-10RTB-1
Positions	10 Screw Terminals	10 Spring Clamp Terminals
Wire Range	30–16 AWG (0.051–1.31 mm²) 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 mm²) Solid / Stranded Conductor 3/64 in (1.2 mm) Insulation Max. 19/64 in (7–8 mm) Strip Length
Conductors	*USE COPPER CONDUCTORS, 75°C* or equivalent.	
Screw Driver	0.1 in (2.5 mm) Maximum*	
Screw Size	M2	N/A
Screw Torque	2.5 lb-in (0.28 N-m)	N/A

*Recommended Screw Driver TW-SD-MSL-1

Document Name	Edition/Revision	Date
P1-4ADL2DAL-2-DS	4th Edition	12/12/2022