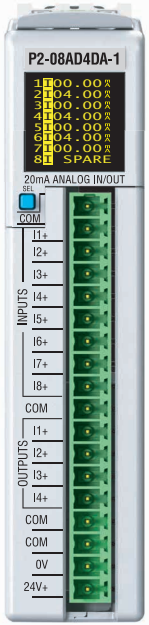
General Specifications

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	2.47 W
Overvoltage Category	II
Enclosure Type	Open Equipment
Module Keying to Backplane	Electronic
Module Location	Any I/O slot in a Productivity2000 System
Field Wiring	Use ***ZIP***Link Wiring System or removable terminal block (not included). See "Wiring Options" on page 5.
Connector Type (not included)	18-Position Removable Terminal Block
Weight	90g (3.2 oz)
Agency Approvals	UL 61010-1 and UL 61010-2-201 File E139594, Canada & USA CE (EN 61131-2 EMC, EN 61010-1 and EN 61010-2-201 Safety)*

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



P2-8AD4DA-1 Analog Input/Output

The P2-8AD4DA-1 Current Analog Input/Output Module provides eight channels of 0–20 mA inputs and four channels of 4–20 mA outputs for use with the Productivity2000 System.

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Terminal Block sold separately, (see wiring options on page 3).
Warranty: Thirty-day money-back guarantee. Two-year limited replacement. (See www.productivity2000.com for details).

Input Specifications

Input Channels	8
Module Signal Input Range	0–20 mA
Signal Resolution	12–16 bit, depending on input resolution
Input Resolution & Update Rate (See Note 1)	Fine: 8ms, 0.305 µA, 16 bit Medium: 2ms, 1.22 µA, 14 bit Coarse: 700µs, 4.88 µA, 12 bit
Data Range	0–65535 counts
Input Type	Sinking, Single Ended (1 common)
Maximum Continuous Overload	±31mA
Input Impedance	250Ω ±0.1%, 1/4W
Hardware Filter Characteristics	Low pass 1st order, -3dB @ 48Hz
All Channel Update Rate (See Note 2)	Fine 57ms Medium: 17ms Coarse: 7ms
Open Circuit Detection Time	Zero reading within 1s
Conversion Method	Successive approximation
Accuracy vs. Temperature	±15ppm/°C maximum
Maximum Inaccuracy	0.1% of range
Linearity Error (end to end)	0.015% of range maximum Monotonic with no missing codes
Input Stability and Repeatability	±0.015% of range (after 10 minute warm-up)
Full Scale Calibration Error (not including offset)	±0.05% of range maximum
Offset Calibration Error	±0.05% of range maximum
Maximum Crosstalk	-96dB ±1 -0.015% of full scale maximum
Recommended Fuse (external)	Edison S500-32-R, 0.032 A fuse
External DC Power Required	24VDC (-20% / +25%), 145mA

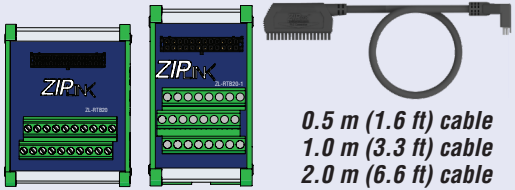
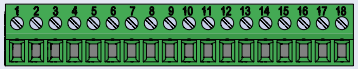
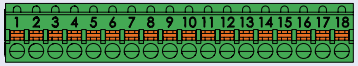
Note 1: The Input Resolution of Fine returns 16 bit resolution. Medium and Coarse are 14 and 12 bit respectively. The 12 and 14 bit input values are scaled to 0-65535.

Note 2: Valid when all channels are set for the same Input Resolution.

Output Specifications

Output Channels	4
Module Signal Output Range	4–20 mA
Output Signal Resolution	16-bit
Resolution Value of LSB (least significant bit)	0.244 µA / count 1 LSB = 1 count
Data Range	0–65535 counts
Output Type	Current sourcing: 20mA max (1 common)
Output Value in Fault Mode	≤ 4mA
Load Impedance (Minimum External Power Supply)	0–480 Ω (19.2 VDC) 0–600 Ω (21.6 VDC) 0–715 Ω (24VDC) 0–840 Ω (26.4 VDC) 0–1010 Ω (30VDC)
Maximum Inductive Load	1mH
Allowed Load Type	Grounded
Maximum Inaccuracy	0.1% of range
Maximum Full Scale Calibration Error (not including offset error)	±0.065% of full scale
Maximum Offset Calibration Error	±0.065% of full scale
Accuracy vs. Temperature	±15ppm/°C max full scale calibration change (±0.0025% of range/°C)
Max Crosstalk	-96dB, 1 LSB
Linearity Error (End to End)	±0.015% of range maximum Monotonic with no missing codes
Output Stability and Repeatability	±0.015% after 10 minute warm-up typical
Output Ripple	0.01% of full scale at 50/60 Hz
Output Setting Time	Rising Time 200µs Falling Time 135µs (full scale change)
All Channel Update Rate	3.55 ms
Maximum Continuous Overload	Outputs open circuit protected
Type of Output Protection	Electronically current limited to 20mA or less
Output Signal (power-up, -down)	≤ 4mA

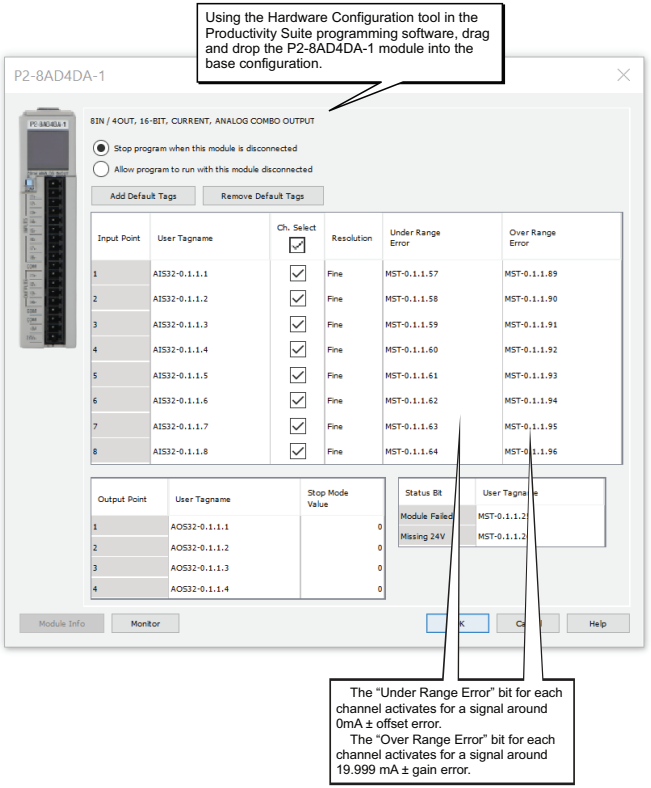
Wiring Options

1	***ZIP*Link Feed Through *Modules and Cables*[1]**	ZIPLINK AUTOMATIONDIRECT
		ZL-RTB20 ZL-RTB20-1
	0.5 m (1.6 ft) cable ***1.0 m (3.3 ft) cable*** ***2.0 m (6.6 ft) cable***	ZL-P2-CBL18 ZL-P2-CBL18-1 ZL-P2-CBL18-2
2	***Terminal Block with pigtail cable***	
		
	1.0 m (3.3 ft) cable ***2.0 m (6.6 ft) cable***	ZL-P2-CBL18-1P ZL-P2-CBL18-2P
3	***Screw Terminal Block only***	
		P2-RTB (Quantity 1)
4	***Spring Clamp Terminal Block only***	
		P2-RTB-1 (Quantity 1)
5	***Accessories*[2]**	
		ZL-RTB-COM TW-SD-SL-1 TW-SD-MSL-1

1.Cable + ***ZIP***Link Module = Complete System

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

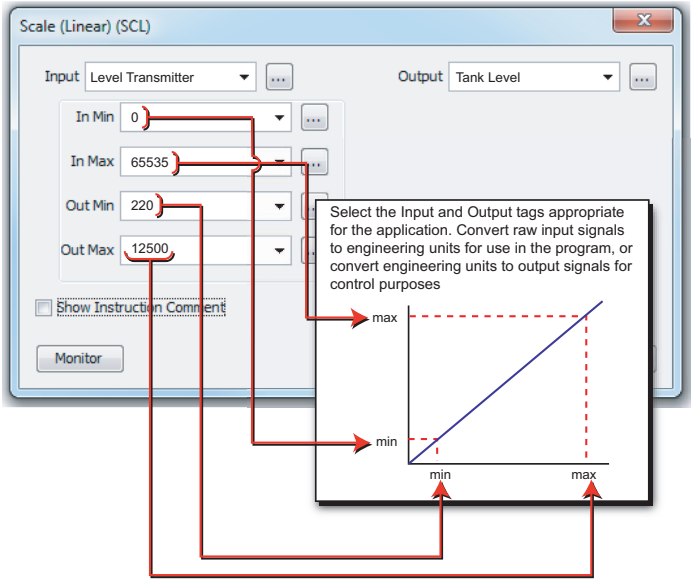
Module Configuration



Linear Scaling

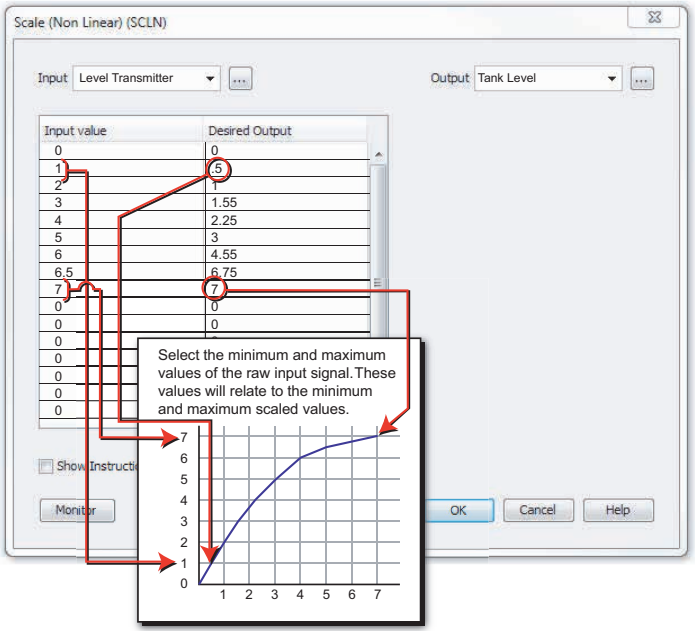
The Scale (Linear) function can be used to:

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

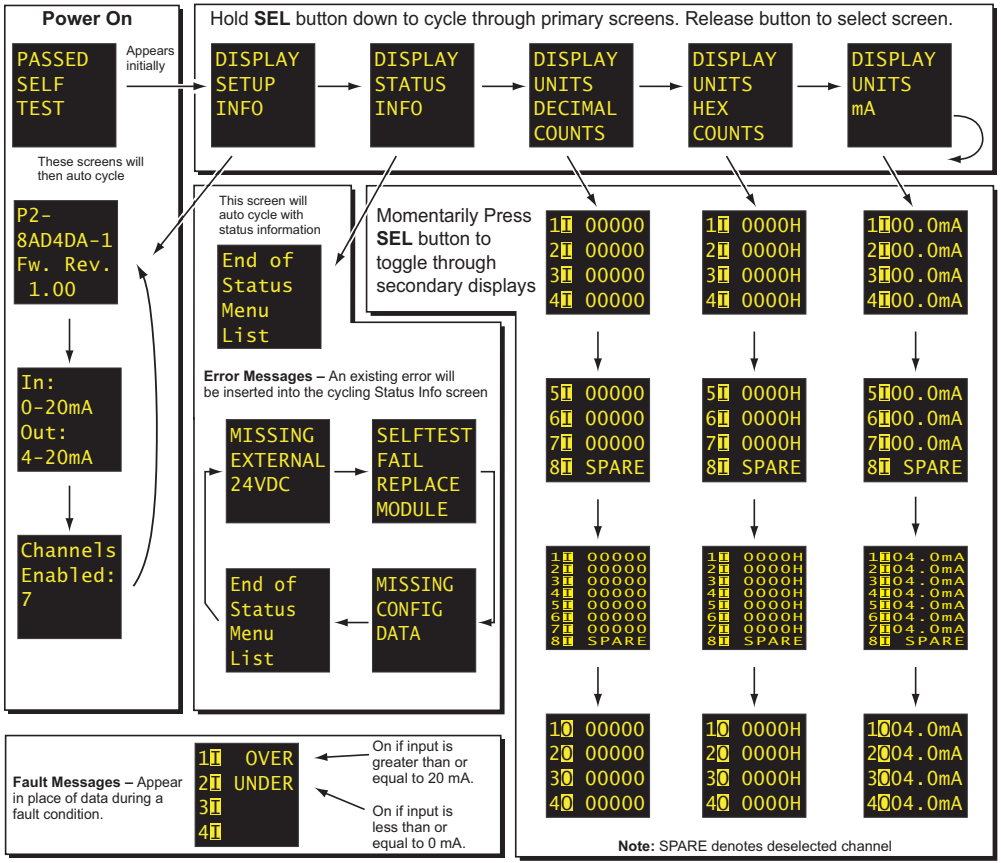


Non-Linear Scaling

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

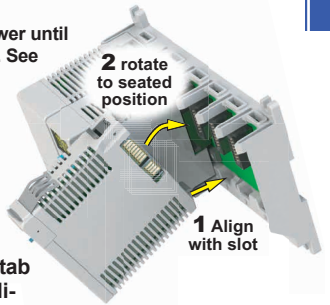


OLED Panel Display



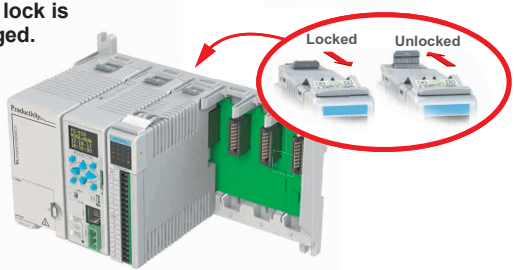
Module Installation

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

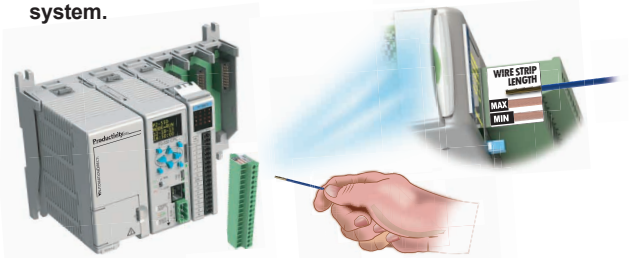


Step One: Align module catch with base slot and rotate module into connector.

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.



QR Code

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

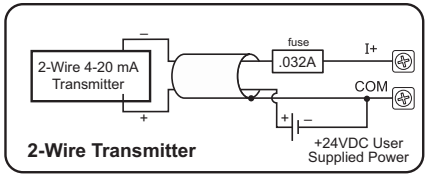
Caution: *If possible, remove field power prior to proceeding. If not, then **EXTREME** care **MUST** be taken to prevent damage to the module, or even personal injury due to a short circuit from the live terminal block.*

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.

Wiring Diagram

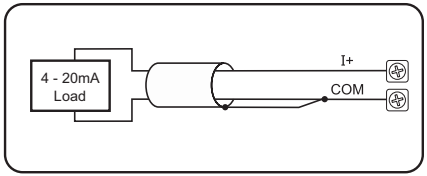
Current Input Circuits



An Edison S500-32-R 0.032A fast-acting fuse is recommended for all 4-20 mA current loops.

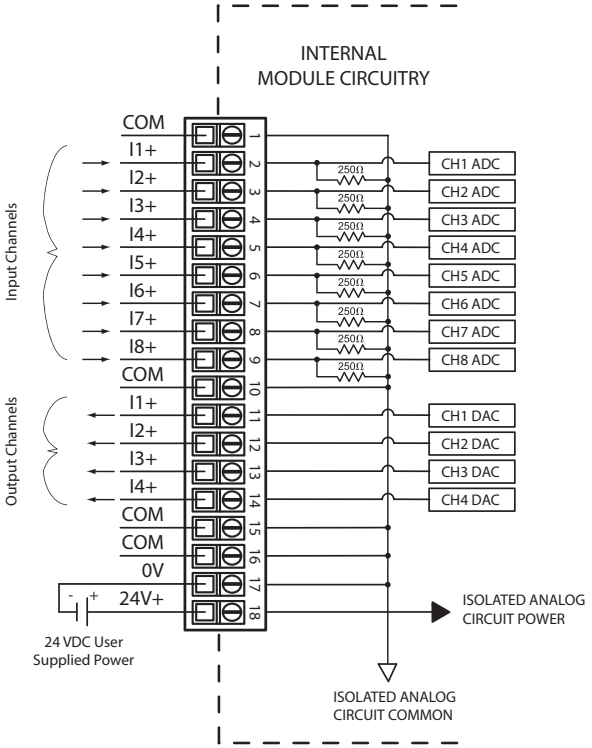
Note: Do not connect both ends of shield.

Current Output Circuits



Note: Shield is connected to common at the source device.

Schematic



Note: This module includes input and output channels. Before connecting field wiring, verify that you are connecting to the appropriate terminals

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.

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Removable Terminal Block Specifications

Part Number	**P2-RTB**	**P2-RTB-1**
Number of positions	18 Screw Terminals	18 Spring Clamp Terminals
Wire Range	30–16 AWG (0.051–1.31 mm²) Solid / Stranded Conductor 3/64 in. (1.2 mm) Insulation Maximum 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 Maximum 19/64 in (7–8 mm) Strip Length
Conductors	"USE COPPER CONDUCTORS, 75ºC" or equivalent.	
Screw Driver Width	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 Screwdriver TW-SD-MSL-1

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

Document Name	Edition/Revision	Date
P2-8AD4DA-1-DS	2nd Ed., Rev. A	2/11/2022