P2-16ADL-2 Analog Input

The P2-16ADL-2 Low Resolution Voltage Analog Input Module provides sixteen channels for receiving 0-10 VDC signals for use with the Productivity2000 System.

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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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Connector Specifications

Connector Type	24-Pin Molex Style 43025-2400
Number of pins	24
Pin Spacing	3x3mm (0.118 x 0.118in.)

Terminal Block sold separately, (see wiring options on page 5).
Warranty: Thirty-day money-back guarantee. Two-year limited replacement. (See www.productivity2000.com for details).

General Specifications

Surrounding Air 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	1100mW max
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 ZIPLink Wiring System ONLY. See “Wiring Options” on page 5. Must use copper conductors 75°C or equivalent
Terminal Type	24-point ZIPLink
Weight	102g (3.6 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)*

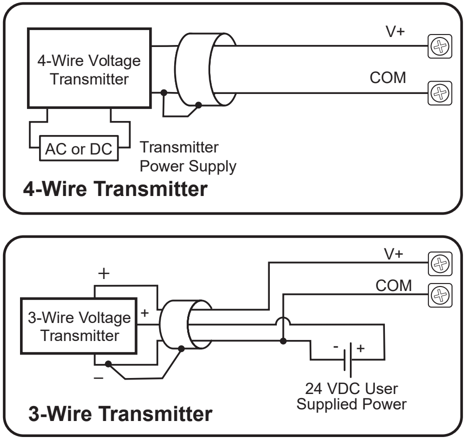
*Meets EMC and Safety requirements. See the D.O.C. for details.

Input Specifications

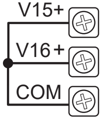
Input Channels	16
Module Signal Input Range	0–10 VDC
Signal Resolution	13-bit
Resolution of LSB (least significant bit)	0–10 VDC = 1.22 mV per count (1LSB = 1 count)
Data Range	0–8191 counts
Input Type	Single-ended (1 common)
Maximum Continuous Overload	±100VDC
Input Impedance	>150kΩ
Filter Characteristics	Low Pass, -3dB @ 500Hz
Sample Duration Time	6.25 ms per channel (does not include ladder scan time)
All Channel Update Rate	25ms
Accuracy vs. Temperature	±75PPM / °C maximum
Conversion Method	Successive approximation
Maximum Inaccuracy	0.5% of range (including temperature drift)
Linearity Error (end to end)	±0.036% of range Monotonic with no missing codes
Input Stability and Repeatability	±0.024% of range
Full Scale Calibration Error (including offset)	±0.097% of range
Offset Calibration Error	±0.097% of range
Max Crosstalk	4 counts / 0.048% of range
External 24VDC Power Required	24VDC (-20% / +25%), 35mA

Wiring Diagram

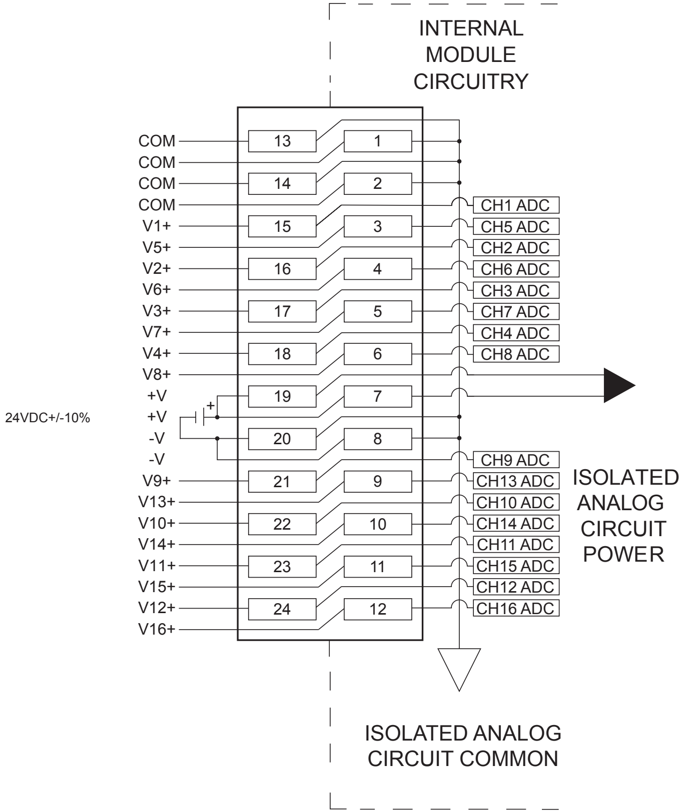
Voltage Input Circuits



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



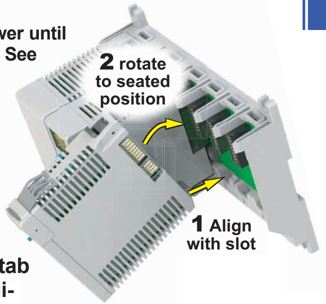
Schematic



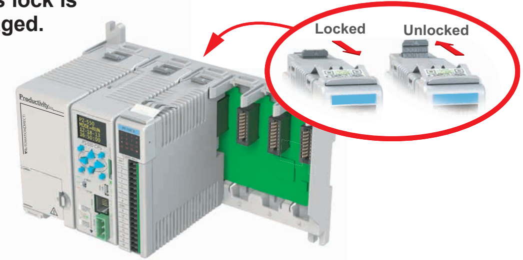
Module Installation

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

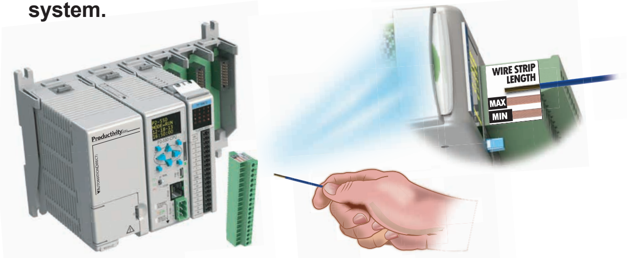
Step One: Align module catch with base slot and rotate module into connector.



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 PAC supports hot-swap! Individual modules can be taken offline, removed, and replaced while the rest of the PAC 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 Options

1 *ZIP*Link Feed Through Modules and Cables[1]

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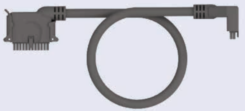
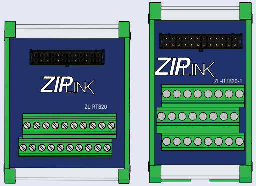


ZIPLink pre-wired terminal block cables

0.5m (1.6FT) cable	ZL-P2-CBL24
1.0m (3.3FT) cable	ZL-P2-CBL24-1
2.0m (6.6FT) cable	ZL-P2-CBL24-2



ZIPLink Modules

ZL-RTB20

ZL-RTB20-1

2 Terminal Block with pigtail cable

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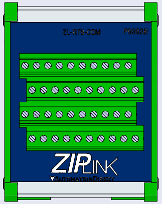
1.0m (3.3FT) cable	ZL-P2-CBL24-1P
2.0m (6.6FT) cable	ZL-P2-CBL24-2P

3 Accessories[2]



ZL-RTB-COM

TW-SD-SL-1

TW-SD-MSL-1

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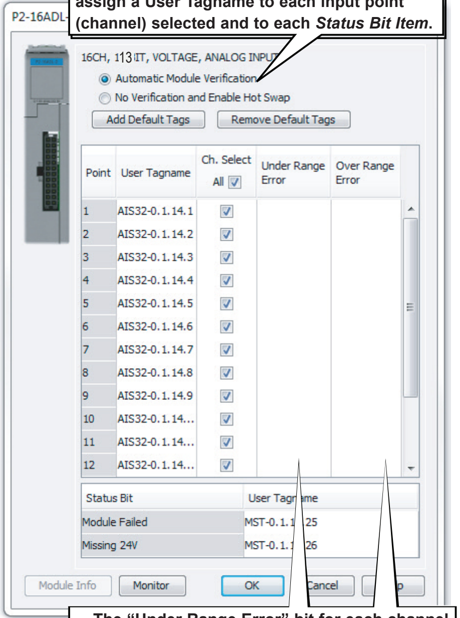
1. Cable + ***ZIP***Link Module = Complete System
2. ZL-RTB-COM provides a common connection point for power or ground

Module Configuration

Using the Hardware Configuration tool in the Productivity Suite programming software, drag and drop the P2-16ADL-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*.



16CH, 113 IT, VOLTAGE, ANALOG INPUT

● Automatic Module Verification

○ No Verification and Enable Hot Swap

Point	User Tagname	Ch. Select All ☑	Under Range Error	Over Range Error
1	AIS32-0.1.14.1	☑		
2	AIS32-0.1.14.2	☑		
3	AIS32-0.1.14.3	☑		
4	AIS32-0.1.14.4	☑		
5	AIS32-0.1.14.5	☑		
6	AIS32-0.1.14.6	☑		
7	AIS32-0.1.14.7	☑		
8	AIS32-0.1.14.8	☑		
9	AIS32-0.1.14.9	☑		
10	AIS32-0.1.14...	☑		
11	AIS32-0.1.14...	☑		
12	AIS32-0.1.14...	☑		

Status Bit	User Tagname
Module Failed	MST-0.1.1 25
Missing 24V	MST-0.1.1 26

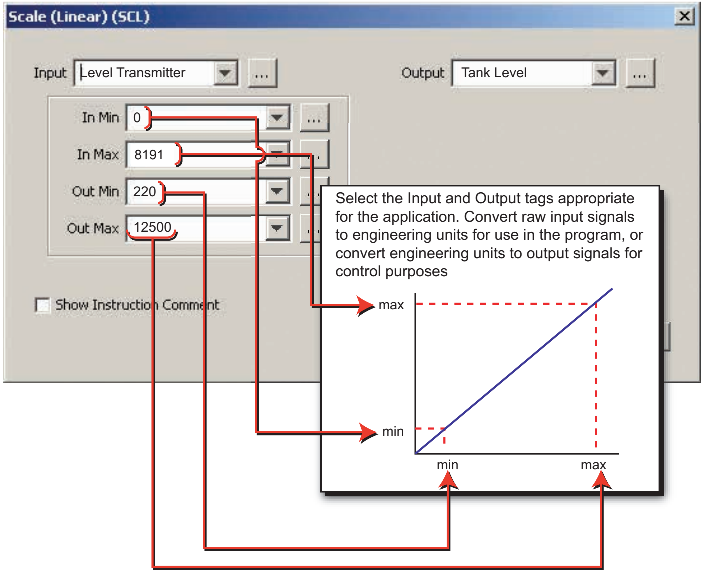
The "Under Range Error" bit for each channel activates for a signal around 0V ± offset error.

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

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.**



Input: Level Transmitter

Output: Tank Level

In Min: 0

In Max: 8191

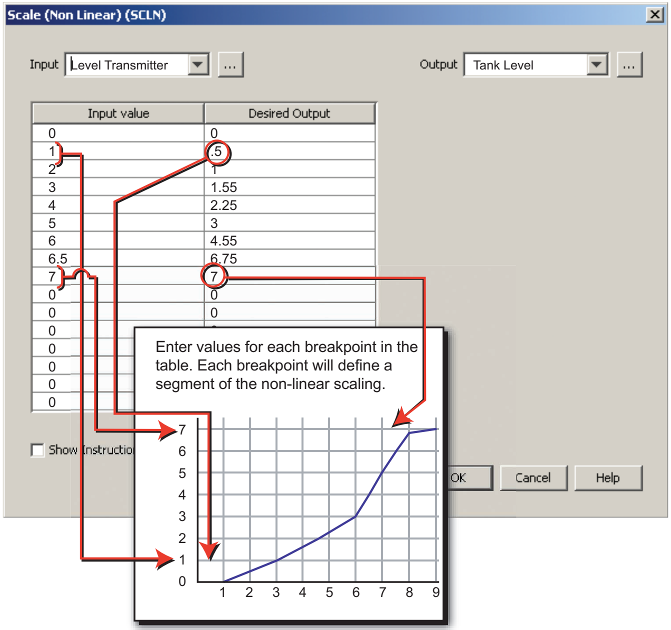
Out Min: 220

Out Max: 12500

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

Non-Linear Scaling

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



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	

Enter values for each breakpoint in the table. Each breakpoint will define a segment of the non-linear scaling.

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
P2-16ADL-2-DS	3rd Ed.	12/12/2022