

Analog Input Modules (ROC800-Series)

The 12-bit Analog Input (AI-12) module and 16-bit Analog Input (AI-16) module for the ROC800-Series Remote Operations Controller (ROC) provide the ROC with the ability to monitor various analog field values.

The AI modules provide four analog input channels. The AI channels are scalable, but are typically used to measure either a 4-20 mA analog signal or a 1-5 V dc signal. If required, the low end of the AI module's analog signal can be calibrated to zero.

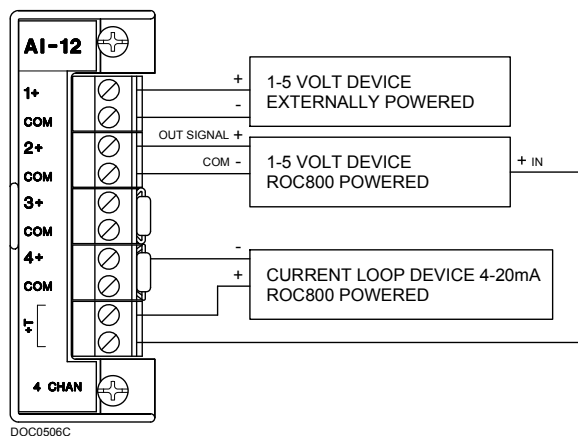
AI modules can provide isolated +12 V dc or +24 V dc field transmitter power (jumper selectable). For example, one module can provide +12 V dc for powering low-power analog transmitters, while another module in the same ROC800-Series can provide +24 V dc for powering conventional 4-20 mA transmitters.

The AI-16 module detects over-range input conditions, with diode-clamping on the inputs providing module protection.

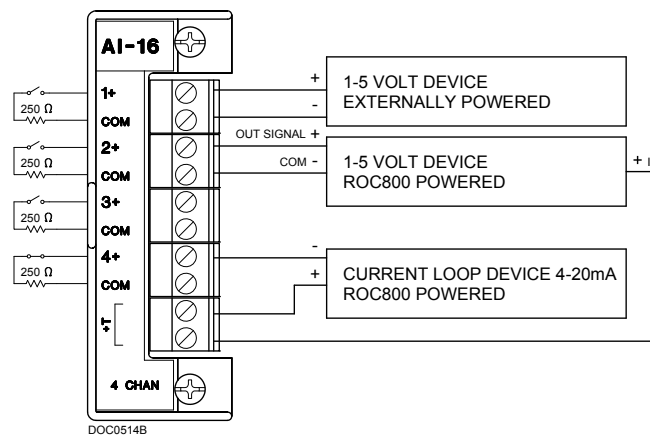
The need for fuses on all ROC800-Series Input/Output (I/O) modules has been eliminated through the extensive use of current-limiting, short-circuit protection, and surge protection techniques. This results in less maintenance for remote locations. I/O modules are self-resetting after a fault clears.

Each module provides 1500 V dc of isolation from other modules and the backplane including power and signal isolation.

AI modules provide isolated loop-power (+T) sources with integrated short-circuit protection. This protection limits the amount of current (+T) during a short-circuit and auto-recovers after the fault clears.



AI-12 Wiring



AI-16 Wiring

Technical Specifications

Compatibility and Installation

AI-12 modules can be installed in the following module slots.

	Series 1 ROC809	Series 1 ROC827	Series 2 ROC809	Series 2 ROC827
Slot	Any	Any	Any	Any

AI-16 modules with a gray faceplate can be installed in the following module slots.

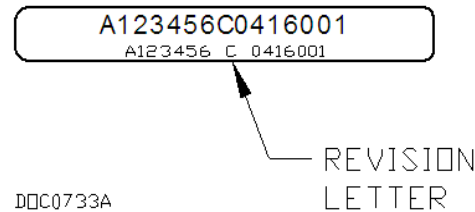
	Series 1 ROC809	Series 1 ROC827	Series 2 ROC809	Series 2 ROC827
Slot	Any	Any	Not currently supported	Not currently supported

AI-16 modules with a black faceplate can be installed in the following module slots.

	Series 1 ROC809	Series 1 ROC827	Series 2 ROC809	Series 2 ROC827
Slot	Any with firmware version 2.13 or greater	Any with firmware version 2.13 or greater and back-plane version 1.04 or greater	Any	Any

All modules can easily be installed or removed from the module slots by removing the two captive screws accessible from the front of the unit. AI-12 modules (Rev. C or later) and all AI-16 modules are hot-swappable, meaning the module can be removed and another module, of the same kind, can be installed under power. AI-12 modules (Rev. C or later) and all AI-16 modules are hot-pluggable, meaning they may be installed directly into unused module slots under power. The modules are also self-identifying via ROCLINK™ 800 Configuration software.

To determine the revision level of your module, power off the ROC and remove the module. Locate the label on the module's board. The label consists of a single letter (the revision level) surrounded by two letter/number sequences.



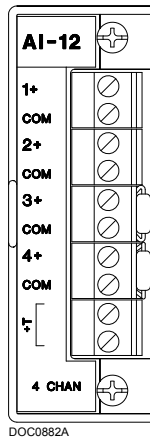
DOC0733A

Module Revision Letter

All modules have removable terminal blocks for convenient wiring and servicing. The terminal blocks can accommodate a wide range of wire gauges (12 to 22 AWG).

AI-12 Module (ROC800-Series)

Field Wiring Terminals



Terminal	Label	Definition
1	1+	Positive Analog Input
2	COM	Common Analog Input
3	2+	Positive Analog Input
4	COM	Common Analog Input
5	3+	Positive Analog Input
6	COM	Common Analog Input
7	4+	Positive Analog Input
8	COM	Common Analog Input
9	+T	Loop Power
10	+T	Loop Power

Inputs

Quantity	Four channels.	
Type	Single-ended, voltage sense.	
Resolution	12 bits.	
Voltage	0-5 V dc, 1.22 mV/count.	
Impedance	10 MΩ typical (without scaling resistor).	
Maximum Overload Voltage	±24 V continuous.	
Reference Accuracy ¹ (after calibration) at 25°C (77°F)	Voltage Input	±0.125%.
Accuracy ¹ Over Operating Temperature Range [-40 to 75°C (-40 to 167°F)]	Voltage Input	±0.875%.
Minimum Scan Period	50 ms for all channels.	
Scaling Resistor	On-connector, 250 Ω precision (0.1%) resistor supplied for each channel.	

Isolation

Field to Logic	1500 V dc, 1 minute minimum.	
Field to Power	1500 V dc, 1 minute minimum.	
Module to Module	1500 V dc, 1 minute minimum.	

Power

Consumption	Main power supply loading at the battery terminals (at 12.0 V dc): 84 mA typical.				
	Additional loading that may apply:	<table border="1"> <tbody> <tr> <td>+T @ 12V</td> <td>1.25 multiplied by current draw at +T terminal.</td> </tr> <tr> <td>+T @ 24V</td> <td>2.5 multiplied by current draw at +T terminal.</td> </tr> </tbody> </table>	+T @ 12V	1.25 multiplied by current draw at +T terminal.	+T @ 24V
+T @ 12V	1.25 multiplied by current draw at +T terminal.				
+T @ 24V	2.5 multiplied by current draw at +T terminal.				
Loop Power	+T Sensor Supply Voltage	Jumper selectable between 12 V dc and 24 V dc.			
	+T Sensor Supply Current	85 mA at nominal 12 or 24 V dc.			

1. Includes: Linearity, Hysteresis, Repeatability, and Stability. Accuracy based on 1-5 V dc (4-20 mA) operating range.

Technical Specifications

Physical

Dimensions	26 mm W by 75 mm H by 133 mm D (1.03 in. W by 2.96 in. H by 5.24 in. D).
Weight	56.7 g (2.0 oz).
Wiring	12 to 22 AWG at the removable terminal block.

Environmental

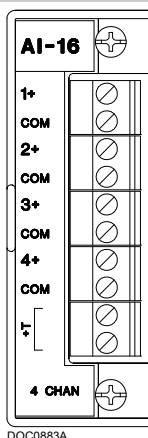
Same as the ROC800 in which it is installed.

Approvals

Same as the ROC800 in which it is installed.

AI-16 Module (ROC800-Series)

Field Wiring Terminals



Terminal	Label	Definition
1	1+	Positive Analog Input
2	COM	Common Analog Input
3	2+	Positive Analog Input
4	COM	Common Analog Input
5	3+	Positive Analog Input
6	COM	Common Analog Input
7	4+	Positive Analog Input
8	COM	Common Analog Input
9	+T	Loop Power
10	+T	Loop Power

Inputs

Quantity	Four channels.	
Type	Single-ended, voltage sense.	
Resolution	16 bits.	
Voltage	0 to 5.5 V dc, 91.55 μ V/count.	
Impedance	10 M Ω typical (without scaling resistor).	
Maximum Overload Voltage	\pm 24V continuous.	
Reference Accuracy ¹ (after calibration) at 25°C (77°F)	Voltage Input	\pm 0.004%
	Current Input	\pm 0.004%
Accuracy ¹ Over Operating Temperature Range [-40 to 75°C (-40 to 167°F)]	Voltage Input	\pm 0.09%
	Current Input	\pm 0.175%
Minimum Scan Period	100 milliseconds for all channels.	
Scaling Resistor	On-board, switch-selectable 250 Ω precision (0.1%) resistor supplied for each channel.	

1. Includes: Linearity, Hysteresis, Repeatability, and Stability. Accuracy is based on 1-5 V dc (4-20 mA) operating range

Isolation			
Field to Logic	1500 V dc, 1 minute minimum.		
Field to Power	1500 V dc, 1 minute minimum.		
Module to Module	1500 V dc, 1 minute minimum.		
Power			
Consumption	Main power supply loading at the battery terminals (at 12.0 V dc): 84 mA typical.		
	Additional loading that may apply:	+T @ 12V	1.25 multiplied by current draw at +T terminal.
		+T @ 24V	2.5 multiplied by current draw at +T terminal.
Loop Power	+T Sensor Supply Voltage	Jumper selectable between 12 V dc and 24 V dc.	
	+T Sensor Supply Current	85 mA at nominal 12 or 24 V dc.	
Physical			
Dimensions	26 mm W by 75 mm H by 133 mm D (1.03 in. W by 2.96 in. H by 5.24 in. D).		
Weight	58.9 g (2.0 oz).		
Wiring	12 to 22 AWG at the removable terminal block.		
Environmental			
Same as the ROC800 in which it is installed.			
Approvals			
Same as the ROC800 in which it is installed.			