SNAP ANALOG INPUT MODULES

Features

- Resolution = 0.004% of nominal range
- Two, 4, 8, or 32 single-ended inputs per module
- Out-of-range indication
- Factory calibrated; no user adjustment necessary



SNAP Analog Input Modules

DESCRIPTION

SNAP analog input modules are part of Opto 22's SNAP PAC System. All of these modules mount on a SNAP PAC rack with a SNAP PAC brain or R-series controller.

A minimum number of SNAP module types support a full range of analog input requirements. These software-configurable modules handle a wide variety of signal levels. They provide high resolution (0.004% of nominal range) for precise signal levels, as well as multiple-channel packaging. All SNAP analog modules are factory calibrated and individually tested.

SNAP analog input modules have an on-board microprocessor to provide module-level intelligence, which makes them an ideal choice for Original Equipment Manufacturers (OEMs). For additional information about the standalone operation of SNAP analog modules, see Opto 22 form #0876, *SNAP I/O Module Integration Guide*.

Notes for legacy hardware: Some of these modules also work with older Opto 22 I/O processors (brains or on-the-rack controllers) and M-series or B-series racks. To check processor compatibility, see the table on page 3.

Specifications begin on page 4. For dimensional drawings, see pages 40–51.

IMPORTANT: Any system using analog sensors and input modules should be calibrated annually for analog signals. For I/O units on a SNAP PAC System, use the PAC Control™ commands "Calculate and Set Offset" and "Calculate and Set Gain." For other Ethernet-based I/O units, you can also use PAC Manager™ software to calculate and set offset and gain.

Isolation

All SNAP analog input modules are isolated from all other modules and from the SNAP I/O processor. The modules in this data sheet do not have channel-to-channel isolation, however. (If you need isolated analog modules, see Opto 22 form #1182.)

Part Numbers

Part	Description	Page
SNAP-AIARMS	2-channel 0 to 10 amp RMS AC/DC input	4
SNAP-AIMA	2-channel analog current input, -20 to +20 mA	6
SNAP-AIMA-4	4-channel analog current input -20 to +20 mA	6
SNAP-AIMA-8	8-channel analog current input -20 to +20 mA	9
SNAP-AIMA-32	32-channel analog current input -20 to +20 mA	10
SNAP-AIRATE **[OBSOLETE]**	**[OBSOLETE]** 2-channel 0–25,000 Hz analog rate input	13
SNAP-AIR40K-4	4-channel analog resistor/thermistor input, 40 K Ohms, 20 K Ohms, 10 K Ohms, or 5 K Ohms	15
SNAP-AIR400K-8	8-channel analog resistor/thermistor input, 400 K Ohms	16
SNAP-AIRTD	2-channel 100 ohm platinum RTD input	20
SNAP-AIRTD-1K	2-channel 1000 ohm platinum RTD input	20
SNAP-AIRTD-10	2-channel 10 ohm copper RTD input	20
SNAP-AIRTD-8U	8-channel multifunction RTD/resistance input	22
SNAP-AICTD	2-channel analog temperature input, ICTD	25
SNAP-AICTD-4	4-channel analog temperature input, ICTD	25
SNAP-AICTD-8	8-channel analog temperature input, ICTD	27
SNAP-AITM	2-channel analog type E, J, or K thermocouple or -150 to +150 mV input or -75 to +75 mV input	28
SNAP-AITM-2	2-channel analog type B, C, D, G, N, T, R, or S thermocouple or -50 to +50 mV DC or -25 to +25 mV DC input	30
SNAP-AITM-8	8-channel B, C, D, E, G, J, K, N, R, S, or T thermocouple or -75 to +75 mV, -50 to +50 mV, or -25 to +25 mV input	30
SNAP-AIVRMS	2-channel 0 to 250 V RMS AC/DC input	31
SNAP-AIV	2-channel analog voltage input -10 to +10 VDC or -5 to +5 VDC	32
SNAP-AIV-4	4-channel analog voltage input -10 to +10 VDC or -5 to +5 VDC	32
SNAP-AIV-8	8-channel analog voltage input -10 to +10 VDC or -5 to +5 VDC	34
SNAP-AIV-32	32-channel analog voltage input -10 to +10 VDC or -5 to +5 VDC	35
SNAP-AIMV2-4	4-channel -50 to +50 mV input or -25 to +25 mV input	37
SNAP-AIMV-4	4-channel -150 to +150 mV input or 75 to +75 mV input	38

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INSTALLATION

Note module and processor compatibility in the following table:

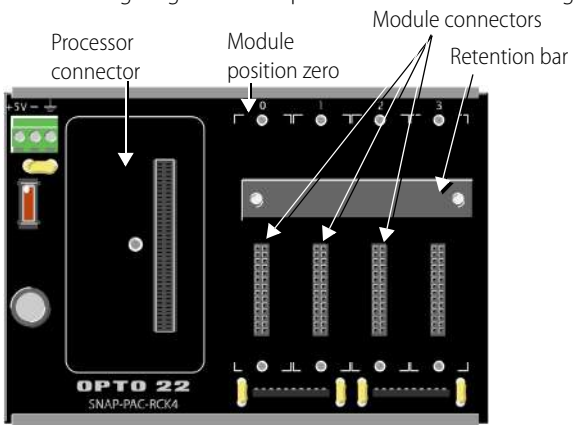
Modules	Compatible I/O Processors
32-channel inputs 8-channel inputs SNAP-AIRTD-10 SNAP-AIRTD-1K	SNAP PAC R-series controllers and SNAP PAC brains, including Wired+Wireless models
4-channel inputs	SNAP PAC R-series controllers and SNAP PAC brains, including Wired+Wireless models Also the following legacy brains: SNAP Ethernet, SNAP Simple, SNAP Ultimate; SNAP-DNP-ASDS; SNAP OEM
2-channel inputs (except SNAP-AIRTD-10 and SNAP-AIRTD-1K)	SNAP PAC R-series controllers and SNAP PAC brains, including Wired+Wireless models Also the following legacy brains: SNAP Ethernet, SNAP Simple, SNAP Ultimate; SNAP-DNP-ASDS; SNAP OEM; serial SNAP brains (B3000, Modbus, Profibus); B3000-HA; B6

All modules can be used with SNAP PAC racks and can be placed in any position on the rack. Two- and four-channel modules (except the SNAP-AIRTD-10 and SNAP-AIRTD-1K) can also be used with legacy SNAP M-series and B-series mounting racks. (For more information on using legacy hardware, see form #1688, the *SNAP PAC System Migration Technical Note*.)

Modules snap securely into place in the row of connectors on the mounting rack. Each module connector has a number. Analog input modules and other types of SNAP I/O modules are mounted on the module connectors starting at module position zero.

Modules require a special tool (provided) for removal.

The following diagram shows part of a SNAP PAC mounting rack.



1. Place the rack so that the module connector numbers are right-side up, with zero on the left, as shown in the diagram above. (If your rack has screw connectors, the screw connectors will be at the bottom.)
2. Position the module over the module connector, aligning the small slot at the base of the module with the retention bar on the rack. When positioning modules next to each other, be sure to align the male and female module keys at the tops of the modules before snapping a module into position.
3. With the module correctly aligned, push on the module to snap it into place.
4. Use standard 4-40 x 1/2 truss-head Phillips hold-down screws to secure both sides of each module.
   CAUTION: Do not over-tighten screws. See Specifications.
5. Follow the wiring diagrams beginning on page 4 to attach modules to the devices they monitor. Most modules accept 22 to 14 AWG wire; the SNAP-AITM-8 accepts a maximum of two solid 18 AWG wires.

For faster, easier field wiring installation and maintenance, use **SNAP TEX** cables and breakout boards. See Opto 22 form #1756, the *SNAP TEX Cables & Breakout Boards Data Sheet*, for compatibility and specifications.

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VOLTAGE INPUT MODULE, -10 VDC TO +10 VDC OR -5 VDC TO +5 VDC, EIGHT CHANNELS

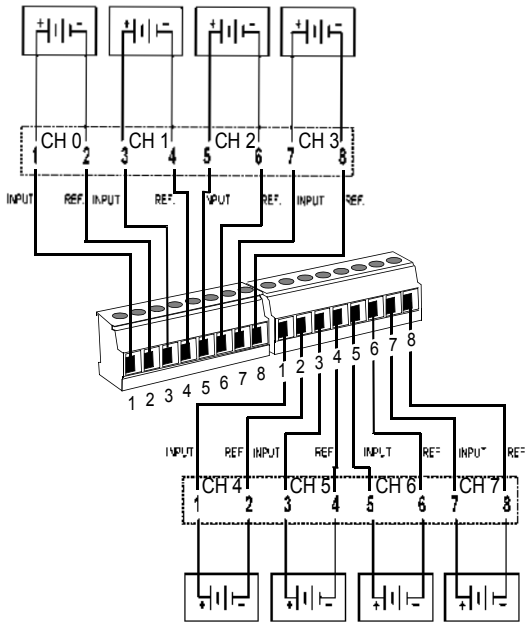
SNAP-AIV-8

Description

The SNAP-AIV-8 module can be configured for either -10 VDC to +10 VDC or -5 VDC to +5 VDC operation on each of its eight input channels. (If you need a module with more channels, see page 35.) The SNAP-AIV-8 can be used only with SNAP PAC brains and rack-mounted controllers (standard wired and Wired+Wireless models).

Note that all channels share a common reference terminal. If you need two isolated channels on the same module, see Opto22 form #1182.

Voltage Source



NOTE: Terminals 2, 4, 6, and 8 on both connectors are connected internally.



Part Number	Description
SNAP-AIV-8	Eight-channel analog voltage input -10 to +10 VDC

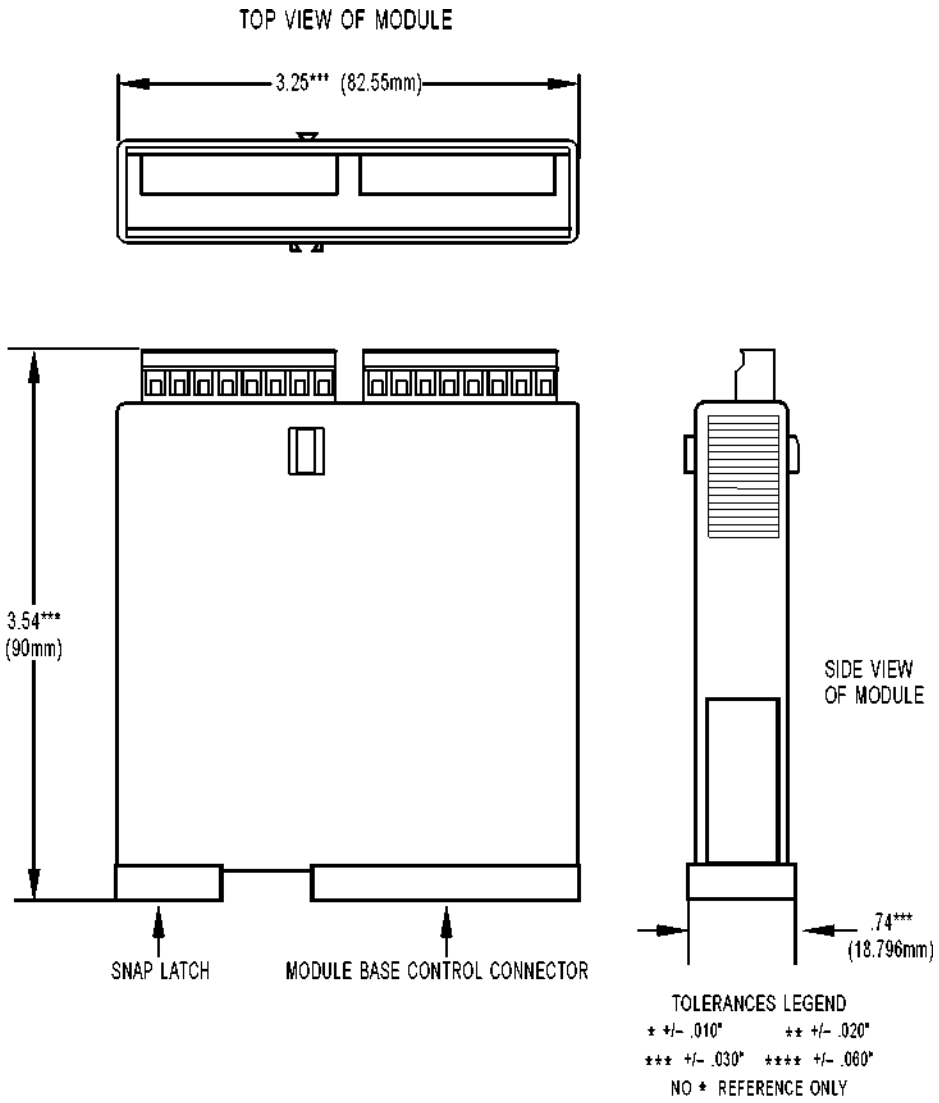
Specifications

Input Range	-10 volts to +10 volts -5 volts to +5 volts
Over-Range Limits	-11 to +11 volts (+/-10 V range) -5.5 to +5.5 volts (+/-5 V range)
Resolution	0.4 mV when configured -10 to +10 V 0.2 mV when configured -5 to +5 V
Input Filtering	-3 dB @ 64 Hz
Data Freshness (Max)	0.28 seconds
DC Common Mode Rejection	>-120 dB
AC Common Mode Rejection	>-120 dB @ 60 Hz
Maximum Survivable Input	220 VAC or 300 VDC
Maximum Operating Common Mode Voltage	250 V
Accuracy	0.05%, 5 mV @ 10 VDC 2.5 mV @ 5 VDC
Gain Temperature Coefficient	30 PPM/ °C
Offset Temperature Coefficient	15 PPM/ °C
Isolation	1500 V
Power Requirements	5 VDC (±0.15) @ 170 mA
Input Resistance	1 M ohms (all channels share the same reference point)
Ambient Temperature: Operating Storage	 -20 °C to 70 °C -40 °C to 85 °C
Humidity	5-95%, non-condensing
Torque, hold-down screws	Not to exceed 1 in-lb (0.11 N-m)
Torque, connector screws	1.7 in-lb (0.19 N-m)
Agency Approvals	CE, RoHS, DFARS
Warranty	Lifetime

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DIMENSIONAL DRAWING

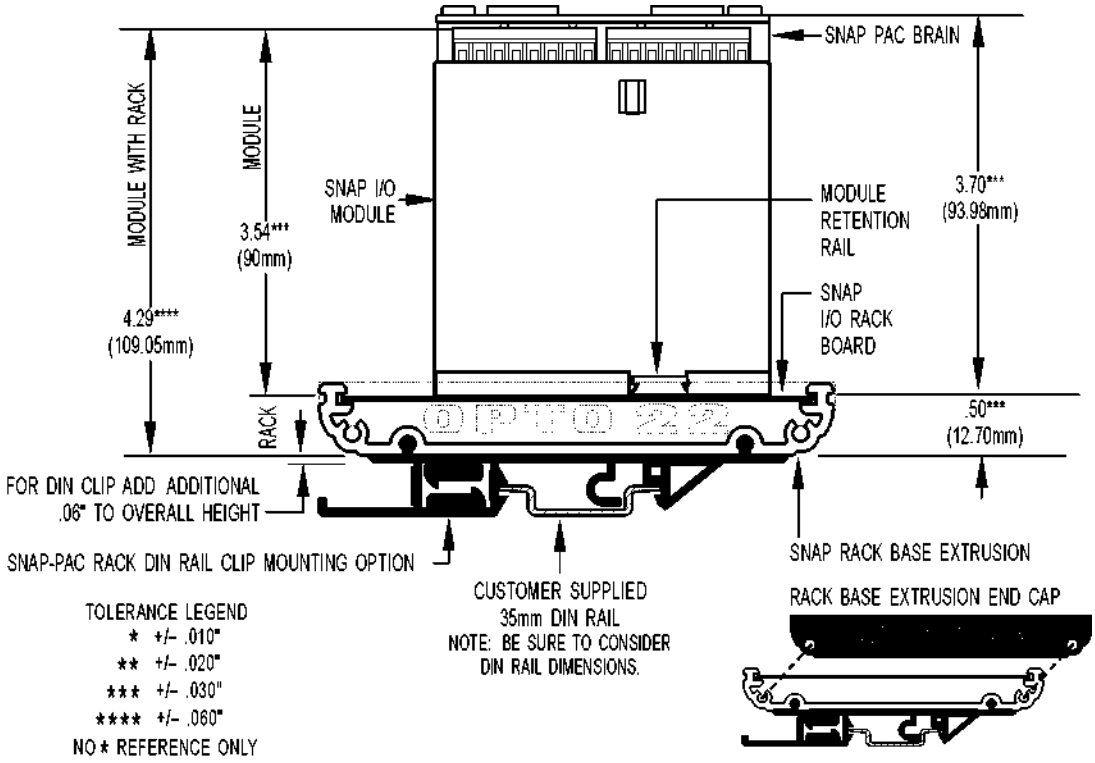
SNAP-AICTD-8, SNAP-AIMA-8, SNAP-AIV-8, and SNAP-AIR400K-8 Modules



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DIMENSIONAL DRAWING

Height on Rack: SNAP-AICTD-8, SNAP-AIMA-8, and SNAP-AIV-8



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