These products are obsolete.

OBSOLETE SNAP ANALOG I/O MODULES TECHNICAL NOTE

This technical note contains information you may need about obsolete SNAP analog I/O modules you're still using. Included are part numbers, descriptions, specifications, wiring diagrams, and dimensional drawings.

In most cases, these parts have been removed from data sheets because we no longer sell them.

This document includes information on the following obsolete SNAP analog I/O modules:

Note: Part numbers ending in FM were Factory Mutual approved prior to 2024.

For Help

As always, if you are using Opto 22 products and cannot find the help you need in this technical note, contact Opto 22 Product Support. Product support is free.

Phone: 800-TEK-OPTO
(800-835-6786 toll-free in the U.S. and Canada)
951-695-3080
Monday through Friday,
7 a.m. to 5 p.m. Pacific Time

NOTE: Email messages and phone calls to Opto 22 Product Support are grouped together and answered in the order received.

Email: support@opto22.com

Opto 22 website: www.opto22.com

When calling for technical support, be prepared to provide a complete description of your hardware and operating system to the Product Support engineer. This information should include:

- accessories installed
- type of power supply
- types of I/O modules and racks used
- third-party devices installed
- how the system is wired

MADE IN THE USA

SNAP ANALOG INPUT MODULES

This section includes information on the following obsolete SNAP analog input modules:

Part Numbers	Description	Specifications
SNAP-AIMA-32-FM	32-channel analog current input -20 to +20 mA	See page 5
SNAP-AITM-8-FM	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	See page 12
SNAP-AIV-32-FM	32-channel analog voltage input -10 to +10 VDC or -5 to +5 VDC	See page 15

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, refer to the *SNAP I/O Module Integration Guide* (form 0876).

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 in the Installation section on page 3.

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 section do not have channel-to-channel isolation. See page 16 for obsolete SNAP isolated analog modules.

Transformer isolation prevents ground loop currents from flowing between field devices and causing noise that produces erroneous readings. Ground loop currents are caused when two grounded field devices share a connection, and the ground potential at each device is different.

Isolation also protects sensitive control electronics from industrial field signals.

IMPORTANT: Since these analog input modules provide multiple single-ended input channels with a common reference, the channels are not isolated from each other. See page 16 for obsolete SNAP isolated analog modules.

Bipolar and Unipolar Input Modules

Most SNAP analog input modules are considered to be bipolar, which means the range extends equal amounts above and below zero. An example of this is the SNAP-AIV-32-FM module, which has a range of -10 to +10 VDC.

Some modules are considered unipolar, which means the range starts or ends at zero. For example, the SNAP-AIVRMS module has a range of 0 to 250 VAC because AC current cannot be negative.

These products are obsolete.

These products are obsolete.

Nominal Range and Over-range Limits

All SNAP analog input modules have a nominal range for the field signal and most support a 10% over-range limit. The nominal range is the normal range of the field signal for the module or point configuration. The over-range limit is the maximum valid field signal the module or point configuration can read outside of the nominal range. For example, the over-range limits for the SNAP-AIV are -11 and +11 VDC, and for the SNAP-AIVRMS, the over-range limit is 275 VAC.

Some modules or point configurations do not support field signals outside of the nominal range. For example, points configured as temperature inputs (thermocouple, RTD, ICTD) do not support over-range readings.

When the field signal is outside of the over-range limits of the module, the brain will not be able to determine if the value is too high or too low, so it will return an "out of range" value of -32768.0

Over-range limits only apply to input modules. Output modules are limited to their nominal ranges.

Installation

Note module and processor compatibility in the following table:

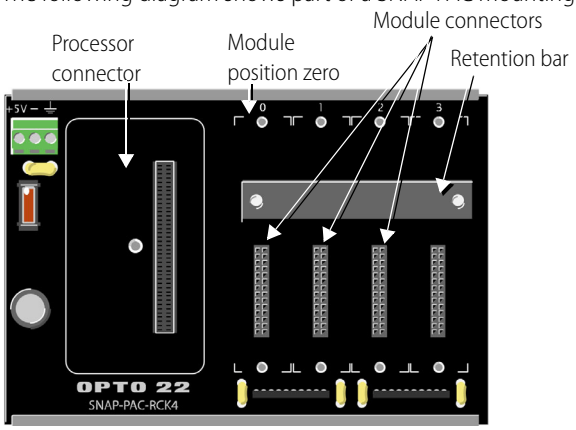
Modules	Compatible I/O Processors
32-channel inputs 8-channel inputs	SNAP PAC R-series controllers and SNAP PAC brains, including Wired+Wireless models

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 for each module to attach modules to the devices they monitor. Most modules accept 22 to 14 AWG wire; the SNAP-AITM-8-FM 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.

SNAP-AIMA-32-FM

The SNAP-AIMA-32-FM module provides 32 channels of input with an input range of -20mA to +20mA. Check the table on page 3 for I/O processor compatibility. Dimensional drawings are on page 9.

These modules DO NOT supply loop excitation current.

Channels are not isolated from each other. Since all inputs share a common reference, the module must be installed at the beginning or end of a typical 4–20 mA loop. If you use both standard and self-sourcing transmitters, put the transmitters on different modules or use different power supplies. See page 16 for obsolete SNAP isolated analog modules.

Wiring

SNAP TEX cables and a breakout rack are available separately for wiring points to field devices (see form #1756, the *SNAP TEX Cables & Breakout Boards Data Sheet*). The SNAP-HD-BF6 cable connects the module to the breakout rack, which can then be wired to field devices. (NOTE: The SNAP-HD-CBF6 wiring harness with flying leads is not recommended for this module.)

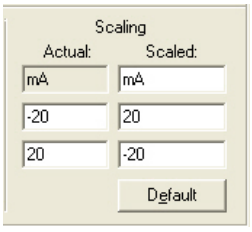
CAUTION: We strongly recommend that you use the breakout rack with these modules. Mis-wiring of any point on the module can cause severe out-of-warranty damage. The breakout rack protects the module from many wiring errors.

if you are using the module with loop power (2-wire) negative common devices, connect to the SNAP-AIMA-HDB (or -FM) rack. If you are using the module with self-powered devices (4-wire) or with devices that share a common positive connection, do not use the SNAP-AIMA-HDB (or -FM) boards, which have a current limiting diode. Instead, wire to the SNAP-AIV-HDB or SNAP-AIV-HDB-FM [OBSOLETE]. See the Alternative Wiring diagrams on page 8 for more details.

Correcting for Inverted Scaling

Positive readings for these modules appear as negative values. Therefore, in order to obtain meaningful readings, use the scaling feature in PAC Control as follows:

1. In the Add or Edit Analog Point dialog box for each point, choose the scalable version of the module.
2. Under Scaling, scale each point negatively as shown below:

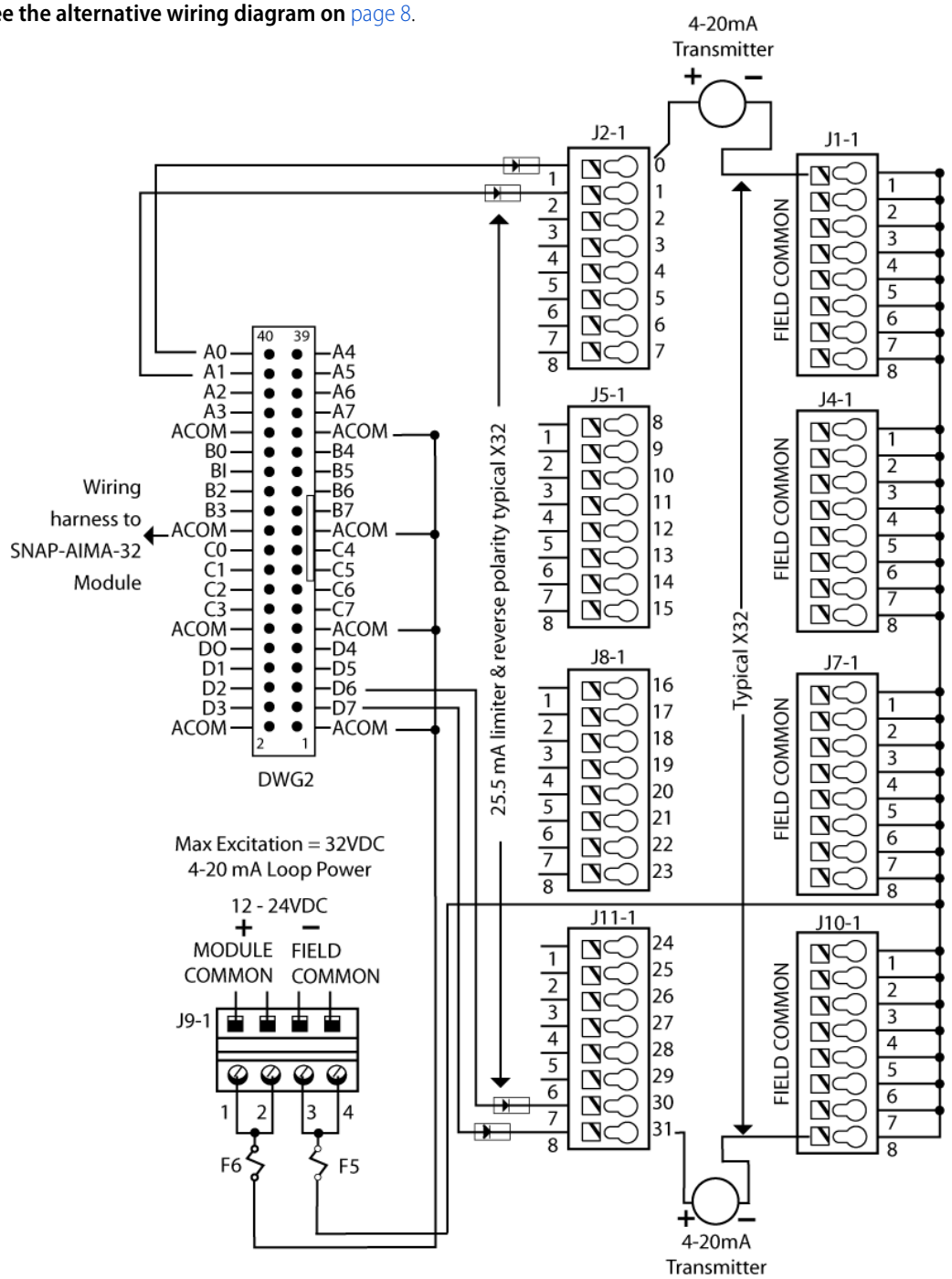


Specifications: SNAP-AIMA-32-FM [OBSOLETE]

Input Range	-20 mA to +20 mA
Over-Range Limits	From -22 to +22 mA (+/-20 mA range)
Resolution	0.8 microamps
Input Filtering	-3 dB @ 31 Hz
Data Freshness (Max)	1.15 s
DC Common Mode Rejection	>-120 dB
AC Common Mode Rejection	>-120 dB @ 60 Hz
Maximum Survivable Input	36 mA or 9 VDC
Maximum Operating Common Mode Voltage	250 V
Accuracy	0.1% (20 microamps)
DRIFT: Gain Temperature Coefficient	30 PPM/ °C
DRIFT: Offset Temperature Coefficient	15 PPM/ °C
Isolation	1500 V, field to logic
Power Requirements	5 VDC (±0.15) @ 150 mA
Input Resistance - Single Ended	100 ohms (each channel)
Operating Temperature	-20 °C to 70 °C
Storage Temperature	-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	5.22 in-lb (0.59 N-m)
Agency Approvals	CE, RoHS, DFARS; UKCA
Warranty	Lifetime

Wiring diagram: SNAP-AIMA-HDB-FM breakout rack to SNAP-AIMA-32-FM module (2 wire)

Use with loop power (2-wire) negative common devices only.
For self-powered (4-wire) devices, see page 7.
For positive common devices, see the alternative wiring diagram on page 8.



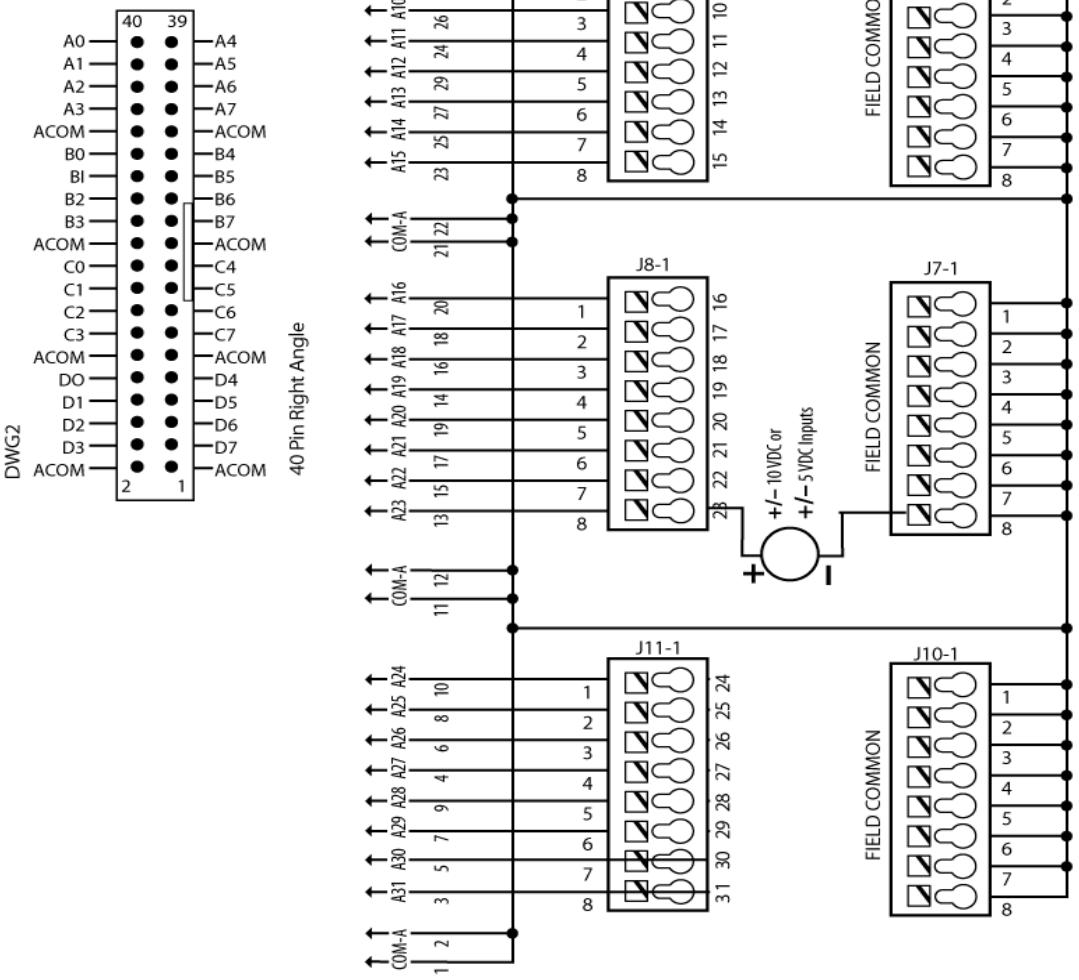
These products are obsolete.

MADE IN THE USA

These products are obsolete.

Wiring diagram: SNAP-AIV-HDB-FM breakout rack to SNAP-AIV-32-FM module (4 wire)

NOTE: Use this diagram when the module connects to a **self-powered (4-wire)** device.

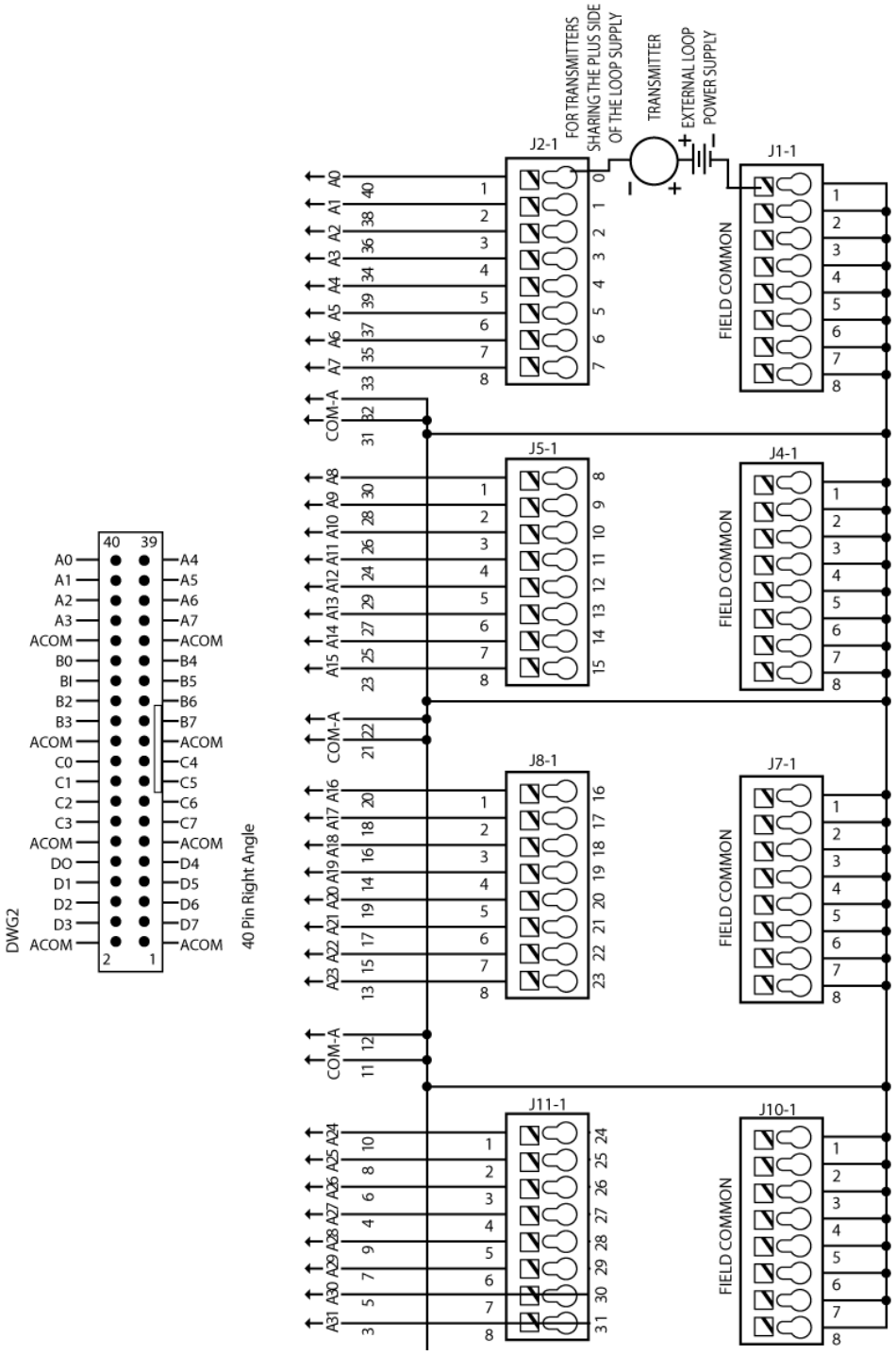


MADE IN THE USA

Alternate Wiring Diagram: SNAP-AIMA-32-FM

SNAP-AIV-HDB-FM breakout rack to SNAP-AIMA-32-FM module

Use this diagram when the module connects to devices that share a positive common connection.

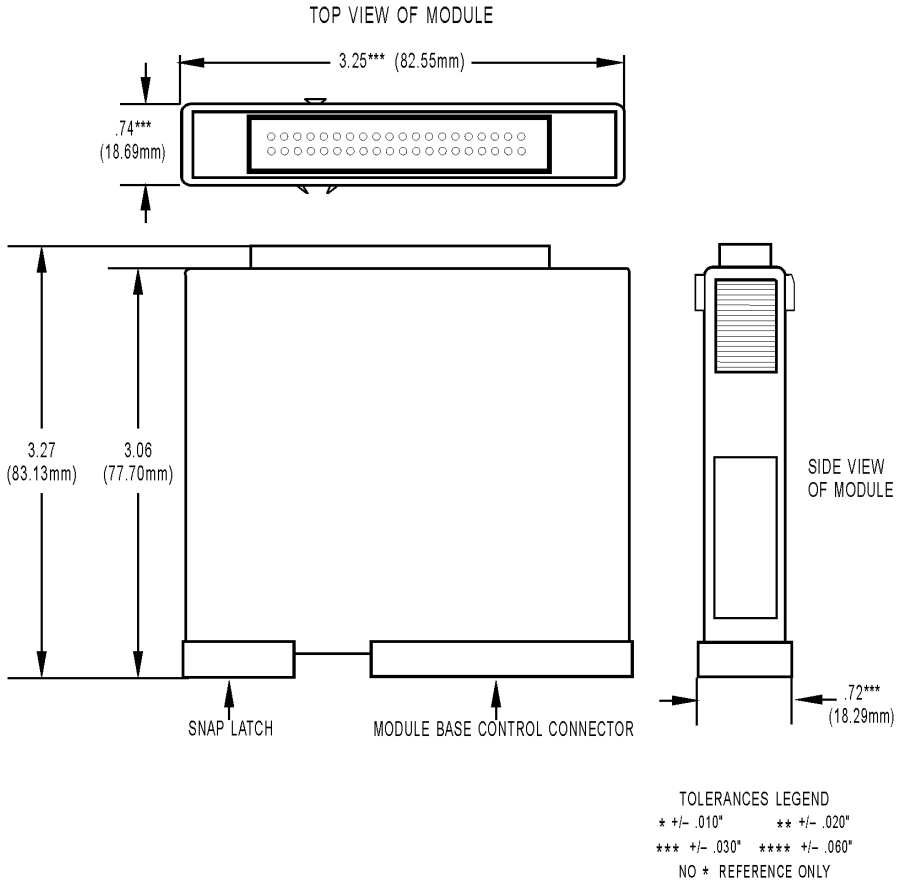


These products are obsolete.

MADE IN THE USA

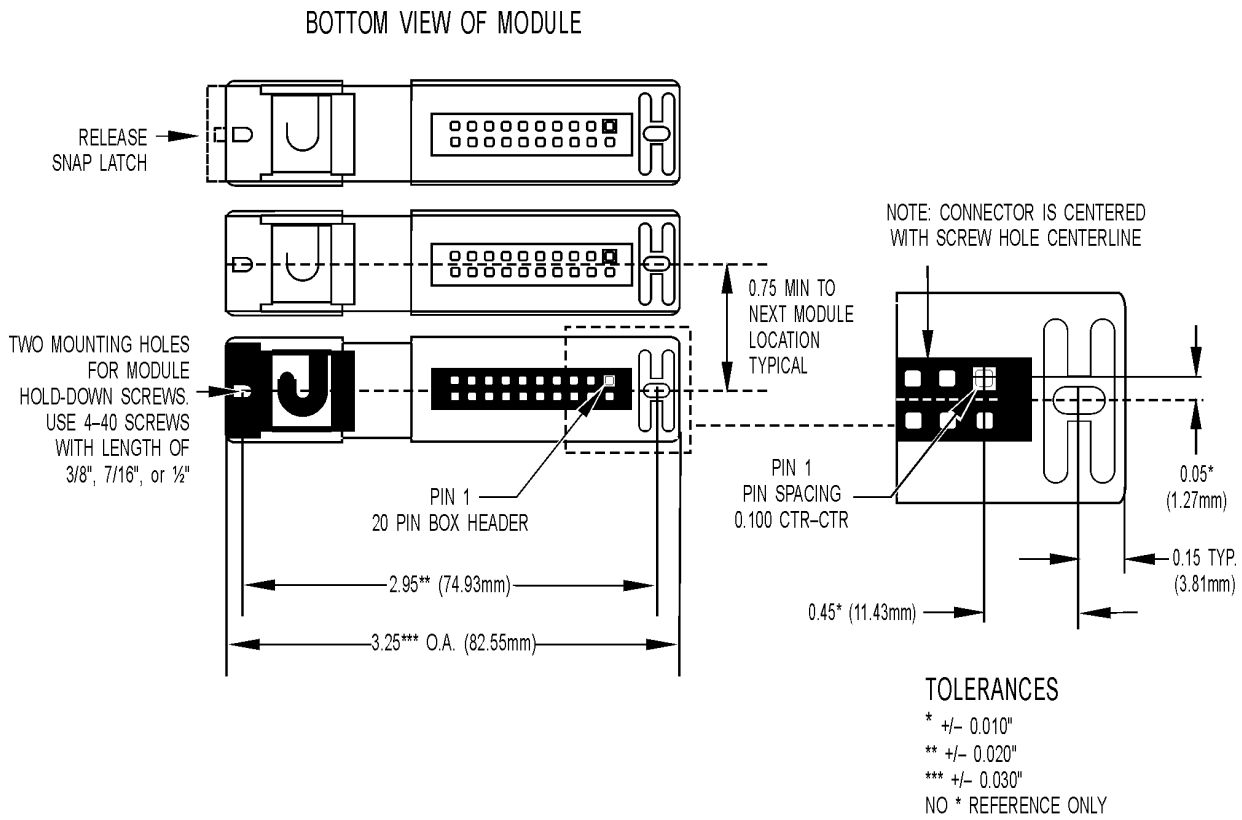
These products are obsolete.

Dimensional Drawing: SNAP Analog Input Modules (top view for 32-channel modules):



MADE IN THE USA

Dimensional Drawing: All SNAP Analog Input Modules (bottom view)



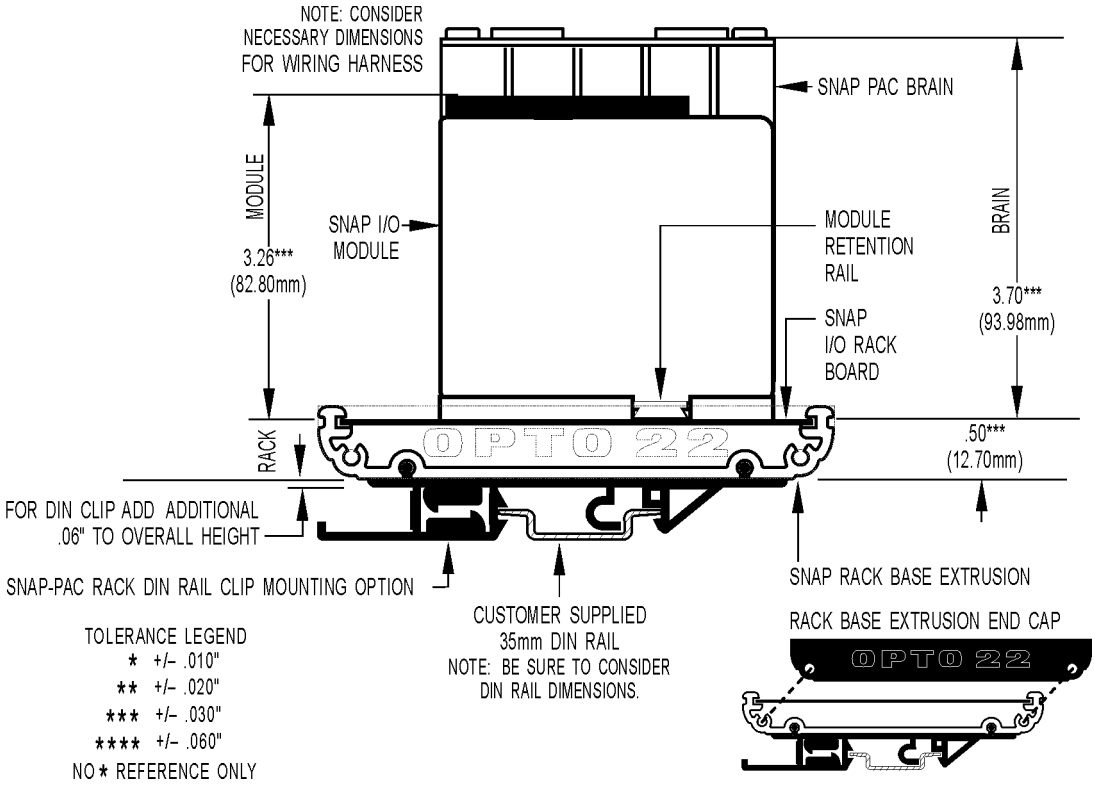
IMPORTANT: The mounting rack connector has 24 pins; the module connector has 20 pins. The extra pins on the mounting rack connector prevent misalignment of the module during installation.

These products are obsolete.

MADE IN THE USA

These products are obsolete.

Dimensional Drawing: SNAP Analog Input Modules (Height on Rack: 32-Channel Modules)



SNAP-AITM-8-FM

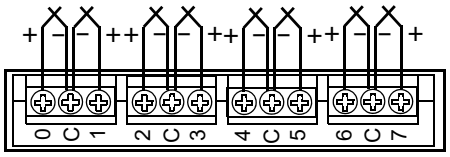
The SNAP-AITM-8-FM module provides eight channels of analog to digital conversion. Each channel on the module can be configured for -75 mV DC to +75 mV DC, -50 mV DC to +50 mV DC, -25 mV DC to +25 mV DC, or for type B, C, D, E, G, J, K, N, R, S or T thermocouple operation.

Since all inputs share the same reference terminal, use isolated probes for thermocouple inputs. See the dimensional diagrams starting on page 13.

Thermocouple Polarity and Range

Type	–	+	Range
B	RED	GRAY	+42° C to +1,820 °C
C, D, G	RED	WHITE	0° C to +2,320 °C
E	RED	PURPLE	-270°C to +1,000 °C
J	RED	WHITE	-210°C to +1,200 °C
K	RED	YELLOW	-270°C to +1,372 °C
N	RED	ORANGE	-270° C to +1,300 °C
R, S	RED	BLACK	-50° C to +1,768 °C
T	RED	BLUE	-270° C to +400 °C

Millivolt Thermocouple Source



Common terminals are connected internally.

NOTE: For best accuracy, wire all points before calibrating, and short all unused channels.

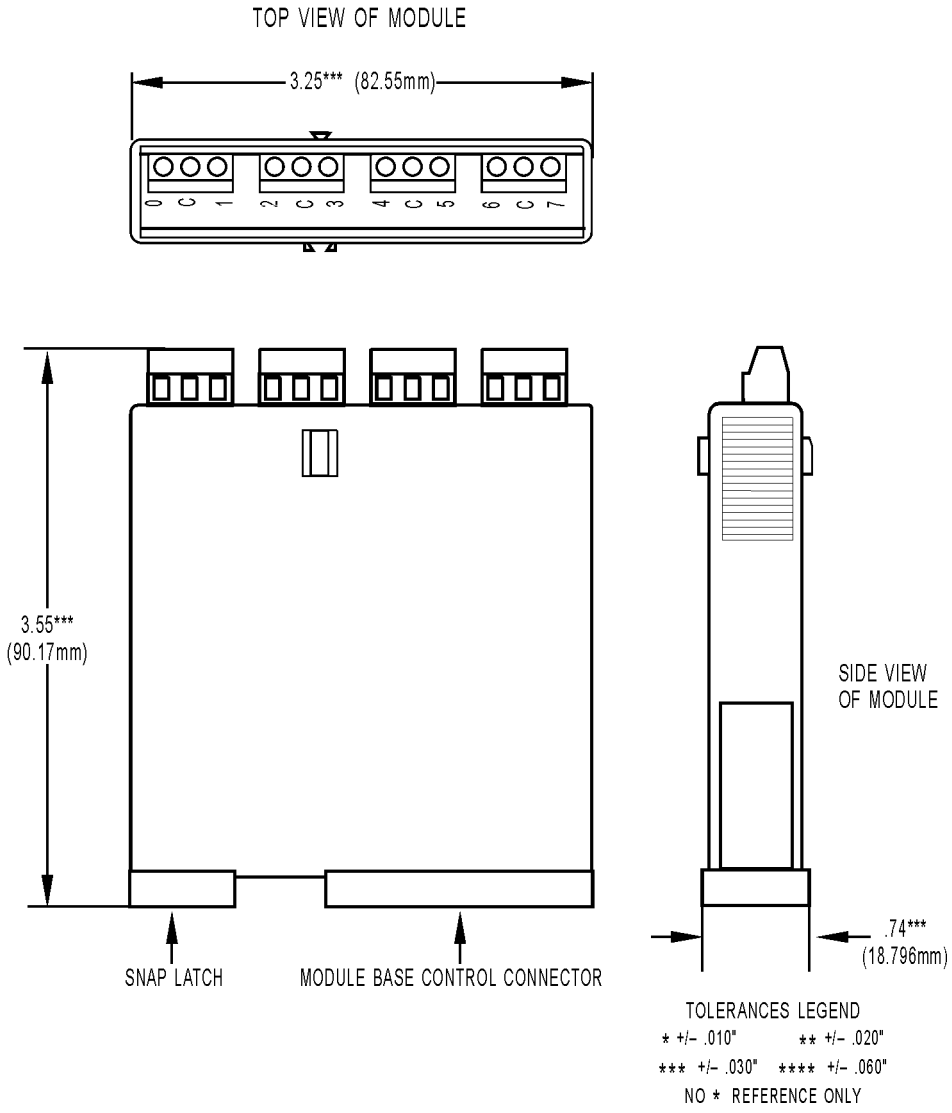
Specifications: SNAP-AITM-8-FM [OBSOLETE]

Input Range	-75 mV to +75 mV -50 mV to +50 mV -25 mV to +25 mV		
Over-Range Limits	-82.5 to +82.5 mV (+/-75 mV range) -55 to +55 mV (+/-50 mV range) -27.5 to +27.5 mV (+/-25 mV range)		
Resolution	3 microvolts from -75 mV to +75 mV 2 microvolts from -50 mV to +50 mV 1 microvolts from -25 mV to +25 mV		
Cold Junction Temperature Compensation	Automatic when used with SNAP I/O processors		
Input Filtering	-3 dB @ 5 Hz		
Data Freshness (Max)	2.25 s		
DC Common Mode Rejection	>-120 dB		
AC Common Mode Rejection	>-120 dB @ 60 Hz		
Maximum Survivable Input	±15 volts		
Max Operating Common Mode Voltage	250 V		
Accuracy at Full Scale	0.1% (75 microvolts) @ 75 mV 0.1% (50 microvolts) @ 50 mV 0.2% (50 microvolts) @ 25 mV		
Drift: Gain Temperature Coefficient	5 microvolts / °C		
Drift: Offset Temperature Coefficient	2 microvolts / °C		
Thermocouple Accuracy [°C]	E, J, K	B, R, S	C, D, G
From factory	±2.0	±5	±4
After user gain and offset commands	±0.5	±3	±2
Isolation	1500 V		
Power Requirements	5 VDC (±0.15) @ 200 mA		
Input Resistance	100 Megohms (each channel)		
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	3 in-lb (0.34 N-m)		
Agency Approvals	CE, RoHS, DFARS; UKCA		
Warranty	Lifetime		

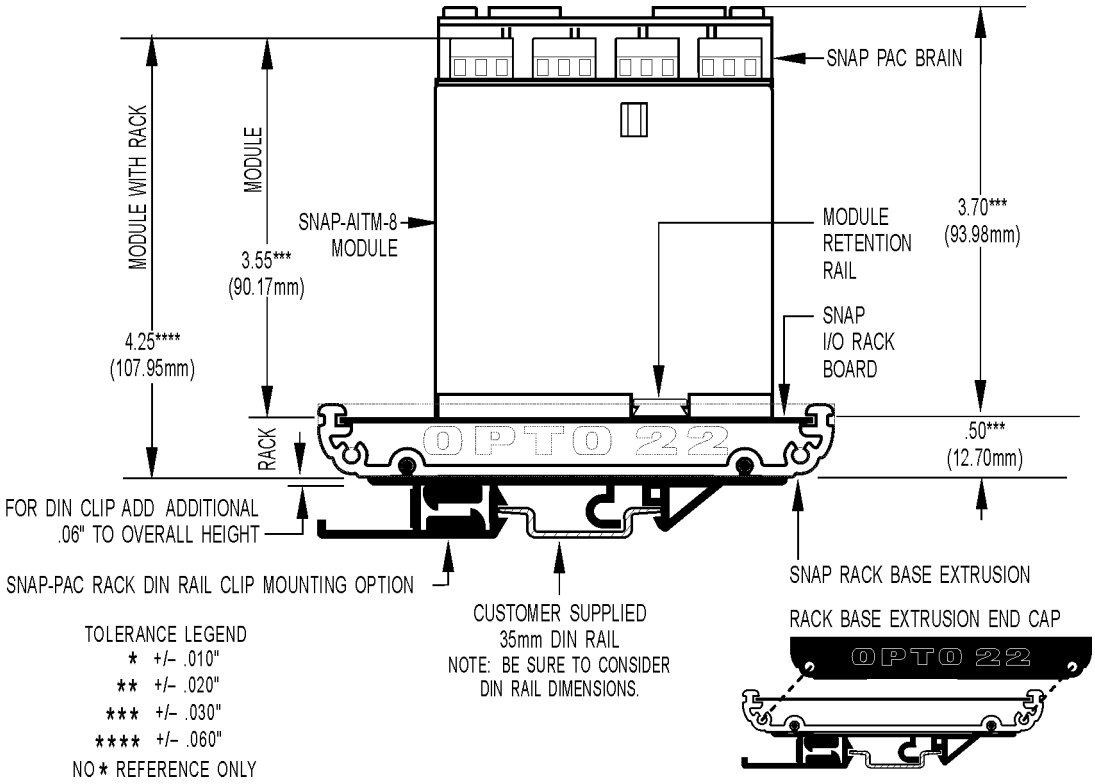
These products are obsolete.

MADE IN THE USA

Dimensional Drawing: SNAP-AITM-8 FM



Dimensional Drawing; SNAP-AITM-8-FM (Height on Rack)



These products are obsolete.

MADE IN THE USA

These products are obsolete.

SNAP-AIV-32-FM

The SNAP-AIV-32-FM module can be configured for either -10 VDC to +10 VDC or -5 VDC to +5 VDC operation on each of its 32 channels. Check the table on page 3 for I/O processor compatibility.

Note that all channels share a common reference terminal. (For channel-to-channel isolated modules, see Opto22 form #1182.)

SNAP TEX cables and a breakout rack are available separately for wiring points to field devices (see form #1756, the *SNAP TEX Cables & Breakout Boards Data Sheet*). The SNAP-HD-BF6 wiring harness connects the module to the breakout rack, which can then be wired to field devices. The SNAP-HD-CFB6 wiring harness has flying leads to connect to field devices.

See the dimensional drawings for this 32-channel module starting on page 9 (also see SNAP Analog Module Mounted on a SNAP Rack on page 29).

Specifications: SNAP-AIV-32-FM [OBSOLETE]

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 volts to +10 volts 0.2 mV when configured -5 volts to +5 volts
Input Filtering	-3 dB @ 31 Hz
Data Freshness (Max)	1.1 s
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) @ 150 mA
Input Resistance	1 M ohms (each channel; 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	5.22 in-lb (0.59 N-m)
Agency Approvals	CE, RoHS, DFARS; UKCA
Warranty	Lifetime

MADE IN THE USA

SNAP ISOLATED ANALOG INPUT MODULES

This section includes information on the following obsolete SNAP isolated analog input modules:

Part Number	Description	Specifications
SNAP-AIARMS-i-FM	Isolated two-channel 0–0 amp RMS AC/DC input	See page 17
SNAP-AIVRMS-i-FM	Isolated two-channel 0–250 V RMS AC/DC input	See page 18
SNAP-AIMA-iSRC-FM	Isolated two-channel analog current input -20 mA to +20 mA, with loop sourcing	See page 19

SNAP isolated analog input modules provide two or more channels isolated from each other, thereby eliminating problems caused by ground loop currents. These isolated analog modules are part of Opto 22's SNAP PAC System and mount on SNAP PAC racks with an I/O processor (brain or on-the-rack controller). SNAP isolated analog input modules are compatible with all SNAP PAC brains and rack-mounted controllers.

Since many SNAP analog input modules are software-configurable and handle a wide variety of signal levels, a small number of modules can support a wide range of input requirements. Modules provide high resolution for precise signal levels, and all SNAP analog modules are factory calibrated. Dimensional drawings start on page 20 (also see Dimensional Drawing: SNAP Isolated Analog Input Modules (Height on Rack) on page 23).

SNAP analog input modules have an on-board microprocessor to provide module-level intelligence, making them an ideal choice for original equipment manufacturers (OEMs). For more information about standalone SNAP analog modules, refer to the *SNAP I/O Module Integration Guide* (form 0876).

SNAP racks have a retention rail locking system. Use two 4-40 by ½-inch standard machine screws to hold each module securely in position on the SNAP rack (recommended torque: 4 inch pounds [0.45 Newton meters]).

Notes for legacy hardware: Most isolated analog input modules can be used with SNAP Simple, SNAP Ethernet, SNAP Ultimate, and SNAP *mistic* brains such as the serial B3000, and with M-series or B-series mounting racks. For exceptions, see individual module descriptions.

Isolation

All SNAP analog input modules are isolated from all other modules and from the I/O processor. In addition, the modules in this section have all channels isolated from each other. Channel-to-channel isolation gives you freedom from ground-loop problems even on grounded devices connected to channels on the same module.

Transformer isolation prevents ground loop currents from flowing between field devices and causing noise that produces erroneous readings. Ground loop currents are caused when two grounded field devices share a connection, and the ground potential at each device is different.

Isolation also provides protection for sensitive control electronics from industrial field signals.

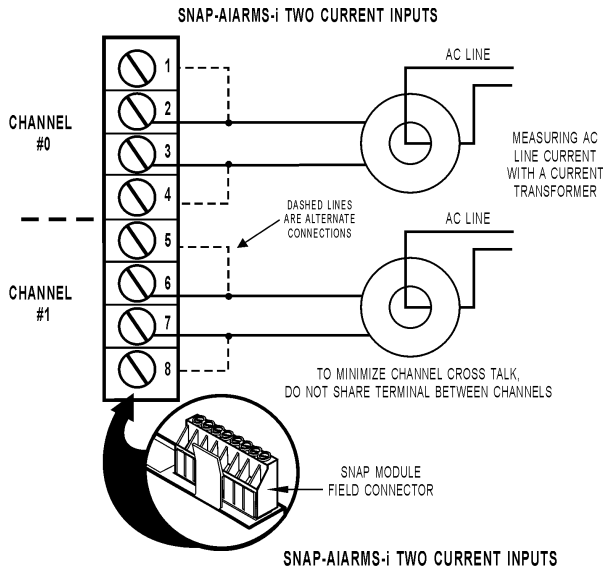
These products are obsolete.

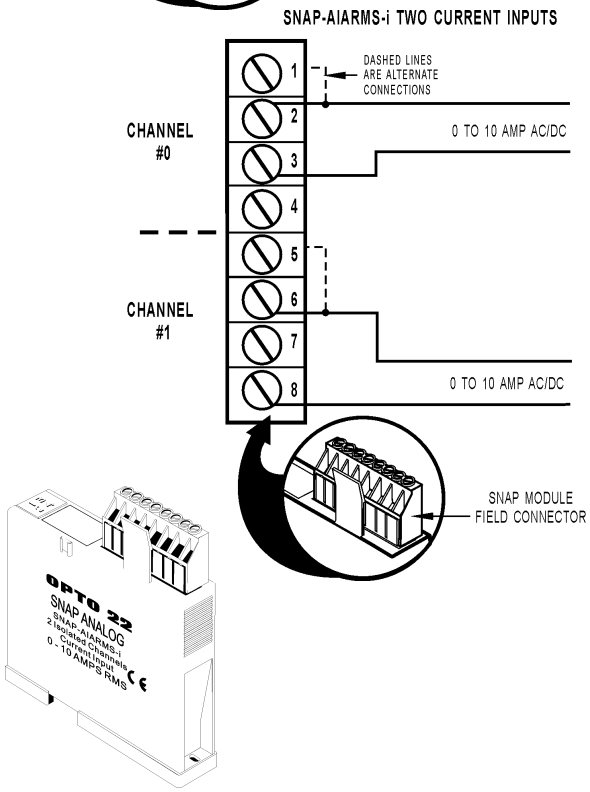
MADE IN THE USA

These products are obsolete.

SNAP-AIRMS-i-FM

Isolated 0 to 10 Amp RMS AC/DC Input Module





IMPORTANT: The mounting rack connector has 24 pins; the module connector has 20 pins. The extra pins on the mounting rack connector prevent misalignment of the module during installation.

Description

The SNAP-AIARMS-i-FM module provides an input range of 0 to 10 amps RMS AC/DC. An ideal input is the 5-amp secondary of a standard current transformer used to monitor AC line current. The two channels are isolated from each other; they do not share any field connection. This module is ideal for differential current measurements. It may also be used to monitor AC current to greater than a 100-amp range, using a current transformer of suitable ratio.

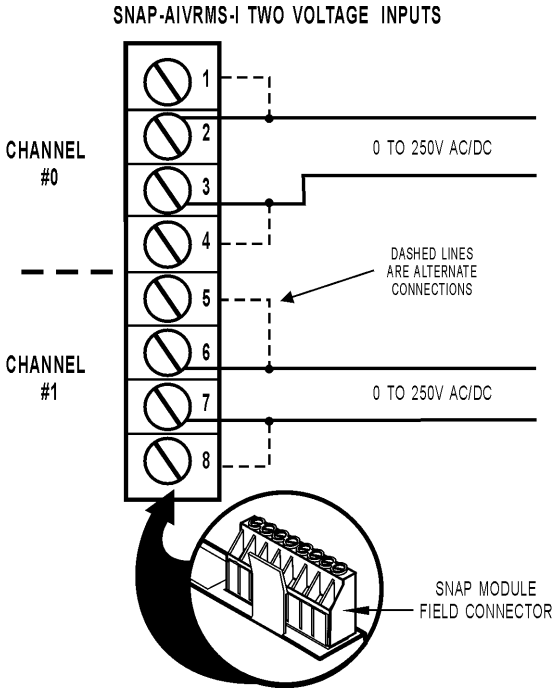
Specifications: SNAP-AIRMS-i-FM [OBSOLETE]

Input Range	0 to 10 amp RMS AC/DC
Input Over Range	To 11 amps
Input Resistance	0.005 ohms
Maximum Input	11 amps AC/DC
Accuracy (AC)	±8 mA and ±0.2% reading
Resolution	400 µA
DC Reversal	±16 mA (0.16%)
Input Response Time (Step Change)	63.2% (6.32 A) in 50 ms 99% (9.92 A) in 75 ms
Data Freshness (Max)	0.025 ms
DC Common Mode Rejection	>-120 dB
AC Common Mode Rejection	>-120 dB at 60 Hz
Maximum Operating Voltage Between Channels Common Mode Voltage	 250 V 250 V
Isolation: Optical	4000 V
Isolation: Transformer	1500 V
Isolation: Channel to Channel	250 V continuous (1500 V transient)
Power Requirements	5 VDC (±0.15 V) at 200 mA
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	5.22 in-lb (0.59 N-m)
Wire size range	22 to 14 AWG
Agency Approvals	CE, RoHS, DFARS; UKCA
Warranty	Lifetime

MADE IN THE USA

SNAP-AIVRMS-i-FM

Isolated 0 to 250 Volt RMS AC/DC Input Module



IMPORTANT: The mounting rack connector has 24 pins; the module connector has 20 pins. The extra pins on the mounting rack connector prevent misalignment of the module during installation.

Description

The SNAP-AIVRMS-i-FM module provides an input range of 0 to 250 volts AC or DC. This module may be used to monitor 120/240-volt AC/DC and 12/24/48-volt AC/DC system voltage.

The two channels are isolated from each other; they do not share any field connection. Because the module has no polarity specification for either the AC or DC field signals, all data from the module is represented as positive values.

These modules are ideal for differential voltage measurements.

Specifications: SNAP-AIVRMS-i-FM [OBSOLETE]

Input Range	0 to 250 V RMS AC/DC
Input Over Range	To 275 V
Input Resistance	1 megohms
Accuracy	±0.2 V and ±0.2% reading
Resolution	10 mV
DC Reversal	± 0.2 V (0.08%)
Input Response Time (Step Change)	63.2% (158 V) in 50 ms 99% (248 V) in 75 ms
Data Freshness	25 ms
DC Common Mode Rejection	>-120 dB
AC Common Mode Rejection	>-120 dB @ 60 Hz
Maximum Operating Voltage Between Channels Common Mode Voltage	 250 V 250 V
Isolation: Optical	4000 V
Isolation: Transformer	1500 V
Isolation: Channel to Channel	250 V continuous (1500 V transient)
Power Requirements	5 VDC (±0.15 V) at 200 mA
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	5.22 in-lb (0.59 N-m)
Wire size range	22 to 14 AWG
Agency Approvals	CE, RoHS, DFARS
Warranty	Lifetime

These products are obsolete.

MADE IN THE USA

These products are obsolete.

SNAP-AIMA-iSRC-FM

Isolated Current Input Module -20mA to +20mA with Loop Sourcing

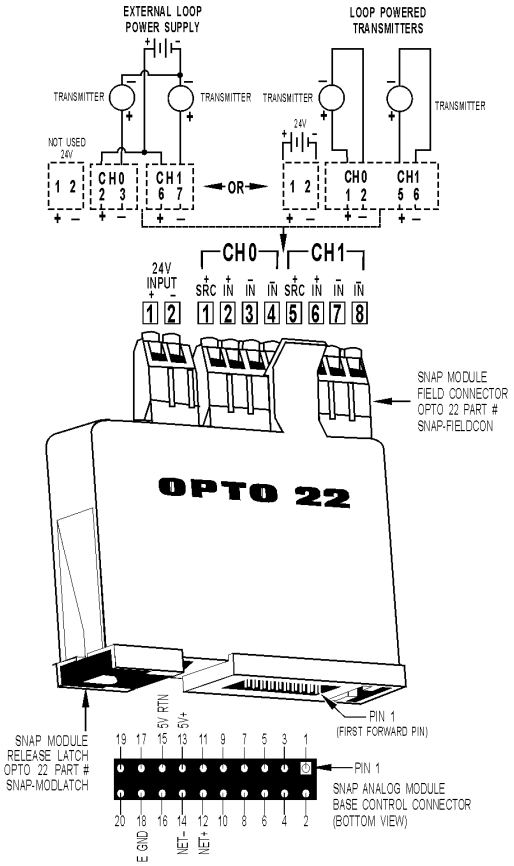
Specifications: SNAP-AIMA-iSRC-FM [OBSOLETE]

Input Range	0 to +20 mA with loop sourcing -20 mA to +20 mA
Maximum Over Range	± 10% (= ± 27500 counts)
Resolution	0.8 µA
Input Response Time (% of span/delta I/delta time)	99.9 %/19.9 mA/10 ms
Data Freshness	11 ms
DC Common Mode Rejection	>-120 dB
AC Common Mode Rejection	>-120 dB @ 60 Hz
Maximum Survivable Input	36 mA or 9 VDC
Maximum Operating Common Mode Voltage	250 V
Accuracy	0.05% (10 µA)
DRIFT: Gain Temperature Coefficient	30 PPM/ °C
DRIFT: Offset Temperature Coefficient	15 PPM/ °C
Isolation: Optical	4000 V
Isolation: Transformer	1500 V
Isolation: Channel to Channel	250 V continuous (1500 V transient)
Power Requirements	5 VDC (±0.15) @ 200 mA
Power Requirements - Loop Power (Input)	From separate field connector: 24 VDC nominal (70 mA max @ 24 V input, both loops @ 20 mA), 30 VDC maximum
Loop Power (Output)	24 VDC (± 1.5 V) @ 20 mA Open loop: 30 V maximum Shorted loop: 24 mA nominal
LED on top of module	Indicates that there is power to the 24v source supply 2-pin connector
Input Resistance	200 ohms (each channel)
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	5.22 in-lb (0.59 N-m)
Wire size range	22 to 14 AWG
Agency Approvals	CE, RoHS, DFARS; UKCA
Warranty	Lifetime

Description

The SNAP-AIMA-iSRC-FM includes built-in loop sourcing capability.

With the connection of a single 24 V power supply, this module sources 24 V for two 4–20 mA loops. The two channels and their loop sources are isolated from each other; they do not share any field connection. The isolation allows you to independently wire one channel to a loop with an external power supply and the other channel to a loop powered through the module. In addition, each loop sourced through the module is current limited so that an external fault on one loop will not affect the other.

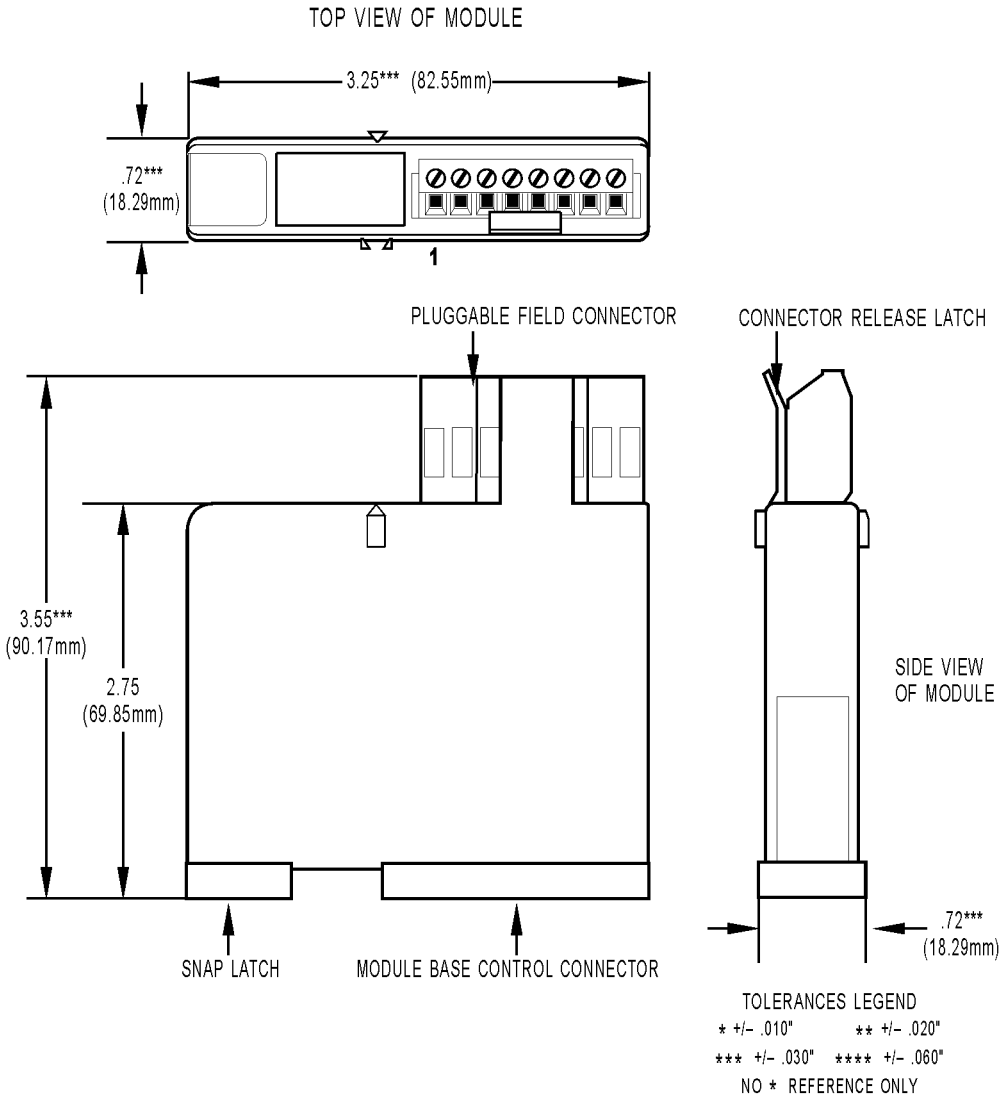


IMPORTANT: The mounting rack connector has 24 pins; the module connector has 20 pins. The extra pins on the mounting rack connector prevent misalignment of the module during installation.

MADE IN THE USA

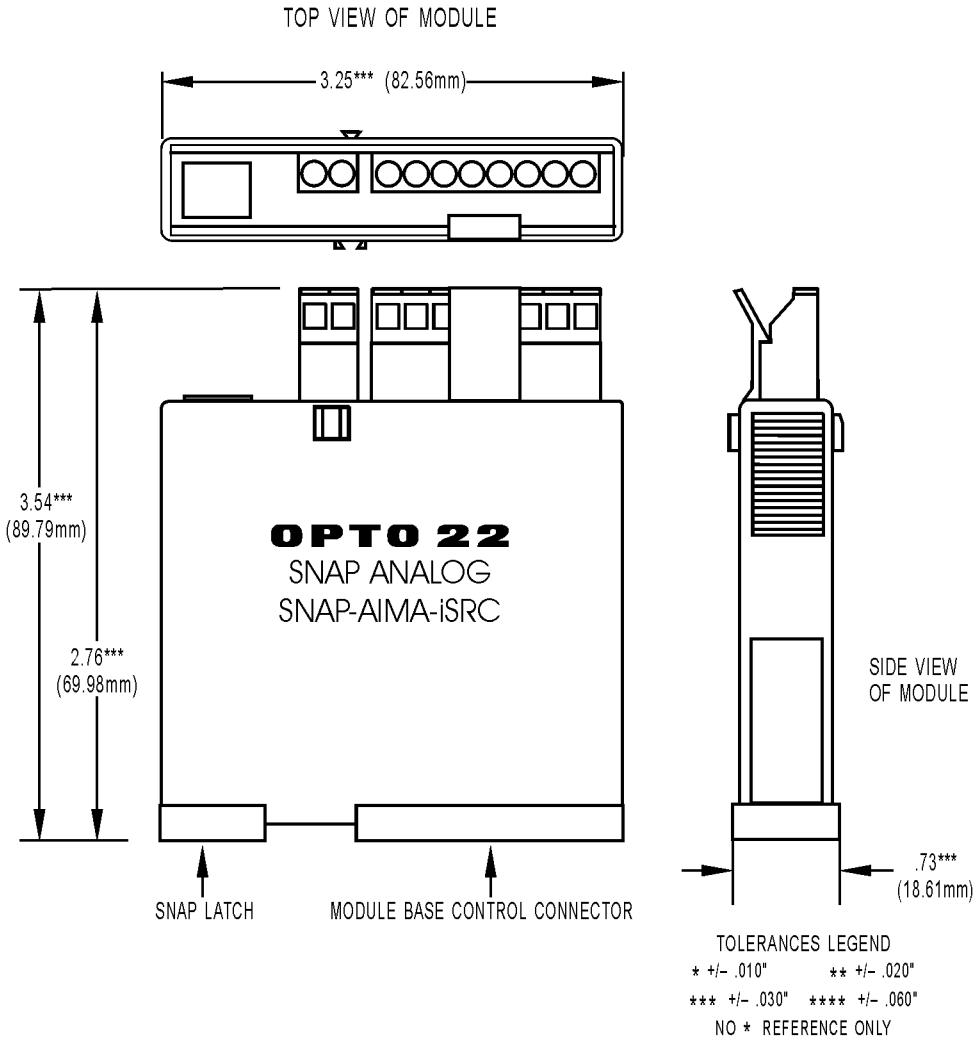
These products are obsolete.

Dimensional Drawing: SNAP-AIRMS-i-FM and SNAP-AIVRMS-i-FM (Top View)

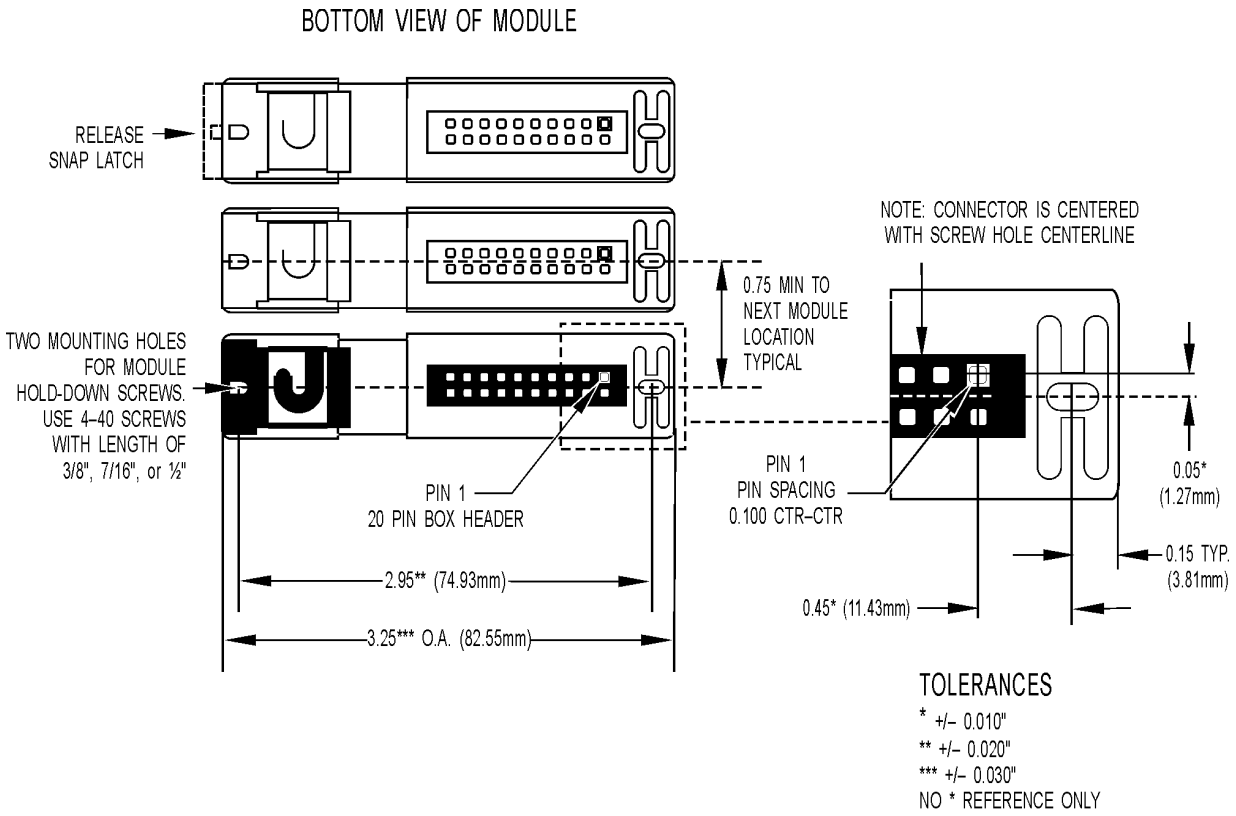


MADE IN THE USA

Dimensional Drawing: SNAP-AIMA-iSRC-FM (Top View)



Dimensional Drawing: SNAP Isolated Analog Input Modules (Bottom View)

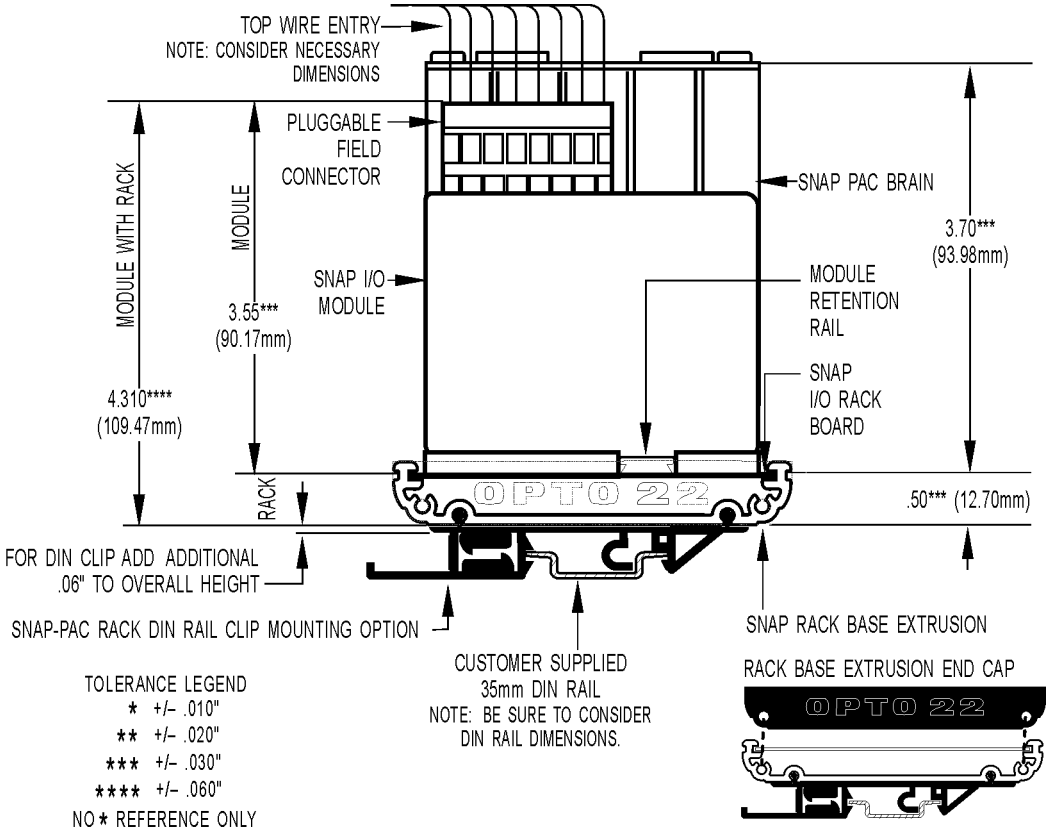


IMPORTANT: The mounting rack connector has 24 pins; the module connector has 20 pins. The extra pins on the mounting rack connector prevent misalignment of the module during installation.

These products are obsolete.

MADE IN THE USA

Dimensional Drawing: SNAP Isolated Analog Input Modules (Height on Rack)



SNAP ISOLATED ANALOG OUTPUT MODULES

This section includes information on the following obsolete SNAP isolated analog output modules:

Part Number	Description	Specifications
SNAP-AOA-23-iSRC-FM	Isolated dual-channel analog output, current loop, 4–20 mA, with loop sourcing	See page 25

SNAP analog output modules are part of Opto 22's SNAP PAC System. They mount on SNAP PAC racks along with other I/O modules and a SNAP PAC brain or R-series controller.

These software-configurable output modules handle a wide variety of signal levels. Most provide dual-channel packaging. All SNAP analog modules are factory calibrated.

SNAP analog output 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 stand-alone operation of SNAP analog modules, see Form 0876, *SNAP I/O Module Integration Guide*.

SNAP racks have a retention rail locking system. Use two 4-40 by ½-inch standard machine screws to hold each module securely in position on the SNAP rack.

Notes for legacy hardware: Most SNAP analog output modules can also be used with legacy SNAP Simple, SNAP Ethernet, and SNAP Ultimate brains and with serial SNAP brains such as the B3000. These modules can be mounted on SNAP B-series or M-series racks. Exceptions are noted in individual module descriptions.

Isolation

All SNAP analog output modules are isolated from all other modules and from the I/O processor (SNAP PAC brain or on-the-rack controller). The SNAP-AOA-23-iSRC-FM has two isolated channels.

Transformer isolation prevents ground loop currents from flowing between field devices and causing noise that produces erroneous readings. Ground loop currents are caused when two grounded field devices share a connection, and the ground potential at each device is different.

Isolation also provides protection for sensitive control electronics from industrial field signals.

SNAP-AOA-23-iSRC-FM

The SNAP-AOA-23-iSRC-FM module provides a nominal output range of 4 mA to 20 mA. This module includes built-in loop sourcing capability.

With the connection of a single 24 V power supply, these modules source two 24 V loops. The loop sources are internally connected to the individual outputs.

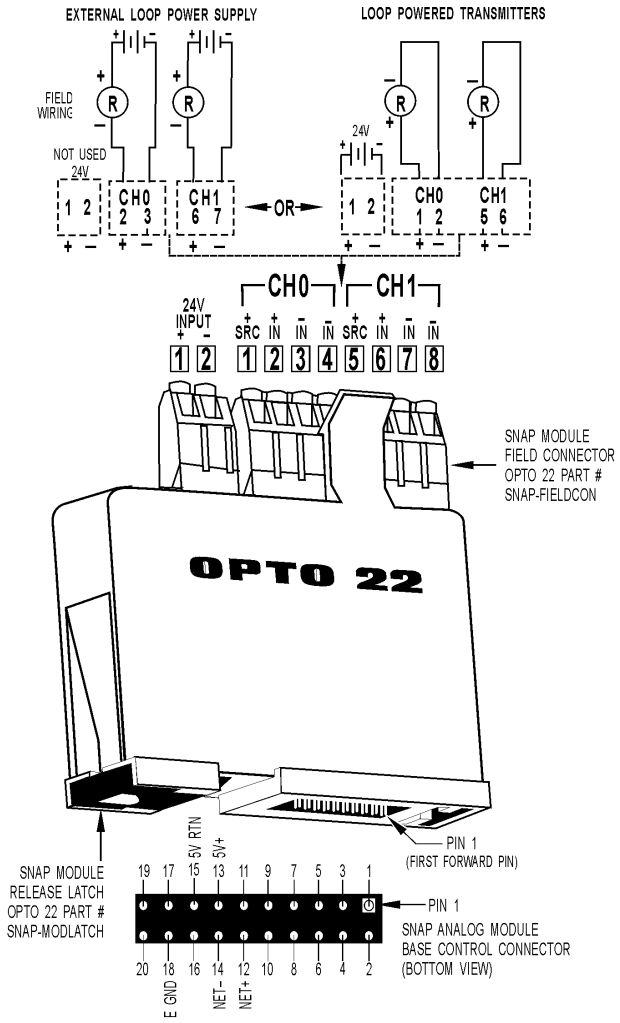
The two channels and their loop sources are isolated from each other; they do not share any field connection. In addition, each loop source is current limited so that an external fault on one loop will not affect the other.

Specifications: SNAP-AOA-23-iSRC-FM [OBSOLETE]

Input	12-bit serial data (each channel)
Outputs	4 to 20 mA (each channel)
Span	16 mA
Resolution	3.9 microamps
Response Time (% of span/delta I/ delta time)	99.9%/15.98 mA/3 mS
DC Common Mode Rejection	>-120 dB
AC Common Mode Rejection	>-120 dB @ 60 Hz
Maximum Operating Common Mode Voltage	250 V
Common Mode Resistance	>1000 Megohms
Accuracy	0.1% of Span
Gain Temperature Coefficient	50 PPM/°C
Offset Temperature Coefficient	20 PPM/°C
Max. Loop Resistance @ Loop Supply	950 Ohms
Ambient Temperature: Operating Storage	 -20 °C to 70 °C -40 °C to 85 °C
Humidity	5-95%, non-condensing
Isolation: Optical	4000 V
Isolation: Transformer	1500 V
Isolation: Channel to Channel	250 V continuous (1500 V transient)
Power Requirements	5 Volts DC (±0.15) @ 200 mA
Power Requirements - Loop Power (Input)	From separate field connector; 24 VDC nominal (70 mA max) @ 24 V input, both loops @ 20 mA), 30 VDC maximum
Loop Power (Output)	24 VDC (±1.5 V) @ 20 mA Open loop: 30 V maximum Shorted loop: 24 mA nominal
LED on top of module	Indicates that there is power to the 24v source supply 2-pin connector
Agency Approvals	CE, RoHS, DFARS, UKCA, ATEX
Torque, hold-down screws	Not to exceed 1 in-lb (0.11 N-m)
Torque, connector screws	5.22 in-lb (0.59 N-m)
Wire size range	22 to 14 AWG
Warranty	Lifetime

MADE IN THE USA

Wiring Diagram: SNAP-AOA-23-iSRC-FM
Isolated Dual-Channel Current Output 4–20 mA



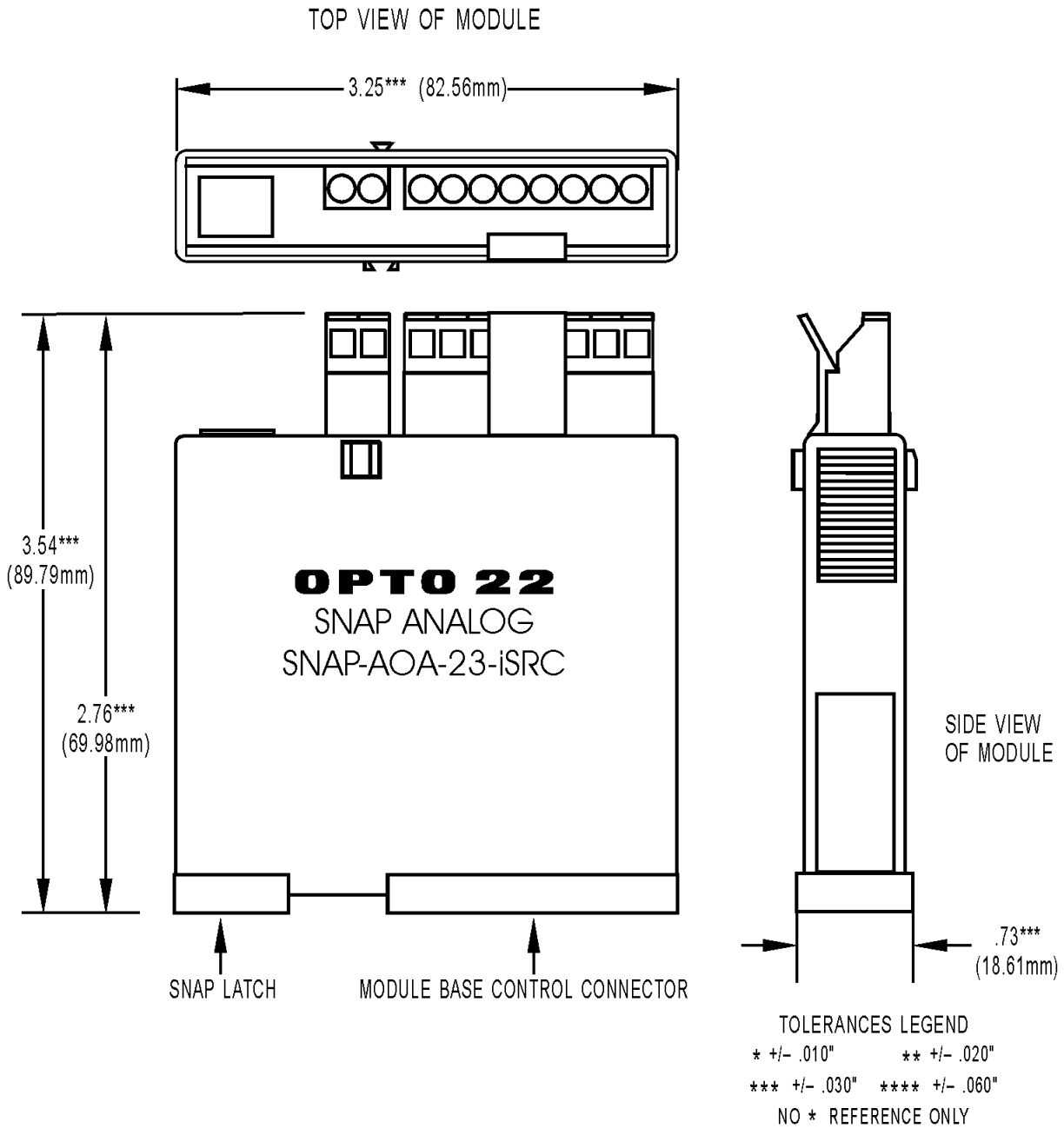
IMPORTANT: The mounting rack connector has 24 pins; the module connector has 20 pins. The extra pins on the mounting rack connector prevent misalignment of the module during installation.

These products are obsolete.

MADE IN THE USA

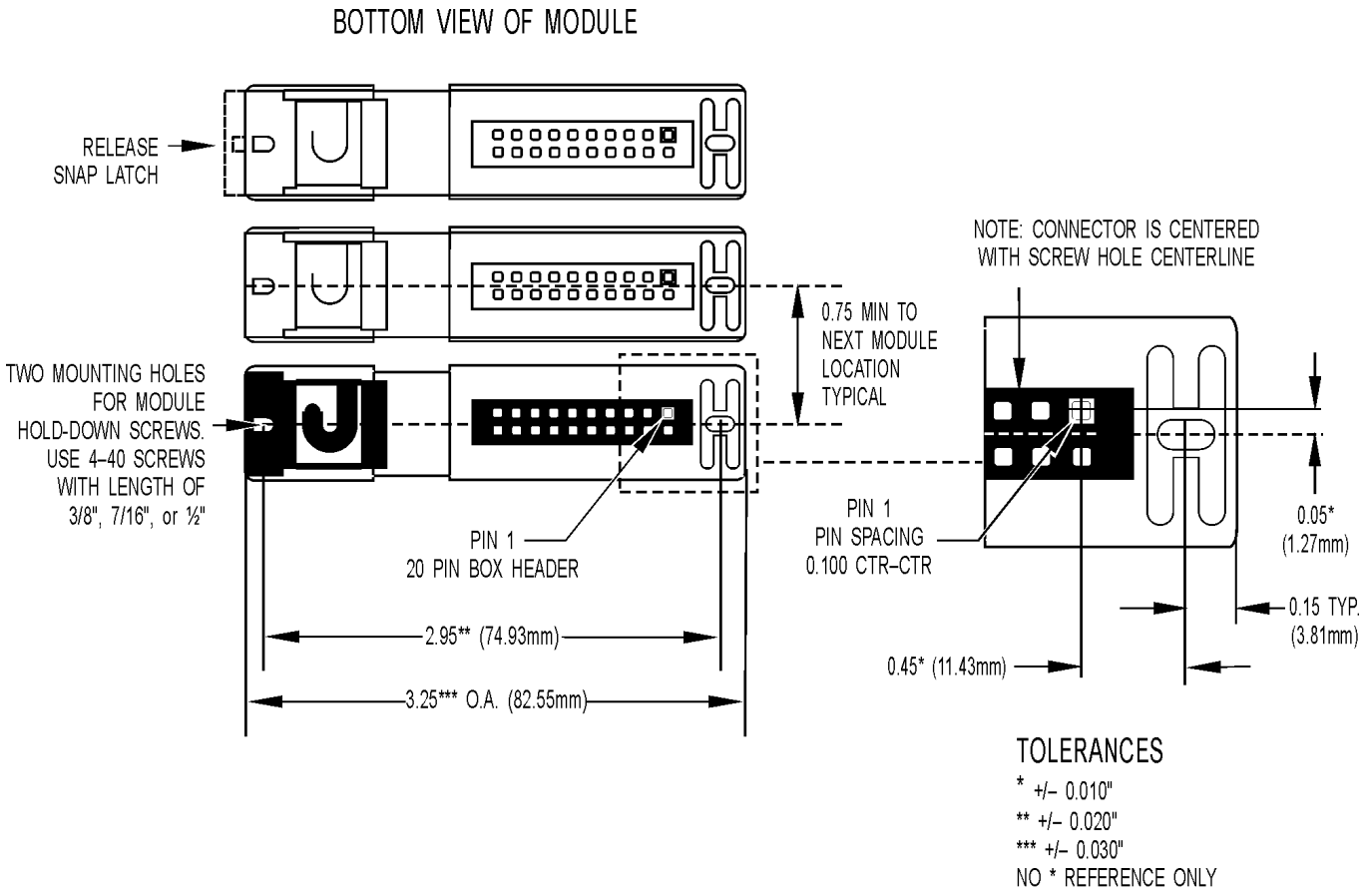
These products are obsolete.

Dimensional Drawing: SNAP-AOA-23-iSRC-FM (Top View)



MADE IN THE USA

Dimensional Drawing: SNAP-AOA-23-iSRC-FM (Bottom View)



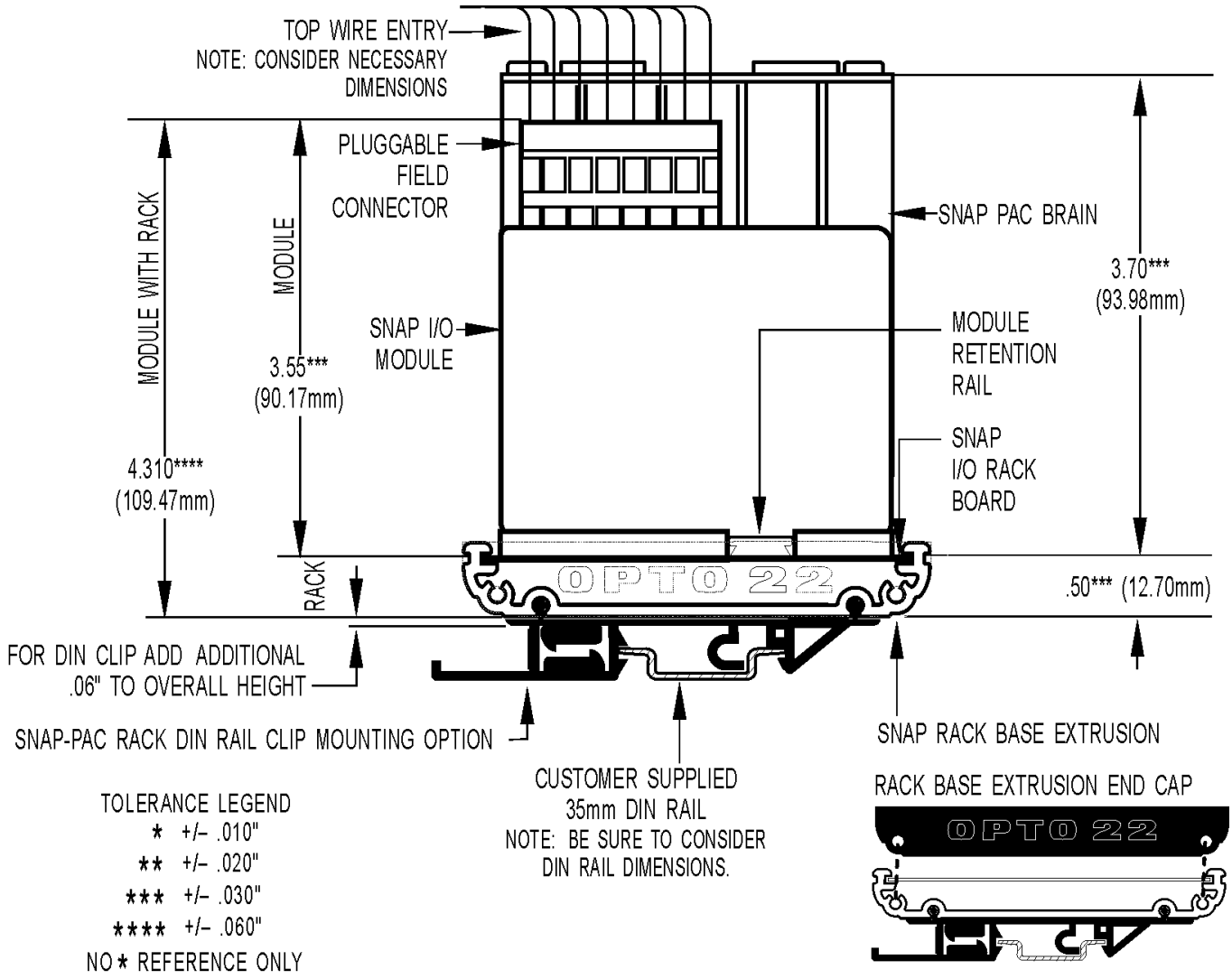
IMPORTANT: The mounting rack connector has 24 pins; the module connector has 20 pins. The extra pins on the mounting rack connector prevent misalignment of the module during installation.

These products are obsolete.

MADE IN THE USA

These products are obsolete.

Dimensional Drawing: SNAP Analog Module Mounted on a SNAP Rack (All Modules)



TOLERANCE LEGEND
* +/– .010"
** +/– .020"
*** +/– .030"
**** +/– .060"
NO * REFERENCE ONLY

OPTO 22 • www.opto22.com
43044 Business Park Dr. Temecula, CA 92590-3614

SALES • sales@opto22.com
800-321-6786 • 1-951-695-3000

SUPPORT • support@opto22.com
800-835-6786 • 1-951-695-3080

MADE IN THE USA