

### Description

The SNAP B-series racks are designed to work with the SNAP family of intelligent I/O processors, which Opto 22 calls brains. SNAP brains are designed to communicate with Opto 22 controllers or a host computer. SNAP B-series racks are compatible with SNAP Ultimate I/O™, SNAP Ethernet I/O™, and SNAP Simple I/O™.

Since SNAP analog, digital, serial, and special-purpose modules have the same footprint, customers using most SNAP B-series racks can mix modules on the same I/O mounting rack. SNAP B-series racks can accommodate 4, 8, 12, or 16 modules. SNAP-B4M, SNAP-B8M, SNAP-B12M, SNAP-B16M, and SNAP-D64RS racks are Factory Mutual approved.

The MC and MC-P model racks provide an auxiliary screw-type terminal strip for field wiring common connections such as loop power distribution. The MC racks use a fixed terminal strip, while the MC-P use removable connectors for easy maintenance (see enlarged view on the following page).

The digital-only SNAP-D64RS rack holds up to 16 4-channel digital SNAP I/O modules and is suitable for use with digital-only SNAP Ultimate brains, SNAP Ethernet brains, and the SNAP-PDPRS64 Profibus brain.

SNAP-M16, SNAP-M32, and SNAP-M64 racks are designed specifically for use with the SNAP-UP1-M64 Ultimate brain and the SNAP-ENET-S64 Simple I/O brain. Both of these brains support analog, digital, or serial/special-purpose modules in any module location. Digital features are limited; see Opto 22 form 1291, the SNAP Ultimate Brain data sheet, or form 1452, the SNAP Simple I/O data sheet, for more information.

Field devices are wired directly to the top-mounted removable connectors on the SNAP I/O modules plugged into each rack.

Part Number	Description
SNAP-B4M*	4-module rack
SNAP-B8M*	8-module rack
SNAP-B8MC	8-module rack with extra terminal block for field wiring
SNAP-B8MC-P	8-module rack with extra terminal block for field wiring, pluggable
SNAP-B12M*†	12-module rack
SNAP-B12MC†	12-module rack with extra terminal block for field wiring
SNAP-B12MC-P†	12-module rack with extra terminal block for field wiring, pluggable
SNAP-B16M*†	16-module rack
SNAP-B16MC†	16-module rack with extra terminal block for field wiring
SNAP-B16MC-P†	16-module rack with extra terminal block for field wiring, pluggable
SNAP-D64RS*	16-module rack for digital-only SNAP Ultimate, SNAP Ethernet, and SNAP-PDPRS64 Profibus brains
SNAP-M16	4-module rack for SNAP-UP1-M64 and SNAP-ENET-S64 brains
SNAP-M32	8-module rack for SNAP-UP1-M64 and SNAP-ENET-S64 brains
SNAP-M64	16-module rack for SNAP-UP1-M64 and SNAP-ENET-S64 brains
SNAP-FUSE4AB	4-amp fuse, 25-pack
SNAP-FUSE1AB	1-amp fuse, 25-pack
SNAP-RACKDIN	SNAP rack DIN-rail adapter clip
SNAPRACKDINB	SNAP rack DIN-rail adapter clip, 25-pack

\* Factory Mutual (FM) approved

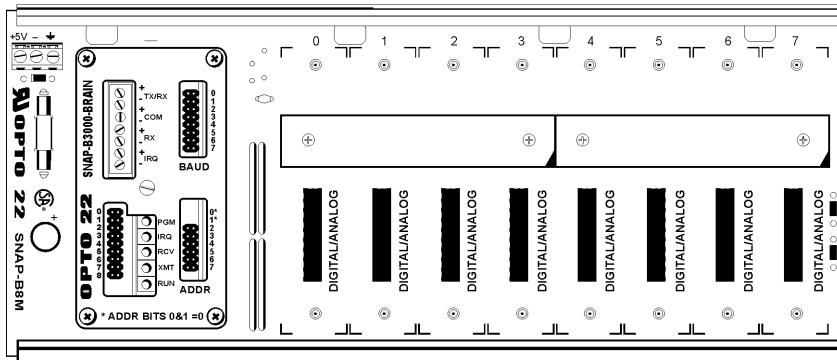
† Positions 8 and above are for analog or serial/special-purpose modules only

The module and rack design allows modules to simply “snap” on and off the mounting rack. SNAP racks use a retention rail locking system that holds modules securely to the rack.

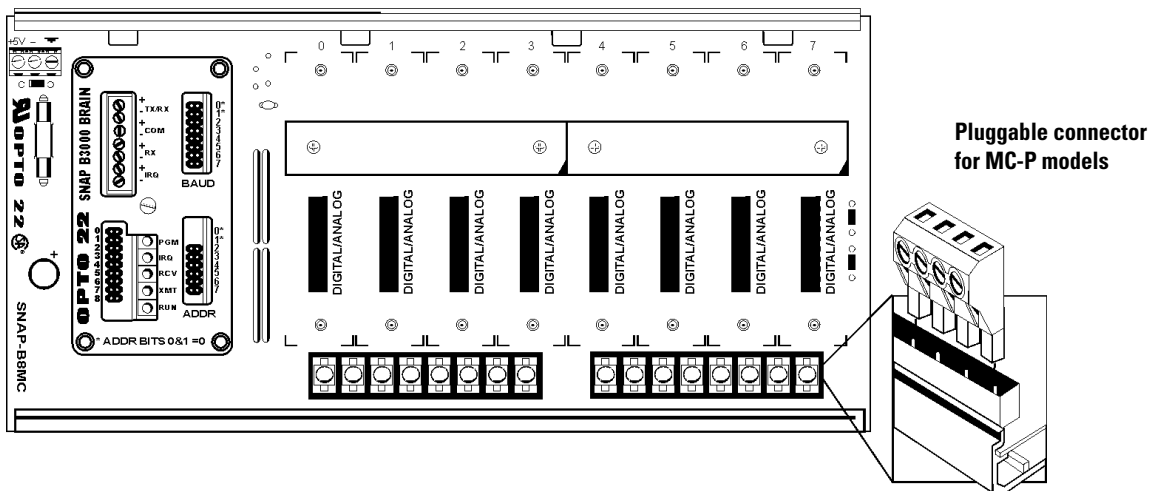
Normally, a hold-down screw is not required. However, for applications that require additional module security, SNAP racks have provisions for two 4-40 by ½-inch standard machine screws to hold each module in position. All SNAP racks offer panel mounting and the option of DIN-rail mounting. SNAP racks require a 5 VDC power source.

### Description (continued)

SNAP-B8M 8-Module Position I/O Mounting Rack  
Shown with SNAP-B3000 Brain (purchased separately)



SNAP-B8MC 8-Module Position I/O Mounting Rack  
Shown with SNAP-B3000 Brain (purchased separately)



### Specifications

Part Number	Description	Power Requirements*	Brain Compatibility	Replacement Fuse	Operating Temperature	Relative Humidity
SNAP-B4M	4-module mixed	5.0 VDC ± 0.1 @ 1.8 Amps max	SNAP-UP1-ADS SNAP-B3000-ENET SNAP-ENET-RTC SNAP-WLAN-FH-ADS B3000 SNAP-B4 SNAP-B6 SNAP-HA SNAP-BRS SNAP-BRS-HA SNAP-BRS-HA-J SNAP-B3000-MODBUS	SNAP-FUSE4A or Bel 5HF4†	0° to 70° C	95%, non-condensing
SNAP-B8M	8-module mixed	5.0 VDC ± 0.1 @ 2.6 Amps max				
SNAP-B8MC	8-module mixed, terminal block					
SNAP-B8MC-P	8-module mixed, pluggable terminal block					
SNAP-B12M	12-module mixed (digital in positions 0–7 only)	5.0 VDC ± 0.1 @ 3.4 Amps max				
SNAP-B12MC	12-module mixed (digital in positions 0–7 only), terminal block					
SNAP-B12MC-P	12-module mixed (digital in positions 0–7 only), pluggable terminal block					
SNAP-B16M	16-module mixed (digital in positions 0–7 only)	5.0 VDC ± 0.1 @ 4.2 Amps max				
SNAP-B16MC	16-module mixed (digital in positions 0–7 only), terminal block					
SNAP-B16MC-P	16-module mixed (digital in positions 0–7 only), pluggable terminal block					
SNAP-M16	4-module mixed (limited digital functions)	5.0 VDC ± 0.1 @ 4.2 Amps max	SNAP-UP1-M64 SNAP-ENET-S64	Littelfuse 297 07.5†		
SNAP-M32	8-module mixed (limited digital functions)					
SNAP-M64	16-module mixed (limited digital functions)					
SNAP-D64RS	16-module digital only (limited digital functions)	5.0 VDC ± 0.1 @ 1.8 Amps max	SNAP-UP1-D64 SNAP-ENET-D64 SNAP-PDPRS64	SNAP-FUSE1A or Buss GDC1A†		

\* Power requirements shown are for a rack, a brain, and a full load of analog modules (for the SNAP-D64RS, a full load of digital modules). Power requirements for SNAP serial and special-purpose modules are higher. See module data sheets for more information.

† Manufacturer's part number (not available through Opto 22).

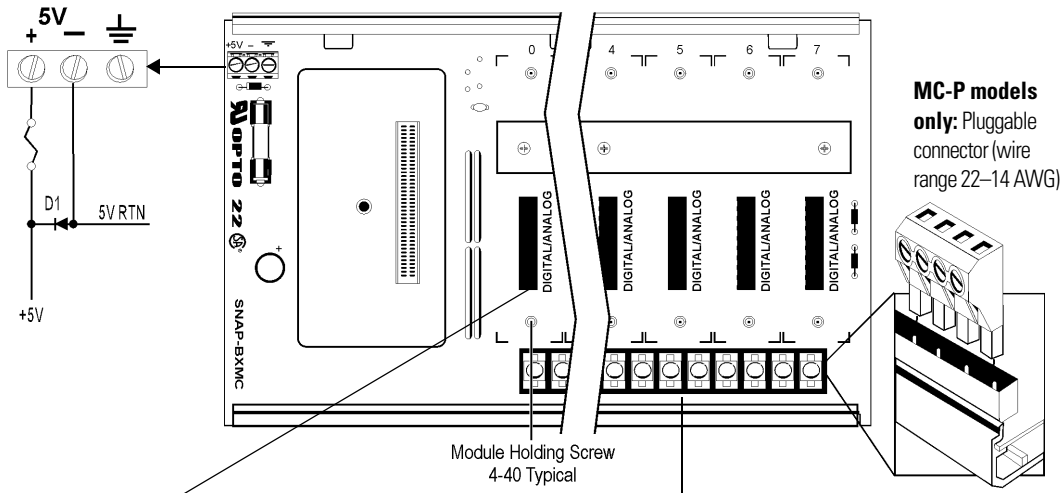
Form 784-041216

### Specifications (continued)

**All models:**

**Power schematic**

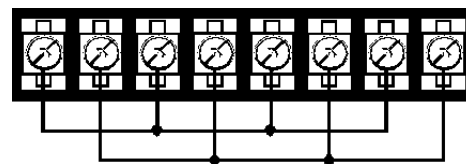
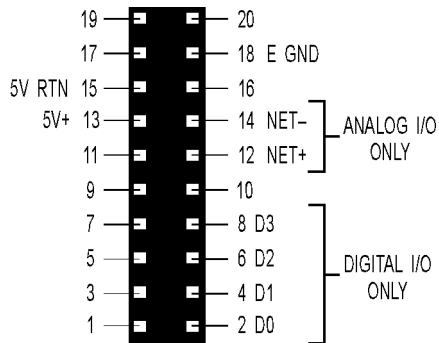
For fuse part numbers, see Specifications on [page 3](#).



**MC-P models only:** Pluggable connector (wire range 22–14 AWG)

**All models:**

Module mating connector pinout (female)

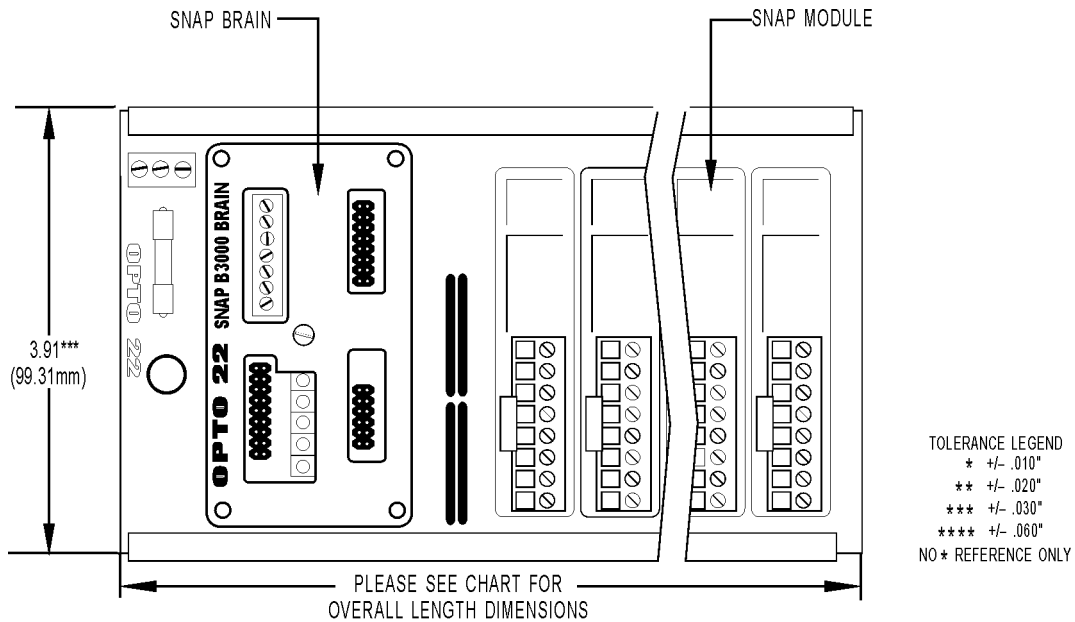


**MC and MC-P models only:** For detailed information on terminal strip usage, see [page 12](#) through [page 16](#).

### Dimensional Drawings

Dimensions—Models Without Terminal Strips

**See next page for SNAP-M16, -M32, and -M64 models**

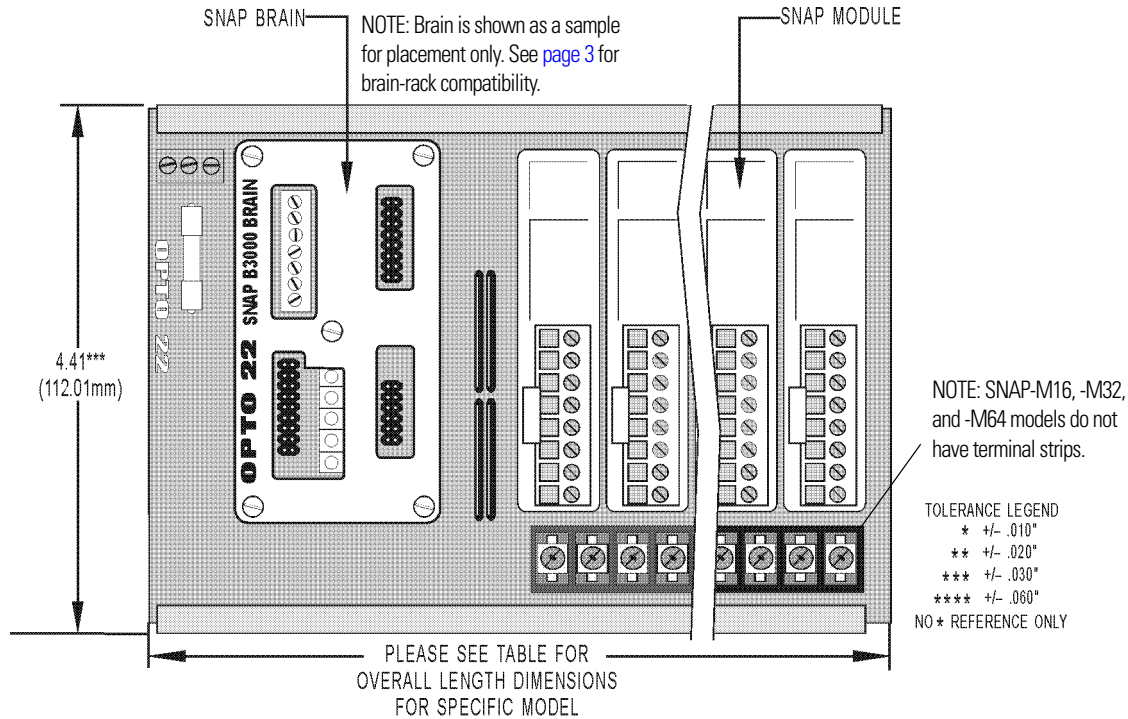


### Overall Length Dimensions (models without terminal strips)

Part Number	Description	Width (inches)	Width (mm)	Length (inches)	Length (mm)
SNAP-B4M	4-module rack	3.91	99.31	6.24	158.41
SNAP-B8M	8-module rack	3.91	99.31	9.24	234.70
SNAP-B12M	12-module rack	3.91	99.31	12.24	310.90
SNAP-B16M	16-module rack	3.91	99.31	15.24	387.10

### Dimensional Drawings (continued)

#### Dimensions—SNAP-M16, -M32, -M64, and Models with Terminal Strips

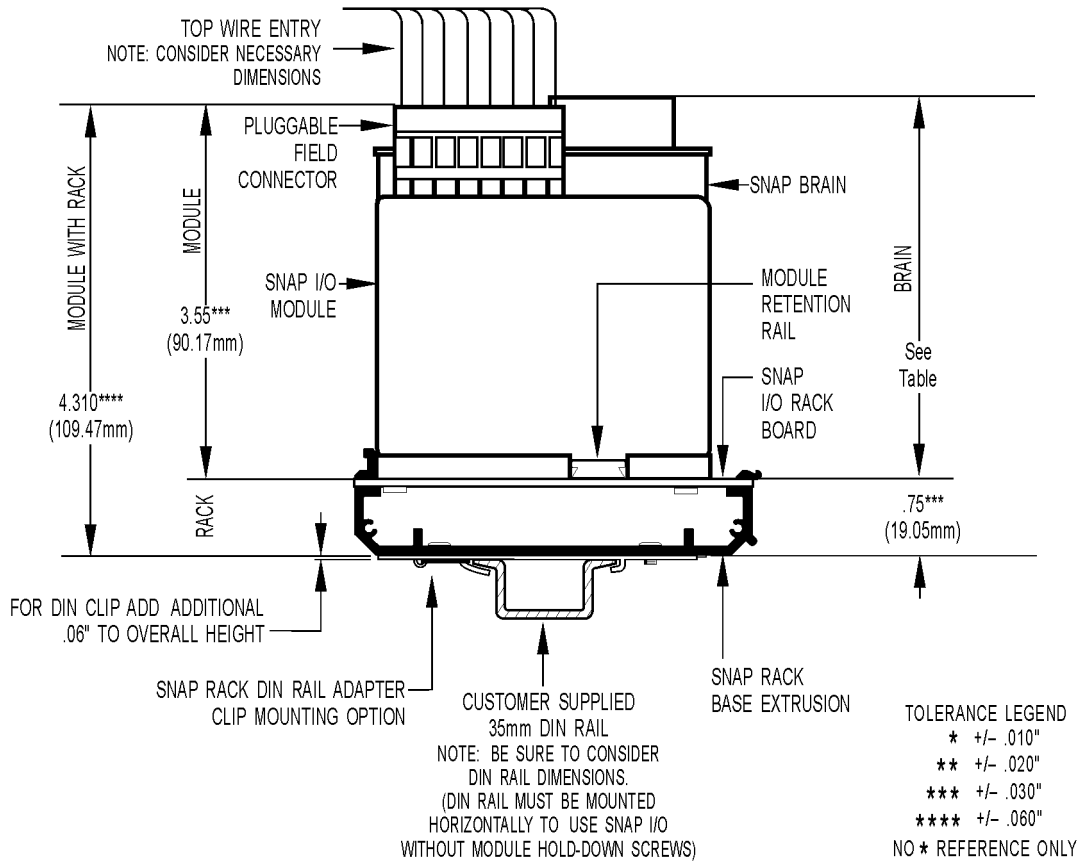


#### Overall Length Dimensions (SNAP-M16, -M32, -M64, and models with terminal strips)

Part Number	Description	Width (inches)	Width (mm)	Length (inches)	Length (mm)
SNAP-M16	4-module rack for SNAP-UP1-M64 and SNAP-ENET-S64 brains	4.41	112.01	6.25	158.75
SNAP-B8MC SNAP-B8MC-P	8-module rack with terminal block	4.41	112.01	9.25	234.95
SNAP-M32	8-module rack for SNAP-UP1-M64 and SNAP-ENET-S64 brains	4.41	112.01	9.25	234.95
SNAP-B12MC SNAP-B12MC-P	12-module rack with terminal block	4.41	112.01	12.25	311.15
SNAP-B16MC SNAP-B16MC-P	16-module rack with terminal block	4.41	112.01	15.25	387.35
SNAP-D64RS	16-module rack, digital only	4.41	112.01	15.25	387.35
SNAP-M64	16-module rack for SNAP-UP1-M64 and SNAP-ENET-S64 brains	4.41	112.01	15.25	387.35

### Dimensional Drawings (continued)

Models without Terminal Strips: Right Side View with DIN-Rail Option Installed  
**See next page for SNAP-M16, -M32, and -M64 models**

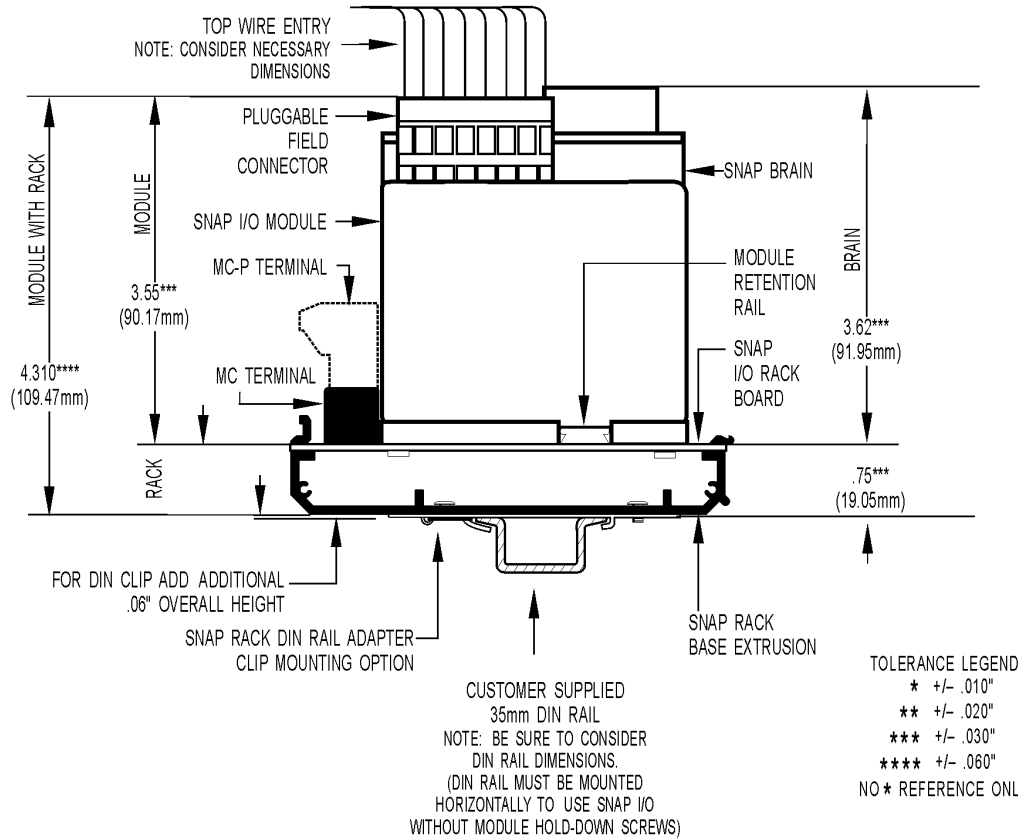


Brain Height*	Brain Part Number		
5.15 in. (130.8 mm)	SNAP-WLAN-FH-ADS		
4.12 in. (104.6 mm)	SNAP-UP1-ADS SNAP-UP1-D64	SNAP-B3000-ENET SNAP-ENET-D64	SNAP-ENET-RTC SNAP-UPN-ADS
3.70 in. (95.9 mm)	B3000 SNAP-B4 SNAP-B6	SNAP-HA SNAP-BRS SNAP-BRS-HA	SNAP-BRS-HA-J SNAP-B3000-MODBUS

\* Height listed is from the brain mounting surface to the highest part of the brain. It does not include wiring, cables, or the antenna for the wireless LAN brain.

### Dimensional Drawings (continued)

#### SNAP-M16, -M32, -M64, and Models with Terminal Strips: Right Side View with DIN-Rail Option Installed



Brain Height*	Brain Part Number		
5.15 in. (130.8 mm)	SNAP-WLAN-FH-ADS		
4.12 in. (104.6 mm)	SNAP-UP1-ADS	SNAP-ENET-S64	SNAP-B3000-ENET
	SNAP-UP1-D64	SNAP-ENET-D64	SNAP-UPN-ADS
	SNAP-UP1-M64	SNAP-ENET-RTC	
3.70 in. (95.9 mm)	B3000	SNAP-HA	SNAP-BRS-HA-J
	SNAP-B4	SNAP-BRS	SNAP-B3000-MODBUS
	SNAP-B6	SNAP-BRS-HA	

\* Height listed is from the brain mounting surface to the highest part of the brain. It does not include wiring, cables, or the antenna for the wireless LAN brain.



### Mounting

NOTE: If you are not using hold-down screws, the SNAP rack assembly should be mounted horizontally.

Use the following steps to mount racks as shown in the diagrams on the next two pages.

#### Preferred Method: Template

(Product on site)

1. Use SNAP rack mounting extrusion as template.
2. Be sure to use the diagrams on the next two pages to determine required product and option clearances.

#### Alternate Method: Prefabrication of Panels

(No product on site)

Mounting holes are in sets of two, located on lower left and upper right with respect to a center line (CL).

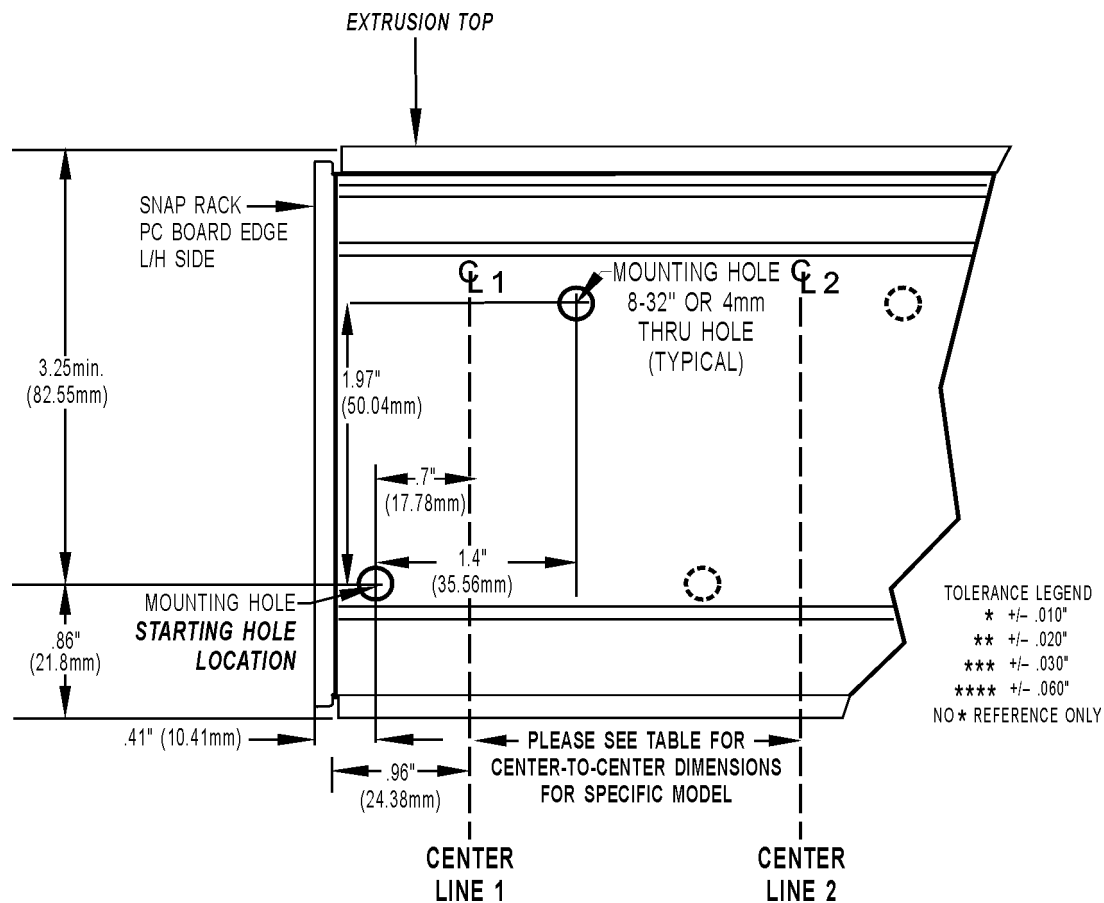
1. Using the diagrams on the next two pages, determine CL1 mounting hole positions. (CL1 is located on the left side of all SNAP rack mounting extrusions.)
2. Use the center-to-center length specification table below to determine the offset between center lines and the number of center line positions for each model.
3. Repeat the process for each center line position.

### Center-to-Center Length (All Models)

Part Number	Description	Center-to-Center Length	Number of Center Positions
SNAP-M16	4-module rack	3.51 in.	2
SNAP-B4M	4-module rack	4.01 in.	2
SNAP-B8M SNAP-B8MC SNAP-B8MC-P SNAP-M32	8-module rack	3.51 in.	3
SNAP-B12M SNAP-B12MC SNAP-B12MC-P	12-module rack	5.01 in.	3
SNAP-B16M SNAP-B16MC SNAP-B16MC-P SNAP-D64RS SNAP-M64	16-module rack	4.34 in.	4

### Mounting (continued)

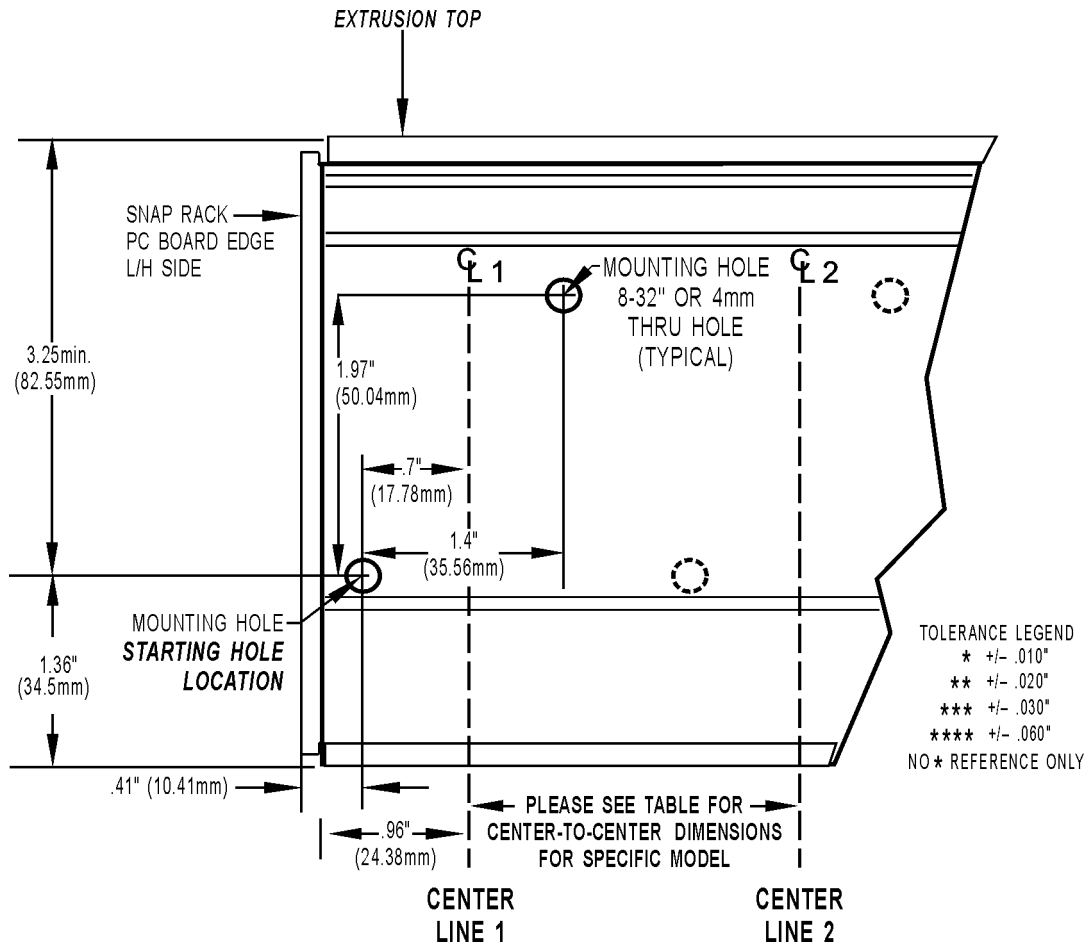
Models without Terminal Strips: Typical Plain View of SNAP Mounting Extrusion  
**See next page for SNAP-M16, -M32, and -M64 models**



See instructions and table on [page 9](#).

### Mounting (continued)

SNAP-M16, -M32, -M64, and Models with Terminal Strips: Typical Plain View of SNAP Mounting Extrusion



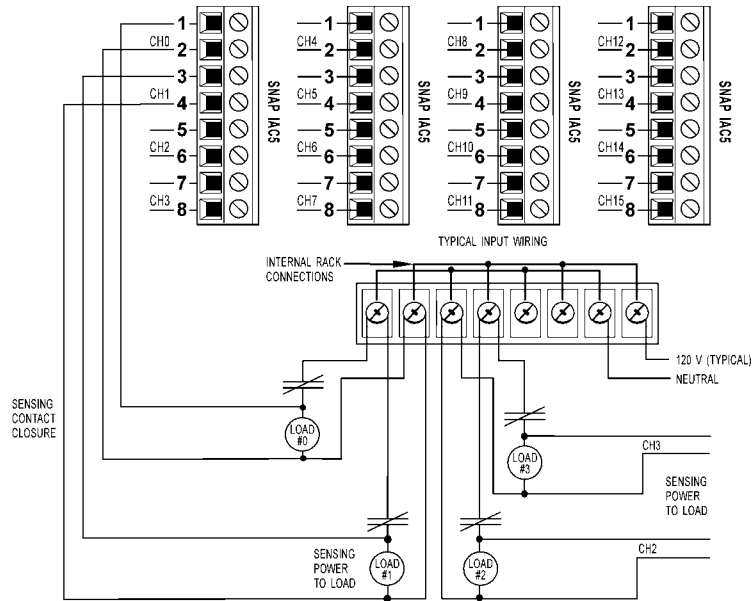
See instructions and table on [page 9](#).

### Wiring Diagrams—Models with Terminal Strips

#### Terminal Strip Usage—Digital

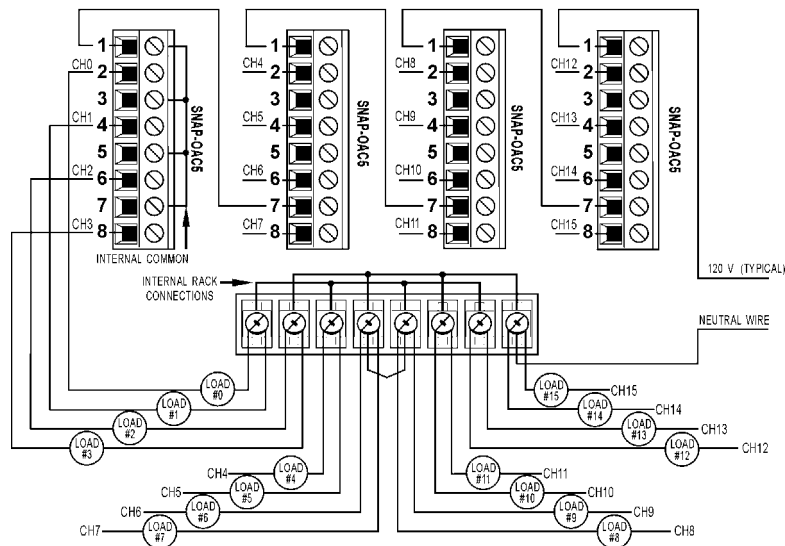
NOTE: Consult the SNAP module data sheet for your specific module for additional wiring information.

Example: Digital Input Using Terminal Strip



Example: Digital AC Output Using Terminal Strip

TYPICAL WIRING FOR "SNAP OACS" DIGITAL OUTPUT MODULE ON A SNAP-4DMC RACK

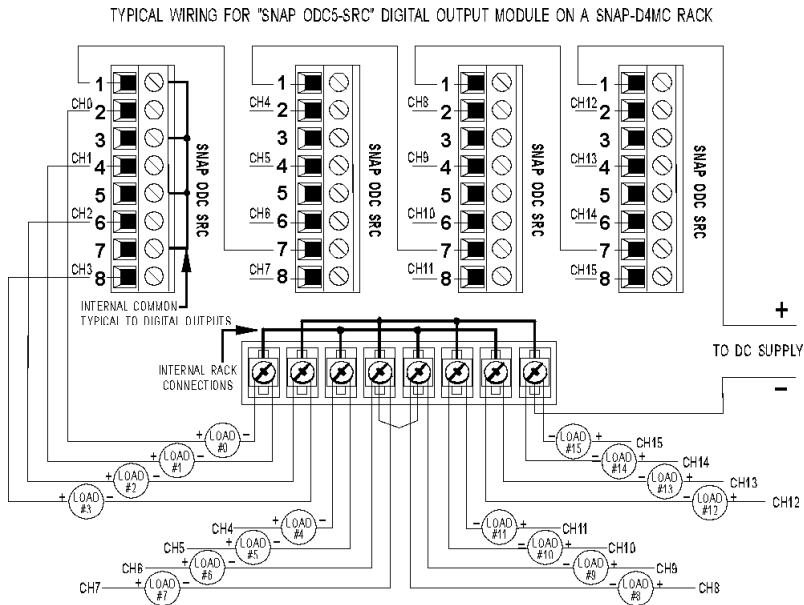


### Wiring Diagrams—Models with Terminal Strips

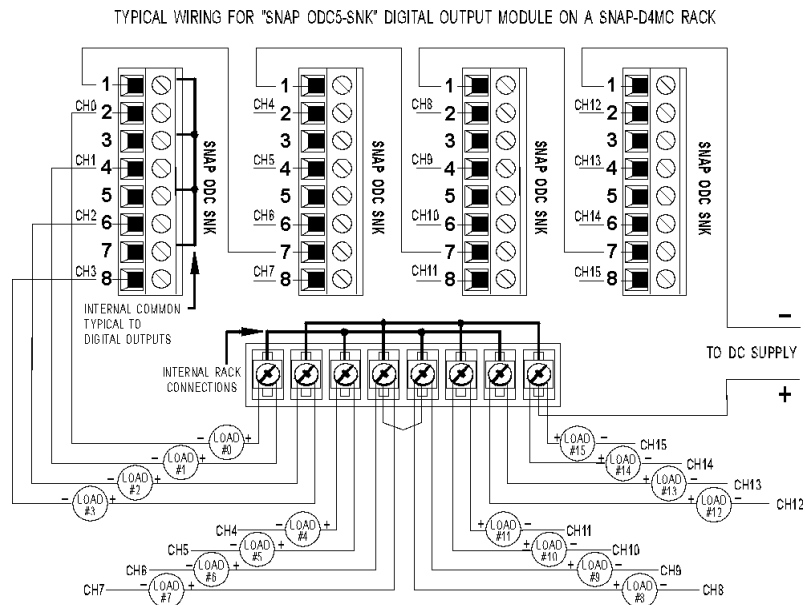
#### Terminal Strip Usage—Digital (continued)

NOTE: Consult the SNAP module data sheet for your specific module for additional wiring information.

#### Example: Digital DC Output (Sourcing) Using Terminal Strip



#### Example: Digital DC Output (Sinking) Using Terminal Strip

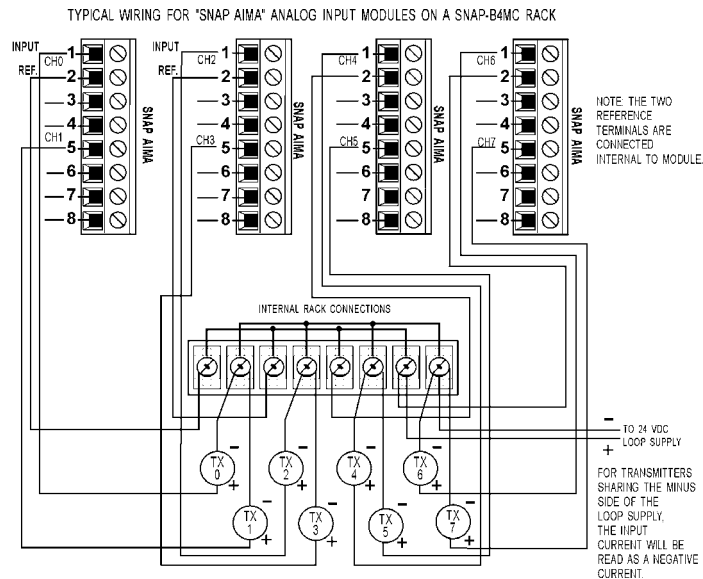


### Wiring Diagrams—Models with Terminal Strips

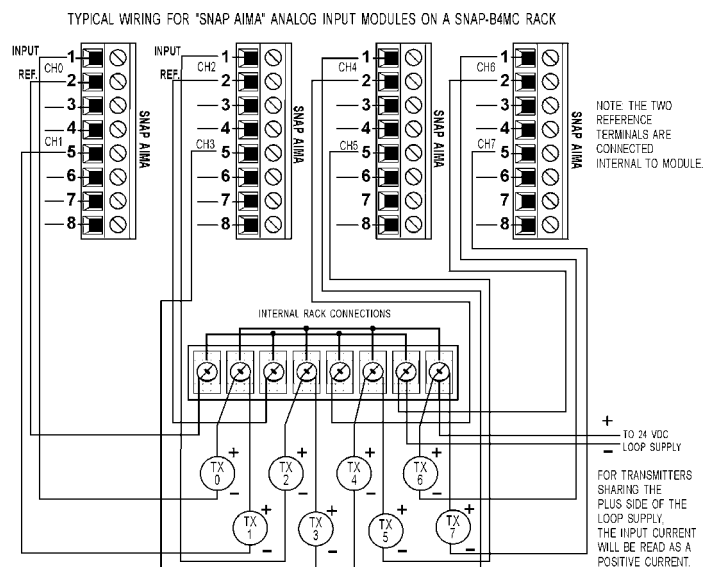
#### Terminal Strip Usage—Analog

NOTE: Consult the SNAP module data sheet for your specific module for additional wiring information.

#### Example: Analog Input (Current: Negative) Using Terminal Strip



#### Example: Analog Input (Current: Positive) Using Terminal Strip

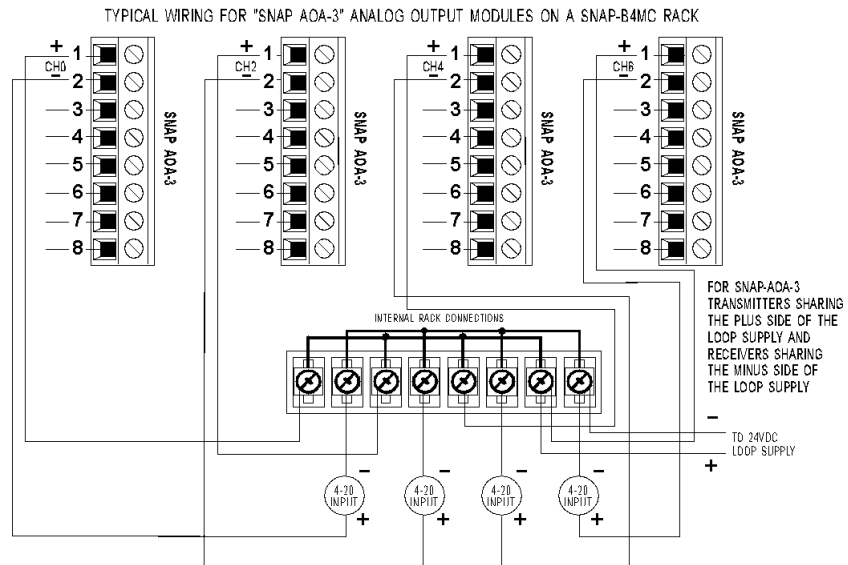


### Wiring Diagrams—Models with Terminal Strips

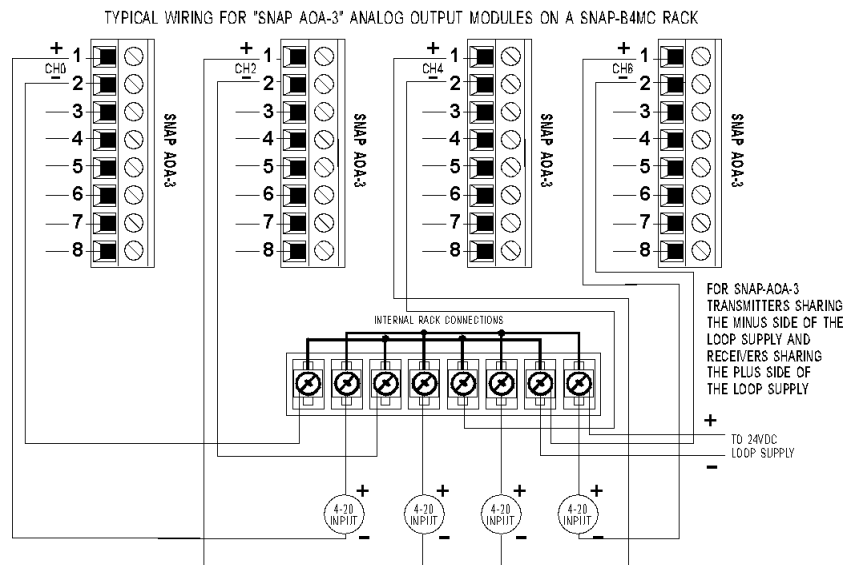
#### Terminal Strip Usage—Analog (continued)

#### Example: Analog Output (4–20 mA Current: Sourcing) Using Terminal Strip

NOTE: Consult the SNAP module data sheet for your specific module for additional wiring information.



#### Example: Analog Output (4–20 mA Current: Sinking) Using Terminal Strip

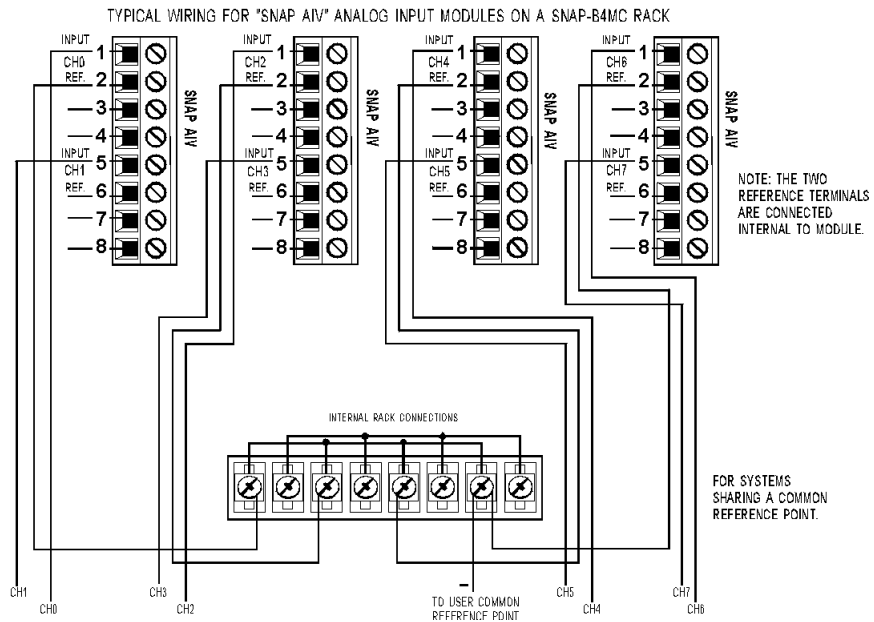


### Wiring Diagrams—Models with Terminal Strips

#### Terminal Strip Usage—Analog (continued)

#### Example: Analog Input (Voltage) Using Terminal Strip

NOTE: Consult the SNAP module data sheet for your specific module for additional wiring information.





## Products

Opto 22 produces a broad array of reliable, flexible hardware and software products for industrial automation, remote monitoring, enterprise data acquisition, and machine-to-machine (M2M) applications.

## SNAP Ethernet Systems

Based on the Internet Protocol (IP), SNAP Ethernet systems offer flexibility in their network connectivity and in the software applications they work with. The physical network may be a wired Ethernet network, a cellular wireless network, or a modem. A wide variety of software applications can exchange data with SNAP Ethernet systems, including:

- Opto 22's own ioProject™ suite of control and HMI software
- Manufacturing resource planning (MRP), enterprise management, and other enterprise systems
- Human-machine interfaces (HMIs)
- Databases
- Email systems
- OPC client software
- Custom applications
- Modbus/TCP software and hardware.



SNAP Ethernet system hardware consists of controllers and I/O units. Controllers provide central control and data distribution. I/O units provide local connection to sensors and equipment.

## SNAP OEM Systems

Opto 22 SNAP OEM I/O systems are highly configurable, programmable processors intended for OEMs, IT professionals, and others who need to use custom software with Opto 22 SNAP I/O modules.

Linux® applications running on these systems can read and write to analog, simple digital, and serial I/O points on SNAP I/O modules using easily implemented file-based operations. Applications can be developed using several common development tools and environments, including C or C++, Java, and shell scripts.



## M2M Systems

Machine-to-machine (M2M) systems connect your business computer systems to the machines, devices, and environments you want to monitor, control, or collect data from. M2M systems often use wireless cellular communications to link remote facilities to central systems over the Internet, or to provide monitoring and control capability via a cellular phone.

Opto 22's Nvio™ systems include everything you need for M2M—interface and communications hardware, data service plan, and Web portal—in one easy-to-use package. Visit [nvio.opto22.com](http://nvio.opto22.com) for more information.

## Opto 22 Software

Opto 22's ioProject and FactoryFloor® software suites provide full-featured and cost-effective control, HMI, and OPC software to power your Opto 22 hardware. These software applications help you develop control automation solutions, build easy-to-use operator interfaces, and expand your manufacturing systems' connectivity.



## Quality

In delivering hardware and software solutions for worldwide device management and control, Opto 22 retains the highest commitment to quality. We do no statistical testing; each product is made in the U.S.A. and is tested twice before leaving our 160,000 square-foot manufacturing facility in Temecula, California. That's why we can guarantee solid-state relays and optically-isolated I/O modules *for life*.

## Product Support

Opto 22's Product Support Group offers comprehensive technical support for Opto 22 products. The staff of support engineers represents years of training and experience, and can assist with a variety of project implementation questions. Product support is available in English and Spanish from Monday through Friday, 7 a.m. to 5 p.m. PST.

## Opto 22 Web Sites

- [www.opto22.com](http://www.opto22.com)
- [nvio.opto22.com](http://nvio.opto22.com)
- [www.internetio.com](http://www.internetio.com) (live Internet I/O demo)

## Other Resources

- OptoInfo CDs
- Custom integration and development
- Hands-on customer training classes.



## About Opto 22

Opto 22 manufactures and develops hardware and software products for industrial automation, remote monitoring, enterprise data acquisition, and machine-to-machine (M2M) applications. Using standard, commercially available Internet, networking, and computer technologies, Opto 22's input/output and control systems allow customers to monitor, control, and acquire data from all of the mechanical, electrical, and electronic assets that are key to their business operations. Opto 22's products and services support automation end users, OEMs, and information technology and operations personnel.

Founded in 1974 and with over 85 million Opto 22-connected devices deployed worldwide, the company has an established reputation for quality and reliability.