

SNAP-IT-1U Installation Guide

Introduction

The SNAP-IT™ rack-mount unit is a packaged solution for attaching electrical, electronic, and mechanical devices to an Ethernet network. Once attached to a network through the SNAP-IT unit, these devices can be monitored and controlled locally or remotely.



Packaged in a 1U box, the unit is designed for mounting in a standard 19-inch rack. It can also be placed on a desktop or table. Typical applications include monitoring and controlling facility, computer, and telecommunications equipment, as well as remote equipment and machines. For example, using SNAP-IT units, you can:

- Monitor alarms and control doors
- Monitor equipment line voltage and current draw
- Turn on or off fans, lights, and motors
- Manage temperature, humidity, and security in facilities
- Report production counts
- Track machine throughput to plan preventive maintenance
- Detect and respond to machine jams and shutdowns
- Remotely reboot servers.

SNAP-IT-1U units come in two models. **SNAP-IT-1U8E** includes a SNAP Ethernet brain, power supply, mounting rack for up to eight digital, analog, or special-purpose input/output (I/O) modules, and a wiring harness. **SNAP-IT-1U8U** also includes a power supply, 8-module mounting rack, and wiring harness, but adds the programming power of a SNAP Ultimate brain. For both models, purchase I/O modules separately as needed for your application.

With either model, you can easily configure modules and manage devices using any authorized computer and included software. The SNAP-IT-1U8U with the SNAP Ultimate brain gives you the additional power to easily create powerful, flowchart-based control programs that run locally. Easy-to-use Windows-based software for developing these programs is included.

What's in This Guide?

This brief guide shows you how to set up the unit and insert input/output (I/O) modules. To configure modules and communicate with the unit, you also need the *ioManager User's Guide*, Opto 22 form #1440.

Wiring information and specifications for modules can be found in the Opto 22 documents listed below. All documents are available in Adobe® Acrobat® PDF form on the Opto 22 Web site at www.opto22.com.

Digital input modules	Form #773
Digital output modules	Form #1144
Analog input modules	Form #1065
Isolated analog input modules	Form #1182
Analog output modules	Form #1066
Serial communication modules	Form #1191
PID modules	Form #1263

For Help

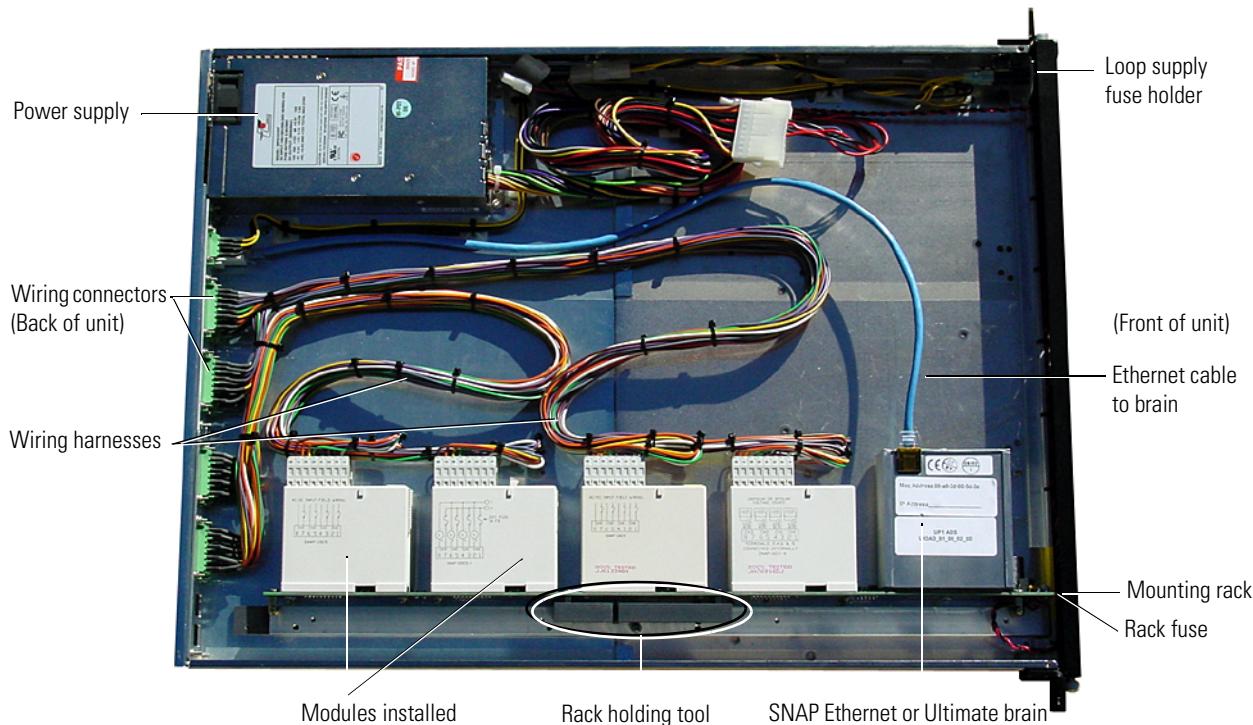
If you have problems installing or using your SNAP-IT unit and cannot find the help you need in this guide, you can contact Opto 22 Product Support.

Phone:	800-TEK-OPTO (835-6786) 951-695-3080 (Hours are Monday through Friday, 7 a.m. to 5 p.m. Pacific Time)
Fax:	951-695-3017
Email:	support@opto22.com
Opto 22 Web site:	support.opto22.com

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

Quick Start

The following figure shows the parts inside the SNAP-IT-1U unit, looking down from the top with the front of the unit on the right. Modules (purchased separately) are shown as they would appear if eight of them were installed; they lie on their sides in pairs on the mounting rack.



Mount the SNAP-IT Unit

Mount the unit on a standard 19-inch rack, or place it on a desktop or table. Since wiring to the devices being managed is attached to connectors at the back of the unit, choose a position that allows rear access.

Input/Output Modules

When you purchase the SNAP-IT-1U unit, you also purchase Opto 22 SNAP input/output (I/O) modules as needed for your application. Modules come in three basic types:

- **Digital modules** monitor and control electrical, mechanical, and electronic devices that can be in one of only two states: either on or off. Dry contacts and door sensors are examples of digital devices. Digital modules contain four points. These points are used either as inputs to report a device's on/off status, or as outputs to turn a device on and off remotely.
- **Analog modules** monitor devices that have a range of possible values, such as temperature or pressure sensors. Analog modules contain either two or four input or output points.

- **Special-purpose modules** provide specific functionality. Serial modules, for example, communicate with serial devices such as chart recorders and barcode readers, by sending and receiving ASCII characters via two serial ports. Wiegand serial modules receive input from security devices such as card readers that use the Wiegand protocol. PID modules monitor input signals and adjust output signals to control one proportional-integral-derivative (PID) loop per module, performing all necessary PID calculations in the module itself.

Inserting Modules

Up to eight modules can be inserted in the mounting rack inside the SNAP-IT unit. Any type of module can be placed in any position.

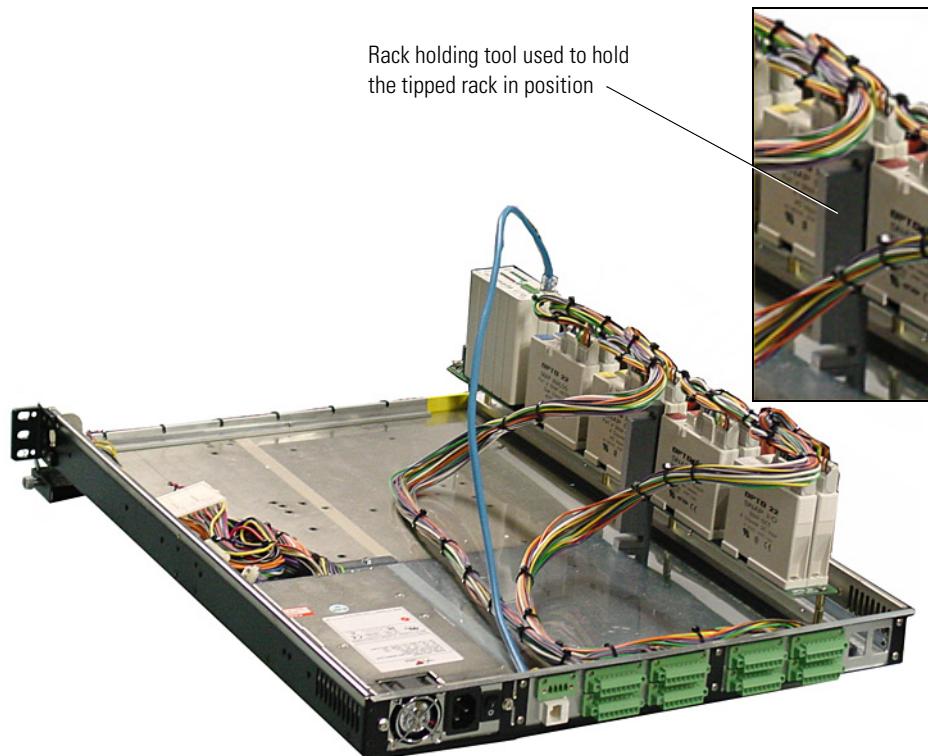
1. Make sure the unit is turned off and the power cord is unplugged from the unit.

2. If the unit is in a rack, remove it so you can take off the top cover.

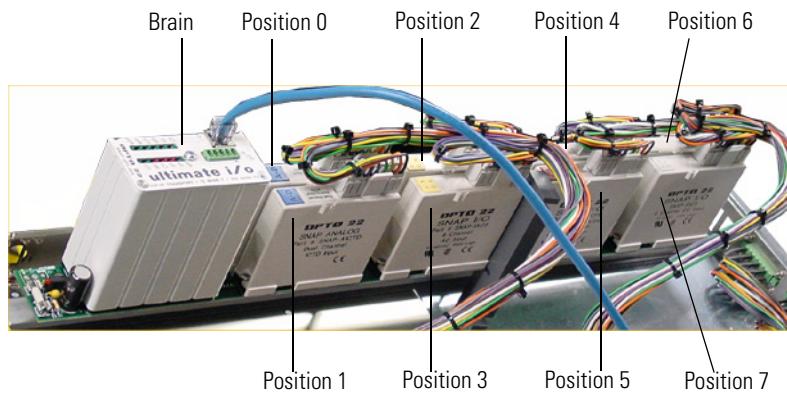
WARNING: *Make sure power is off before continuing, or you may severely damage the module.*

3. Unscrew the four small screws holding on the SNAP-IT unit's top cover. Carefully slide the cover out of the slots on each side.

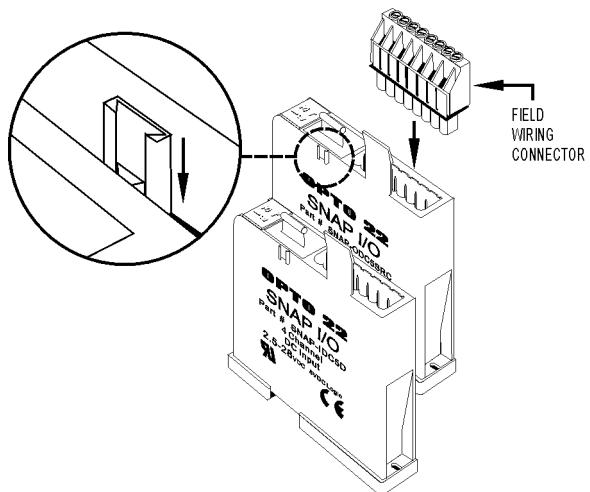
4. Tip up the rack. Remove the rack holding tool from its storage position (see the diagram on [page 3](#)) and use it to hold the rack level, as illustrated below. The diagram shows modules already in position, so you can see where they will go.



- Notice that each module position has a number, beginning with P0 (zero). If you are looking at the rack with the brain on the left side, module positions are as shown below:



- Place the module in the position you want. When positioning a module next to another, be sure to align the male and female module keys (shown in the detailed view in the illustration below) before placing it.

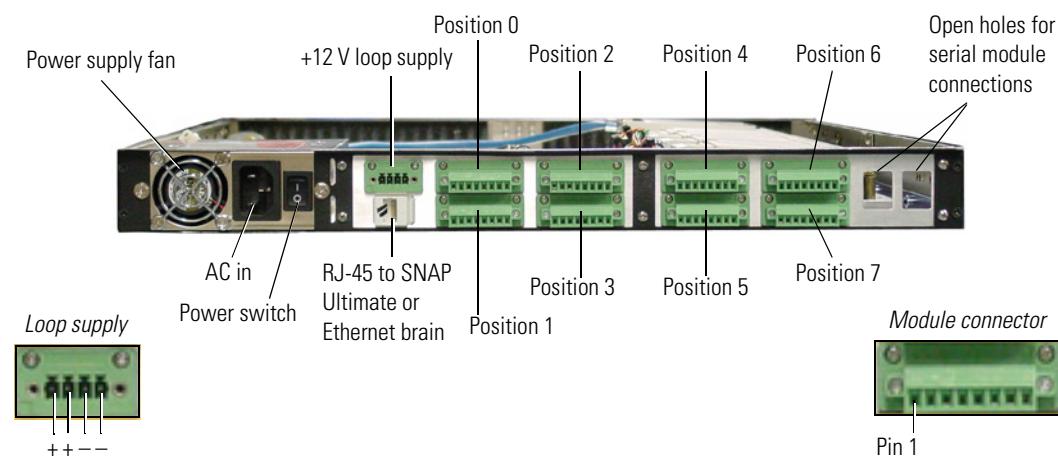


- Use two trussed-head 4-40 x 5/8 screws to hold the module in position. (Modules *must* be held in position with screws.)

CAUTION: Do NOT over-torque screws.

Connect the Devices

The following diagram shows device wiring to the back of the SNAP-IT-1U unit.



Wiring Modules

Wiring harnesses are provided for wiring between the analog and digital I/O modules on the rack and the wiring connectors on the back of the SNAP-IT unit. Field wiring is one for one, and module position numbers correspond with the connectors, as shown in the diagram above.

The correct wiring harness connector for each module will probably be apparent from their position and length. In addition, each connector is marked with its module position number.

- 1.** After modules are in place, snap the correct connector into the top of each module, matching the module's position with the number on the connector.
- 2.** To wire field devices to a connector on the unit's back panel, unscrew the holding screws for the connector and pull it out of its housing. Wire devices according to the module data sheet (data sheets are referenced on [page 2](#)). Then snap the connector back in and reattach its holding screws.
- 3.** If you are using an analog module that requires a loop power supply, wire the supply to the loop supply wiring connector on the back panel. See the diagram above for connections.
- 4.** For serial communication modules, run wiring to field devices through the holes provided at the right side of the back panel (see diagram, above).

Other Wiring

- 1.** When you have finished inserting and wiring modules, replace the top of the unit and put the unit back in its location.
- 2.** Plug the RJ-45 Ethernet connector into the back of the SNAP-IT unit.

Apply Power to the Unit

Plug AC power into the unit and turn the unit on using the power switch in the back panel (see the previous figure).



WARNING: Electrical hazard!

Do not plug in the unit unless the top cover is securely in place.

Use the SNAP-IT Unit on the Network

Follow instructions in the *ioManager User's Guide* (Opto 22 form #1440 to do the following:

1. Assign an IP address to the SNAP-IT unit.
2. Test communication.
3. Configure I/O points, event/reactions, and security.

The SNAP-IT unit is ready to use.

Specifications

The following table lists specifications for SNAP-IT units.

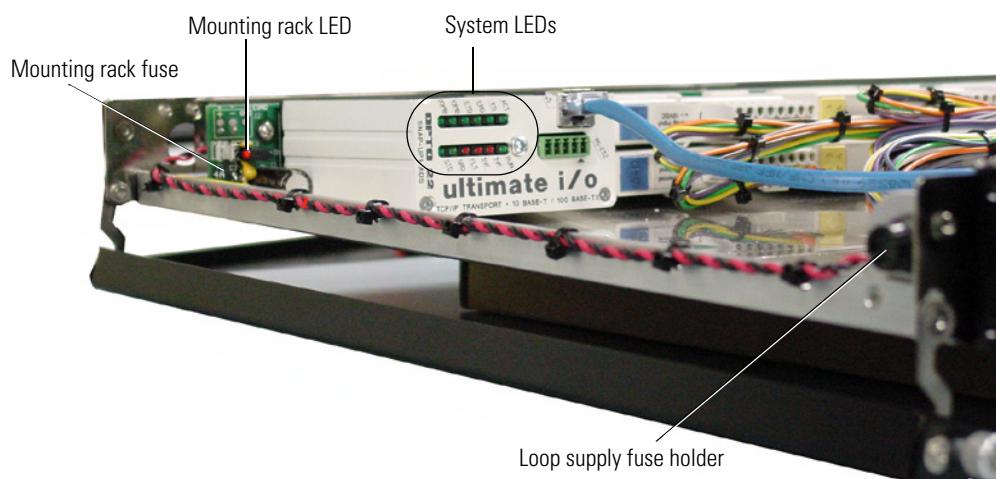
Communications	
Protocols	SNMP, SMTP, FTP, and Modbus/TCP over TCP/IP, UDP/IP, and PPP
Serial Port	RS-232. Default rate is 19,200 Kbd; baud rate is soft-selectable from 2400 to 115,200 Kbd.
Ethernet Port	10/100 Mbps Fast Ethernet, using Category 5 or superior solid UTP cable with RJ-45 connector
Other Specifications	
Dimensions	19-inch rack-mount enclosure, 1U. 19" (482.6 mm) W, 1.75 (44.4 mm) " H, 23.5" (596.9 mm) D
Power Supply	UL rated 120–250 VAC Manufacturer rated 100–250 VAC (Other options available by special order.)
Power Cord	(Ordered separately) 120 VAC United States, 240 VAC United Kingdom, or 240 VAC International
Power Consumption	30 W
Temperature	0° to 55° C operating, -30° to 85° C storage
Humidity	0–95% humidity, non-condensing

LED Indicators and Fuses

LEDs and fuses are located inside the front of the SNAP-IT unit. To open the front cover of the unit, unscrew the thumbscrews on each side of the cover and swing the cover down from the top.



The mounting rack LED is visible through the front grill. Inside the box, you can see the loop supply fuse holder, the mounting rack LED and fuse, and system LEDs.

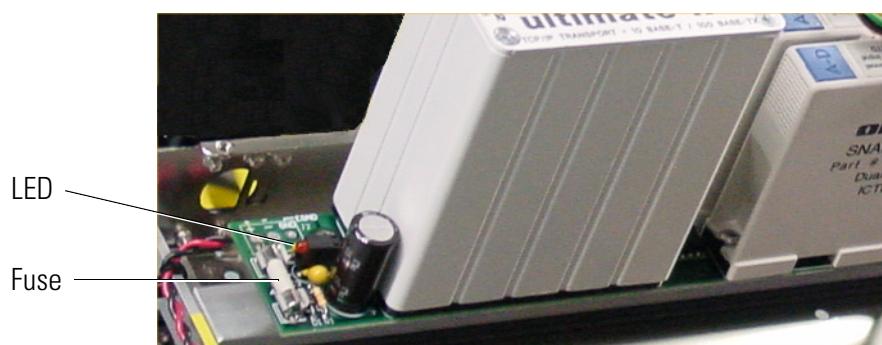


Loop Supply Fuse Holder

The loop supply fuse holder is just inside the front cover of the SNAP-IT unit on the right side.

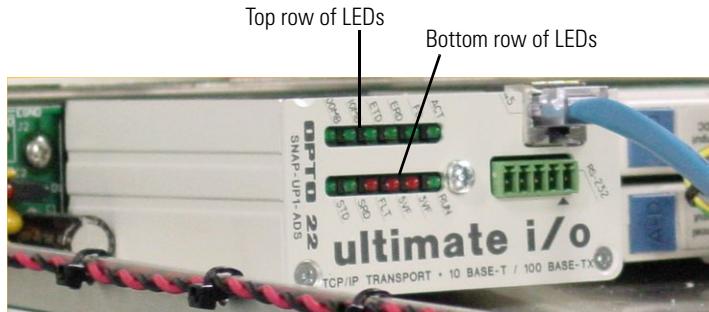
Mounting Rack LED

The red LED on the mounting rack should be lit. If the red LED is off, check the fuse on the mounting rack as shown in the following figure. (The rack has been tipped up for easier access, as shown on [page 4](#).)



System LEDs

System LEDs are located on the SNAP Ultimate or SNAP Ethernet brain. When you have opened the front cover, look into the unit to see the LEDs inside:



System LEDs are described in the following table. For more information on LEDs and for troubleshooting suggestions, see the *ioManager User's Guide* (Opto 22 form #1440) .

Top Row			Bottom Row		
LED	Color	Description	LED	Color	Description
ACT	green	Network Activity	RUN	green	Normal Operation
FD	green	Full Duplex Mode	3VF	red	3 Volt Fault
ERD	green	Ethernet—Receive Data	5VF	red	5 Volt Fault
ETD	green	Ethernet—Transmit Data	FLT	red	Microprocessor Fault
10MB	green	Ethernet Link Detection at 10 Mbps	SRD	green	Serial—Receive Data
100MB	green	Ethernet Link Detection at 100 Mbps	STD	green	Serial—Transmit Data

Digital Module LEDs

In addition to the system LEDs shown in the table above, numbered LEDs on each digital module indicate the status of the module's four points. A lighted LED indicates that the digital point is on. Module LEDs are not visible unless the top cover of the unit is open.

Notes on Brain Maintenance

Maintenance instructions for the brain are in the *ioManager User's Guide* (Opto 22 form #1440). If you need to change the SNAP-IT unit's IP address, reset it to factory defaults, or download new firmware, you will need to use the instructions in this guide.

CAUTION: *Jumpers in the SNAP-IT-1U unit are different from jumpers on other SNAP-IT units. Be sure to follow the "Standard SNAP Ethernet or SNAP Ultimate Brain" diagram in the user's guide to determine which jumper is which.*

Removing Modules

Removing Modules

1. Turn off power and unplug the power cord from the unit.

WARNING: *Make sure power is off before continuing, or you may severely damage the module.*

2. If the unit is in a rack, remove it so you can take off the top cover.
3. Unscrew the small screws holding on the SNAP-IT unit's top cover. Carefully slide the cover off.

Each module position is numbered (P0 through P7), but the numbers are not visible when modules are in place. Check the module's position in the diagram on [page 5](#).

4. Tip up the rack. Use the rack holding tool to hold the rack level.
5. Remove the module's two hold-down screws. Lift up on the module to remove it.

NOTE: *If you are replacing the module with no change in wiring to it, you can unplug the field wiring connector on the old module's top and use it with the new module.*

6. When you have finished removing and replacing modules, replace the top of the unit, put the unit back in its location, and plug the power cord back in.

Copyright © 2003 Opto 22. All rights reserved. Printed in the United States of America.

The information in this manual has been checked carefully and is believed to be accurate; however, Opto 22 assumes no responsibility for possible inaccuracies or omissions. Specifications are subject to change without notice.

All trademarks, trade names, logos, and service marks referenced herein belong to their respective companies.