# SNAP Simple I/O
## BRAINS



| Part Number | Description |
|---|---|
| SNAP-ENET-S64 | Analog/simple digital/serial brain |

## Description

Opto 22 SNAP Simple I/O™ is the low-cost, high-quality solution that brings you the ease of Ethernet/TCP communications as well as the flexibility of analog, simple digital, and serial capability on the same mounting rack.

Ideal for high-density commercial and industrial applications and for remote monitoring applications with high I/O point counts, a SNAP Simple I/O unit consists of a SNAP-ENET-S64 brain mounted on a 16-module SNAP-M64 rack with standard SNAP I/O™ modules. These analog, digital, and serial modules can be mounted in any position on the rack (maximum 8 serial modules).

SNAP Simple I/O can act as part of a SNAP control system, controlled by a SNAP Ultimate I/O™ unit or a SNAP-LCE controller running ioControl™ strategies (version 5.1 or newer), or it can act as an independent I/O unit. You can communicate with an independent Simple I/O unit using Modbus/TCP, the OptoOPCServer (available separately), or applications you develop using the free SNAP Ethernet I/O Driver Toolkit. The brain also supports data streaming.

SNAP Simple I/O is easily configured using the ioManager™ software utility included with the brain, which includes a BootP feature for assigning IP addresses.

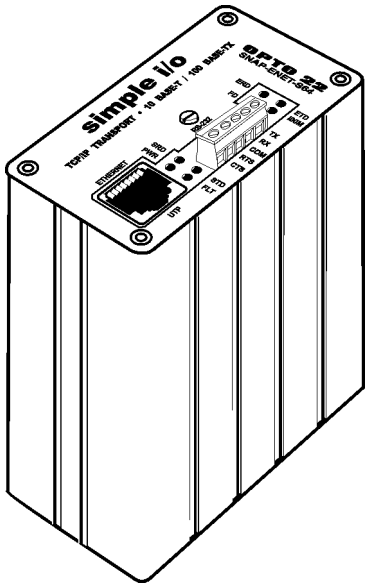
The SNAP-ENET-S64 brain provides both 10 and 100 Mbps Fast Ethernet compatibility, with automatic speed negotation and a standard RJ-45 twisted-pair connector. The brain also includes a serial port for programming and diagnostics.

Simple I/O brain functions include the following:

- **Digital**—Input latching, on/off status, and watchdog timer.
- **Analog**—Thermocouple linearization (32-bit floating point for linearized values), minimum/maximum values, offset and gain, scaling, time-proportional output, filter weight, output clamping, and watchdog timer.
- **Serial**—Ability to send and receive ASCII strings to and from attached serial devices, such as chart recorders and barcode readers.

See the chart on page 4 for a detailed comparison of SNAP Simple I/O, SNAP Ethernet I/O, and SNAP Ultimate I/O features.

Each SNAP digital module contains four input or four output points. SNAP analog modules used with the SNAP-ENET-S64 brain contain either two points or four points, depending on the module. SNAP serial communication modules provide two serial ports to connect serial devices to the Ethernet network.




## Features

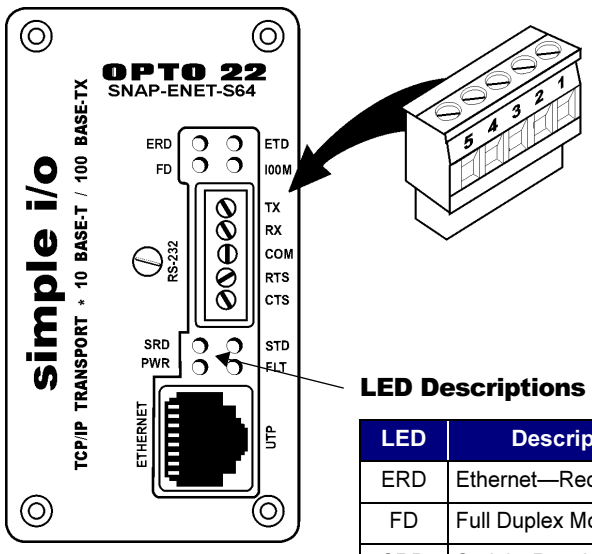
- 10/100 Mbps Fast Ethernet network connectivity
- Use SNAP analog, digital, and serial modules in any position on a single 16-module mounting rack
- Compatible with SNAP Ultimate I/O and ioControl strategies (version 5.1 or newer)
- Simultaneous communication using Modbus/TCP, OPC, and other applications you develop.

## Description (continued)

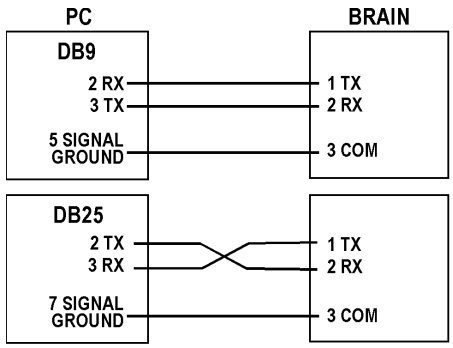
## Specifications

| | |
|---|---|
| Power Requirements | 5.0 VDC ± 0.1 VDC at 1.2 A maximum (does not include module power requirements) |
| Operating Temperature | 0° C to 70° C |
| Storage Temperature | -40° C to 85° C |
| Humidity | 0–95% humidity, non-condensing |
| Network Interface | IEEE 802.3 network, 10Base-T and 100Base-TX |
| Serial Port | RS-232 (for programming and diagnostics only) |
| Serial Data Rates | Default is 19,200 kBd; baud rate is soft-selectable from 2400 to 115,200 kBd. |
| Maximum Ethernet Segment Length | 100 meters with Category 5 or superior UTP.<br>For 100 Mbps at this distance, use Category 5 or superior solid UTP. |
| Jumpers (Internal) | Boot to kernel/boot to loader<br>Reset to factory defaults |

### Serial Connector Pinouts




### RS-232 Serial Cable




### LED Descriptions

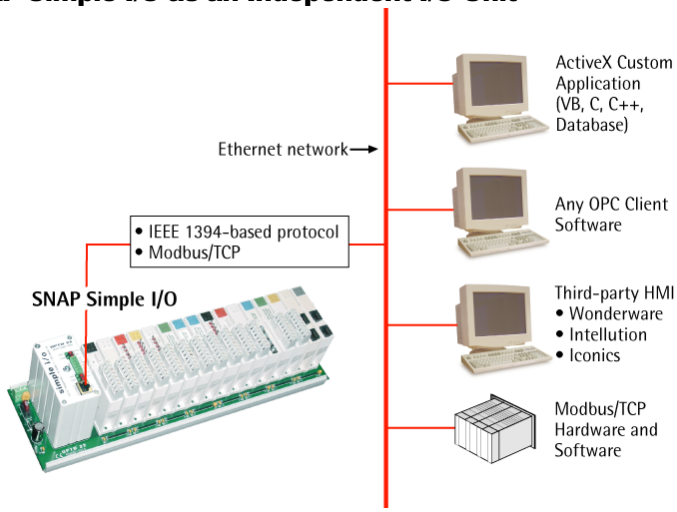
| LED | Description |
|---|---|
| ERD | Ethernet—Receive Data |
| FD | Full Duplex Mode |
| SRD | Serial—Receive Data |
| PWR | Power On |

| LED | Description |
|---|---|
| ETD | Ethernet—Transmit Data |
| 100M | Ethernet Link Detection at 100 Mbps |
| STD | Serial—Transmit Data |
| FLT | Microprocessor Status or Fault |

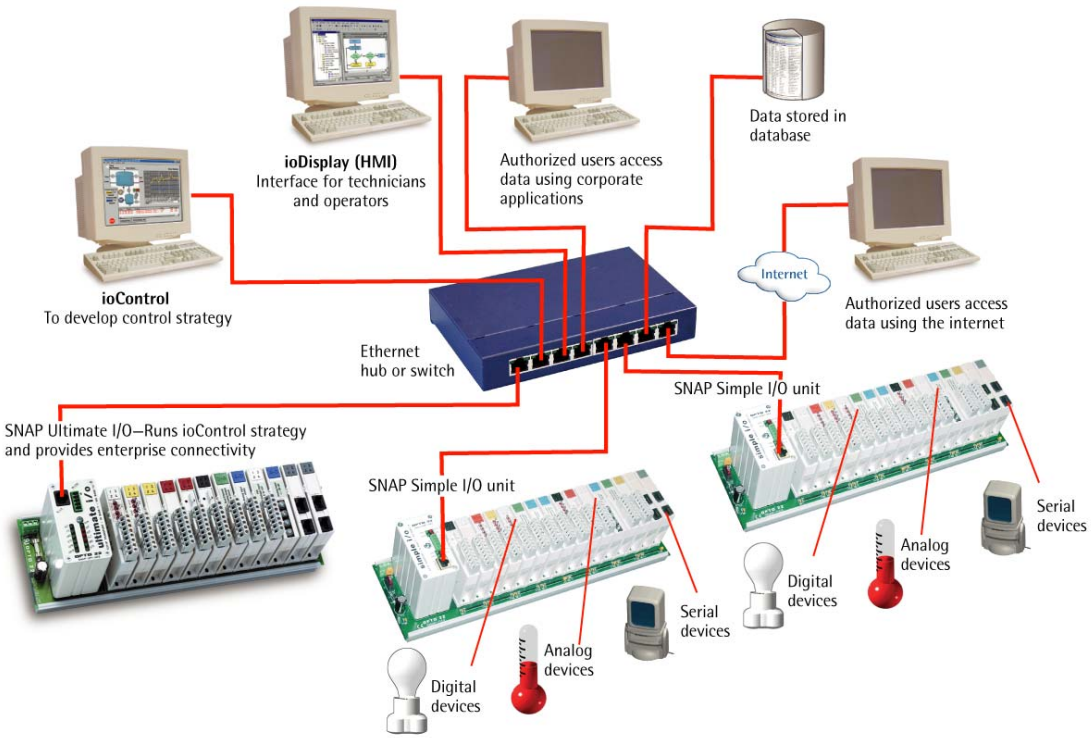
## System Architecture

The SNAP-ENET-S64 is shown with a SNAP-M64 mounting rack and standard SNAP I/O modules (analog, digital, and serial).

**SNAP Simple I/O as an Independent I/O Unit**




**SNAP Simple I/O as Part of a SNAP Ultimate I/O Control System**



## SNAP Ethernet I/O Comparison Chart

The following table compares Opto 22 Ethernet-based brains: SNAP Simple I/O, SNAP Ethernet I/O, and SNAP Ultimate I/O.

| FEATURE | | SNAP Simple I/O | SNAP Ethernet I/O | | | SNAP Ultimate I/O | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | SNAP-ENET-S64 | SNAP-B3000-ENET | SNAP-ENET-D64 | SNAP-WLAN-FH-ADS | SNAP-UP1-ADS | SNAP-UP1-D64 | SNAP-UP1-M64 | SNAP-UPN-ADS |
| Digital I/O points | Input latching | X | X | X | X | X | X | X | X |
| | On/off status | X | X | X | X | X | X | X | X |
| | Watchdog timer | X | X | X | X | X | X | X | X |
| | High-speed counters (20 kHz) | | X | | X | X | | | X |
| | Quadrature counters | | X | | X | X | | | X |
| Analog I/O points | Thermocouple linearization (32-bit floating point for linearized values) | X | X | | X | X | | X | X |
| | Minimum/maximum values | X | X | | X | X | | X | X |
| | Offset and gain | X | X | | X | X | | X | X |
| | Scaling | X | X | | X | X | | X | X |
| | Time-proportional output | X | X | | X | X | | X | X |
| | Output clamping | X | X | | X | X | | X | X |
| | Filter weight | X | X | | X | X | | X | X |
| | Watchdog timer | X | X | | X | X | | X | X |
| Serial communication modules | | X | X | | X | X | | X | X |
| Serial events | | | X | | X | X | | X | X |
| PID logic on the brain | | | X | | X | X | | X | X |
| PID modules | | | X | | X | X | | X | X |
| Digital events | | | X | X | X | X | X | X | X |
| Alarm events | | | X | | X | X | | X | X |
| Timers | | | X | X | X | X | X | X | X |
| Event messages | | | X | X | X | X | X | X | X |
| UDP Streaming | | X | X | X | X | X | X | X | X |
| Email (SMTP client) | | | X | X | X | X | X | X | X |

| FEATURE | SNAP Simple I/O | SNAP Ethernet I/O | | | SNAP Ultimate I/O | | | |
|---|---|---|---|---|---|---|---|---|
| | SNAP-ENET-S64 | SNAP-B3000-ENET | SNAP-ENET-D64 | SNAP-WLAN-FH-ADS | SNAP-UP1-ADS | SNAP-UP1-D64 | SNAP-UP1-M64 | SNAP-UPN-ADS |
| OPC driver | X | X | X | X | X | X | X | X |
| Data logging in the brain | | X | | X | X | | X | X |
| Security (IP filtering, port access) | X | X | X | X | X | X | X | X |
| Real-time clock (RTC) | | X* | | | X | X | X | X |
| I/O point data mirroring | | X | | X | X | | X | X |
| Memory map copying | | X | | X | X | | X | X |
| Scratch Pad area—bits | | X | X | X | | | | |
| Scratch Pad area—bits, floats, integers, strings | | | | | X | X | X | X |
| SNMP (network management of I/O & variables) | | X | X | X | X | X | X | X |
| PPP (dial-up and radio modems) | | X | X | X | X | X | X | X |
| FTP server and client | | | | | X | X | X | X |
| Modbus/TCP | X | X | X | X | X | X | X | X |
| Wired network (Ethernet) | X | X | X | | X | X | X | X |
| Wireless LAN (802.11 FH wireless network) | | | | X | | | | |
| Nokia M2M platform compatibility | | | | | | | | X |
| Runs ioControl strategies | | | | | X | X | X | X |
| ioControl compatibility (through SNAP Ultimate I/O or SNAP-LCE controller) | X | X | X | X | X | X | X | X |
| OptoControl compatibility (through Opto 22 controller with Ethernet card) | | X | X | X | | | | |
| Mounting rack | SNAP-M64 | SNAP B-series | SNAP-D64RS | SNAP B-series | SNAP B-series | SNAP-D64RS | SNAP-M64 | SNAP N-series |
| Number of modules per mounting rack | 16 | 4, 8, 12, or 16 | 16 | 4, 8, 12, or 16 | 4, 8, 12, or 16 | 16 | 16 | 8 or 12 |
| Module types and maximum numbers allowed per I/O unit | 16 digital 16 analog 8 serial | 8 digital 16 analog 8 serial | 16 digital | 8 digital 16 analog 8 serial | 8 digital 16 analog 8 serial | 16 digital | 16 digital 16 analog 8 serial | 8 digital 12 analog 8 serial |

* Complete use of this feature requires SNAP-ENET-RTC hardware

## Dimensional Drawing