

Description

The M4SENET-100 is an Ethernet network interface card designed for Opto 22's M4 series controllers, such as the SNAP-LCM4 and the M4RTU. The card provides connection capability with a 10Base-T or 100Base-TX Ethernet network.

The M4SENET-100 functions both as an I/O interface with Opto 22 Ethernet I/O, and as a host interface with the Opto 22 FactoryFloor® software suite. Peer-to-peer communication between controllers is also supported. Each M4 controller can accept one M4SENET-100 card.

Physical network configuration follows the 10Base-T and 100Base-TX standards. The network uses a star topology with a maximum hub-to-M4SENET-100 distance of 100 meters using solid-core category 5 or better unshielded twisted-pair cable. A standard RJ-45 female connector is provided. The M4SENET-100 automatically detects network speed and the presence of a half- or full-duplex environment. Previous Opto 22 Ethernet cards supported both NetBIOS and TCP/IP; the M4SENET-100 supports TCP/IP only.

The M4SENET-100 includes an auxilliary RS-232 serial port for maintenance and for firmware downloads. The card can be easily configured and diagnosed using Telnet.

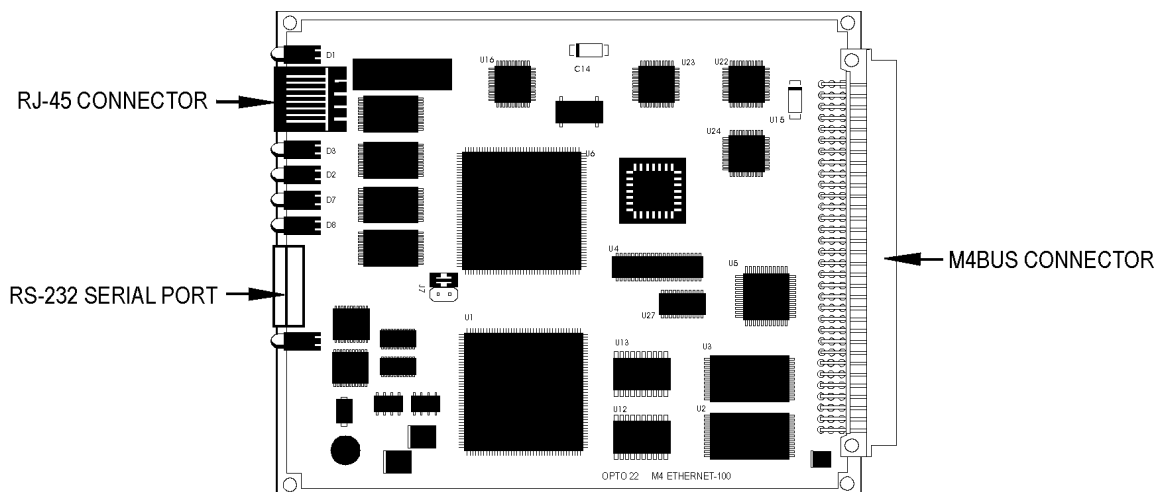
For installation information, see Opto 22 form #1156, the *M4SENET-100 Installation Guide*.

Advantages

The M4SENET-100 offers significant advantages over other types of network interfaces. Its key advantage is its ability to operate on standard Ethernet networks using standard TCP/IP transport. Because host and I/O traffic are on a standard network, a separate I/O or control network may not be required for the control system; or, if it is required, it can be built using off-the-shelf components.

The M4SENET-100 uses TCP/IP transport for all transactions, allowing you to use the card in switched, routed, bridged, or wide-area networks without special equipment requirements.

M4SENET-100 Network Interface Card



Description (continued)

Software

The M4SENET-100 interface card is designed to work with FactoryFloor version 3.1 or higher. FactoryFloor is Opto 22's powerful suite of 32-bit industrial automation software for Microsoft® Windows® 95, Windows 98, and Windows NT®. FactoryFloor consists of four integrated components:

- OptoControl™, a graphical, flowchart-based development environment for machine control and process applications
- OptoDisplay™, an intuitive, shared database, human-machine interface (HMI) and trending package, including alarming
- OptoServer™, a robust, OPC-compliant data server that connects the controller network with the PC network

- OptoConnect™, a bidirectional link between the Opto 22 database in the controller and Microsoft's SQL Server® and Access databases.

NOTE: FactoryFloor versions lower than 3.0 do not support the M4SENET-100 card. FactoryFloor versions 3.0 and above support only the M4SENET-100, not the older M4SENETU or M4SENETC Ethernet cards.

Firmware

The M4SENET-100 card comes with firmware already installed. However, you may have to upgrade firmware for the controller in which you install the card. The card requires a version 3.0 or higher Opto 22 kernel in the controller. If necessary, you can use OptoTerm, a utility included with FactoryFloor, to download an updated controller kernel. For instructions, see Opto 22 form #1156, the *M4SENET-100 Installation Guide*.

Specifications

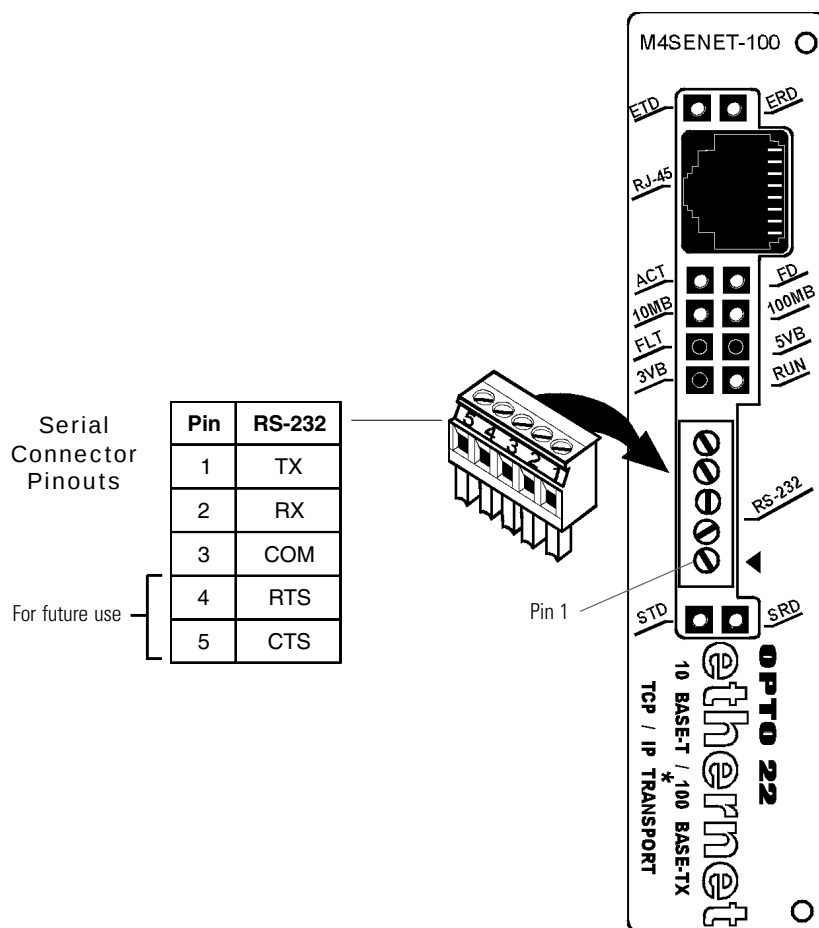
Item	Specification
Card Type	Ethernet NIC, communication coprocessor
Transports Supported	TCP/IP
Maximum Sessions	128 total; up to 128 for SNAP Ethernet I/O, up to 32 for host or peer
Communications	Ethernet 10Base-T or 100Base-TX Auxiliary: RS-232C (for maintenance and kernel downloads)
Data Rate	10 or 100 Mbps auto-detected on Ethernet 19.2 Kbps or software selectable on serial port (maximum 115.2 Kbps)
Cable Type	Solid-core unshielded twisted pair, Category 5 recommended for 10 Mbps and required for 100 Mbps
Maximum Distance	100 meters from hub to node for single segments
Connectors	One RJ-45 Ethernet One five-position Phoenix type for serial port
Current Draw	1.00 Amps
Jumpers (Internal)	Boot to kernel/Boot to loader Normal operation/Restore factory defaults
Operating Temperature	0° to 70° C
Storage Temperature	-40° to 85° C
Humidity	0–95% humidity, non-condensing

Description (continued)

LED Descriptions

LED	Description	LED	Description
ETD	Ethernet—Transmit Data	ERD	Ethernet—Receive Data
ACT	Network Activity	FD	Full Duplex Mode
10MB	Ethernet Link Detection at 10 Mbps	100MB	Ethernet Link Detection at 100 Mbps
FLT	Microprocessor Fault	5VB	5-Volt Fault
3VB	3-Volt Fault	RUN	Normal Operation
STD	Serial—Transmit Data	SRD	Serial—Receive Data

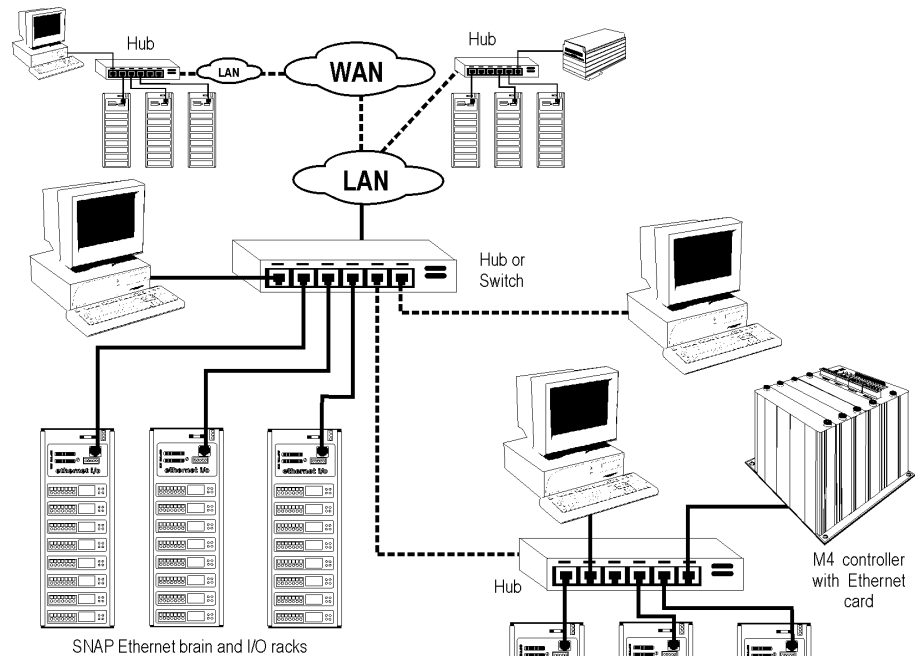
M4SENET-100 Cover Plate



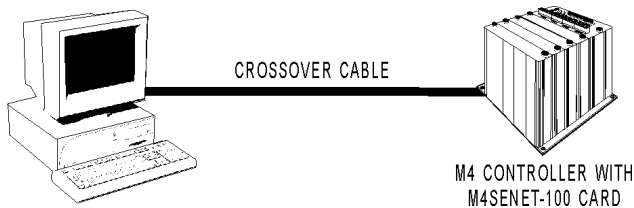
M4SENET-100 System Architecture

M4SENET-100 Network Configuration

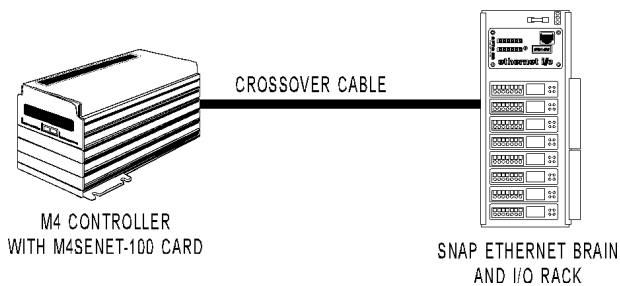
For information on installing the M4SENET-100 interface card and connecting to Opto 22 Ethernet I/O, see form #1156, the *M4SENET-100 Installation Guide*.



M4SENET-100 Host-only Configuration



M4SENET-100 I/O Unit-only Configuration



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 Nvivo™ 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 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
- nvio.opto22.com
- 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.