Part Number	Description
M4	Modular M4 Controller

Description

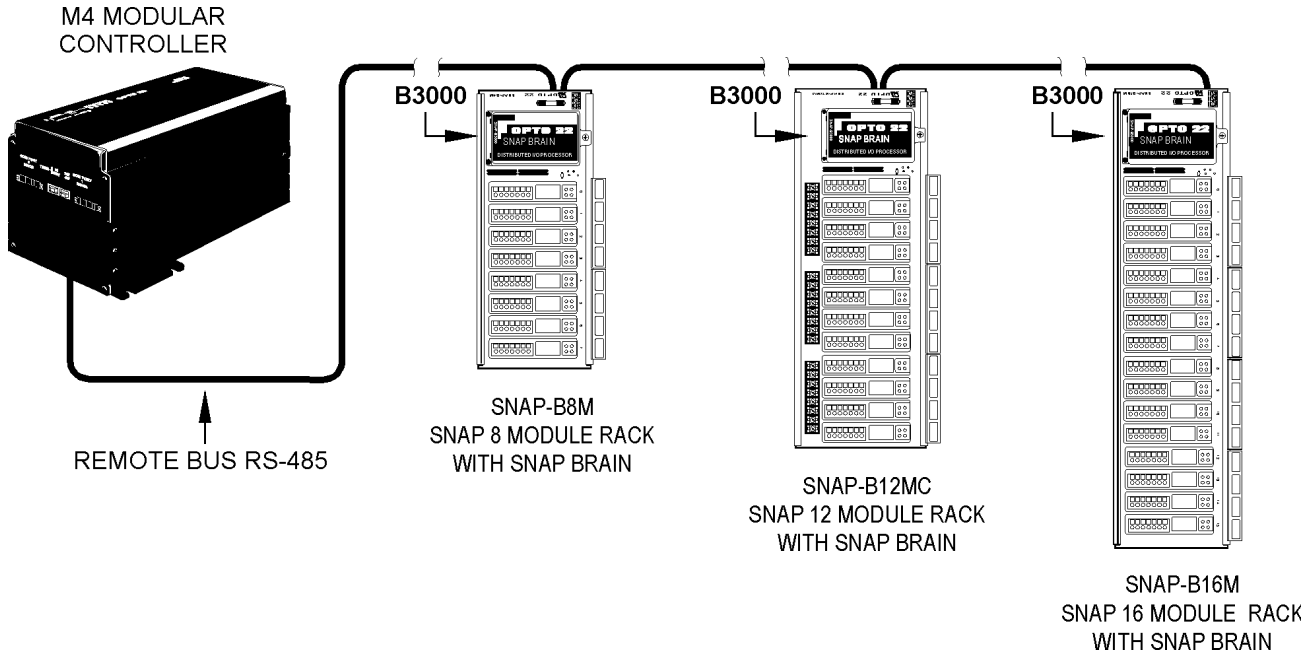
The Modular M4 Controller features powerful communication capabilities, built-in diagnostics, and 32-bit processors. Modular controllers are designed to take advantage of the Opto 22 distributed, intelligent I/O architecture and provide a solid hardware foundation for the Opto 22 FactoryFloor® software suite.

The M4 is ideal for remote applications in harsh environments where its unusually broad range of communication options, including radio modems, cellular modems, and even satellite communication capabilities, are critical. The M4 was designed specifically for industrial field applications, such as waste water treatment, well monitoring, tank farms, petro-chemical and gas pipelines, remote office/plant management, and many others.

The M4 handles program control and host communications with a 32-bit 68020 microprocessor. This processor board is combined with a 3-slot vertical expansion bus board (M4BUS) and a modular power supply into a compact aluminum extrusion package that can be mounted horizontally or vertically. For safety and convenience, the M4 has system monitors for temperature, AC operation, and low battery, and includes such features as a real-time clock and watchdog timers. Removable connector technology is integrated throughout the unit for easy maintenance and wiring removal.

The M4 works in combination with FactoryFloor, a suite of industrial control software applications designed to help you solve control automation problems, build easy-to-use operator interfaces, and expand your manufacturing systems' connectivity. FactoryFloor consists of four integrated components:

- OptoControl™, a graphical, flowchart-based development environment for control solutions, with optional scripting to streamline programming tasks such as string handling, math expressions, and conditions
- OptoDisplay™, a graphical, full-featured HMI with advanced trending and multimedia
- OptoServer™, a data server that connects the controller network with the PC-based FactoryFloor network.
- OptoConnect™, a seamless, bidirectional interface between data systems and control systems, featuring a drag-and-drop interface to Microsoft's SQL Server and Access databases..



Description (Continued)

Software

M4 configuration and development are performed through OptoControl on a PC workstation. OptoControl is an easy to use, self-documenting control environment with a plain English command set and a long tagname database that is shared by all FactoryFloor components.

The M4 also works with Opto 22's classic 16-bit software: Cyrano, Mistic MMI, and Mistic Data Server (MDS.)

Communication Options (Standard)

The M4 communication options, combined with Opto 22 software, support modems (direct, lease, and radio), two-way dial-up capability (host to M4, M4 to host), and peer-to-peer communications. The M4 also supports remote firmware downloading to flash memory, remote program downloading and debugging, and remote data uploading and downloading. The M4 base unit has two serial ports:

- 1 RS-232 serial port, 300-115kBd
- 1 full duplex RS-422/485 serial port, 300-115kBd

Interface Options (Adapter Cards)

The M4BUS has three expansion slots to accommodate a variety of communication interface cards. All modular interface cards for serial communications or network connectivity are supported as standard selections in the FactoryFloor software.

I/O Connectivity

The built-in RS-485/422 COM1 port can be used as a serial link to communicate with remote digital and analog I/O units. Up to 4,096 I/O points can be connected. The M4SSER adapter card can provide two additional serial ports.

Expansion Options (RAM And ROM)

The RAM can be used to store a user's control strategy (program) and data. The flash memory (ROM) stores a kernel (operating system) and can be used to store a control strategy permanently.

RAM: 1 M
ROM: Base, 256K Expansion, 1 M.

Power Supplies

To accommodate a wide variety of applications, seven power supplies are available. These fuse-protected power supplies feature input-to-output isolation protection, a built-in EMI filter, and an on/off switch. They supply enough power to operate the M4 I/O base unit and three M4BUS expansion options.

Interface Adapter Card	Function
M4SSER	Two additional serial ports, up to 115 Kbd (configurable as RS-232 or RS-485/422)
M4SARC	High performance ARCNET connection
M4SENET-100	Ethernet connection (RJ-45)
M4SARCF	Fiber Optic ARCNET connection
M4SARCFR	Fiber Optic ARCNET repeater connection

Power Supply Model	Voltage	Frequency
M4PS12D	12 VDC input (9-15 V)	----------
M4PS24D	12 VDC input (9-15 V)	----------
M4PS48D	48 VDC input (36-60 V)	----------
M4PS125D	125 VDC input (94-156 V)	----------
M4PS120A	120 VAC input (95-130 V)	47-63 Hz
M4PS240A	240 VAC input (190-250 V)	47-63 Hz
M4PSF	Line Filter - requires 24 VDC and 5 VDC	----------

Specifications

Item	Specification
CPU	32-bit Motorola 68020 processor IEEE floating-point math
CPU clock frequency	16.67 MHz
Memory: RAM Flash EEPROM on controller	 1 MB with battery backup (user programs and data) 256 KB -1 MB (Mistic firmware and user programs)
RAM/clock battery	3.6-volt lithium, non-rechargeable
Communication: Base unit Expansion Modem support	 1 RS-232 and 1 RS-485/422 port Via daughter cards: configurable serial ports, Ethernet, ARCNET Direct, lease, and radio
Real-time clock	Clock/calendar, Epson 62421A with battery backup
Power requirements	5 VDC at 3.5 A (maximum) 24 VDC at 300 mA (maximum)
Typical operating temperature	-20° C to 70° C
Storage temperature	-40° C to 85° C
Humidity	5% to 95% relative humidity
Software	FactoryFloor (OptoControl, OptoDisplay, OptoServer, OptoConnect) Classic Software (Cyrano, Mistic MMI, MDS)
System monitors: Host communications Watchdog timers RAM battery backup low Operating temperature	 Detect communication errors from processor, I/O, etc. Detect main power supply operation Detects program corruption (checksum RAM test) Detects temperature

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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 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.

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