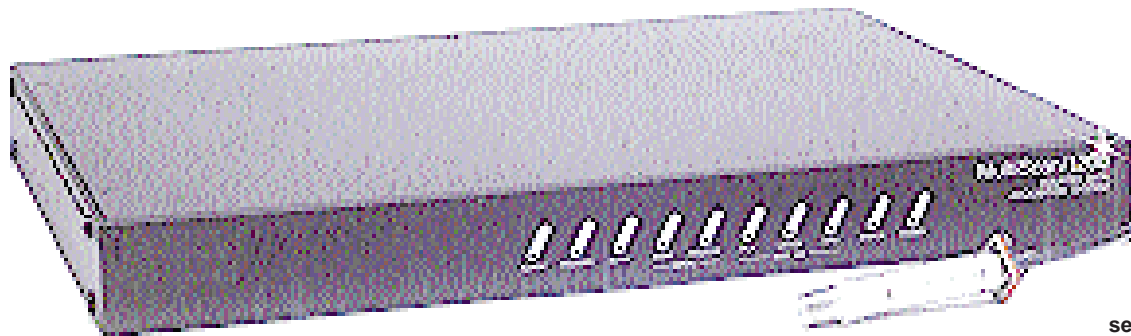


High Speed Isolated Temperature/Voltage Interface

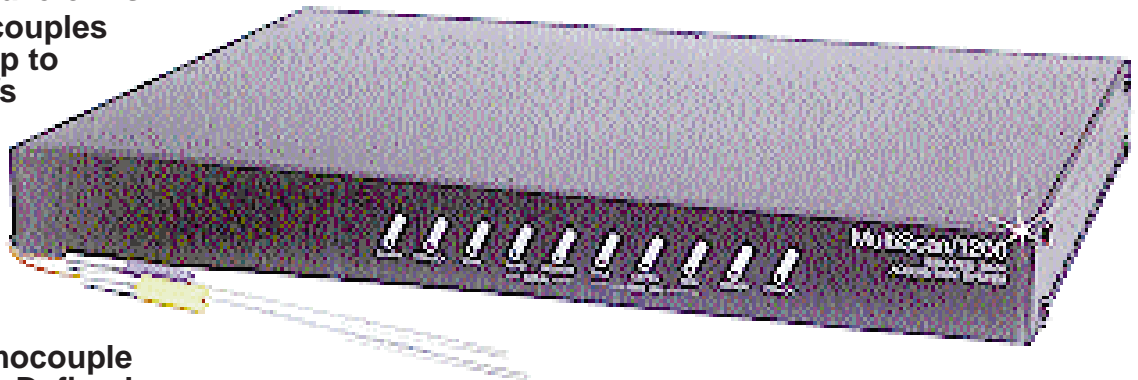
Model OMB-MULTISCAN-1200



\$1595
Basic Unit

Pressure transducer sold separately. See the OMEGA Complete Pressure, Strain and Force Measurement Handbook and Encyclopedia®.

- ✓ Measure Temperature, ac/dc Voltage and Waveforms
- ✓ Scan Thermocouples and dc Volts up to 147 Channels/s
- ✓ Single-Channel Burst Mode for Digitizing Waveforms up to 20 kHz
- ✓ Custom Thermocouple Types for User-Defined Linearization Tables
- ✓ Scanning Modules Available for 24 Channels of Thermocouple/Voltage or High Voltage
- ✓ 744 Channel Max Expansion
- ✓ Built-In IEEE-488 and RS-232/422 Interfaces
- ✓ 32 TTL Digital Alarm Outputs and 8 TTL Digital Inputs
- ✓ Two Programmable Scan Rates for:
 - Pre-Trigger and Post-Trigger Sampling
 - Accelerated Sampling On-Event Detection
- ✓ 256 Kbytes Memory, Expandable to 8 Mbytes
- ✓ Real-Time Clock
- ✓ Includes MultiView Datalogging and PostView Graphic Data Review Programs for Windows



Thermocouple probes sold separately. See the OMEGA Complete Temperature Measurement Handbook and Encyclopedia®.

The OMB-MULTISCAN-1200 is a compact, 19-inch rack-mountable temperature and voltage measurement interface that features channel-to-channel isolation. It has the versatility to scan thermocouples and volts at up to 147 channels/s, and digitize waveforms up to 20 kHz.

The standard unit accepts 24 differential inputs for any combination of voltage and temperature measurements. It has a 16-bit A/D converter, oversampling, and averaging for low noise and AC line rejection.

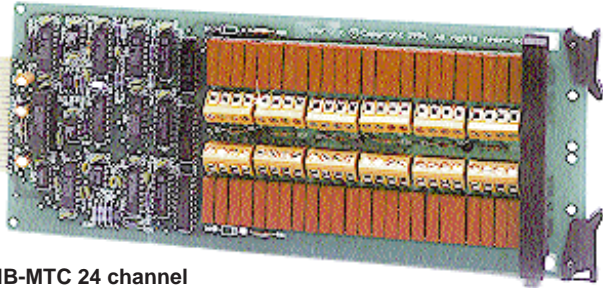
Unlike most temperature measuring instruments and PC plug-in boards, which are difficult or expensive to expand beyond their built-in channel capacity, the OMB-MULTISCAN-1200 can be easily expanded up to 744 channels via low-cost slave expansion units.

The OMB-MULTISCAN-1200 includes easy-to-program IEEE-488 and RS-232/422 interfaces. Two Windows applications, MultiView, a set up, acquisition, and display program; and PostView, a post-acquisition display program, are provided with each unit.



SCANNING MODULES

The OMB-MULTISCAN-1200 can accept either the OMB-MTC-24 thermocouple/voltage or OMB-MHV-24 high voltage input module. Each module features 24 input channels. Using available expansion chassis, up to 30 additional input modules can be accommodated, yielding 744 total input channels.



OMB-MTC 24 channel thermocouple/voltage input module, \$995

The OMB-MTC-24 thermocouple/volts module accepts J, K, T, E, R, S, B, and N thermocouple types, or ± 10 V, ± 5 V, ± 1 V, and ± 100 mV inputs. Channel-to-channel isolation is 200 Vdc peak.

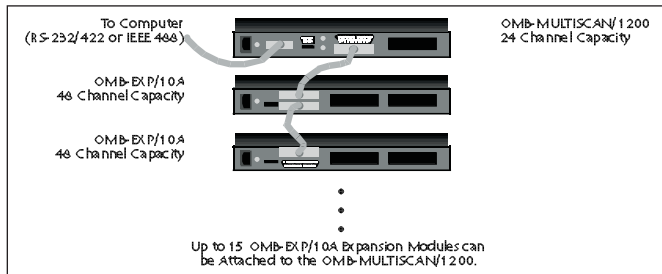
Input Module Measurement Capability

Signal	OMB-MTC-24	OMB-MHV-24
Thermocouple	✓	
Vdc	✓	✓
Vac	✓	✓

The OMB-MHV-24 high-voltage module accepts ± 250 V, ± 25 V, ± 2.5 V. Channel-to-channel isolation is 500 Vdc peak.

EXPANSION ARCHITECTURE

The OMB-MULTISCAN-1200 master unit can control up to 15 OMB-EXP-10A slave expansion units. Each OMB-EXP-10A accepts either one or two 24-channel input modules, providing a maximum of 744 input channels.



MEASURING MODES

The OMB-MULTISCAN-1200 offers users three measuring modes for application flexibility — line-cycle integration, high-speed multi-channel scanning and single-channel burst modes.

Line-Cycle Integration

The OMB-MULTISCAN-1200 can sample and average 32 measurements per line cycle, making it useful for high-accuracy applications. In addition, when engaged in line-cycle averaging, the unit provides ac or dc voltage, or linearized and compensated thermocouple-based temperature readings at up to 44 channels/s.

The OMB-MULTISCAN-1200's ac voltage measurement capability is ideal for power-line monitoring applications. For each measurement, the unit calculates the equivalent true RMS voltage based on 32 samples it acquires during each ac line cycle.

Measurement Mode

	Line Cycle Integration	High Speed Multichannel Scanning	Single-Channel Burst Mode
Thermocouple	✓	✓	
Vdc	✓	✓	✓
Vac	✓		✓

High-Speed, Multichannel Scanning

When line-cycle averaging is disabled, the OMB-MULTISCAN-1200 can average 1, 2, 4, 8, 16, or 32 samples per channel. When the unit is configured to take 1 sample per channel, it can scan 147 channels/s—or all of its potential 744 expansion channels in approximately 5 seconds.

This is important if the application involves monitoring tens to hundreds of channels. By contrast, dataloggers and other temperature measuring instruments typically acquire readings at only 5 to 20 channels/s.

Single-Channel Burst Mode

In single-channel burst mode, the OMB-MULTISCAN-1200 can sample at up to 20 kHz on a single channel and store the data in its memory, which can be expanded up to 8 Mbytes. When performing post-acquisition waveform analysis such as Fast Fourier transforms (FFTs), the unit can return each data point in a waveform to your program. Alternatively, the unit can provide a true RMS value of the equivalent ac voltage.

SCANNING CAPABILITIES

The OMB-MULTISCAN-1200 provides an array of scanning capabilities to meet user application requirements. Because data logging applications frequently require the logging of readings at fixed time intervals, the OMB-MULTISCAN-1200 uses the standard hours-minutes-seconds (hh:mm:ss.s) format to specify the time interval between channel scans. Users can configure the unit to begin and end data logging on a specified event—such as a TTL signal, temperature level, IEEE GET, alarm condition, or absolute time of day—or upon completion of a specified number of readings.

SEE PAGE C-14 TO ORDER.

High Speed Isolated Temperature/Voltage Interface

Two Programmable Scan Rates

The OMB-MULTISCAN-1200 offers two programmable scan rates for applications that require acceleration of the measurement rate on a specified event, such as an alarm condition. For example, you can program the OMB-MULTISCAN-1200 to sample once per minute and then, upon the occurrence of a specified alarm condition, to switch to sampling once per second. Upon cessation of the alarm condition, the unit resumes sampling at the rate of once per minute.

ACCURACY

The OMB-MULTISCAN-1200 has a number of features and capabilities that enable it to deliver the high accuracy demanded by many research applications.

High Resolution

The unit's high-speed 16-bit A/D converter enables it to offer up to 0.1°C and 3.12 μ V resolution with the OMB-MTC-24 scanning module.

Noise Filtering

The OMB-MULTISCAN-1200 filters ac line cycle noise by sampling and averaging 32 measurements per line cycle, or, for more demanding applications, by averaging across multiples of 1, 2, 4, or 8 line cycles.

High-Accuracy Cold-Junction Compensation

The OMB-MTC-24 thermocouple scanning module features three strategically located temperature sensors that provide high accuracy cold-junction compensation across all 24 inputs.

Accurate Linearization

The OMB-MULTISCAN-1200 enables quick and accurate linearization by providing built-in lookup tables for popular thermocouple types, including J, K, T, E, R, S, B, and N. The unit can also store user-defined lookup tables in non-volatile RAM (NVRAM) for use with user-defined thermocouple linearization curves.

ALARMS

Many process-control applications require only periodic monitoring during normal conditions, with accelerated measurement and control until the process returns to a steady state. The OMB-MULTISCAN-1200 provides 32 digital alarm outputs that can be activated on a per-channel basis via user-specified alarm conditions, and it automatically returns its alarm outputs to steady state once limit conditions are resolved.

The OMB-MULTISCAN-1200 can also update alarmed output channels in real-time, at its programmed scan rate, and can alert the host computer of active alarm conditions via an IEEE-488 service request (SRQ). The ability to automatically update alarm outputs in real-time affords greater control of applications and reduces programming burden by eliminating the need for constant, per-channel monitoring by the controlling computer.

REAL-TIME CLOCK

The OMB-MULTISCAN-1200 features a real-time clock to synchronize acquisition to a specific time of day. During acquisition, the OMB-MULTISCAN-1200 stores the time and date of each data scan in memory,

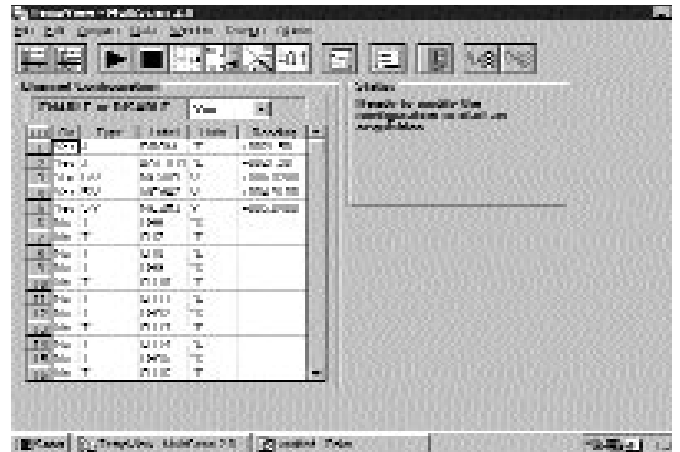
enabling later retrieval of this information for use in plotting and analyzing measurements over time. The unit also time and date stamps each channel's high and low excursions, providing a precise time record of a channel's minimum and maximum values.

MEMORY

The OMB-MULTISCAN-1200 has 256 Kbytes of data storage, which can be upgraded to 1, 4, or 8 Mbytes with standard SIMMS (single in-line memory modules). Because individual measurements are not necessary for all data logging applications, the unit makes each channel's high, low, and last readings available throughout acquisition.

SOFTWARE

The OMB-TEMPSCAN-1100 is shipped with TempView datalogging software for effortless set-up, acquisition and real-time display. Compatible with Windows 3.x and Windows 95, TempView requires no programming and provides a graphical spreadsheet-style display that lets you easily configure your hardware, acquisition and display parameters. TempView data logging software enables users to record temperature and voltage measurements within minutes rather than hours. TempView's graphical toolbar and spreadsheet style



interface allows novice users to obtain results quickly and easily. Yet, TempView also taps the OMB-TEMPSCAN-1100's extensive functionality to satisfy demanding data logging requirements without programming.

TempView's spreadsheet-style interface allows you to enable or disable channels, select thermocouple types or voltage ranges, enter a channel label, and choose units in which to display data including (mX+b) on a per-channel basis. After your channel configuration is complete, a single click of the mouse displays data in real-time in the spreadsheet.

TempView provides four display types for developing custom real-time displays. The display types are digital meters, analog meters, bar graphs and charts. Any combination of these four displays may be active at any time.

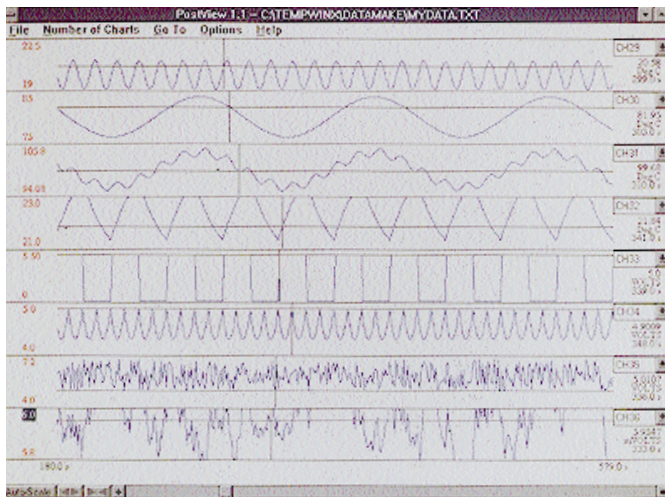
Model OMB-MULTISCAN-1200

The meters and bar graphs support display of up to 32 channels at a time. The charts support up to 16 channels of data in a smooth scrolling stripchart recorder-like fashion

POSTVIEW SOFTWARE

PostView for Windows is also included with the OMB-MULTISCAN-1200. PostView provides strip-chart recorder-like graphical displays for reviewing waveforms previously acquired with MultiView. PostView allows simultaneous display of up to 16 channels and provides independent cursors for each channel. It also supports both manual and automatic scaling, and permits graphical output to any Windows-supported printer.

IEEE-488 & RS-232/422 CONTROL



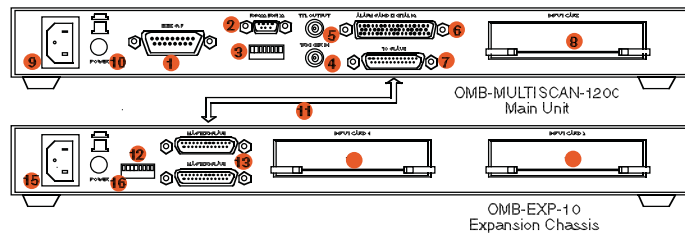
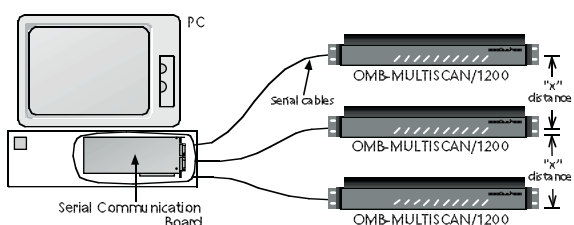
IEEE-488

The IEEE-488 interface can transfer data at up to 300 Kbytes/s. It lets you log readings directly to a computer's hard disk in real-time, making it compatible with OMEGA's IEEE-488.2 controllers for IBM PC and Macintosh computers.

RS-232/422

The RS-232/422 interface can connect directly to a serial port. The unit is suited for process control and environmental control, and other applications that require instruments to be located remotely from the controlling computer. Switch selectable baud rates from 300 to 9600 are supported.

OMB-MULTISCAN-1200 REAR PANEL



- IEEE-488 Connector:** Provides full IEEE-488 control from PCs, Macintosh computers, and SUN, DEC, and HP computers
- RS-232C/RS-422 (DB9) Connector:** Serial port for operation at remote distances from controlling computer; supports 300 to 9600 baud using RTS/CTS or XON/XOFF handshaking
- DIP Switches:** Easy-to-access switches for selecting IEEE-488 or RS-232/422 communication and respective parameters (IEEE-488: Address; RS-232/422: handshaking, parity, and baud rate)
- Trigger input (BNC) Connector:** For initiating and/or stopping acquisition with TTL input signal
- TTL output (BNC) Connector:** TTL output signal occurs for each channel scan; used for synchronizing other equipment with OMB-MultiScan-1200 acquisition
- Alarms and Digital Input/Output (DB50) Connector:** Provides easy access to 32 TTL digital alarm outputs and 8 digital input lines
- Master/slave (DB25) connector:** Connection to OMB-Exp/10A expansion units for channel expansion greater than 24 channels
- Shielded Enclosure:** Accepts scanning modules (OMB-MTC-24 or OMB-MHV-24); designed to keep noise outside and a constant temperature inside
- Power Input Connector:** Internally configurable for either 105-125 or 210-250 Vac, 50/60 Hz, plus fuse circuit breaker
- Power On/Off Switch**
- CA-35-1 Master/Slave Cable**

OMB-EXP/10A REAR PANEL

- DIP Switches:** Easy-to-access switches for selecting OMB-Exp/10A slave ID
- Master/slave (DB25) Connectors:** Provides connection from the OMB-MultiScan-1200 to other OMB-Exp-10A expansion chassis
- Shielded Enclosure:** Accepts any combination of scanning modules (OMB-MTC-24 or OMB-MHV-24)
- Power Input Connector:** Internally configurable for either 105-125 or 210-250 Vac, 50/60 Hz, plus fuse circuit breaker
- Power On/Off Switch**

Specifications

OMB-MULTISCAN-1200

Number of Slots: 1

Number of Channels: up to 24 differential thermocouple or voltage inputs; accepts OMB-MTC-24 or OMB-MHV-24 scanning modules

Channel Attributes: high and low set points; hysteresis value for high and low setpoints

Scan Sequence: channels may be specified in any combination, but are always scanned in ascending order

Scan Interval: absolute time between channel scans (hh:mm:ss.s); minimum = 00:00:00.0; maximum = 99:59:59.9

SEE PAGE C-14 TO ORDER.

High Speed Isolated Temperature/Voltage Interface OMB-MULTISCAN-1200

Maximum Measurement Rate:

1. Line Cycle Integration

Line Cycle Integration					
Line Cycle per Reading	DC Volts & Thermocouple		AC Volts		Maximum Channel Number
	50 Hz	60 Hz	50 Hz	60 Hz	
1	38.5*	44*	38.5*	44*	744
2	19.2*	22*			431
3	9.6*	11*			234
4	4.8*	5.5*			122

2. High-Speed Multichannel Scanning: 147 channels/s

3. Single-Channel Burst Mode: 20 kHz

Programmable Triggering:

temperature or voltage level, absolute time of day, alarm condition, IEEE GET, IEEE TALK, external TTL trigger, specified number of readings

Level Trigger: programmable value for any one channel (not available in single-channel burst mode)

TTL Trigger: programmable for rising or falling edges

Pre-Trigger Count: programmable (\leq memory size - 1)

Post-Trigger Count: programmable

ALARMS & DIGITAL I/O

Number of Digital Alarm Outputs:

32 bits, TTL-level compatible

Number of Digital Inputs: 8 bits, TTL-level compatible

Connector: 50 pin D-connector; mating connector supplied

Alarm Conditions: may be detected by SRQ or software query (SPOLL or U Command)

DATA STORAGE & FORMAT

Storage: 256 Kbyte standard; optional 1 Mbyte, 4 Mbyte, and 8 Mbyte user-installable

Data Formats: ASCII and binary; binary format returns a 16-bit compensated and linearized temperature value (0.1°C/bit); user programmable for hi/lo byte or lo/hi byte; **Note:** High-speed DMA transfers are binary format only

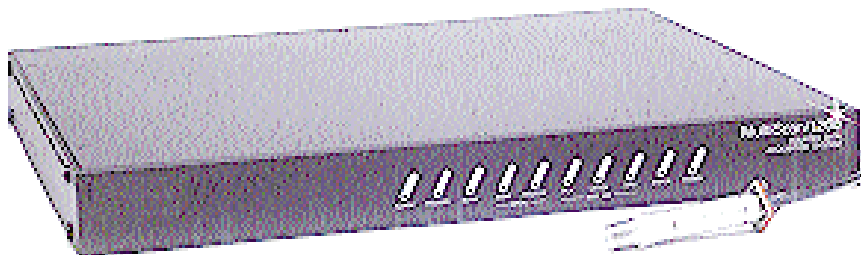
Statistical Parameters: high, low, and last available per channel (not available in single-channel burst mode)

Time Stamp: available for each scan group and for each channel's high, low, and last parameters (ASCII data format only) (not available in single-channel burst mode)

Time Format: absolute date and time (mm/dd/yy hh:mm:ss.sss); relative time (\pm hh:mm:ss.sss, DDDDDDD)

IEEE-488 INTERFACE

Implementation: SH1, AH1, T6, TE4, L4, LE4, SR1, PP0, RL0, DC1, DT1, C0, and E1



Pressure transducer sold separately. See the OMEGA Complete Pressure, Strain and Force Measurement Handbook and Encyclopedia®.

Programmable Parameters: alarm set points, thermocouple types, temperature units, trigger level, pre-trigger and post-trigger scan interval, trigger mode, SRQ mask, scan count, pre-trigger count, digital input, digital output, real time clock, data output format, and terminators

Maximum Data Transfer Speed: 300 Kbytes/s

Connector: standard IEEE-488 connector with metric studs

RS-232/422 INTERFACE

Baud Rates: 300, 1200, 2400, 4800, 9600

Data Bits: 8

Stop Bits: 1

Parity: even, odd, none

Handshaking: RTS/CTS, XON/OFF

Connector: male DB-9

GENERAL

Front Panel Indicators: LEDs for alarm, scanning, talk, listen, SRQ, error, send, receive, power, and trigger status

Power: 105-125 or 210-250 VAC, 50/60 Hz; 20 VA max

Warm-Up: one hour to rated accuracy

Environment: 0 to 50°C; 0 to 95% RH (non-condensing) to 35°C; linearly derate 3% RH/°C from 35°C to 50°C

Dimensions: 45 H x 425 W x 305 mm D (1.75" x 16.75" x 12")

Weight: 3.62 kg (8 lb)

IEEE-488 Connector: standard IEEE-488 connector with metric studs

RS-232/422 Connector: male DB-9

Master/Slave Port: female DB25

Digital I/O and Alarms: female DB50 (32 alarms, 8 digital inputs, 10 ground pins)

Trigger Input: BNC

TTL Output: BNC

Configuration Switches: IEEE-488 or RS-232/422, IEEE-488 address, handshake, parity, baud rate, and calibration-memory write enable/disable

CALIBRATION

Calibration Cycle: one year

Calibration Constants: chassis constants stored in nonvolatile memory; card constants stored in EEPROM; the OMB-MULTISCAN-1200 includes example software for automating its calibration procedure; calibration is enabled via software password

OMB-EXP/10A EXPANSION CHASSIS

Number of Slots: 2

Number of Channels: up to 48 differential voltage or thermocouple inputs; accepts any combination of two OMB-MTC-24 and OMB-MHV-24 scanning modules

Front Panel Indicators: LEDs for scanning, error, and power

Power: 105 to 125 or 210 to 250 VAC, 50/60 Hz; 20 VA max

Environment: 0 to 50°C; 0 to 95% RH (non-condensing) to 35°C; linearly derate 3% RH/°C from 35°C to 50°C

Dimensions: 45 H x 425 W x 305 mm D (1.75" x 16.75" x 12")

Weight: 2.53 kg (5.5 lb)

Rear Panel

Configuration Switches: DIP switch for setting slave ID

Master/Slave Ports: two female DB25 ports

SCANNING MODULE SPECIFICATIONS

OMB-MTC-24—Thermocouple Scanning Module

Number of Channels: 24 differential; programmable by channel for specific thermocouple type or a voltage input

Input Types: J, K, T, E, R, S, B, N, custom thermocouple, and voltage

Input Connectors: screw terminal

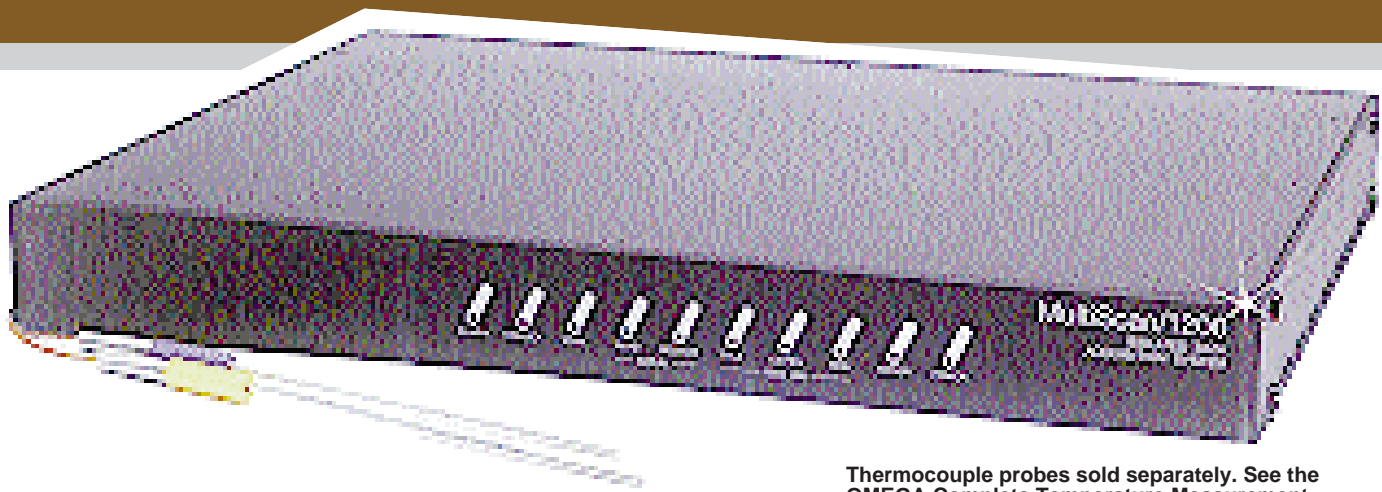
Maximum Allowable Input: ± 25 Vrms

Channel-to-Power Ground Isolation: 200V peak

Channel-to-Channel Isolation: 200V peak

Temperature Coefficient: $<(0.1 \times \text{rated accuracy})\%/^{\circ}\text{C}$

Digital Filtering: averages 32 samples at 50/60 Hz for line-cycle noise rejection (Vdc and thermocouple measurements)



Thermocouple probes sold separately. See the OMEGA Complete Temperature Measurement Handbook and Encyclopedia®.

TEMPERATURE SPECIFICATIONS

Thermocouple Wire: #20 AWG recommended (#18 AWG max)

Temperature Range and Accuracy:

Type	Range	Accuracy*	Resolution**
J	-100 to 760°C	±0.5°C	0.10°C
	-200 to -100°C	±0.8°C	0.20°C
K	-100 to 1372°C	±0.6°C	0.10°C
	-200 to -100°C	±0.8°C	0.20°C
T	-100 to 400°C	±0.5°C	0.15°C
	-200 to -100°C	±0.8°C	0.25°C
E	-100 to 1000°C	±0.7°C	0.10°C
	-200 to -100°C	±0.9°C	0.20°C
R	0.0 to 1780°C	±2.0°C	0.40°C
S	0.0 to 1780°C	±2.0°C	0.40°C
B	+350 to 1820°C	±2.0°C	0.50°C
	-100 to 1300°C	±0.6°C	0.15°C
N	-100 to 1300°C	±0.6°C	0.15°C
	-200 to -100°C	±0.9°C	0.20°C

* 18° to 28°C, 1 year; includes cold junction compensation

**Typical; excludes thermocouple errors

Temperature Units: °C, °F, °K, °R, and mV

Fault Detection: open thermocouple may be detected by software query

Cold-Junction Sensors: one for every 8 input channels

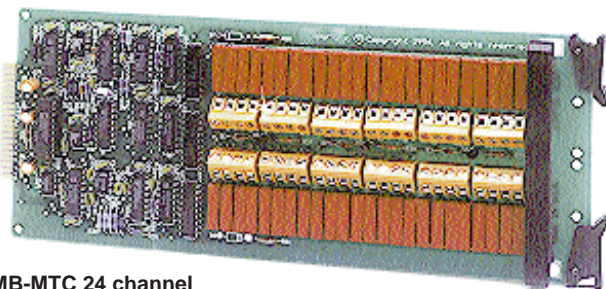
Linearization: performed by lookup table; includes support for storing user-defined linearization tables in NVRAM

AC/DC VOLTAGE SPECIFICATIONS

Range/Resolution:

Range	Resolution
±100 mV	3.12 µV/bit
±1 V	31.21 µV/bit
±5 V	156.06 µV/bit
±10 V	312.12 µV/bit

Accuracy: ±0.02% of range



OMB-MTC 24 channel thermocouple/voltage input module, \$995

OMB-MHV-24—High Voltage Scanning Module

Number of Inputs: 24 differential; programmable by channel for any input range

Input Connectors: screw terminal

Range/Resolution:

Range	Resolution
±2.5 V	781.4 µV/bit
±25 V	78.14 µV/bit
±250 V	7.81 mV/bit

Accuracy: ±0.02% of range

Digital Filtering: averages 32 samples at 50/60 Hz for line-cycle noise (Vdc measurements)

Temperature Coefficient: <0.01%/°C

Input Impedance: 1 MΩ typ

Input Bias Current: 40 nA max

Common Mode Rejection: 100 dB typ

Maximum Allowable Input: 400 VDC

Channel to Power Ground Isolation: 500V peak

Channel-to-Channel Isolation: 500V peak; 325 V peak if used in the same system with the OMB-MTC-24 module

To Order (Specify Model Number)

Model No.	Price	Description
OMB-MULTISCAN-1200	\$1595	Multiscan-1200 main unit, includes MultiView and PostView software board
OMB-EXP-10A	1195	2-slot expansion chassis
OMB-EXP-11A	2295	2-slot expansion chassis
OMB-MTC-24	995	24-channel thermocouple/voltage input module
OMB-MHV-24	995	24-channel high voltage input module

Memory Options

Model No.	Price	Description
OMB-MULTIMEM1	\$395	1 MB additional memory
OMB-MULTIMEM4	595	4 MB additional memory
OMB-MULTIMEM8	995	8 MB additional memory

Each OMB-MULTISCAN-1200 unit supplied with MultiView software, digital I/O mating connector, rack mount kit and complete operator's manual. Each OMB-EXP-10A supplied with rack mount kit and master/slave cable.

Ordering Example: OMB-MULTISCAN-1200 main unit, OMB-EXP-10A expansion chassis, and three OMB-MTC-24 24-channel thermocouple/voltage input modules, for 72-channels of thermocouple/voltage measurement, \$1595 + 1195 + 3(995) = \$5575.