NEW™

Portable High-Speed Multichannel Digitizer for Notebook or Desktop PCs

OMB-WAVEBOOK-512

$2495
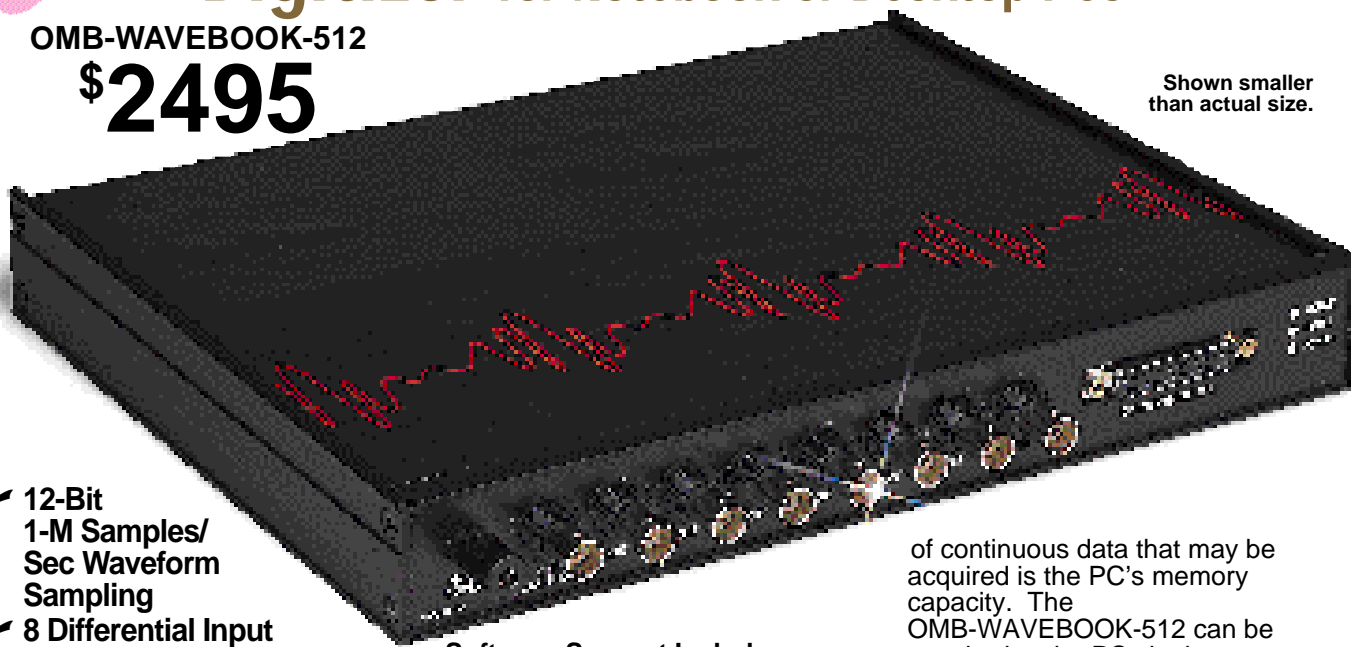
✔ **12-Bit 1-M Samples/Sec Waveform Sampling**

✔ **8 Differential Input Channels, Expandable to 72**

✔ **1 μsec/Channel Scanning of Any Combination of Channels**

✔ **128-Location Programmable Channel/Range Sequencer**

✔ **DSP-Based Design Provides Real-Time Digital Calibration on All Channels**

✔ **Single and Multichannel Triggering with Programmable Level and Slope**

✔ **Digital TTL-Level Triggering**

✔ **Programmable Pre- and Post-Trigger Sampling Rates**

✔ **8 High-Speed 1-MHz Digital Inputs**

✔ **Connects to Notebook PCs Via Enhanced Parallel Port (EPP) or Optional PCMCIA Card**

✔ **Connects to Desktop PCs Via EPP or Optional ISA-Bus Plug-in Card**

✔ **Operable from AC Adapter, 10-30 Vdc Source, 12 V Car Battery, or Optional Rechargeable Battery Module**

Software Support Includes:
- **WaveView for Windows Software for Easy Setup and Real-Time Waveform Display**
- **PostView for Windows Software for Easy Review of Acquired Waveforms**
- **Visual Basic eXtensions (VBXs)**
- **DOS and Windows Drivers**

The OMB-WAVEBOOK-512 is a portable, high-speed multichannel digitizer that easily attaches to notebook or desktop PCs. Its compact, all-metal construction and convenient BNC signal connections make it ideal for laboratory and field applications. Its digital signal processing (DSP)-based design automatically calibrates every channel and eliminates all potentiometers. The DSP further enables multichannel triggering capability typically associated with far more expensive waveform recorders and replaces a great deal of expensive, power-hungry circuitry, making the OMB-WAVEBOOK-512 compact and flexible. The unit can be powered from a standard ac line, an optional rechargeable battery, or even a 12-V car battery.

Because the OMB-WAVEBOOK-512 transfers acquired readings directly into PC memory, the only limit to the amount of continuous data that may be acquired is the PC's memory capacity. The OMB-WAVEBOOK-512 can be attached to the PC via the enhanced parallel port (EPP), which is supported by most new PCs, or via an optional PCMCIA interface card for notebook PCs or an ISA-plug-in board interface for desktop PCs. The unit is supplied with drivers that handle all aspects of PC communication.

The OMB-WAVEBOOK-512's design takes advantage of the increasingly powerful capabilities of notebook and desktop PCs. Instead of duplicating features already provided by the PC, such as memory for data storage, the OMB-WAVEBOOK-512 leverages the PC's inherent capabilities. Thus, the unit serves primarily as a digitizing and multiplexing front-end to the PC's processing and data storage capabilities. The net result is a lower cost and more compact solution than that provided by traditional digitizers or dataloggers.

INPUT STAGE

The OMB-WAVEBOOK-512 features a differential input amplifier on each of its eight differential input channels. This isolates the input signals from any multiplexing transients and greatly improves the frequency response. It also reduces the sensitivity to input signal source impedance as compared with most plug-in boards, which directly multiplex the input signals.
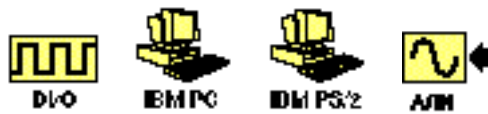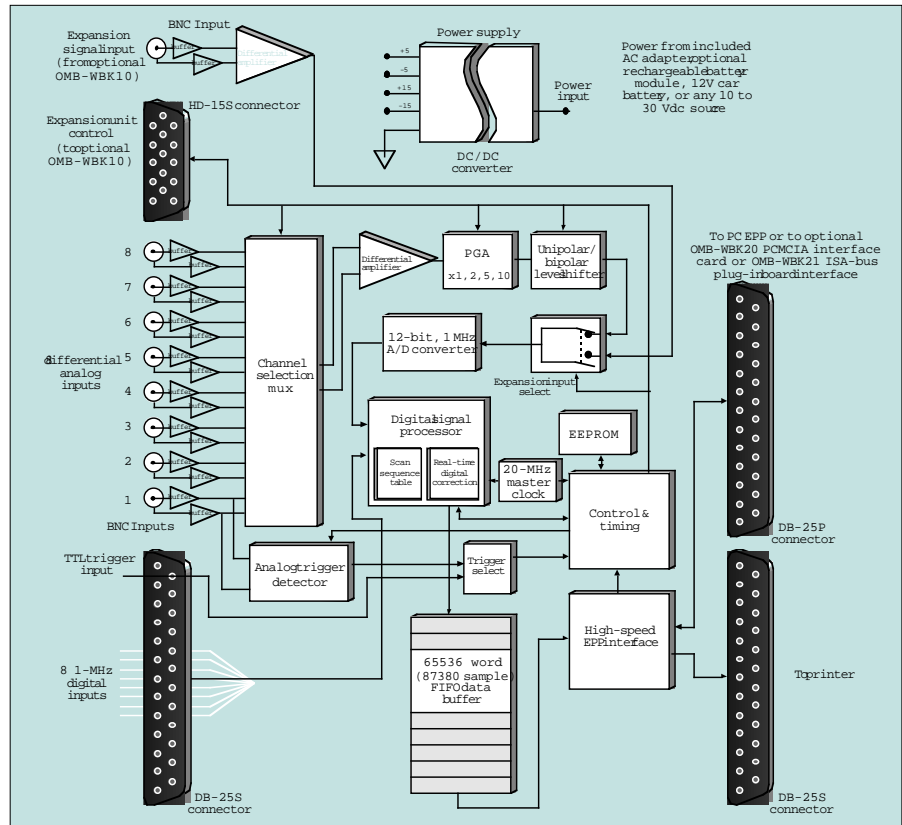
Notebook Computer not included

The OMB-WAVEBOOK-512 offers both bipolar and unipolar input ranges that can be programmed on a per-channel basis by the sequencer. The unit's bipolar ranges are ±5, ±2.5, ±1, and ±0.5 VFS. Its unipolar ranges include 0 to +10, +5, +2, and +1 VFS. Three additional bipolar and three unipolar ranges are available with the internal OMB-WBK-11 optional accessory panel.

HIGH-SPEED DIGITAL INPUT

The OMB-WAVEBOOK-512 also features an 8-bit TTL digital input/output port, which may be used for high-speed digital input, sampling 8 bits of digital data at the beginning of each scan sequence and permitting the time correlation of digital signals with analog samples. It may also be used, when data acquisition is not underway, as a 32-address, byte-wide, general-purpose input/output port. The DB25 digital I/O port includes a 15 V and +5 connections to power attached devices.

TRIGGERING

The OMB-WAVEBOOK-512 offers a wide variety of programmable analog and digital trigger modes. It also allows a different pre- and post-trigger sample rate. All trigger conditions are software programmable prior to the start of a scan sequence. Four trigger sources are supported: software, digital, single channel analog, and multichannel analog. In addition to the selection of trigger sources, the user can select one of several trigger modes, including four post-trigger and two pre-trigger modes.

POST-TRIGGER MODES

The post-trigger mode acquires data only after a trigger condition has occurred. The user has a choice of four methods of collecting data in the post-trigger mode. In all cases, the acquired data is placed into a pre-defined buffer, which is limited only by the PC's available memory.

INFINITE LINEAR MODE

In this mode, the unit acquires data for an infinite amount of time after a trigger occurs, placing the data into the buffer, until a "stop" command is issued by the PC. If the amount of acquired data exceeds the size of the buffer, the PC must supply an additional buffer or the acquisition will halt and an error condition will be reported.

INFINITE CIRCULAR MODE

In this mode, the unit acquires data into a circular buffer for an infinite

OMB-WAVEBOOK-512 Block Diagram

amount of time, until a "stop" command is received from the PC. When the circular buffer becomes full, it writes over previously acquired data, and thus always contains the most recently acquired data.

FINITE LINEAR MODE

In this mode, the unit acquires data after receipt of the trigger until a specified number of scans (from 1 to 100 million) is acquired and places the data into the buffer. If the amount of data exceeds the size of the buffer, the PC must supply an additional buffer or acquisition will halt and an error message will be reported.

FINITE CIRCULAR MODE

In this mode, the unit acquires data into a circular buffer until a specified number of scans (from 1 to 100 million) is acquired. When the circular buffer becomes full, it writes over previously acquired data, and thus always contains the most recently acquired data.

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PRE-TRIGGER MODES

Pre-trigger mode a
acquisition of readi
receipt of a trigger
trigger can be usec
the four trigger sou
described above. V
pre-trigger is select
the rate at which a
scan group
repeats can differ
before and after
a trigger. (Only
the time between
scan groups can
differ; the time
between consecuti
samples within a gr
at 1 µsec.) For exa
group of eight char
triggered at 100 ms
to a trigger conditic
per scan after the t
is satisfied.

Rear view of OMB-WAVEBOOK-512

PRE-TRIGGER CIRCULAR MODE

In this mode, data is placed into a circular buffer until it becomes full, after which the buffer writes over previously acquired data. This typically happens when the unit is acquiring pre-trigger data. Assuming the buffer has sufficient room, at the end of the acquisition it will contain the pre-trigger number of pre-trigger scans followed by the post-trigger number of post-trigger scans.

PRE-TRIGGER LINEAR MODE

In this mode, the data is placed into a buffer. If the total amount of data exceeds the size of the buffer, the PC must supply additional buffer or the acquisition will halt and an error condition will be reported. Since the amount of pre-trigger data may be nearly infinite (if the trigger takes a very long time to occur), this mode may require very large buffers to avoid loss of data.

SIMULTANEOUS SAMPLING

The OMB-WAVEBOOK-512 samples each channel in sequence, at a fixed 1 µsec/channel rate. Thus, for example, when eight channels are scanned sequentially, the time between sampling the first channel and the eighth channel is 7 µsec.

To Order, See Page C-58.

and hold card is available. This card can be installed in either the OMB-WAVEBOOK-512 or the OMB-WBK10 expansion chassis; it provides simultaneous sampling of all channels in a system. Even when multiple OMB-WBK11 cards are used within one system, all channels are sampled within 100 nsec of one another.

The OMB-WBK11 also provides a system with the following additional ranges: ±0.25 V, ±0.1 V, and ±0.05 bipolar, and 0 to +0.5 V, +0.2 V, and +0.1 V unipolar. Unlike the OMB-WAVEBOOK-512's base ranges, the ranges provided by the OMB-WBK11 cannot be switched from the sequencer on a per-channel basis. Instead, the range can be programmed at the beginning of a scan sequence via a software command.

EXPANSION

You can easily expand the OMB-WAVEBOOK-512 beyond its built-in 8-channel capacity to obtain up to 72 analog input channels. Expansion is accomplished through the use of up to eight OMB-WBK10 expansion and power chassis. Each chassis provides the OMB-WAVEBOOK-512 with an additional eight differential analog input channels. All expansion

OMB-WAVEBOOK-512

OMB-CA-128   OMB-CA-129

OMB-WBK10 expansion chassis

OMB-WBK10 expansion chassis
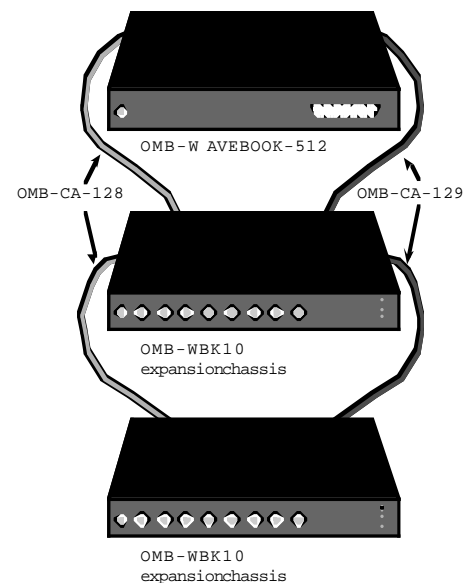
channels have exactly the same functionality as the main unit's eight built-in channels.

The OMB-WBK 10 has the same power flexibility as the OMB-WAVEBOOK-512. It can operate from a standard ac line, an optional rechargeable battery, a 12 V car battery, or any 10 to 30 Vdc power supply.
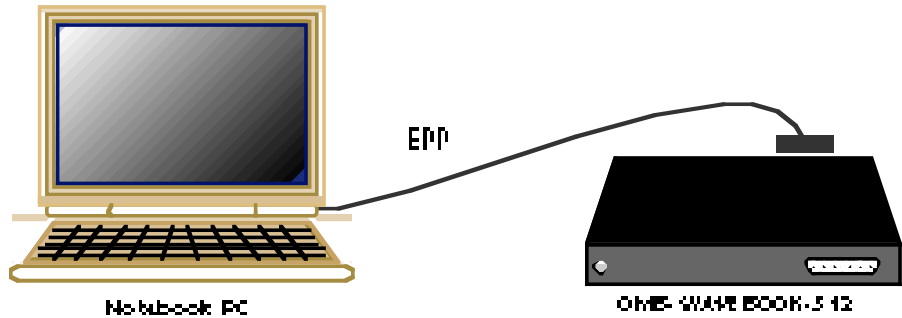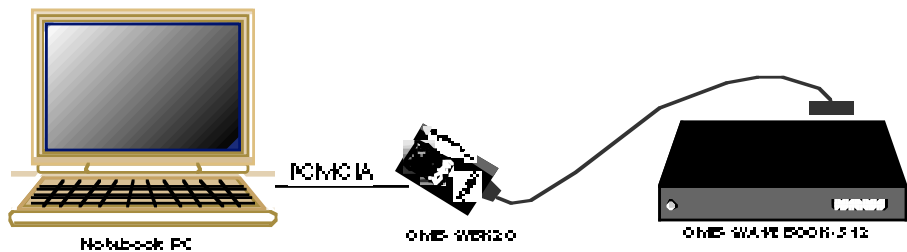
NOTEBOOK PC CONNECTION

You can attach the OMB-WAVEBOOK-512 to a notebook PC two ways. If your application's required aggregate sampling rate is less than 500 K samples/sec, you can attach the unit directly to the notebook PC's EPP. All that is needed to make this connection is the cable supplied with the OMB-WAVEBOOK-512. If your notebook PC is not equipped with EPP or if your application demands that the OMB-WAVEBOOK-512 achieve a continuous sampling rate higher than 500 k samples/sec, you must connect the unit to your PC via the optional OMB-WBK20 PCMCIA interface card and cable. The OMB-WBK20 supports 2 Mbyte/sec data transfer, allowing the OMB-WAVEBOOK-512 to sample continuously at its maximum 1 M samples/sec without losing data.
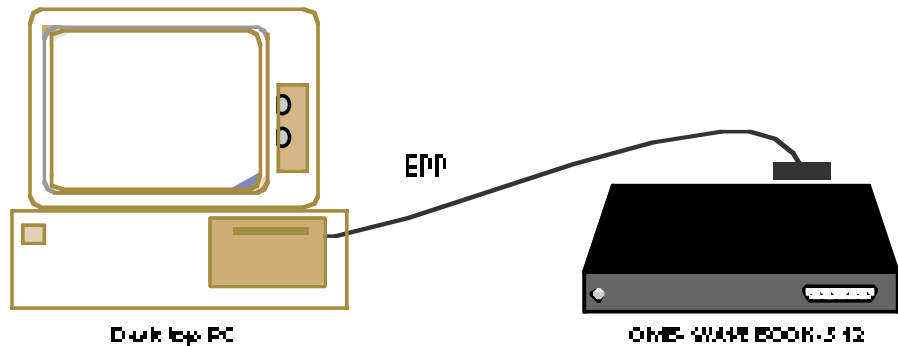
DESKTOP PC CONNECTION

If you are using a desktop PC and your application's required aggregate sampling rate is less than 500 k/sec, you can attach the OMB-WAVEBOOK-512 directly to the desktop PC's EPP. If the PC is not equipped with EPP or your application demands that the OMB-WAVEBOOK-512 achieve a continuous sampling rate of greater than 500 k samples/sec, you should connect the unit to your PC via the optional OMB-WBK21 ISA-bus plug-in board interface. This interface provides EPP capability at over 2 Mbytes/sec, which allows the OMB-WAVEBOOK-512 to sample continuously at the full 1 M samples/sec rate.
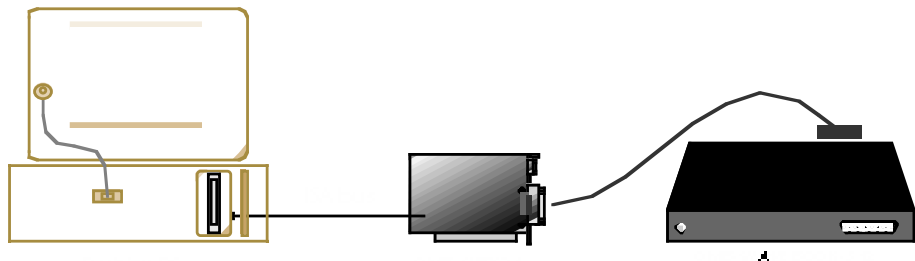

When connected to a notebook PC's EPP, the OMB-WAVEBOOK-512 transfers data at a maximum of 500K bytes samples/sec.

When connected to a notebook PC's PCMCIA port via the optional OMB-WBK20 PCMCIA interface card, the OMB-WAVEBOOK-512 can transfer data at 1M samples/sec.

When connected to a desktop PC's EPP, the OMB-WAVEBOOK-512 transfers data at a maximum of 500K samples/sec.

See Page C-58 to Order.

When connected to a desktop PC via the optional OMB-WBK21 ISA-bus interface board, the OMB-WAVEBOOK-512 can transfer data at 1M samples/sec.

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SOFTWARE

WaveView is a Windows-based setup and acquisition application included with the OMB-WAVEBOOK-512 that allows you to set up and operate the unit without programming. The software's two operating modes, Scope and Logger, provide you with complete control of the OMB-WAVEBOOK-512 and acquired data.

SCOPE MODE

When set for Scope mode, the OMB-WAVEBOOK-512 can collect up to 72 channels of data and display as many as eight channels in a real-time, oscilloscope-like format. WaveView permits the OMB-WAVEBOOK-512 to be set for continuous or one-shot data acquisition—just like a digital scope. WaveView's on-screen zoom-in and zoom-out functions allow you to display waveforms that represent either a small or large segment of acquired data. Once the data is collected, you can save it to disk in several formats, including an Excel-compatible spreadsheet format.

LOGGER MODE

When set for Logger mode, the OMB-WAVEBOOK-512 can collect data from up to 72 channels while seamlessly streaming the data directly to disk for storage. The acquired data can be stored in any of several formats, including spreadsheet-compatible format. If you wish to review stored waveforms, the PostView application provides display and report-generation capabilities.

LANGUAGE DRIVERS

Comprehensive support for popular languages is also supplied with the OMB-WAVEBOOK-512. Supported languages include Visual Basic and C++ for Windows, and Quick Basic, C, and Pascal for DOS.
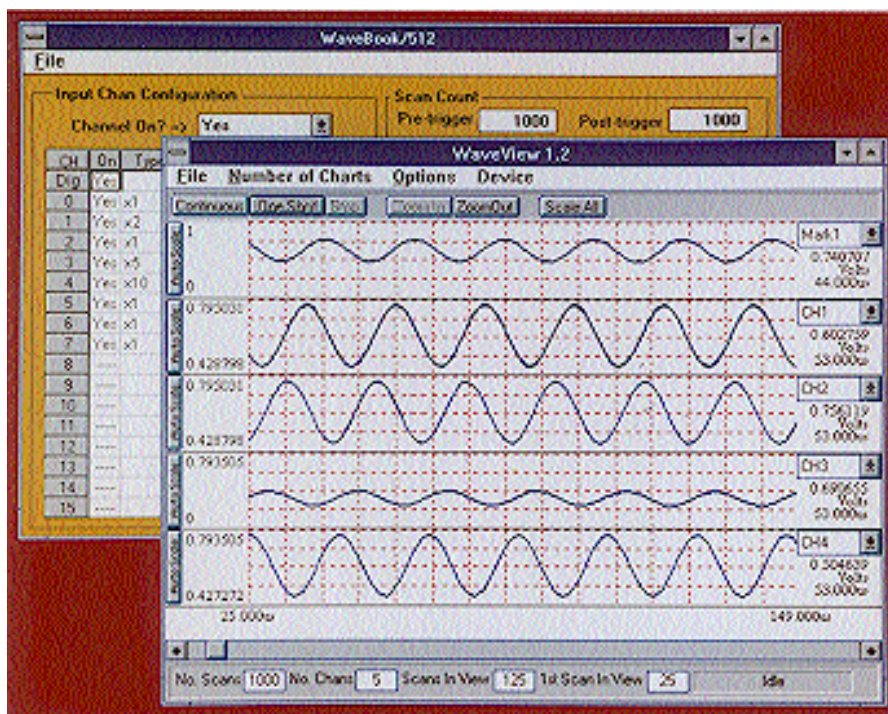
Specifications

GENERAL

Power Consumption: 0.9 A @ 15 Vdc max

Input Power Range: 10 to 30 Vdc

Operating Ambient: 0 to 50°C (32 to 122°F); 0-95% RH, non-condensing

WAVEVIEW Windows-Based Setup and Acquisition Application

Storage Temperature: 0 to 70°C (32 to 158°F)

Dimensions: 35 mm H x 220 mm W x 285 mm L (1.375" x 8.5" x 11")

Weight: 3.3 lbs (1.5 kg)

OMB-WAVEBOOK-512 DIGITIZER ANALOG INPUTS

Channels: 8 differential, expandable to 72 differential

Connector: BNC

Resolution: 12 bit

Ranges: Unipolar/bipolar operation is software selectable via sequencer

Unipolar: 0 to +10 V, 0 to +5 V, 0 to +2 V, 0 to +1 V

Bipolar: -5 to +5 V, -2.5 to +2.5 V, -1 to +1 V, -0.5 to +0.5 V

Maximum Overvoltage: ±30 Vdc

Input Current: 50 nA typ., 500 nA max

Input Impedance: Single-ended: 5 Mohm in parallel 30 pf, differential-ended: 10 Mohm in parallel 30 pf

Accuracy: ±0.025% FS

Offset: ±1 LSB

TRIGGERING

Single-Channel Analog Trigger: Range:-5 to +10 Vdc; latency: 300 nsec

Multichannel Analog Trigger: Range: selectable per channel to input range; latency: 2 µsec/channel, plus 2 µsec

TTL Trigger: Range: TTL-compatible; latency: 200 nsec

Software Trigger: Latency: 100µsec typical

SEQUENCER

Randomly programmable for channel and gain and for unipolar/bipolar ranges

Depth: 128 location

Channel-to-Channel Rate: 1µsec/channel, fixed

Maximum Repeat Rate: 1 MHz

Minimum Repeat Rate: 100 sec

Expansion Channel Sample Rate: Same as on-board channels, 1µsec/channel

HIGH-SPEED DIGITAL INPUTS

8 input lines

Connector: DB25 male

Maximum Sampling Rate: 1 byte/µsec

Input Low Voltage: 0.8 V max

Input High Voltage: 2 V min

Input Low Current: 500µA

Input High Current: 300µA

OMB-WBK10 EXPANSION AND POWER CHASSIS ANALOG INPUTS

Channels: 8 differential

Connector: BNC

Resolution: 12 bit

Ranges: Unipolar/bipolar operation is software selectable via sequencer

Unipolar: 0 to +10 V, 0 to +5 V, 0 to +2 V, 0 to +1 V

Bipolar: -5 to +5 V, -2.5 to +2.5 V, -1 to +1 V, -0.5 to +0.5 V

Accuracy: ±0.025% FS

Offset: ±1 LSB

Maximum Overvoltage: 30 Vdc

Input Current: 50 nA typ., 500 nA max

Input Impedance: Single-ended: 5 Mohm in parallel 30 pf, differential-ended: 10 Mohm in parallel 30 pf

Gain Temp. Coefficient: 5 ppm/°C typ

Offset Temp. Coefficient: 12 µV/°C max

Power: 0.6 A @ 15 Vdc max

Dimensions: 35 mm H x 220 mm W x 285 mm L (1.375" x 8.5" x 11")

Weight: 1.3 kg (2.8 lb)

OMB-WBK11 SIMULTANEOUS SAMPLE-AND-HOLD CARD

Connectors: Internal to the OMB-WAVEBOOK-512 (36-pin socket mates with 36-pin connector)

Ranges: Software programmable prior to a scan sequence (in addition to built-in ranges)

Unipolar: 0 to +0.1 V, 0 to +0.2 V, 0 to +0.5 V

Bipolar: -0.05 to +0.05 V, -0.25 to +0.25 V, -0.1 to +0.1 V

Accuracy: ±0.025% FS

Offset: ±1 LSB

Aperture Certainty: 75 psec

Shown with Notebook Computer

Voltage Droop: 1 mV/msec

Maximum Signal Voltage: ±5.00 Vdc (x1)

Weight: 0.14 kg (0.3 lb)

OMB-WBK20 PCMCIA INTERFACE CARD AND CABLE

Bus Interface: 8-bit PCMCIA card standard 2.1

Dimensions: 5 mm (PCMCIA Type II) card

Connector: DB25 F

Cable: 0.6 m (2 ft), included

OMB-WBK21 ISA-BUS INTERFACE BOARD

Bus Interface: 16-bit ISA-bus interface

LPT Address: 378 or 278

LPT Interrupts: 5 or 7

Serial Port Address: 3F8, 2F8, 3E8, or 2E8

Serial Port Interrupt: 2, 3, 4, or 5

Connector: DB25F

To Order *(Specify Model No.)*

Model No.	Price	Description
OMB-WAVEBOOK-512	$2495	Portable high speed digitizer
OMB-WBK10	1495	8-Channel expansion module, includes AC adapter and cable
OMB-WBK11	995	Simultaneous sample-and-hold accessory board
OMB-WBK20	295	PCMCIA to OMB-WAVEBOOK-512 interface for notebook PCs
OMB-WBK21	295	ISA Slot to OMB-WAVEBOOK-512 interface for desktop PCs
OMB-DBK30A	495	Rechargeable battery/excitation module

The OMB-WAVEBOOK-512 comes complete with software, ac adapter, parallel cable, and complete operators manual.

Ordering Example: *OMB-WAVEBOOK-512 digitizer ($2495), OMB-WBK10 eight-channel expansion module ($1495), plus OMB-DBK20 PCMCIA interface card for use with notebook PCs ($295), $2495 + 1495 + 295 = **$4285.***