OMB-LOGBOOK-300

Stand-Alone, Intelligent PC-Based Data Acquisition System

2 YEAR WARRANTY

MADE IN USA

YEAR 2000 COMPLIANT

$3495
Basic Unit

The OMB-LOGBOOK-300 data acquisition system with PC-Card memory and Remote Operation Terminal

- **Operates Without a PC at the Test Site**
- **16-Bit, 100-kHz Sampling**
- **Compact Yet Expandable Architecture Can Accommodate Over 400 Channels of Analog, Digital & Frequency I/O**
- **Stand-Alone Nonvolatile Storage of Over 250 Million Samples Via Removable PC-Card Memory**
- **Card Swapping and Uploading During Acquisition Allows Continuous Data Acquisition**
- **Communication with PC Via RS-232, Parallel Port, or by Transporting a PC-Card; Optional RS-422 and RS-485 Interfaces**
- **Built-in Analog Inputs Support 14 Programmable Ranges up to 20 V**
- **Synchronous, Mixed Signal Acquisition of Analog, Digital and Frequency Inputs**
- **Optional Control Terminal Provides Channel Inspection and Acquisition Queries**
- **AC or DC Powerable**

SIGNAL CONDITIONING OPTIONS

- **Expansion Cards & Modules for High-Voltage/Current, Strain Gages, Thermocouples, Isolation, Relays, Accelerometers, Filtering & Simultaneous Sample & Hold**

SOFTWARE

- **Includes LogView Software for Easy Setup, Calibration, & More; No Programming Required**
- **Simple Spreadsheet Style provides Powerful Setup Features for Immediate Startup**
- **Acquisition Configurations Can Be Transported to the OMB-LOGBOOK-300 Via PC-Card or via Serial or Parallel Port Connection**
- **Provides Direct Support for a Wide Variety of Transducers**
- **Includes PostView for Post-Acquisition Data Viewing**

The OMB-LOGBOOK-300 is a portable data acquisition system that can be used for remote, portable and unattended operation. It is also operational with a PC attached.

The OMB-LOGBOOK-300 combines on-board intelligence and a large capacity PC-Card removable memory with the industry's easiest and most powerful data logging software. Its 16-bit, 100-kHz A/D and triggering capabilities make it ideal for collecting high and low speed phenomena. A comprehensive array of signal conditioning expansion cards and modules are offered that allow the OMB-LOGBOOK-300 to take measurements from virtually any transducer, from thermocouples to accelerometers.

The OMB-LOGBOOK-300 data acquisition system includes LogView graphical display and acquisition software, which allows for fast setup and easy use, with no programming required. LogView software uses a spreadsheet metaphor rather than programming to configure the channels and the acquisition parameters.

Operating Modes

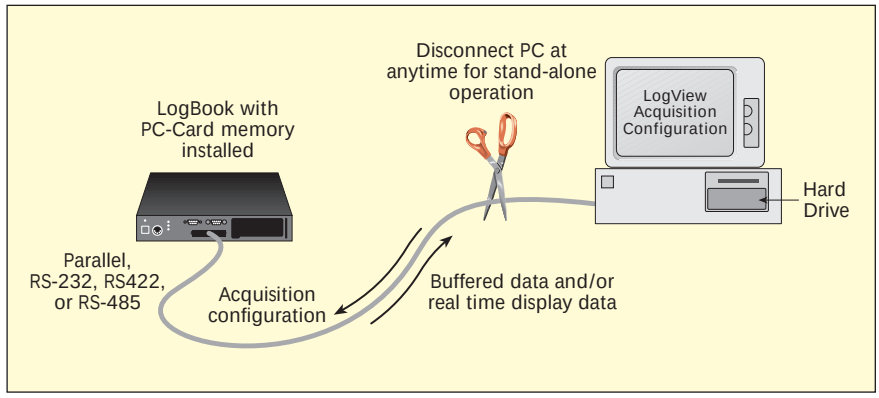
Once an acquisition configuration has been developed, it can be downloaded to a PC-Card for transport to a remote OMB-LOGBOOK-300, or it can be directly downloaded to an attached OMB-LOGBOOK-300 via the serial or parallel port. The OMB-LOGBOOK-300 can be used in stand-alone mode where no PC is present, or it can be linked to a PC via a serial or parallel port for interactive data collection.

A PC running LogView can interact with an attached OMB-LOGBOOK-300 at any time, both during the setup and/or while the acquisition is taking place. To observe acquired data, channel values can be displayed in any or all of LogView's many real-time indicators.

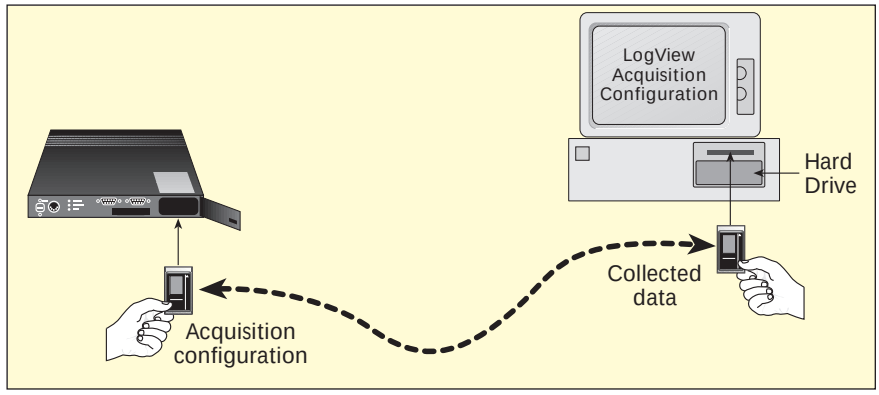
Removable Nonvolatile Memory

The OMB-LOGBOOK-300 requires a standard Type I, Type II, or Type III solid-state or hard drive ATA PC-Card for use as its nonvolatile memory. The cards can transport acquisition configurations and collected data between the PC and the OMB-LOGBOOK-300. Using a 500-Mbyte PC-Card, for example, you can store up to 250 million samples equating to more than 40 minutes of recording time at the full 100-kHz acquisition rate. The OMB-LOGBOOK-300 supports standard ATA memory PC-Cards, as well as other PC-Cards.

OMB-LOGBOOK-300 OPERATING MODES



LogView can download acquisition configurations over any of its communication interfaces. Stored data and real-time readings can be uploaded in the same way.



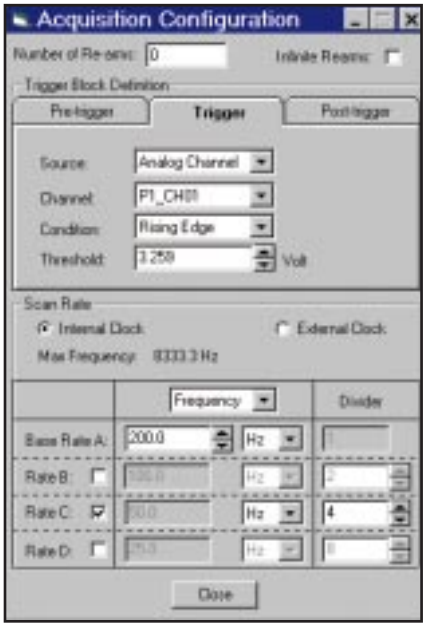
LogView downloads an acquisition configuration to a PC-Card in the PC's socket for transport to a remote OMB-LOGBOOK-300. Data is transported back to the PC via the PC-Card.

One PC-Card can be removed and another PC-Card inserted without causing a gap in the acquired data.

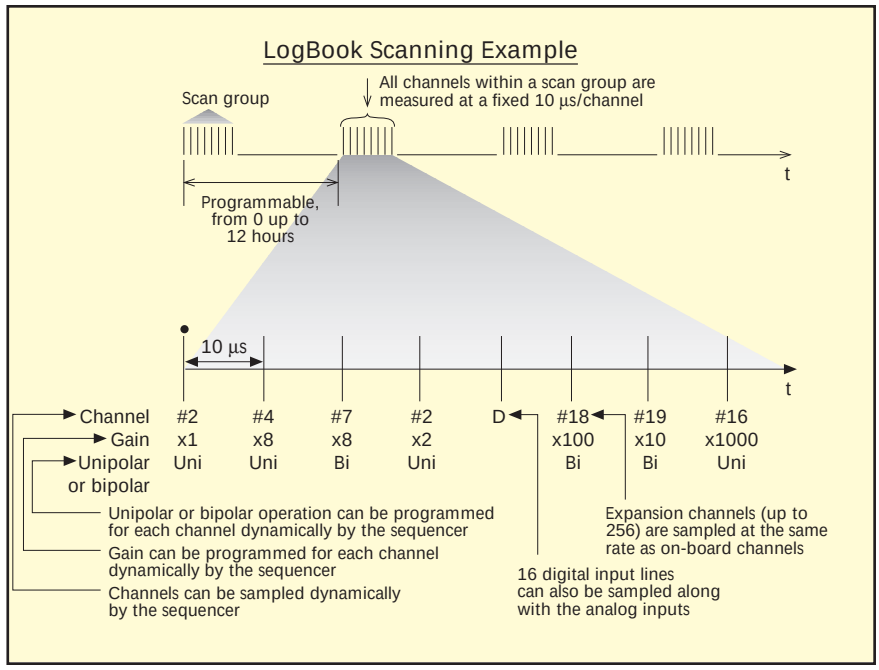
SOPHISTICATED TRIGGERING AND SAMPLING

Along with simple triggering and continuous data logging, the OMB-LOGBOOK-300 can be configured to intelligently collect only the data you want. For sophisticated triggering, a calculated channel can be specified as the trigger or the stop event. A calculated channel can describe virtually any combination of channel conditions. For example, you can develop a calculated channel called TRIG and specify it as the trigger channel. If the channel's equation is TRIG = (Temp1 - Temp2) > 50.0, the data collection process will be triggered when the difference between the two temperature channels is above 50.0 degrees.

The OMB-LOGBOOK-300 is capable of continuous, gapless data collection or for exception capturing using triggering.



Acquisition configuration dialog box



CHANNEL-SCANNING FLEXIBILITY

The OMB-LOGBOOK-300 offers a scan sequencer that allows you to select each channel and associated input amplifier gain at random. The sequencer circuitry circumvents a major limitation encountered with many plug-in data acquisition boards–a drastic reduction in the scan rate for external expansion channels. All inputs, including analog, digital, counter, and calculated channels, are sampled at 100 KHz allowing time correlation of mixed signals. The OMB-LOGBOOK-300 permits each scan group to be repeated immediately or at programmable intervals for up to 10 hours. Within each scan group, consecutive channels are measured at a fixed 10 µs/channel rate.

If data collection is only desired under specific conditions, an appropriate trigger can be specified. When using a trigger to start the acquisition, a pre-trigger count can be supplied so that information just before the trigger can be collected and saved. The stop event definition specifies when the data collection activity should end. A wide variety of trigger sources and stop event choices provides a high degree of exception capture flexibility. For example, the OMB-LOGBOOK-300 can be configured to capture all data from all input channels for as long as the temperature difference between channels 1 & 2 is greater than 50 degrees.

The OMB-LOGBOOK-300 offers significant channel scanning flexibility to accommodate the wide variety of signals and sensors that can be measured. The channel scanning capability applies to all signals attached to the OMB-LogBook-300, including analog inputs, digital inputs, frequency inputs, and all signals attached to expansion and signal conditioning options.

The user first selects the fastest rate at which any channel will be measured. This can range from once per hour to 100K samples per second. They can then select up to four lower sampling rates that can be assigned to any channel. These "sub-rates" are integer sub-multiples of the fastest rate. For example, if the fastest desired sample rate is 10 kHz, then four sub-rates of 10 kHz/n, where n is an integer, can be selected. This feature allows slower-changing signals, such as temperature from a thermocouple, to be sampled at a much lower rate, and thereby consume less storage space in the PC-Card memory.

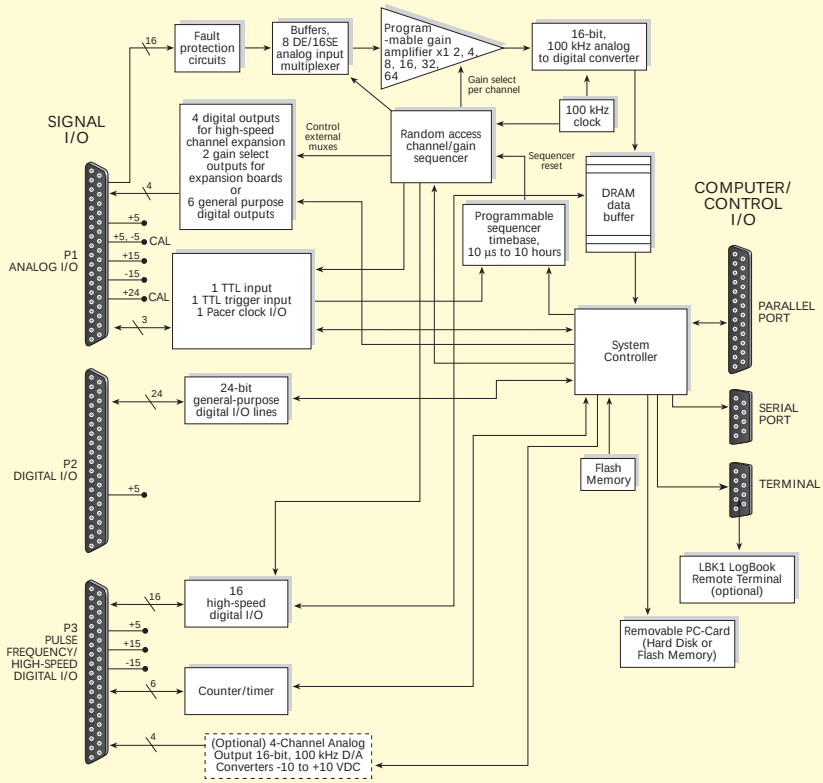
For downloading acquisition configurations to a remote OMB-LOGBOOK-300 or uploading collected data to a PC, these cards can be inserted directly into your PC's standard PC-Card socket. No card reader or additional hardware is necessary to interact with the data.

For continuous data collection, PC-Cards can be swapped while the acquisition is taking place. As one card becomes nearly full, it can be removed and another card inserted without causing a gap in the acquired data.

During the card swapping process, acquired data is temporarily stored in the OMB-LOGBOOK-300's internal 4 Mbyte RAM. If card swapping is required during a fast acquisition, a 16 Mbyte memory option is available. At 100 kHz sampling, the standard 4 Mbytes of RAM memory provides approximately 10 seconds to swap cards, while the 16 Mbyte option provides over 1 minute.

At slower acquisition speeds, there is even more time to swap cards. At 10 kHz, the standard 4M RAM memory provides approximately 1.5 minutes of swap time, while the 16M RAM upgrade provides more than 11 minutes of swap time.

OMB-LOGBOOK -300 Block Diagram



I/O, EXPANSION AND SIGNAL CONDITIONING

The OMB-LOGBOOK-300 data acquisition system is equipped with the following I/O:

- 16 single-ended or 8 differential analog inputs, with 6 programmable ranges:

  Bipolar: 10V, 5V, 2.5V, 1.25V, 0.625V, 0.3125V, 0.15625V

  Unipolar: 20V, 10V, 5V, 2.5V, 1.25V, 0.625V, 0.3125V

- 40 lines of general purpose digital I/O
- 4 pulse counting channels for totalizing and frequency measurement
- 2 pulse train outputs
- 4 optional 16-bit, 100-kHz analog outputs

The system can be expanded using a comprehensive line of signal conditioning and expansion options. The OMB-LOGBOOK-300 is expandable to up to 256 analog inputs and 208 digital I/O lines. Economical signal conditioning hardware includes thermocouple, RTD, high gain, high voltage, current, strain gage, accelerometer, frequency, filter, and simultaneous sample and hold.

All of the channels in an OMB-LOGBOOK-300 system, including the base I/O and expansion channels, are sampled synchronously, providing time correlation of all collected data. The OMB-LOGBOOK-300 provides both internal and external pacer clock control so that scans can be collected using the OMB-LOGBOOK-300's internal programmable oscillator or an externally supplied custom frequency clock.

Unlike many multiplexed input data loggers, the OMB-LOGBOOK-300's base analog input channels have a unique buffer-amplifier-per-channel design to eliminate noise and channel-to-channel crosstalk while maximizing accuracy—even with high-impedance transducers. For ease of use, all of the OMB-LOGBOOK-300's settings are software controlled, eliminating the need for switches and jumpers. Each channel is digitally calibrated, eliminating drift-prone potentiometers.

Unlike many plug-in board data acquisition systems, the OMB-LOGBOOK-300's programmable channel/gain sequencer scans expansion channels at the same rate as its on-board channels. For this reason, the OMB-LOGBOOK-300 is well suited for test applications that require both high channel-count and high speed.

LOGVIEW SOFTWARE SIMPLIFIES SETUP

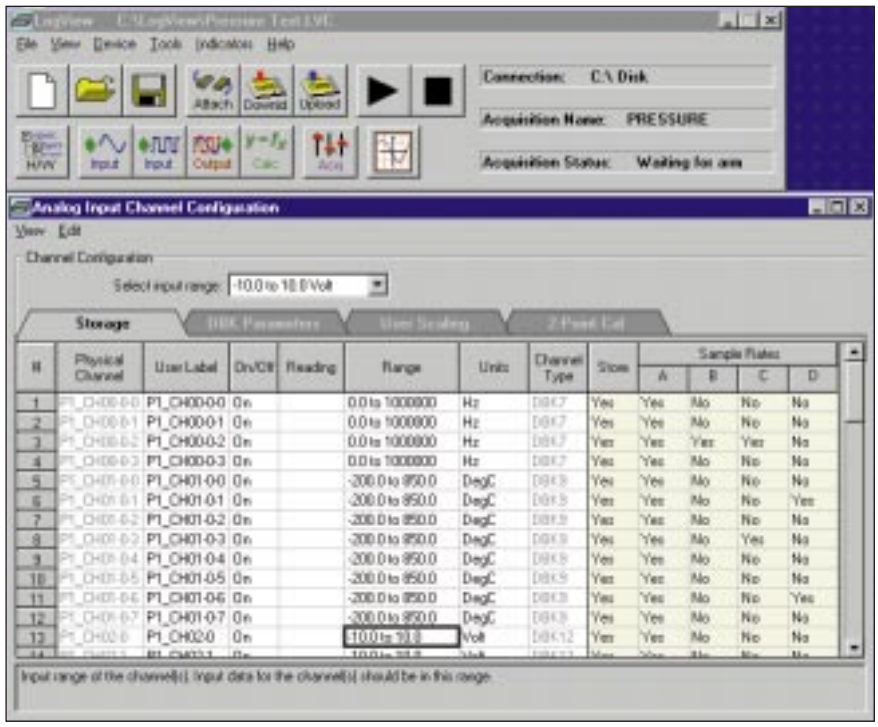
LogView uses a series of spreadsheets to allow simple setup and display of all channel parameters. No auxiliary dialog boxes, configurable block diagrams, or programming methodologies are employed. Simply select the appropriate cell, choose the desired setting from the dropdown list, and the parameter is set. To apply the same setting to multiple channels, select a block of cells within a column and use the spreadsheet's fill-down feature.

After the channels and the acquisition parameters have been configured, download the configuration to a PC-Card in one of your PC's sockets, or send the configuration directly to the OMB-LOGBOOK-300 via the serial or parallel port. When a PC-Card is used to transport the acquisition configuration to a remote OMB-LOGBOOK-300, inserting the card into one of its sockets signals the OMB-LOGBOOK-300 to read and execute the new acquisition configuration.

Once the channel configuration parameters have been downloaded to the OMB-LOGBOOK-300, LogView can display the channel values of a connected OMB-LOGBOOK-300 in real time, both before and during an acquisition. LogView conveniently displays channel values in the channel configuration spreadsheet or in real-time bar graphs, analog meters, and digital indicators.

SPREADSHEETS MAKE IT SIMPLE

All of the parameters for the analog I/O, digital I/O, frequency and calculated channels can be viewed and adjusted through LogView's unique spreadsheet interface. The spreadsheets make it possible to see and adjust the parameters of many channels concurrently, unlike typical data logging software that requires channels to be set up one at a time through auxiliary dialog boxes.



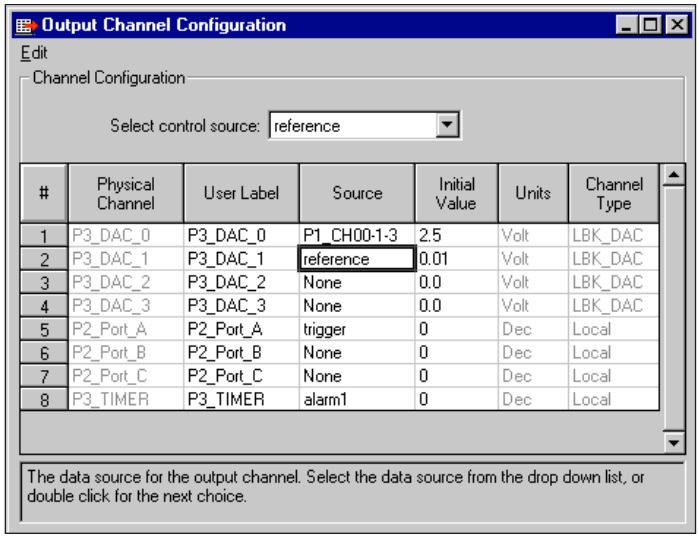
LogView's analog input spreadsheet makes viewing and adjusting many channels easy

Channel parameters are independent of one another. Channel parameters include:

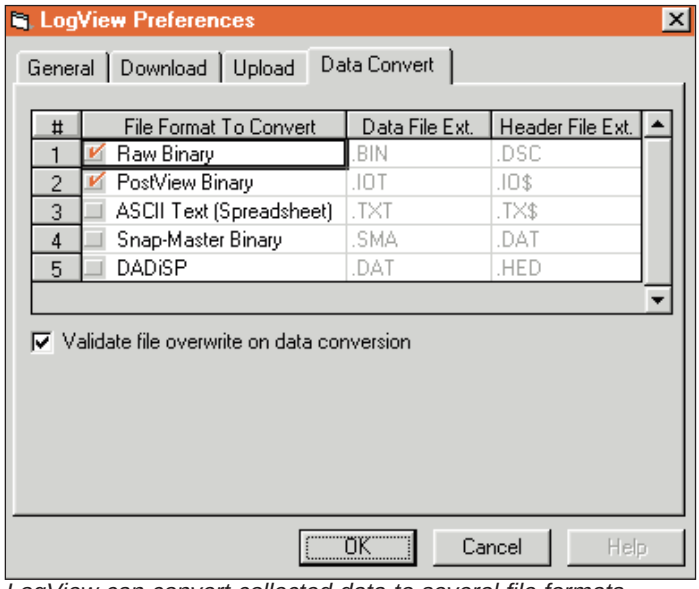
- Turning the channel on or off
- Programmable input range for analog input channels
- Scaling and offset for engineering units conversion
- Any or all of 4 timebases to log the channel
- The equation that defines the calculated channel
- The physical output channel to direct a calculated or input channel
- Special parameters specific to certain signal conditioning modules

All inputs including analog, digital, frequency and calculated channels are collected synchronously so that data from widely dissimilar inputs can be correlated in time.

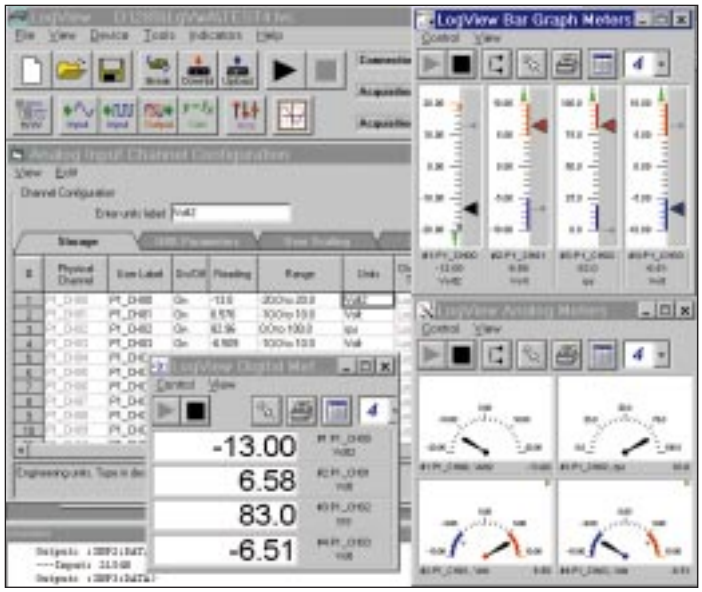
Within the analog spreadsheet, an offset adjustment or 2-point calibration can be performed for each channel. This function compensates for inaccuracies in signal conditioning circuitry and sensors.



Output functions are easily controlled using calculated channels



LogView can convert collected data to several file formats



Real-time indicators provide channel feedback from an attached OMB-LOGBOOK-300

ANALOG AND DIGITAL OUTPUTS

The OMB-LOGBOOK-300's analog and digital outputs allow it to control external devices and/or stimulate the unit-under-test. Using LogView's calculated channels, equations can be derived that can be used to stimulate digital outputs for use as alarms or for on/off control. For example, the equation DIG1 = (CH1 - CH2) < 20 turns on digital output 1 if the difference between channels 1 and 2 is less than 20.

The system's four 16-bit analog outputs can also be used for controlling or stimulating external devices. Using channel data derived from input channels and equations, the analog output channels can be used for soft control.

DATA FORMATS AND DATA FILES

Data collected with the OMB-LOGBOOK-300 can be uploaded to your PC's hard disk in any or all of several data formats for post-acquisition analysis. Some of the available file formats include Excel, Snap-Master, MATLAB, DASYLab, Lotus, Quattro, and ASCII, which are compatible with virtually all post-acquisition analysis software. LogView creates the necessary headers for each data format so that the post-acquisition analysis software can use the channel labels, the acquisition timebase information, and other necessary parameters.

AUXILIARY REAL-TIME INDICATORS

Along with displaying channel data from an attached OMB-LOGBOOK-300 in real time in the setup spreadsheets, LogView also provides real-time indicators. These indicators provide a means of monitoring the real-time channel values so that signals can be verified. Each indicator provides a high degree of setup flexibility to customize your display.

POSTVIEW

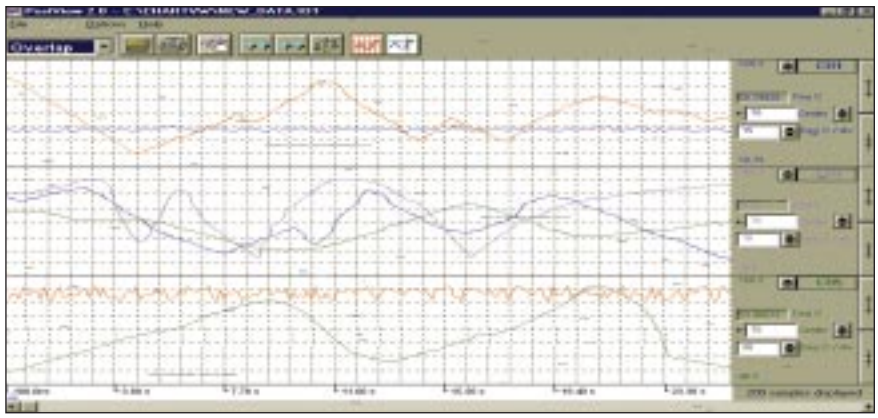
Included with LogView, PostView post-acquisition waveform display software provides graphical displays, which are similar to those provided by stripchart recorders, for viewing up to 16 channels of previously acquired data at one time. Using the program's intuitive on-screen controls, you can expand, contract, and auto-scale waveforms as well as manually scroll in either direction. PostView is the perfect tool for browsing through data collected to disk.

REMOTE OPERATION TERMINAL

The optional OMB-LBK1 Remote Operation Terminal connects directly to the OMB-LOGBOOK-300, providing control of the OMB-LOGBOOK-300 without a computer. Without the terminal, the OMB-LOGBOOK-300 is immediately armed once power is applied and a programmed PC-Card is present. With the terminal connected, operation can be started and stopped with a push of a button. The terminal requires no external power connection.

- The terminal connects to the OMB-LOGBOOK-300 via a standard 6-pin RJ11 to RJ11 modular telephone cable up to 100 feet long.
- The rugged terminal provides many useful functions including:
- Inspect Channel Values
- Query Channel Values
- Query acquisition status
- Check disk status
- Manually mark events using the keyboard, tagging a location in the file

The optional OMB-LBK1 Remote Operation Terminal provides control of the OMB-LOGBOOK-300 system in the field when no PC is present



PostView for post-acquisition viewing

SPECIFICATIONS

General

Power Consumption:
0.9 A @ 15 V
Operating Temperature:
-15 to 50°C
Storage Temperature: 0 to 80°C
Humidity: 0 to 95%
RH non-condensing
Dimensions: 220 x 279 x 44 mm (8.5 x 11 x 1.75")
Weight: 1.5 kg (3.3 lbs)
PC-Card Memory:
Standard ATA Type
A/D Specifications
Type: Successive approximation
Resolution: 16 bit
Conversion Time: 10 µs
Monotonicity: No missing codes
Linearity: ±1 bit

Analog Inputs

Channels: 16 single-ended, 8 differential, expandable to 256 differential; single-ended or differential operation is software programmable
Connector: DB37 male, P1
Resolution: 16 bits
Accuracy: ±0.01% FS
Ranges:
Unipolar/bipolar operation is switch selectable
Unipolar:
0 to +20V, 0 to +10V,
0 to +5V, 0 to +2.5V, 0 to +1.25V,
0 to +0.625V, 0 to +0.3125V
Bipolar:
±10V, ±5V, ±2.5V, ±1.25V,
±0.625V, ±0.3125V, ±0.15625V
Maximum Overvoltage:
-35V to +45V
Input Current
Differential: 0.4 µA typ/0.7 µA max
Single-ended:
0.2 µA typ/0.35 µA max
Input Impedance
Single-Ended:
5M Ohm in parallel with 30 pF
Differential:
10M Ohm in parallel with 20 pF

Triggering

Analog Trigger
Programmable Level Range:
Full range of specified channels
Digital Trigger
Logic Level Range:
0.8V low/2.2V high
Trigger to A/D Latency:
10 µs max
Software Trigger
Trigger to A/D Latency:
Dependent on PC
Pre-Trigger: Up to 4 gig scans, depending on size of PC-Card memory

Sequencer

Randomly programmable for channel & gain
Depth: 512 location
Channel-to-Channel Rate:
10 µs/channel, fixed
Maximum Repeat Rate: 100 kHz
Minimum Repeat Rate: 10 hours
Expansion Channel Sample Rate: Same as on-board channels, 10 µs/channel

ANALOG OUTPUT OPTION (INTERNAL)

Channels: 4
Connector: DB37 male, P3
Resolution: 16 bit
Voltage Range: ±10V
Maximum Output Current: 10 mA

OMB-DBK4 Two-Channel Dynamic Signal-Input Card

OMB-DBK19 High-Accuracy Thermocouple Card

OMB-DBK7 Four-Channel Frequency-Input Card

OMB-DBK9 Eight-Channel RTD Measurement Card

The OMB-LOGBOOK-300 is compatible with a comprehensive line of signal conditioning expansion cards. Contact engineering for details.

GENERAL PURPOSE DIGITAL I/O

Channels: 40 I/O channels, expandable up to 208
Connector: DB37 male, P2
Output Voltage Levels
Minimum "1" Voltage: 3.0 @ 2.5 mA sourcing
Maximum "0" Voltage: 0.4 @ 2.5 mA sinking
Output Current
Maximum Source Current: 2.5 mA
Maximum Sink Current: -2.5 mA
Input Voltage Levels
Minimum Required "1" Voltage Level: 2V
Maximum Allowed "0" Voltage Level: 0.8V
Output Float Leakage Current: 10 µA

FREQUENCY/PULSE COUNTERS

Channels: 4
16 bits per channel, cascadable
Connector: DB37 male, P3
Maximum Pulse Count: 32-bit binary (2 channels cascaded)
Maximum Input Rate: 1 MHz
Input Voltage: -15V to +15V
Threshold Voltage
Low: 0.8V typ, 0.5V min
High: 1.6V typ, 2.1V max
Hysteresis: 400 mV min
Pulse Width Low or High: 520 ns min
Input Impedance: 27K Ohm pull-up to +5V in parallel with 50 pF

FREQUENCY/PULSE GENERATOR

Channels: 2, 16 bits
Connector: DB37 male, P3
Frequency/Pulse Generating Mode: Input frequency divided by 1 to 65,535
Input Low Voltage: 0.8V max
Input High Voltage: 2V min
Input Low Current: -10 µA max
Input High Current: 10 µA max
Output High Voltage: 2.4V min @ -8 mA
Output Low Voltage: 0.5V max @ 8 mA

To Order *(Specify Model Number)*

Model Number	Price	Description
OMB-LOGBOOK-300	**$3495**	PC-Based Data Acquisition System Requires One Solid State Memory Card (OMB-MEMCARD-X)
OMB-MEMCARD-12	**295**	12MB Solid State Memory
OMB-MEMCARD-40	**595**	40MB Solid State Memory
OMB-MEMCARD-80	**1195**	80MB Solid State Memory
OMB-MEMCARD-260	**595**	260MB Rotating Hard Drive Memory
OMB-MEMCARD-520	**995**	520MB Rotating Hard Drive Memory
OMB-LBK-1	**695**	Hand-held Terminal w/2Ft. cable
OMB-LBK-2	**495**	Internal 4-Channel Analog Output Module
OMB-MOUNT-1	**75**	Panel for fastening OMB-LBK-1 to top of OMB-LOGBOOK-300
OMB-LBK-MEM1-U	**595**	16MB Internal Memory Upgrade for OMB-LBK-1 (field installed)
OMB-LBK-COM-422-485	**195**	RS-422 and RS-485 Interfaces added to existing RS-232 and Parallel Port

The OMB-LOGBOOK-300 includes LogView software and a complete user's manual.
Ordering Example: OMB-LOGBOOK-300** Data Acquisition System and **OMB-MEMCARD-12,** 12 MB Solid State Memory Card, **$3495** + **295** = **$3790