# LogBook

## Stand-Alone, Intelligent PC-Based Data Acquisition Systems, Models /300 & /360

iotech®
iotech.com

## Features

- Operates without a PC at the test site
- 16-bit, 100-kHz analog and digital sampling
- Compact yet expandable architecture can accommodate over 400 channels of analog, digital, and frequency I/O
- Stand-alone nonvolatile storage of over 500 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, modem, or by transporting a PC-Card; optional RS-422 interface
- Built-in analog inputs support 14 programmable ranges up to 20V
- Synchronous, mixed signal acquisition of analog, digital, and counter inputs
- GPS support (LogBook/360 only) logs location information
- Optional control terminal provides channel inspection, and acquisition queries
- AC or DC powerable

## Signal Conditioning Options

- Expansion cards and modules for high-voltage/current, strain gages, thermocouples, isolation, relays, accelerometers, filtering, simultaneous sample & hold, vehicle network measurements, and more

## Software

- Includes LogView *Out-of-the-Box* software for easy setup, calibration, and more; no programming required
- Simple spreadsheet-style interface provides powerful setup features for immediate startup
- Acquisition configurations can be transported to the LogBook via PC-Card, serial port, parallel port, or modem connection
- Provides direct support for a wide variety of transducers
- Includes PostView for post-acquisition data viewing

*The LogBook/360 data acquisition system includes an expansion bay for up to three signal conditioning cards*

The LogBook/300 and LogBook/360 are portable data acquisition systems that can be used for remote, portable, and unattended operation. They are also operational with a PC attached.

The LogBook 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 LogBook to take measurements from virtually any transducer, from thermocouples to accelerometers.

The LogBook data acquisition system includes LogView *Out-of-the-Box* 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.

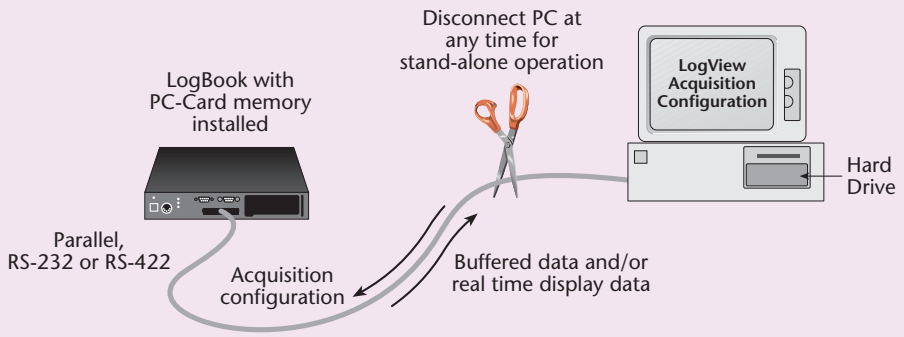
*The LogBook/300 data acquisition system with PC-Card memory and Remote Operation Terminal*

## Operating Modes

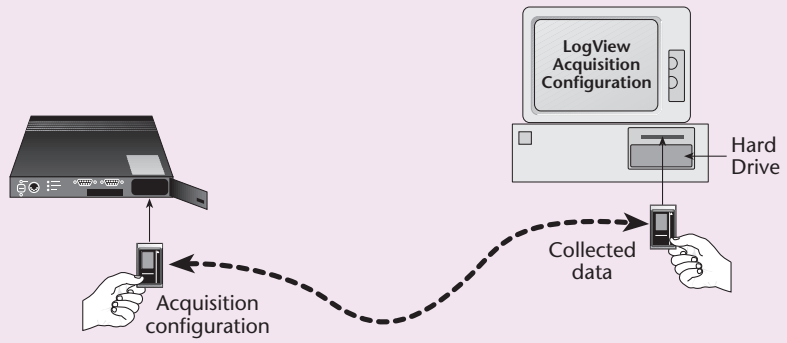
Once an acquisition configuration has been developed, it can be downloaded to a PC-Card for transport to a remote LogBook, or it can be directly downloaded to an attached LogBook via a serial port or parallel port. The LogBook can also be used in a stand-alone mode where no PC is present.

A PC running LogView can interact with an attached LogBook 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.

### LogBook/300 Operating Modes




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




*LogView downloads acquisition configuration to a PC-Card in the PC's socket for transport to a remote LogBook. Data is transported back to the PC via the PC-Card.*

## Removable Nonvolatile Memory

The LogBook requires a standard Type I, Type II, or Type III solid-state media PC-Card for use as its nonvolatile memory. The cards can transport acquisition configurations and collected data between the PC and the LogBook. Using a 1 Gbyte PC-Card, for example, up to 500 million samples can be stored, equating to more than forty minutes of recording time at the full 100-kHz acquisition rate. The LogBook/300 and LogBook/360 support standard ATA memory PC-Cards, as well as CompactFlash® memory with an ATA adapter, both available from IOtech.

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

# LogBook
## General Information

iOtech®
iotech.com

For downloading acquisition configurations to a remote LogBook or uploading collected data to a PC, these cards can be inserted directly into the 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 LogBook's internal 4 Mbytes of 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.

## I/O, Expansion and Signal Conditioning

The LogBook data acquisition system is equipped with the following I/O:

- 16 single-ended or eight differential analog inputs, with seven 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
- Four pulse counting channels for totalizing
- Two pulse train outputs

The system can be expanded using a comprehensive line of DBK signal conditioning and expansion options. The LogBook 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, filter, and simultaneous sample and hold.

*The LogBook/360's drawer-style architecture supports up to three DBK signal conditioning cards*

The LogBook/300 attaches to DBK options externally, via a simple ribbon cable connection. The LogBook/360 provides added functionality by providing space for up to three DBK signal conditioning cards housed internally.

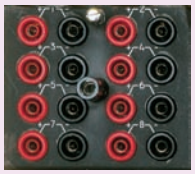
User-selectable termination panels offer a choice of connector types including BNC, removable screw terminal, thermocouple, and safety jack. Each panel includes pre-stripped wires by which the user can connect to any of the three DBK cards installed in the LogBook/360 enclosure. A user-customizable blank termination panel is also available for custom applications.

All of the channels in a LogBook system, including the base I/O and expansion channels, are sampled synchronously,

### LogBook/360 Termination Panels

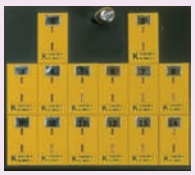
*BNC termination panel (DBK602) features 16 BNC connectors*

*Removable-block screw-terminal termination panel (DBK606) offers 48 convenient connections*



*Safety-jack termination panel offers 16 connectors (Red and black jack-pairs, DBK604 shown)*

*Slotted panel with adjustable clamp that holds wires in place (DBK607)*



*Thermocouple termination panel (DBK605) features 14 connectors for types J, K, and T thermocouples*

*DB37-style termination panel (DBK608) features three standard 37-pin female connectors*

Note: DBK601 and DBK603 not shown.

providing time correlation of all collected data. The LogBook provides both internal and external pacer clock control so that scans can be collected using the LogBook's internal programmable oscillator or an externally supplied custom frequency clock. Users have bit-wise control of digital I/O.

Unlike many multiplexed input data loggers, the LogBook'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 LogBook'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 LogBook's programmable channel/gain sequencer scans expansion channels at the same rate as its on-board channels. For this reason, the LogBook is well suited for test applications that require both high channel-count and high speed.

## Triggering and Sampling

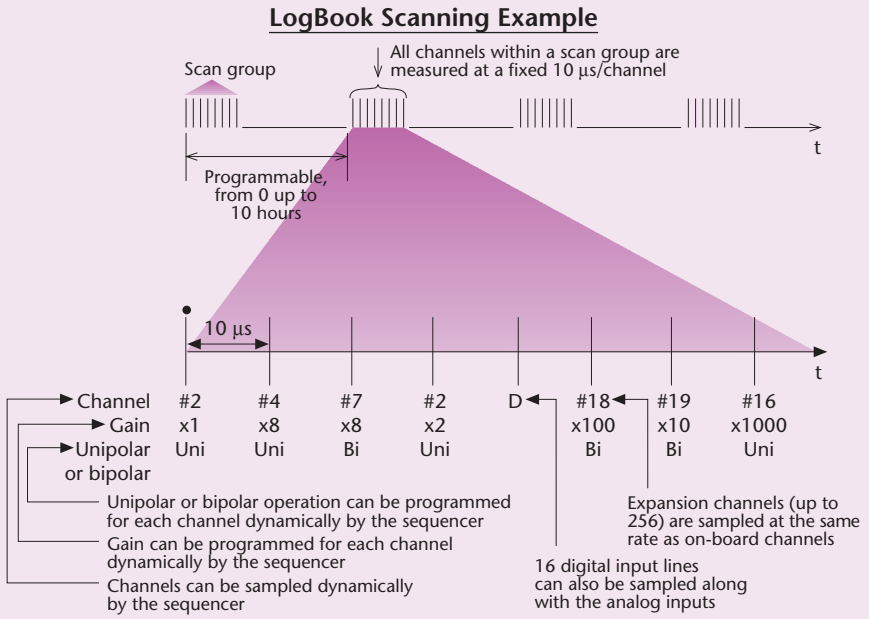
Along with simple triggering and continuous data logging, the LogBook can be configured to collect only the data you want. For sophisticated triggering, a calculated channel can be specified as the trigger or the stop event. A calculated channel can describe virtually any combination of channel conditions. 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 2 temperature channels is above 50.0 degrees.

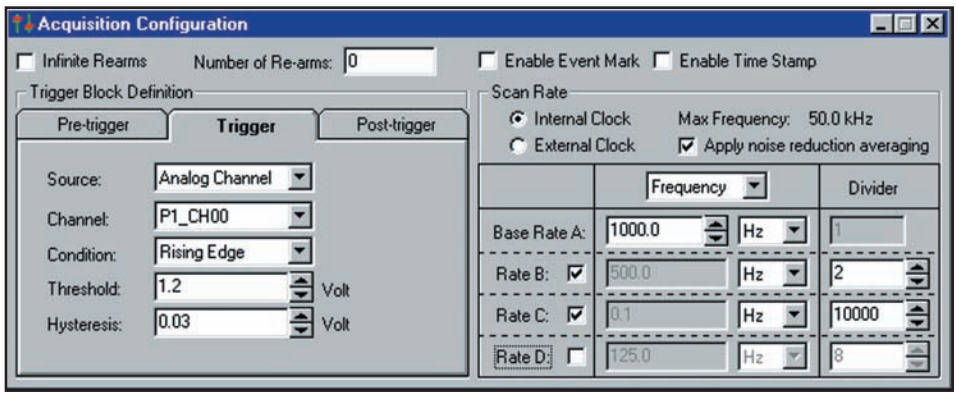
The LogBook is capable of continuous, gapless data collection or exception capturing using triggering.

If data collection is only desired under specific conditions, an appropriate trigger can be specified. When using a trigger to start

## Channel-Scanning Flexibility

The LogBook offers a 512-location 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 LogBook channels, including the 256 potential expansion channels, are scanned at 100 kHz (10 µs/channel). In addition, the LogBooks' digital and counter inputs can be scanned using the same scan sequence employed for analog inputs, enabling the time correlation of acquired digital data to acquired analog data. The LogBook permits each scan group, which can contain up to 512 channel/gain combinations, to be repeated immediately or at programmable intervals of up to 10 hours. Within each scan group, consecutive channels are measured at a fixed 10 µs/channel rate.




*The acquisition configuration dialog box allows the selection of trigger and scanning specifics*

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 provide a high degree of exception capture flexibility. For example, the LogBook can be configured to capture all data from all input channels for as long as the temperature difference between channels 1 and 2 is greater than 50 degrees.

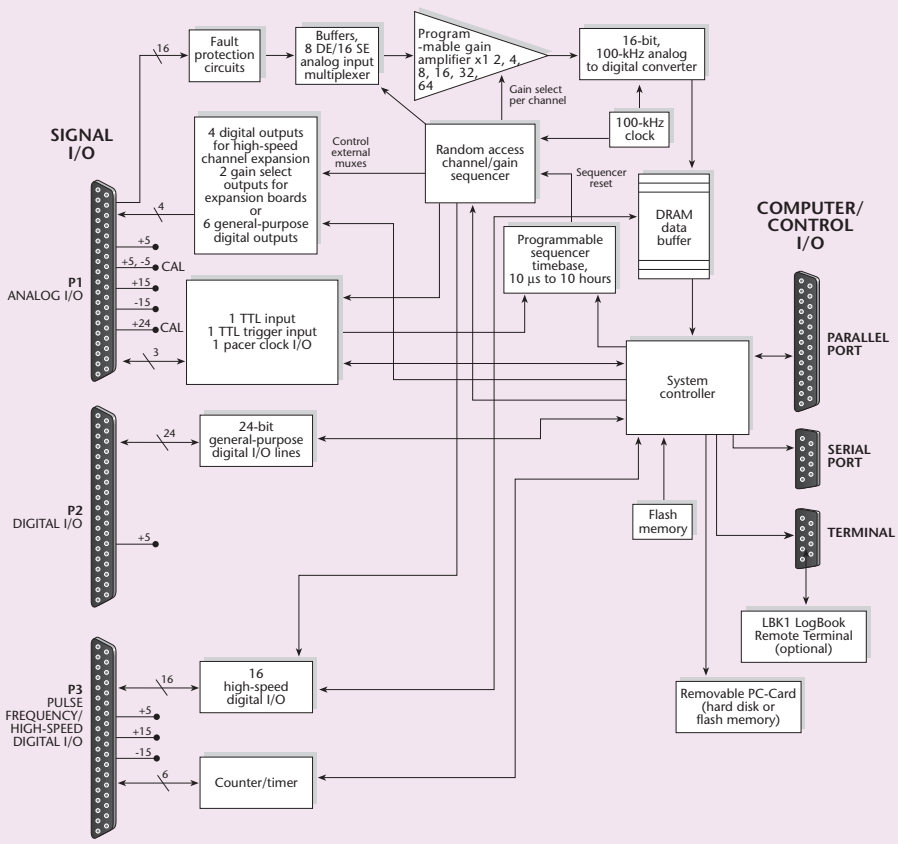
The LogBook offers significant channel scanning flexibility to accommodate the wide variety of signals and sensors that can be measured. The channel scanning capability applies to all signals attached to the LogBook, including analog inputs, digital inputs, frequency inputs*, and all signals attached 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 100 Ksamples/s. 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.

## Remote Operation Terminal

The optional LBK1 Remote Operation Terminal connects directly to the LogBook, providing control of the LogBook without a computer. Without the terminal, the LogBook 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.

### LogBook Block Diagram




The terminal connects to the LogBook via a standard 6-pin RJ11 to RJ11 modular telephone cable up to 100 feet long.

The rugged terminal provides many useful functions including the ability to:

- Inspect channel values
- Check acquisition and storage status
- Trigger the acquisition when "Manual Trigger" is the selected trigger source
- Manually mark events using the keyboard, tagging a location in the file
- Query acquisition settings and disk status
- Set terminal parameters


*The optional LBK1 Remote Operation Terminal provides control of the LogBook system in the field when no PC is present*

* For mixed signal applications requiring frequency measurement along with high-speed analog inputs, see DBK7

# LogBook
## Modem Communications & GPS Support

## Modem Communicaitons

The LogBook/300 and LogBook/360 can be interfaced to a user supplied modem for remote communications to a PC using LogView software. The user supplied modem interfaces directly to the LogBook RS-232 serial communications port. LogView software provides an interface for configuring standard modem parameters, which allows the LogBook to interface to the connected modem on power up. A Hayes™ compatible modem is required for this configuration and the modem must be configurable for auto-answer mode. Cellular-based modems can only be used if they are 100% Hayes compatible over the RS-232 serial port and have auto-answer capability.

Remote modem configurations provide the same functionality as a system using direct serial port cable communications, including system configuration and data collection. Communication performance in remote modem applications may vary due to modem connection quality. Because of the many types of modems and modem technologies that are available, IOtech cannot guarantee compatibility with all modems. In addition, modem setup and configuration changes may be required by the end-user for proper modem interfacing to the LogBook system. Contact IOtech for complete information.

LogView software provides an interface for selecting a Hayes compatible modem installed in the PC and for specifying dial-out phone numbers for multiple remote LogBook system configurations.

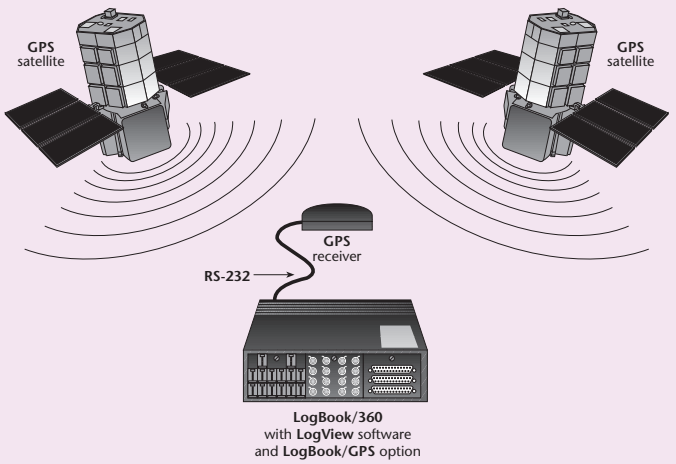
An automatic scheduler utility is also provided with LogView software which allows the PC to perform unattended dial-out and data collection of multiple modem equipped LogBook systems.

## Global Positionng System (GPS) & Serial Instrument Support for the LogBook/360

### Features

- **Allows the LogBook/360 to record GPS and/or serial instrument data along with regular measurements**
- **Allows the LogBook/360 to record GPS longitude, latitude, altitude, fix quality, and UTC as independent data channels**
- **Collects and records data from any serial instrument that transmits ASCII data**
- **Easy channel configuration, without programming, via LogView *Out-of-the-Box* software**

The LogBook/GPS software adds Global Positioning System (GPS) and serial instrument data collection capability to the LogBook/360* data acquisition system.




*When connected to a GPS receiver, the LogBook/360 can correlate latitude, longitude, and altitude coordinates with transducer data*

When connected to a user-supplied GPS receiver, a LogBook/360 with LogBook/GPS support can store latitude, longitude, and altitude coordinates along with the analog and digital data from the attached transducers. LogBook/GPS support provides direct support for any GPS receiver that conforms to the NMEA 0183 protocol standard. No programming or string manipulation is required. The captured coordinates are recorded in units of degrees for latitude and longitude, and meters for altitude. In addition to the position coordinates, the quality of the fix can also be recorded showing the validity of the coordinates. If the GPS receiver loses its fix, it will be reflected in the Quality channel.

LogBook/GPS support also enables data collection from any serial device (RS-232C) that transmits ASCII strings. This includes specialized instruments like navigational devices and weight scales. A virtually unlimited number of channels can be defined in LogView, each describing the criteria for selecting the string segment of interest within the ASCII sentence, and the instructions for converting it into a numeric or character value.

GPS and serial instrument channels can be concurrently recorded with transducer and voltage channels at up to 4 unique timebases. The LogBook/360 provides (2) RS-232C serial input ports, to which, any combination of GPS and serial instruments can be attached.

This support does not include the GPS receiver itself. These devices are available from many sources including Garmin, Inc. and Magellan, Inc.

* Only the LogBook/360 has the necessary serial ports (two RS-232C ports) to accommodate GPS support

# Module-to-Module Connection
## for LogBook Systems

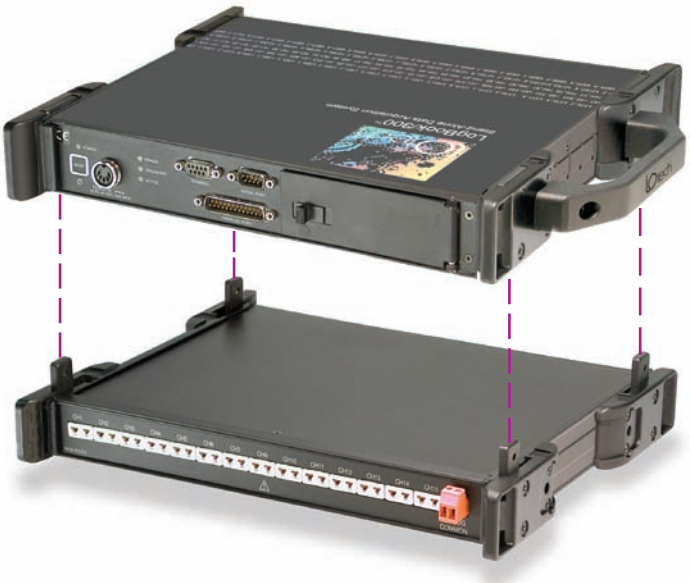
Assembling a LogBook system is easy with our new packaging and module-to-module connection system. Every LogBook and DBK option is housed in an all-metal enclosure, and is encased with rugged molded bumpers on all corners. The bumpers serve to protect the connectors as well as to attach multiple modules together. Within each bumper is a tab which can be rotated 90˚ to lock with other modules attached to either the top or bottom of each module.

*An assembled system consisting of a LogBook/360 plus one DBK60 3-slot expansion option*

*An assembled system consisting of a LogBook/360 plus a DBK84 thermocouple option, and a DBK50 isolated voltage input option*

One handle is included with each LogBook, and additional handles can be purchased for in-vehicle applications where a handle on both sides of the system is desirable for securing the system to the vehicle. When multiple modules are attached in a system, the handle can be easily moved from the LogBook to any other module in the system.

For owners of existing LogBook and/or DBK systems, the new bumpers can be easily added to your existing hardware. Contact IOtech or your local IOtech representative for details.



*Built-in connection tabs in every expansion module make assembling a system easy – above illustrates how a DBK84 thermocouple option would attach to a LogBook/300*

*An assembled system consisting of a LogBook/300 pluse one DBK84 thermocouple option, and a DBK50 isolated voltage input option*

# LogView

*Out-of-the-Box* Software

iOtech®
iotech.com

## LogView Software Simplifies Setup

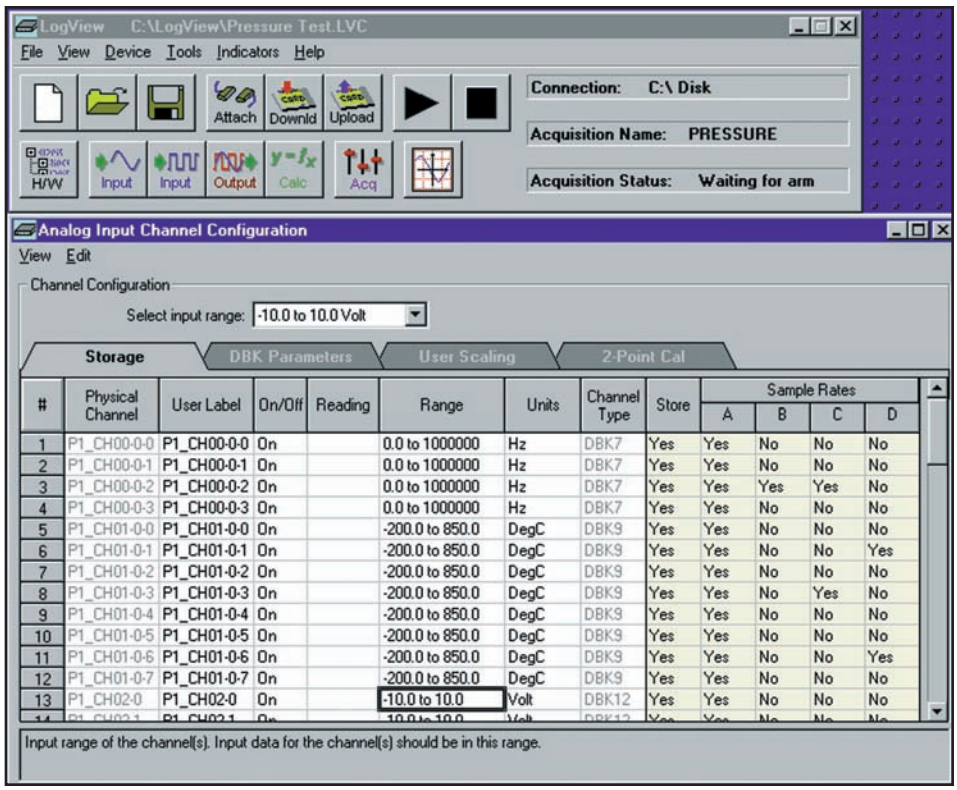
LogView uses a series of spreadsheets to allow simple setup and display of all channel parameters. No auxiliary dialog boxes, configurable block diagrams, or programming methodologies are employed. Simply select the appropriate cell, choose the desired setting from the dropdown list, and the parameter 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 LogBook via the serial port, parallel port, or modem. When a PC-Card is used to transport the acquisition configuration to a remote LogBook, inserting the card into its socket signals the LogBook to read and execute the new acquisition configuration.

Once the channel configuration parameters have been downloaded to the LogBook, LogView can display the channel values of a connected LogBook 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, counter/timers, 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.




| # | Physical Channel | User Label | On/Off | Reading | Range | Units | Channel Type | Store | Sample Rates A | B | C | D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | P1_CH00-0-0 | P1_CH00-0-0 | On | | 0.0 to 1000000 | Hz | DBK7 | Yes | Yes | No | No | No |
| 2 | P1_CH00-0-1 | P1_CH00-0-1 | On | | 0.0 to 1000000 | Hz | DBK7 | Yes | Yes | No | No | No |
| 3 | P1_CH00-0-2 | P1_CH00-0-2 | On | | 0.0 to 1000000 | Hz | DBK7 | Yes | Yes | Yes | Yes | No |
| 4 | P1_CH00-0-3 | P1_CH00-0-3 | On | | 0.0 to 1000000 | Hz | DBK7 | Yes | Yes | No | No | No |
| 5 | P1_CH01-0-0 | P1_CH01-0-0 | On | | -200.0 to 850.0 | DegC | DBK9 | Yes | Yes | No | No | No |
| 6 | P1_CH01-0-1 | P1_CH01-0-1 | On | | -200.0 to 850.0 | DegC | DBK9 | Yes | Yes | No | No | Yes |
| 7 | P1_CH01-0-2 | P1_CH01-0-2 | On | | -200.0 to 850.0 | DegC | DBK9 | Yes | Yes | No | No | No |
| 8 | P1_CH01-0-3 | P1_CH01-0-3 | On | | -200.0 to 850.0 | DegC | DBK9 | Yes | Yes | No | Yes | No |
| 9 | P1_CH01-0-4 | P1_CH01-0-4 | On | | -200.0 to 850.0 | DegC | DBK9 | Yes | Yes | No | No | No |
| 10 | P1_CH01-0-5 | P1_CH01-0-5 | On | | -200.0 to 850.0 | DegC | DBK9 | Yes | Yes | No | No | No |
| 11 | P1_CH01-0-6 | P1_CH01-0-6 | On | | -200.0 to 850.0 | DegC | DBK9 | Yes | Yes | No | No | Yes |
| 12 | P1_CH01-0-7 | P1_CH01-0-7 | On | | -200.0 to 850.0 | DegC | DBK9 | Yes | Yes | No | No | No |
| 13 | P1_CH02-0 | P1_CH02-0 | On | | -10.0 to 10.0 | Volt | DBK12 | Yes | Yes | No | No | No |

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

Channel parameters are independent of one another and 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 four 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.

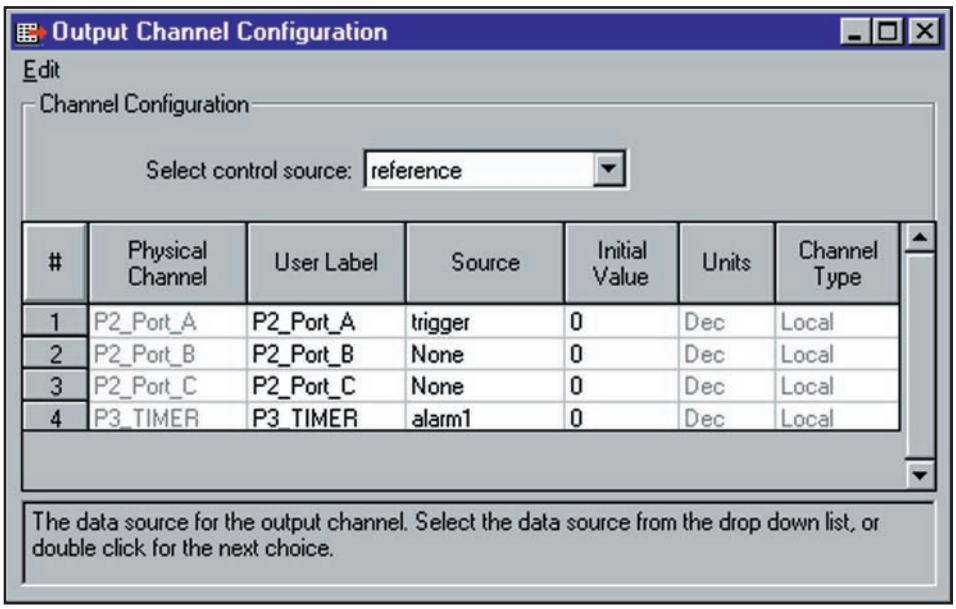
Within the analog spreadsheet, an offset adjustment or 2-point calibration can be performed for each channel. This function compensates for inaccuracies in signal conditioning circuitry and sensors.

LogView provides a file concatenate feature for combining separately uploaded data segments, from the same trigger block, into one file.

* PC-Card not supported by Windows® Vista™. Contact factory for complete information.

## Digital Outputs

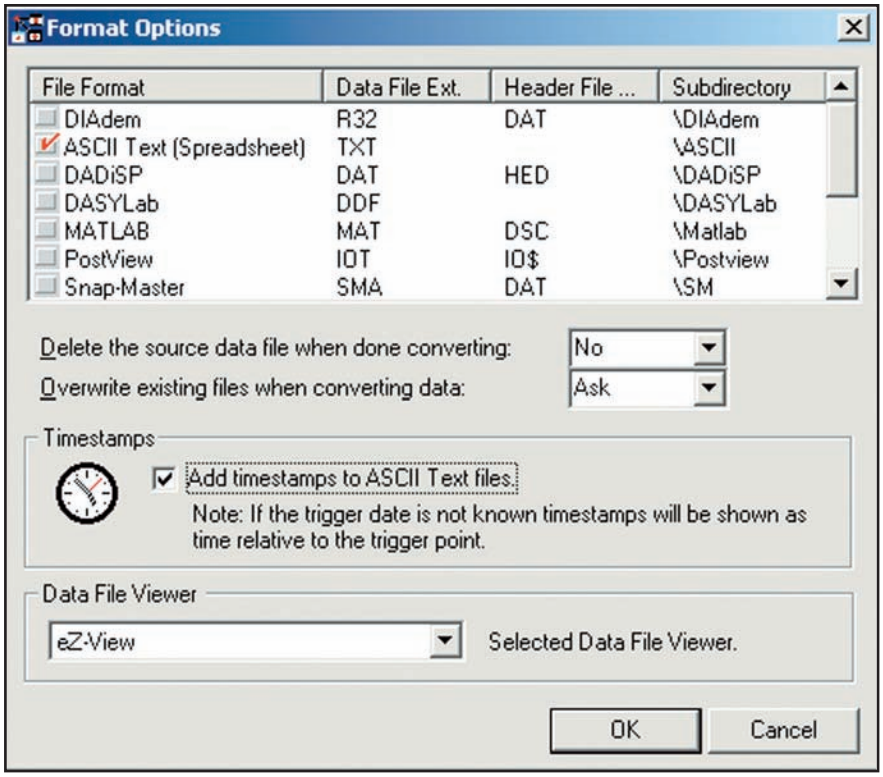
The LogBook's digital outputs allow it to control external devices and/or stimulate the unit under test. Using LogView's calculated channels, equations can be derived that can be used to stimulate digital outputs for use as alarms or for on/off control*. For example, the equation DIG1 = (CH1 - CH2) 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




*Output values are easily computed using calculated channels*

## Data Formats and Data Files**

Data collected with the LogBook 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 ASCII Text, DASYLab®, DADiSP™, MATLAB®, DIAdem, .WAV, UFF58A, and UFF58B, 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.

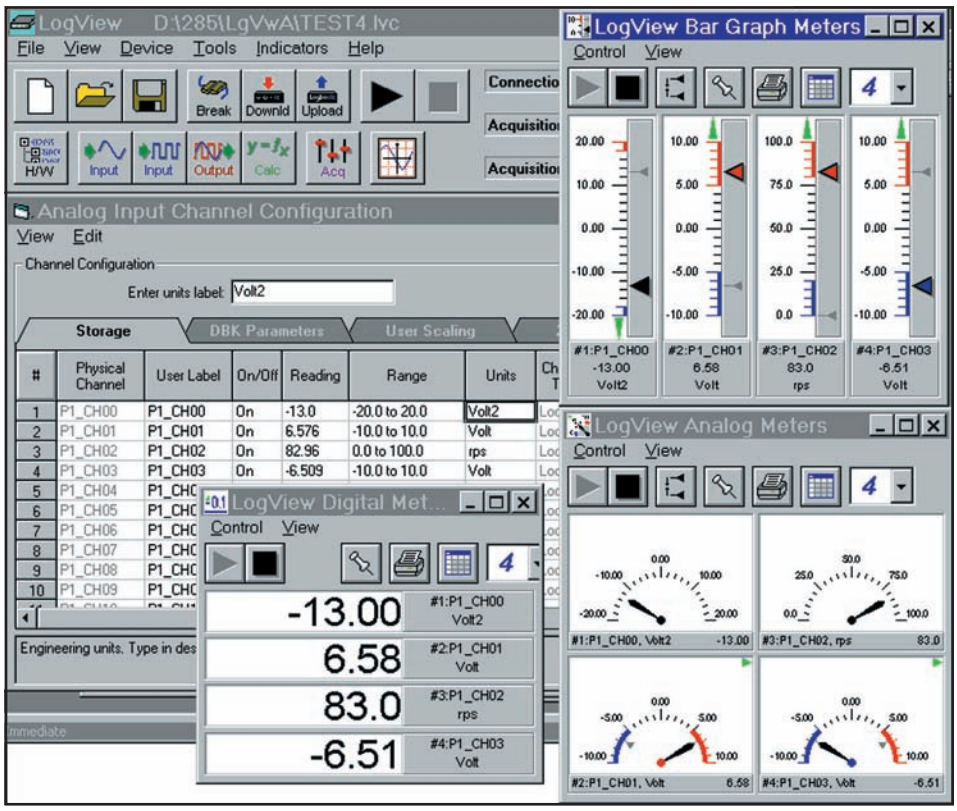



*LogView can convert collected data to several file formats*

* Not for PID specific control applications
** New formats are continuously being developed, contact factory for availability

## Auxiliary Real-Time Indicators

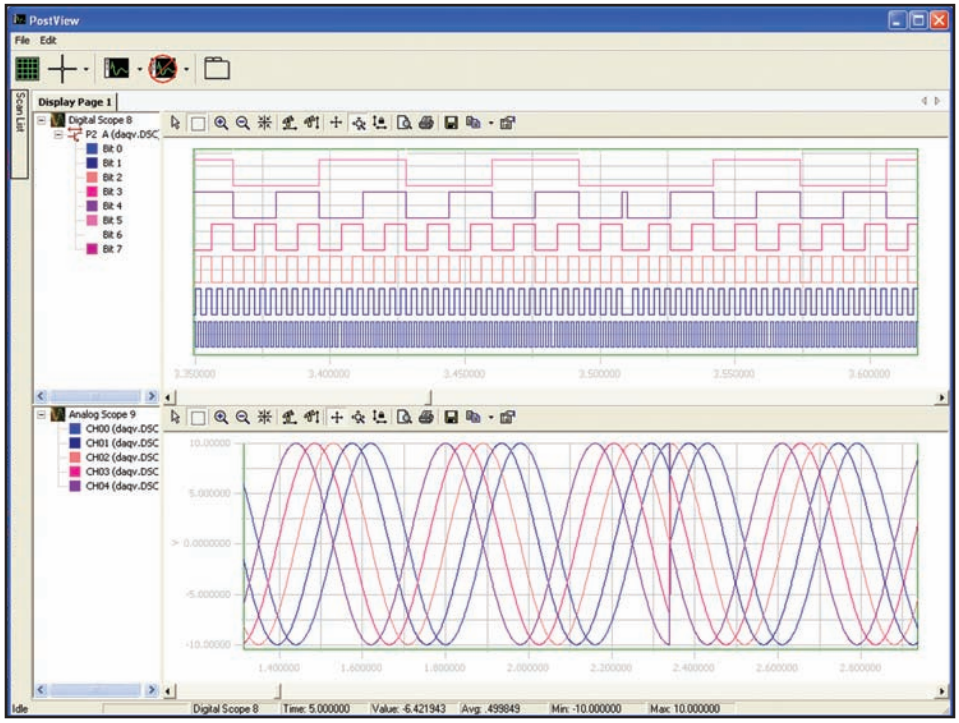
Along with displaying channel data from an attached LogBook in real time in the setup spreadsheets, LogView also provides real-time indicators. These indicators provide a means of monitoring the real-time channel values so that signals can be verified. Each indicator provides a high degree of setup flexibility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




*Real-time indicators provide channel feedback from an attached LogBook*

## PostView

PostView is a time-domain post-acquisition data viewing package which is integrated and ready to use from within your View package when you install it. PostView provides easy to use basic time-domain data viewing for IOtech data acquisition *Out-of-the-Box* View packages.




*PostView for post-acquisition viewing*

iotech.com

# Specifications

## General

**Power Consumption**: 0.9A @ 15VDC
**Operating Temperature:** -40˚ to +60˚C
**Storage Temperature:** -40˚ to 80˚C
**Shock and Vibration:** MIL-STD-810E
**Humidity:** 0 to 95% RH, non-condensing
**Dimensions**
**/300:** 280 mm W x 216 mm D x 44 mm H (11" x 8.5" x 1.75")
**/360:** 280 mm W x 356 mm D x 89 mm H (11" x 14" x 3.5")
**Weight**
**/300:** 1.8 kg (4 lbs)
**/360:** 4.1 kg (9 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

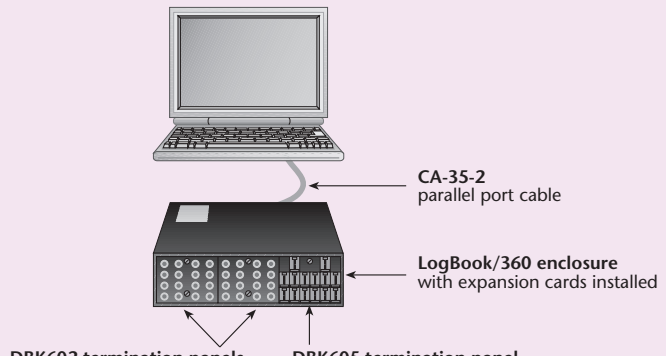
## Analog Inputs

**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**

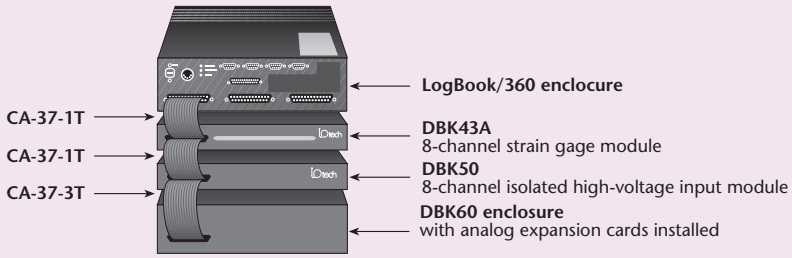
| Range | ±(% Reading + µV) |
|---|---|
| ±10V | 0.015 + 100 |
| ±5V | 0.015 + 100 |
| ±2.5V | 0.015 + 100 |
| ±1.25V | 0.015 + 100 |
| ±0.625V | 0.015 + 150 |
| ±0.3125V | 0.020 + 150 |
| ±0.15625V | 0.050 + 100 |
| 0 to +20V | 0.015 + 500 |
| 0 to +10V | 0.015 + 500 |
| 0 to +5V | 0.015 + 300 |
| 0 to +2.5V | 0.015 + 250 |
| 0 to +1.25V | 0.015 + 150 |
| 0 to +0.625V | 0.020 + 150 |
| 0 to +0.3125V | 0.050 + 100 |

**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
**Gain Temp. Coefficient:** ±30 ppm/˚C max
**Offset Temp. Coefficient:** ±10 ppm/˚C max

## LogBook System Examples




*Typical LogBook/360 configuration with optional DBK80 and DBK82 cards installed (not shown). The DBK602 panel provides convenient BNC inputs while the DBK605 panel allows industry-standard thermocouple plugs.*




*LogBook/360 system with addition of DBK43A strain gage module, DBK50 high-voltage isolation module, and DBK60 expansion module*

## 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

## Sequencer

Randomly programmable for gain
**Channel-to-Channel Rate:** 10 µs/channel, fixed
**Maximum Repeat Rate:** 100 kHz
**Expansion Channel Sample Rate:** Same as on-board channels, 10 µs/channel

## General Purpose Digital I/O

**Channels:** 24 I/O channels, expandable up to 192
**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

# LogBook
## Specifications & Ordering Information

iotech.com

### Pulse Counters
**Channels:** 4
16 bits per channel
**Connector:** DB37 male, P3
**Maximum Pulse Count:** 16-bit binary
**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 Impedence:** 27k Ohm pull-up to +5V in parallel with 50 pF

### Frequency/Pulse Generator
**Channels:** Two, 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
**Supply Power Range:** 10 to 45 VDC (90 to 240V AC adapter included)

### Modem Support*
**Supported Modems:** Hayes-compatible
**Maximum Baud Rate:** 115k baud, auto answer mode required
**Electrical:** RS-232
**Provided Connection:** DB9 male connector

### GPS Support
#### (LogBook/360 only)
**Supported Protocol:** NMEA 0183
**Electrical:** RS-232
**Provided Connection:** DB9 male connector
**Baud Rate:** 4800 baud

## Ordering Information

| Description | Part No. |
|---|---|
| Data acquisition system including AC adapter; LogView and PostView software; and modem software support | LogBook/300 |
| Data acquisition system with signal conditioning bay including serial ports; LogView and PostView software; and modem and GPS software support | LogBook/360 |

### Accessories

| | |
|---|---|
| PC-Card Memory (required) | |
| 1 GB rotating hard drive memory | MEMCARD-10 |
| Hand-held terminal with 2 ft. cable to LogBook (no external power required) | LBK1 |
| Internal DRAM | |
| 16 MB internal memory option (factory installed) | LBKMEM1 |
| Interface | |
| RS-422 and RS-485 interfaces added to existing RS-232 and parallel ports | LBK/COM/422/485 |

### Termination Panels
#### (LogBook/360 only)

| | |
|---|---|
| Blank termination panel | DBK601 |
| 16-connector BNC termination panel | DBK602 |
| 16-connector (8 pairs) red and black safety-jack termination panel and wiring kit | DBK604 |
| 14-connector type J thermocouple panel and wiring kit (male thermocouple connector sold separately) | DBK605-J |
| 14-connector type K thermocouple panel and wiring kit (male thermocouple connector sold separately) | DBK605-K |
| 14-connector type T thermocouple panel and wiring kit (male thermocouple connector sold separately) | DBK605-T |
| 48-connector removable-block screw-terminal panel and wiring kit | DBK606 |
| Slotted termination panel with adjustable clamp | DBK607 |
| Three DB37 female connector termination panel and wiring kit | DBK608 |

### Male Connectors for Subminiature TC Jacks

| Description | Part No. |
|---|---|
| Type J male connector | CN-144-JM |
| Type K male connector | CN-144-KM |
| Type T male connector | CN-144-TM |

### Cables

| | |
|---|---|
| DB25 male to DB25 female parallel cable, 2 ft. | CA-35-2 |
| DB25 male to DB25 female parallel cable, 6 ft. | CA-35-6 |
| Expansion cable from LogBook to DBK expansion products, | |
| 2.5 in. expansion cable | CA-37-1T |
| 4.5 in. expansion cable | CA-37-3T |
| 5.5 in. expansion cable | CA-37-4T |
| 11.5 in. expansion cable | CA-37-8T |
| Null-modem cable, 6 ft. | CA-47 |
| 5-pin male locking DIN to automobile cigarette lighter power cable, 8 ft. | CA-171 |
| Retractable cable from LBK1 to LogBook/300 and LogBook/360, 6 ft. | CA-173 |



* IOtech cannot gaurantee compatibility with all modem types