GENERAL®

3-AXIS USB VIBRATION/ACCELERATION DATA LOGGER

USER'S MANUAL

VB10

Please read this manual carefully and thoroughly before using this product.

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INTRODUCTION

Thank you for purchasing General Tools & Instruments' VB10 3-Axis USB Vibration/Acceleration Data Logger. Please read this user's manual carefully and thoroughly before using the product.

The VB10 system has three components:

1. A USB memory stick (data logger) with three precision on-board microelectronic gravitational force sensors (accelerometers). The data logger is designed to be attached to an operating piece of equipment (a motor, for example) and left in place to measure and record the equipment's acceleration in three dimensions over an extended period of time.

2. A pedestal with magnets and screw holes for firmly mounting the data logger to the piece of equipment.

3. A Windows-compatible graphics application that can download thousands of stored or real-time acceleration readings to a PC from the data logger via its USB interface. Using powerful analysis tools in the software, an engineer or technician can assess the health or diagnose any performance problems of the equipment by relating the acceleration data to physical manifestations such as vibration, motion and tilt.

KEY FEATURES

- Three accelerometers precisely measure acceleration on x, y and z axes
- Data logger stores up to 327,600 data points in flash memory
- One button starts/stops data logging without PC
- Plug-and-play USB 2.0 interface; no need for cables, cradles or docks
- Mounting pedestal with magnets and three screw holes
- Included PC interface/analysis software can download recorded data or acquire real-time data or real-time frequency data
- Software is used to set system clock, operating mode (normal, time-triggered or motion measuring), sampling rate and axial high/low alarm thresholds

- Powerful analysis modes, including Fast Fourier Transform frequency conversion and time-domain analysis
- One-click exporting of tabular data to .txt file or graph to printer
- Red and green LEDs indicate device status (recording, not recording, battery low, memory full)
- Powered by high-capacity, long-life, non-rechargeable Li-ion battery

WHAT'S IN THE PACKAGE

The VB10 system comes in a white box. Inside the box are:

- The USB data logging device with a pre-installed battery that requires activation
- A mounting pedestal
- An extension cable with a full-size USB plug at one end and a full-size USB jack at the other
- A mini-disc containing the .exe file of the Shock Software V2.1 application and a pdf explaining how to install and use it
- A hard copy of this user's manual

PRODUCT OVERVIEW

Fig. 1 below and on the next page shows all controls, indicators and physical structures on the data logger and pedestal.
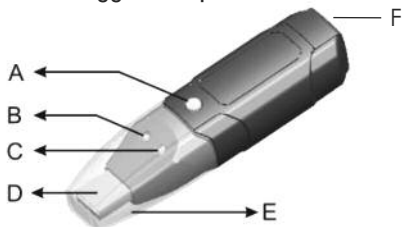
A. Logging start/stop button
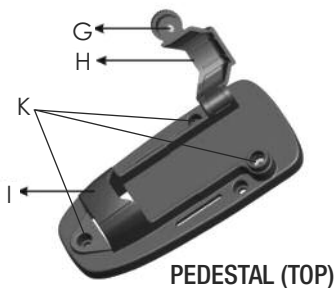
B. Green **Rec** LED

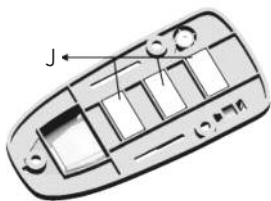C. Red **Alm** LED

D. USB plug

E. Transparent plug cap

F. Battery compartment

USB DATA LOGGER

PEDESTAL (TOP)   PEDESTAL (BOTTOM)

G. Locking thumbscrew
H. Data logger clamp
I. Pedestal
J. Magnets
K. Screw mounting holes

SETUP INSTRUCTIONS

ACTIVATE BATTERY

1. Use a very small Phillips-head screwdriver to remove the two silver screws securing the grey battery compartment cover (Fig. 1, Callout F) to the bottom of the data logger. Set the screws aside, taking care not to lose them.

2. Carefully remove the battery compartment cover to expose the "1/2AA" battery inside.

3. Remove the battery from the well. If the battery is covered by a transparent plastic cover, remove and discard it. If not, proceed to the next step.

4. Insert the battery in the well cathode (- side) first.

5. Replace the battery compartment cover and secure it with the two silver screws.

INSTALL SOFTWARE

1. Remove the Shock Software V2.1 mini-disc from its protective sleeve and place it in the tray of your PC's CD/DVD drive with the label facing up. Close the tray.

2. On the AutoPlay screen that appears next, click on "Open folder to view files"

3. The next screen will indicate that there are two files on the disc: <Shock Software V2.1 Instructions.pdf> and <Shock V2.1 Setup.exe>. Before installing the application, General recommends that you copy the pdf to your hard drive to make the software instructions available without having to re-load the disc. You may also want to print out the instructions for off-line reference.

4. Double-click <Shock V2.1 Setup.exe>. The screen below will appear.
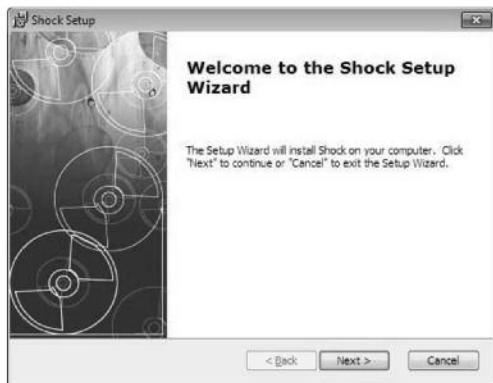
5. Click **Next** to call up the screen at right. Use the **Browse** button if you want to save the Shock software somewhere other than the ProgramFiles folder. Otherwise, click **Next**.
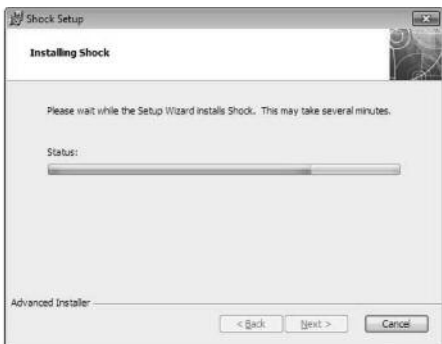
Shock Setup

Select Installation Folder

This is the folder where Shock will be installed.

To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".

Folder:

C:\Program Files\Shock\Shock\   Browse...

Advanced Installer

< Back   Next >   Cancel
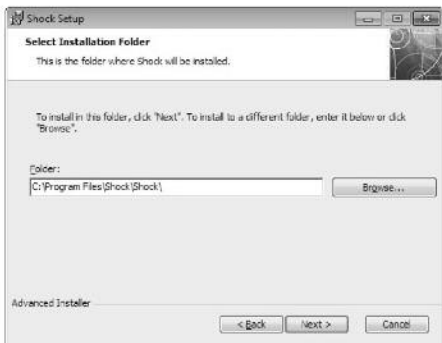
6. On the **Ready to Install** screen at right, click **Install**.

Shock Setup

Ready to Install

The Setup Wizard is ready to begin the Shock installation

Click "Install" to begin the installation. If you want to review or change any of your installation settings, click "Back". Click "Cancel" to exit the wizard.

Advanced Installer

< Back   Install   Cancel
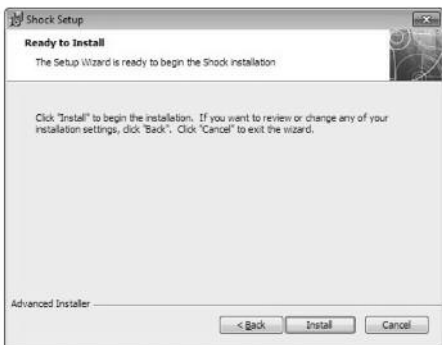
7. While the software installs, you will see the screen at right.

Shock Setup

Installing Shock

Please wait while the Setup Wizard installs Shock. This may take several minutes.

Status:

Advanced Installer

< Back   Next >   Cancel

8. When installation is complete, click **Finish** to exit the Shock Setup Wizard.
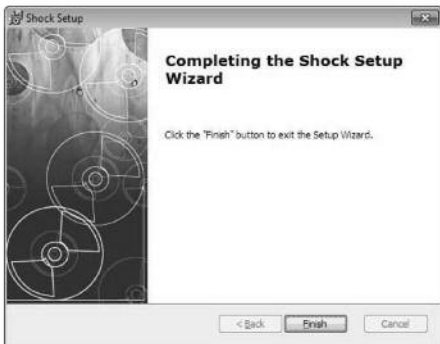
CONFIGURE DATA LOGGER

The next two steps in the setup process install a software driver for the USB data logger, and configure the unit to your data logging preferences.

Remove the transparent plug cap (Fig. 1, Callout E) from the data logger to prepare it to be plugged into a USB port of your computer.

Note that the software installation has added a ✎ icon to your desktop. To facilitate access to the program, right-click on the icon and pin it to both your Start button and the Quick Start area at the left of your taskbar. You can now eject the Shock Software mini-disc and store it with your other important software.

Plug the data logger into an available USB port of your computer. If your computer is a laptop and the only available USB jack does not have enough vertical clearance to accommodate the logger without mechanically stressing its USB plug, *do not* plug the logger directly into the jack. You do not want the plug of the logger to support any of the weight of the laptop. If that is the case, plug the data logger into the jack of the included USB extension cable and insert the plug of the extension cable into the computer's USB jack.

The first time you plug the data logger into your computer, your system tray will notify you that the computer is "Installing Device Driver Software". When the notification disappears, open the Shock program by selecting it via your Start button, clicking on its icon on your taskbar, or double-clicking its desktop icon.

If the software has installed correctly and you have plugged the data logger into a working USB port of your computer, the screen at right will appear on your computer's display.
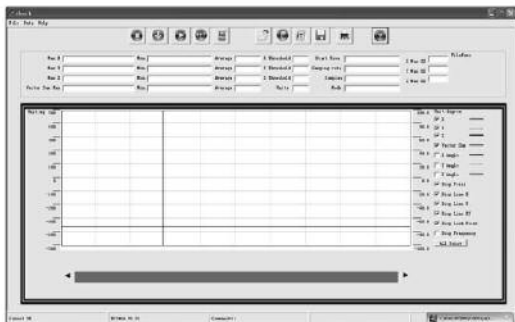
To configure the data logger, begin by selecting the **System Parameter** pulldown of the **File** menu at upper left. This will call up the screen at right.
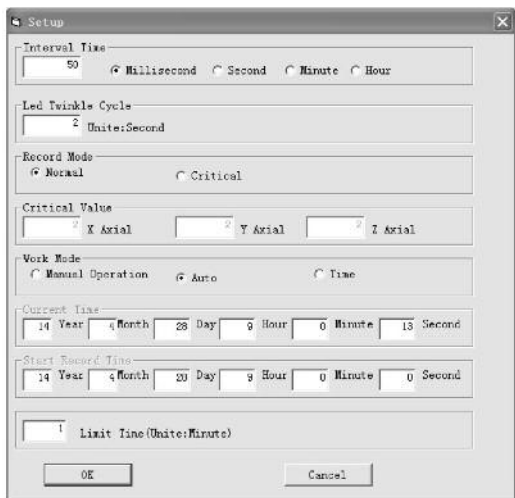
Of all the options available on this screen, there is only one you should initially change from the default value: **Interval Time**. General suggests that you change this value (more commonly called Sampling Time) from 50ms to 500ms to avoid filling up the on-board flash memory with redundant information (nearly identical samples taken too close together in time). Note that the **Current Time** and **Start Record Time** fields have already been synchronized to your PC's clock. You can always change the other default values later, after you have gained some experience operating the VB10 system and the Shock software.

After you have changed the **Interval Time** to 500ms, click **OK** at the bottom left of the screen to save the settings.

DEPLOY DATA LOGGER

To obtain accurate readings, the data logger must be securely attached to the equipment whose vibration or motion history you wish to log and analyze.

The data logger fits snugly in the supplied mounting pedestal. To insert the logger in the pedestal, turn the locking thumbscrew (Fig. 1, Callout G) to loosen it, raise the clamp (Fig. H), insert the logger, lower the clamp over it, and turn the thumbscrew to secure the clamp.

There are three ways to attach the pedestal and data logger to the equipment whose acceleration is to be measured: 1) Using the three magnets on the back of the pedestal (Fig. 1, Callout J); 2) Using screws or bolts (not included) to permanently attach the pedestal to the equipment through the three holes in the pedestal (Callout K); 3) Gluing the pedestal to the equipment.

OPERATING INSTRUCTIONS

MONITORING DEVICE STATUS

The VB10 uses two colored LEDs to indicate its working status. The table below describes the meaning of four LED flashing patterns and any action to be taken in response.

LED Status	Indication	Recommended Action
Both LEDs off	Battery not detected or dead	Check battery installation or install fresh battery
Green **Rec** LED flashes once every 10 seconds (default), with Red **Alm** LED off	Logger is recording	To change the flashing interval, enter the Shock software's Setup menu by selecting **System Parameter** from the **File** menu. Then adjust the value in the box labeled **LED Twinkle Cycle**.
Red **Alm** LED flashes once every 30 seconds, with Green **Rec** LED off	Low battery (automatically stops data logging, with no loss of data)	Install fresh battery
Both LEDs flash alternately once every 60 seconds	Data logger memory is full	Download recorded data

STARTING & STOPPING DATA LOGGING

To start data logging with the VB10 plugged into a USB port of your computer, press and hold the yellow Logging start/stop button (Fig. 1, Callout A) until the green **Rec** LED flashes four times.

To stop logging with the VB10 plugged in, briefly press the Logging start/stop button. This will cause the red **Alm** LED to flash four times.

To start data logging with the VB10 operating in standalone mode (unplugged from your computer), briefly press the Logging start/stop button. This will cause the green **Rec** LED to flash four times.

To stop logging with the VB10 operating in standalone mode, briefly press the Logging start/stop button. This will cause the red **Alm** LED to flash once. The two LEDs will then alternate flashing until each has flashed four times.

CALIBRATION

To calibrate the VB10, unplug the unit from your computer and place it on a flat, level surface. Then press and hold the Logging start/stop button until the green **Rec** LED flashes four times. The self-calibration cycle may take a few minutes, and it is complete when the red **Alm** LED flashes four times. Do not touch the unit during calibration, and try not to miss the red **Alm** LED flashing to indicate completion of the cycle.

Note: If the battery is removed from the data logger while it is recording or before it has been configured using the software, the data logger must be reconfigured before it can be reactivated. If it is not reconfigured, the data logger will remain in standby mode.

Replacement batteries (Part No. BA10) are available from General (www.generaltools.com).

DOWNLOADING DATA AND USING THE SOFTWARE

For detailed operating instructions, refer to the <Shock Software V2.1 Instructions.pdf> found on the mini-disc.

Use the following diagram (also printed on the battery compartment cover) to correlate x-, y- and z-axis readings with the orientation of the data logger.
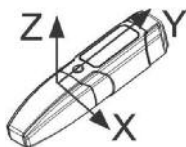
SPECIFICATIONS

Acceleration Measurement Range: -16g to 16g

Acceleration Accuracy: ±0.5g

Acceleration Resolution: 0.0039g

Frequency Range: 0 to 60Hz

Data Logging Capacity: 327,600 data points in 16MByte flash memory

User-selectable Sampling Time: 50ms to 24hours

Interface: USB 2.0

Software Compatibility: Windows XP/Vista/WIN7/WIN8

Power Source: 3.6V/1200mA "1/2AA" non-rechargeable Li-ion battery

Maximum Continuous Logging Time: 60 hours

Operating Temperature : 32° to 113°F (0° to 45°C) @5 to 95%RH, non-condensing

Storage Temperature: -4° to 140°F (-20° to 60°C) @≤85%RH (without battery)

Dimensions (including pedestal):
  4.45 x 2.13 x 1.28 in. (113 x 54 x 32.5mm)

Weight (without battery): 2.6 oz. (73.5g)

WARRANTY INFORMATION

General warrants its instruments and accessories, and digital tools products against defects in material or workmanship for one year from the date of purchase unless otherwise stated on the packaging, manual, and/or marketing materials. General also warrants its non-digital tools products against defects in material or workmanship on a limited lifetime term.

General will replace or repair the defective unit, at its option, subject to verification of the defect.

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State laws vary. The above limitations or exclusions may not apply to you.

For more details or to file a warranty claim, contact General Tools & Instruments Technical Support at techsupport@generatools.com.

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Every effort has been made to provide you with a reliable product of superior quality. However, in the event your instrument requires repair, please contact our Customer Service to obtain an RGA (Return Goods Authorization) number before forwarding the unit via prepaid freight to the attention of our Service Center at this address:

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> Secaucus, NJ 07094
> 212-431-6100

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