QUICK START GUIDE

Model 3330 G-Logger   Model 3340 G-Logger

v. 23.10.06

© Silicon Designs, Inc.
13905 NE 128th Street
Kirkland, WA 98034
Phone 425-391-8329 • Fax 425-391-0446
www.silicondesigns.com

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

TABLE OF CONTENTS

HARDWARE & SYSTEM REQUIREMENTS

The 33x0 supports three channels of input, i.e. up to three 1-axis modules or one 3-axis module. The 33x0 is designed to work exclusively with SDI accelerometer modules requiring 8 to 32 V DC power and also has a chip test function compatible with SDI's 1521, 1522, 1531, and 1525 surface mount accelerometers when combined with an EB-J or EB-L test board set. It does <u>not</u> currently support SDI models 1410, 1527, 2225, 2227, 2012, 2422 or 2422H, as well as other accelerometer brands.

System requirements to use the 3330 or 3340 G-Logger include:

- Microsoft Windows XP or newer
- Desktop, laptop, or notebook PC
- 2 GB available RAM
- 50 GB available hard disk space
- Available USB 2.0 or 3.0 port
- An internet connection may be needed during software installation

INCLUDED CONTENTS

Please check that the following items are included in your box before using your G-Logger:

1. SDI Model 3330 of 3340 G-Logger Data Acquisition System
2. SD memory card (may be installed in G-Logger if unit is preconfigured)
3. 25 Pin terminal strip adapter (may be installed)
4. USB A to Micro B cable
5. Installation Software (also avail by [download])

If missing any item, please contact support@siliocndesigns.com.

FEATURE DESCRIPTIONS

SD MEMORY CARD SLOT
The 3330 and 3340 G-Loggers are supplied with a 16 GB SD card and can support up to 32 GB on a SDHC or SD type memory card, or micro-SD memory card with an adaptor. The card must be speed class 6 or higher. Maximum individual file size is 4 GB.

AUXILIARY POWER PORT (3340 ONLY)
For supplying power only. Use the Auxiliary Power Port if an external power source is preferred or necessary *when the 3340 is not connected to a computer/laptop.* Sources can include portable battery packs, a USB cable to car adapter or port, or to wall power using a USB adaptor.

USB LINK LIGHT
- The LED flashes when the G-Logger is trying to establish a connection.
- The LED is solid when the G-Logger successfully communicates with the host computer.

STATUS LIGHT
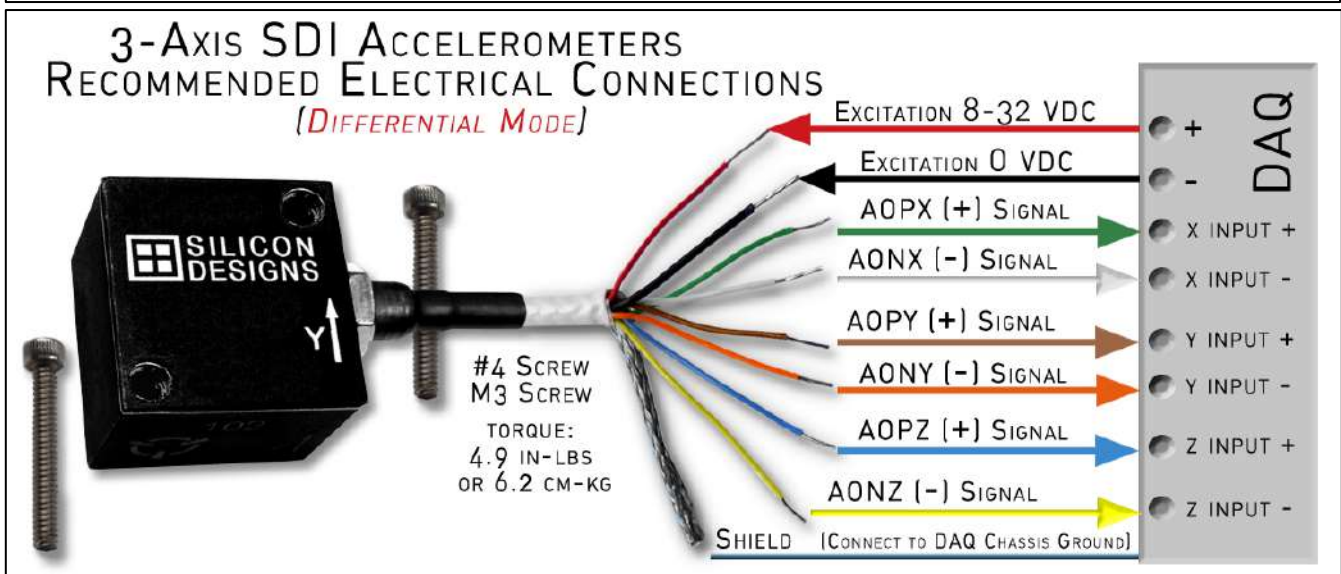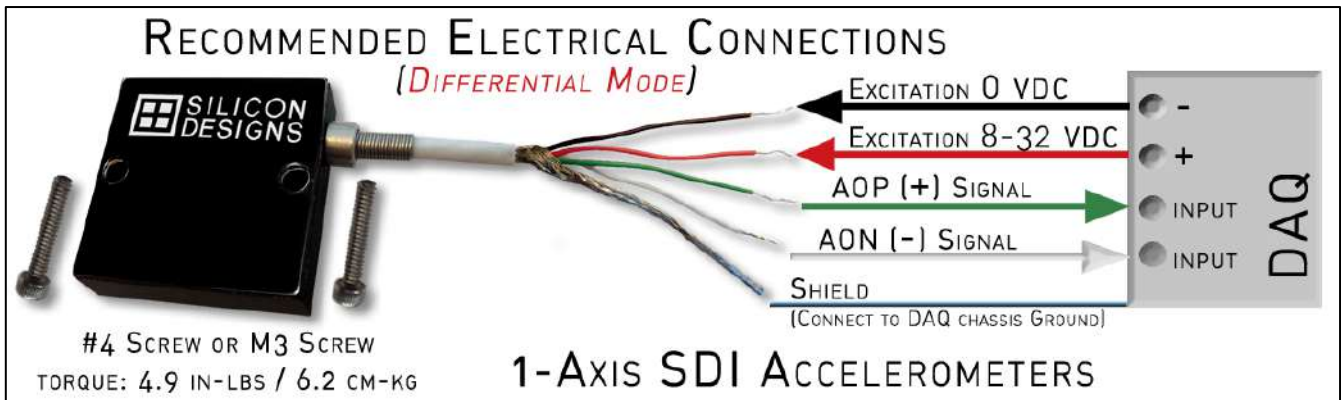- Slow, regularly blinking light indicates data acquisition in progress.
- Rapidly, irregularly blinking light indicates an error. Get log for details.
- Off means not acquiring data and no errors

COIN BATTERY
Inside the unit is a 3-volt type CR2032coin battery, which retains the clock time and log information. It typically lasts 1 year in the G-Logger. To replace, unscrew the plates and remove the lid.

25-PIN TERMINAL STRIP PIN LAYOUT

RECOMMENDED ELECTRICAL CONNECTIONS
(DIFFERENTIAL MODE)

EXCITATION 0 VDC
EXCITATION 8-32 VDC
AOP (+) SIGNAL
AON (-) SIGNAL
SHIELD (CONNECT TO DAQ CHASSIS GROUND)

#4 SCREW OR M3 SCREW
TORQUE: 4.9 IN-LBS / 6.2 CM-KG

1-AXIS SDI ACCELEROMETERS

3-AXIS SDI ACCELEROMETERS
RECOMMENDED ELECTRICAL CONNECTIONS
(DIFFERENTIAL MODE)

EXCITATION 8-32 VDC
EXCITATION 0 VDC
AOPX (+) SIGNAL
AONX (-) SIGNAL
AOPY (+) SIGNAL
AONY (-) SIGNAL
AOPZ (+) SIGNAL
AONZ (-) SIGNAL
SHIELD (CONNECT TO DAQ CHASSIS GROUND)

#4 SCREW
M3 SCREW
TORQUE:
4.9 IN-LBS
OR 6.2 CM-KG

TOP ROW PIN #	1	2	3	4	5	6	7	8	9	10	11	12	13
TOP ROW SIGNAL	CH 0 0 Volt	CH 0 AON	CH 1 0 Volt	CH 1 AONY	CH 2 0 Volt	CH 2 AONZ	X	X	X	X	X	X	X
BOTTOM ROW PIN #	14	15	16	17	18	19	20	21	22	23	24	25	SH
BOTTOM ROW SIGNAL	CH 0 AOP	CH 0 8-32 V	CH 1 AOPY	CH 1 8-32 V	CH 2 AOPZ	CH 2 8-32 V	X	X	X	X	X	X	Shield

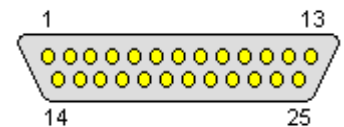3, 5, 17, & 19 not used w/ 3-Axis   X = Not in use

Shield connection is required.

Alternatively, you can hard-wire the accelerometer cables to a 25 Pin Male D-sub (not included).

Note: There will be no "0 Volt" or "8-32 V" connections on PIN 3, 5, 17, or 19 when connecting a 3-axis module.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Silicon Designs, Inc. • 13905 NE 128th Street, Kirkland WA 98034 • Phone: 425-391-8329 • support@silicondesigns.com
www.silicondesigns.com   [page 4]   6-October-2023

SOFTWARE INSTALLATION

The SDI G-Logger software package consists of two programs, SDIServer and SDILogger. Both applications must be installed and running for the G-Logger to function and display data. Installation should take less than 5 minutes. You can also underline download additional copies from the SDI website.

SDIServer Explained

SDIServer should be launched prior to launching SDILogger. This is a passive program and runs in the background to support the SDILogger program's features. It can also act as a server, transmitting data to the SDILogger application via TCP/IP to support remote access through the SDILogger program. SDIServer must be running on the same computer to which the 33x0 is connected via the USB cable.

SDILogger Explained

The SDILogger program is the graphical user interface for the 33x0. This is where you can configure, view, record, and play back the data you collect. The SDILogger may either be installed on the same computer as SDIServer, or on a different computer where remote viewing is desired.

Installing the Software

1) Using Windows Explorer, open the CD drive or unzip the download folder
2) Click on Setup.exe
3) Click YES to allow the installer to make changes to your computer
4) Click NEXT on the G-Logger Setup Wizard screen
5) Check both boxes and click INSTALL
6) Click NEXT to the Device Driver Installation Wizard
7) Click FINISH to complete the Device Driver Installation Wizard

If your PC already has .NET installed, the installer will detect this and proceed to step 8. Steps a. through d. below will only appear if your PC needs .NET installed. In this event, you will need an internet connection to download .NET.

   a. Click OK to begin .NET framework download
   b. Click OK to install .NET framework
   c. Check the box to accept the .NET license terms and click INSTALL
   d. Click FINISH to complete the .NET installation

8) Click FINISH to the G-Logger Setup Wizard

SDIServer

Always launch SDIServer prior to launching SDILogger. It must run in the background on the computer that connects to the 33x0 to provide a server platform for the user interface.

Ensure your G-Logger is connected to the computer, the accelerometer(s) are wired properly, and the 25-Pin Strip is securely connected prior to launching the SDIServer application.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Silicon Designs, Inc. • 13905 NE 128th Street, Kirkland WA 98034 • Phone: 425-391-8329 • support@silicondesigns.com
www.silicondesigns.com   [page 5]   6-October-2023

SDILogger

SDILogger is the graphical user interface for the 33x0. It configures the accelerometers, controls the 33x0, displays the data, and provides access to saved data streams.

1) Connect your G-Logger by the USB cable and attach the 25-pin adapter with accelerometers.
2) Launch the SDIServer program.
3) Launch the SDILogger program.

SDILogger - CONNECT tab

G-Logger Configuration

If your G-Logger is preconfigured by SDI or already configured from prior use, skip to Pre-Configured G-Logger / Use Existing Configuration to maintain that configuration.

NEW

If your accelerometers are new to your G-Logger, or your G-Logger is brand new but not preconfigured:

1) On the Connect tab, click New and a Device Configuration pop up will open.
2) Enter a name for this configuration of accelerometers, i.e. "ShowTrio."
3) Leave the IP field as "localhost" if your SDIServer and SDILogger are running on the same computer.
4) Repeat the following process for all channels with accelerometers wired on them:
    a) Enter a name for this module or axis, i.e. "2470sn222" or "X-Axis" or "left 2210."
    b) Choose the SDI accelerometer model # from the drop down.
        i) A 3-axis module will auto-fill the Y and Z axes to channels 1 and 2.
    c) Enter the serial number from the accelerometer.
    d) Sensitivity & Bias will be automatically populated with SDI's default values for the Model selected. If entering the data for your specific module, the Sensitivity is also called "Scale Factor" and can be found on the module's bag or sticker on the cable.
    e) Maximum and Minimum are auto-filled based upon the g-level of the selected model.
5) Click Save and the pop up will close and save the configuration to your PC.
6) Click Connect. Your 33x0 is now ready to collect data.

EDIT

Select EDIT if you have already used this G-Logger and would like to replace the attached accelerometer or modify an existing configuration.

1) If button in the top middle of the CONNECT screen shows DISCONNECT, click it to enable the EDIT button, and then click EDIT.
2) Modify the fields of the Device Configuration to the desired values, as described in step 5) of New Configuration and click SAVE.

If prompted, select "Update to New Configuration" to write your new configuration to your device.

3) Your 33x0 should automatically connect at this point and is ready to collect data. If not, click Connect.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE
Silicon Designs, Inc. • 13905 NE 128th Street, Kirkland WA 98034 • Phone: 425-391-8329 • support@silicondesigns.com
www.silicondesigns.com   [page 6]   6-October-2023

Pre-Configured G-Logger / Use Existing Configuration

If this 33x0 device's settings match those saved the last time the SDILogger program was used on this computer, you will not see the pop-up. No changes are necessary unless you wish to change the accelerometer(s).

If your 33x0 came pre-configured from SDI with one or more accelerometers, the channels will already have assigned model numbers and custom calibrations *stored on the 33x0 device*. To retain these preconfigured settings, be sure to use Keep Last Configuration in step 2 below.

To sync settings from the 33x0 to your PC, or from your PC to the 33x0, a pop-up will ask Update to New Configuration or Keep Last Configuration.

1) Choose Update to New Configuration
    a. if it is your first time connecting to an *unconfigured* 33x0. This writes a new or edited configuration from your computer to your 33x0 device.
    b. to write the saved configuration last used on this computer onto the 33x0, overwriting the previous settings stored on the device.
    c. Do not use this if it is your very first time connecting to a *preconfigured* device.
2) Choose Keep Last Configuration
    a. to use the *preconfigured* settings of your new 33X0 device.
    b. to update the SDILogger program on this computer with the last configuration stored in this 33x0 device.
3) The 33x0 should automatically connect at this point.
4) You are now ready to collect data.

Chip Mode Accelerometer Testing

Silicon Designs is the OEM of the actual accelerometer LCCs inside all of its modules. To support other OEMs using SDI's accelerometer LCCs, the G-Logger has a Chip Mode to support rapid calibration and characterization of every SDI chip prior to installation. See the full-length User Manual for more information.

SDILogger - ACQUIRE tab

The ACQUIRE tab consists of six sections: Setup, Data, Spectrum, Meters, Events (3340 only), and GPS (3340 only).

ACQUIRE/Setup

The Setup section is for configuring the data collection settings. If necessary, click the STOP CAPTURE button to access AQUIRE/Setup.

START CAPTURE

Click on Start Capture to begin collecting data, power the accelerometer(s), starts data acquisition, and displays the data.

SAVE TO FILE

Save To File is only available following an acquisition. If unavailable, click Stop Capture.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Silicon Designs, Inc. • 13905 NE 128th Street, Kirkland WA 98034 • Phone: 425-391-8329 • support@silicondesigns.com
www.silicondesigns.com   [page 7]   6-October-2023

Files are automatically saved to the SD card, and can also be saved to the PC by clicking Save To File. The most recently acquired data will be saved to your PC as a .bin (binary) file in the directory: C:\users\{username}\Documents\SDI

DISPLAY FILE

Display File will open a file previously saved to your PC. To display a file previously stored on our 33x0's SD card, click on the SD CARD tab.

EXPORT

Export will convert a previously saved SDI G-Logger binary data file to text, CSV, or MATLAB format.
1. Select the source binary file you wish to convert and click OK.
2. Select the file type to which you would like to export.

For additional information, see the full-length User Manual.

SAMPLE RATE

Turn on or off the acquisition of the active channels by checking or unchecking the boxes.   This will not record their data streams and save file size. Alternatively, the Data tab provides a HIDE function to still collect the data but hide it during playback.

The 33x0 supports up to 10Khz/channel and has a built-in hardware filter at 50% of sample rate. Each sample is 16-bits. Max file size is 4GB (using up to a 32GB SD card).

Select the minimal sampling rate and number of channels that will give you the resolution your application requires to reduce your file size and increase the maximum acquisition time. When selecting the sample rate in hertz per channel, if you are trying to see 1 Hz vibration data, increase the sample rate to 10hz to reduce aliasing.

When choosing the sampling rate, also take into account that the G-Logger hardware automatically applies a low pass, anti-aliasing filter with a cut-off frequency that is 25% that of the chosen sampling rate. Thus, the sampling rate should be at least 4 times that of the greatest signal frequency of interest.

All the compatible SDI accelerometers provide an analog output, so the signal is effectively a stream.

The COMMENT field will add the entry into your saved file headers.

DOWNSAMPLE
Downsampling is not recommended except in cases where you are already using the minimal sampling rate but need to further reduce your exported file size. For additional information, see the full-length User Manual.

3340 SETTINGS – EVENT DETECTION
The 3340 can identify and report peak events. When enabled, the 3340 will identify events and automatically write to a file on the SD card *when recording is initiated by clicking* Start Capture *in the user interface*. To enable event detection on a given channel, click ENABLE for that channel, and provide a threshold value, greater than zero, above which an event will be recorded.

For further instructions, see EVENTS. For complete instructions, see the full-length User Manual.

3340 STANDALONE SETTINGS
Available only with the 3340 G-Logger, the Standalone Settings are used *when acquisition is initiated by an external button press on the device itself or by a scheduled acquisition*, as opposed to clicking Start Capture.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Silicon Designs, Inc. • 13905 NE 128th Street, Kirkland WA 98034 • Phone: 425-391-8329 • support@silicondesigns.com
www.silicondesigns.com   [page 8]   6-October-2023

The Scheduled Acquisitions table allows configuration of automatic, timed acquisitions. Click on New to add an entry to the Scheduled Acquisitions table.

1. Set the Start Date and Start Time to your desired future starting time.
2. Set the acquisition duration. The maximum duration depends on how much space is available on your SD card, as well as your acquisition data rate, up to a max file size of 4GB.
3. Set the # of Repeats field up to 100 times or until the SD card is full. If this field is zero, this entry will only acquire data once, beginning at the specified start time.
4. Set the Days, Hours, and Minutes to the period at which you would like the data acquisition to repeat.
5. Click OK to save this entry to the Scheduled Acquisitions table, or Cancel to discard.

You may have up to 124 entries in the table, where each entry may repeat up to 100 times.

Overlapping entries are not permitted (a new acquisition may not begin when an acquisition is already in progress, regardless of how the acquisition is initiated).

For complete instructions, see the full-length User Manual.

3340 SETTINGS - GPS

The 3340 has the option to add an external, aftermarket GPS module (widely available through Amazon or similar sources) to collect GPS data along with the accelerometer data.

When installed and enabled in 3340 Settings, the 3340 will record GPS data and automatically write to a file on the SD card *when recording is initiated by clicking* Start Capture *in the user interface*.

The GPS data is written to a file on the SD card that shares the same prefix as the associated accelerometer data file, but with a .GPS suffix instead of a .BIN suffix.

If the 3340 does not receive any GPS data for 90 seconds, it will stop collecting GPS data.

Retrieve GPS data by clicking on the SD CARD tab, selecting the desired *.GPS file, and clicking SAVE FILE TO PC.

For additional instructions, see GPS. For complete instructions, see the full-length User Manual.

ACQUIRE/Data

Click on Start Capture to begin live data collection and recording. Click on Display File to open a previously saved .bin file.

HORIZONTAL SCALE changes the period of time displayed in the window (but will not affect the sampling rate). A longer time period will compact the data, and a shorter time period will expand the width of the waveforms for higher resolution.
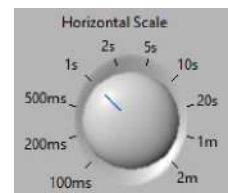
The section above the display lists the active channels and their display colors.   Clicking HIDE will only hide a channel's line on the display but the data will still be collected. To view, unhide the channel and rewind the recording.

SCALE G/DIV: Sets the vertical grid of the display. Lower numbers will expand the waveforms vertically.

OFFSET G: Defaults to 0. Use this to move each channel waveform vertically to separate or combine the waveforms.

ACQUIRE/Spectrum

SPECTRUM displays the FFT of the data. This advanced feature allows you to analyze the data by frequency to see at which frequencies the maximum vibrations are occurring.

AVERAGING PARAMETERS can be set to modify the FFT with averaging, weighting, and a variable number of averages. RESTART will refresh the screen and begin computing with the data collected from that point on.

POWER SPECTRUM MIN and MAX FREQUENCY set the range of frequencies desired for the display.

The FREQUENCY boxes above the display show the location of the two yellow lines in the display. You can select two frequencies by dragging the yellow lines with your cursor. The AMPLITUDE boxes reflect the magnitude of the data collected at the respective selected frequency in units of dBV. The V/ROOT-HZ displays the difference between the left and right frequencies in volts per root-hz. HIDE will remove the channel from the display but not impact the data collection.

The FREQUENCY boxes above the display show the location of the two yellow lines in the display. You can move the yellow lines by dragging them with your cursor.

The AMPLITUDE boxes reflect the size of the data collected at the respective frequency.

The G/ROOT-HZ displays the difference between the left and right frequencies.

HIDE will remove the respective channel from the display. It will NOT impact the data collection.

ACQUIRE/Meters

The METERS screen provides DC, RMS, and peak values in either Volts or Gs.

The values are calculated over the time interval selected by the HORIZONTAL SCALE setting selected on the Data tab.

The values are updated by that same time interval.

ACQUIRE/Events (3340 Only)

Available only with the 3340 G-Logger, the 3340 can identify and report peak events based upon user-defined thresholds. Events can be simultaneously captured independently on all three channels.

Setup for Events is done in 3340 Settings – Event Detection.

For complete setup instructions, see the full-length User Manual.

VIEWING EVENT FILES

When event detection is enabled, the 3340 will identify and write events to the SD Card. The event file shares the same prefix as the associated accelerometer data file, but with a *.evt suffix instead of a *.bin suffix.

To access Events, first open the SD CARD tab, select your .EVT file, and click Display File. This will open the file on the Events tab and provide a list of all the events that met or surpassed the thresholds entered in the Setup tab under 3340 Detection Thresholds or Standalone Settings.

Selecting one event and clicking on Display Event will then open the Data display screen. The file data will automatically load and begin playing in the display window. All the display settings, such as scaling, offset, and horizontal scale, can be modified to view the data from different perspectives. The playback controls below the display provide forward/pause/play/rewind functionality for the event.

ACQUIRE/GPS (3340 Only)

The GPS function works similarly to the Events function. The 3340 has the option to add an external, aftermarket GPS module (widely available through Amazon or similar sources) to collect GPS data along with the accelerometer data.

Setup for Events is done in 3340 Settings – Event Detection.

For complete setup instructions, see the full-length User Manual.

VIEWING GPS FILES

When GPS is enabled, the 3340 will record GPS data and the accelerometer data, but will save it separately to a ".GPS" file in the SD Card with the same file name prefix as the associated .BIN accelerometer data files.

To access GPS data, first open the SD CARD tab, select your ".GPS" file, and click Display File. This will list the file on the GPS screen and provide a list of all the GPS data. Selecting one GPS entry and clicking on the Display Event will then open the Data display screen.

ENABLING GPS

Click on the Setup section in the ACQUIRE tab. If Setup is unavailable because a recording is in progress, click on Stop Capture.

The Setup page contains two sections for configuring GPS, each with a specific function.

3340 SETTINGS: Click GPS ENABLE to automatically write GPS data to a file on the SD card every time data acquisition occurs, regardless if by clicking Start Capture in the user interface, the external device button, or the acquisition scheduler.

3340 STANDALONE SETTINGS are applied when acquisition is initiated only via an external button press on the device itself or by a scheduled acquisition.

There are three components to the 3340 Standalone Settings:
1. General settings to apply when acquisition is triggered by *the external device button or a scheduled acquisition.* Set the sample rate and enable the channels you'd like to record. Add a comment that will be included in your file.
2. The GPS Enable check box will initiate GPS data collection when acquisition is triggered by *the external device button or a scheduled acquisition.*
3. See the Event Detection section for information on setting Event Detection Thresholds

The Scheduled Acquisitions table allows configuration of automatic, timed acquisitions. You may have up to 124 entries in the table, where each entry may repeat up to 100 times.
1. Click on New to add an entry to the Scheduled Acquisitions table.
2. Set the Start Date and Start Time to your desired future starting time.
3. Set the acquisition duration. The maximum duration depends on how much space is available on your SD card, as well as your acquisition data rate, up to a max file size of 4GB.

For complete setup instructions, including wiring diagrams, see the full-length User Manual.

SDILogger - CALIBRATE tab

All of SDI's accelerometer modules are calibrated and programmed during the production process. The basic calibration data of bias and scale factor (sensitivity) are provided one each unit's factor bag, and units with integrated cables also have a label listing these numbers.
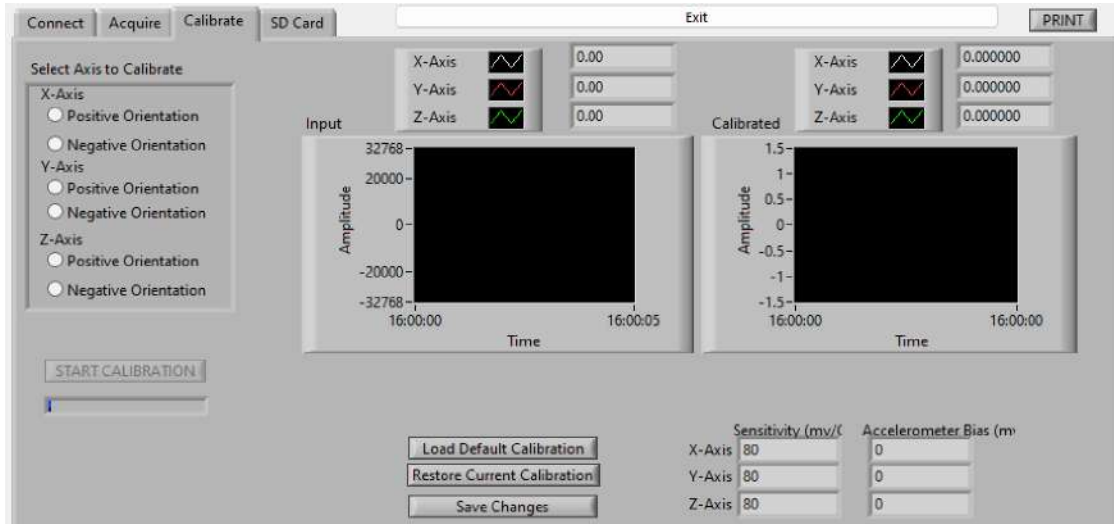
The calibrate screen can quickly verify the performance of your accelerometer is still within the tolerances specified on its data sheet. See https://www.silicondesigns.com/datasheets for current versions. If your accelerometer is an older generation, contact SDI Tech Support for the appropriate data sheet.

To perform a calibration:

1) Place your accelerometer on a flat, unmoving, horizontal surface with the lid facing up and hold it still.

2) Click on the POSITIVE ORIENTATION bubbles for the axis to be calibrated.

3) Press START CALIBRATION and the blue status bar will indicate when it's done.

4) Flip the accelerometer over so the lid faces down, select the NEGATIVE ORIENTATION bubble, and repeat the process.

5) For additional 1-axis modules, repeat the process with each unit; their wiring to the 25-pin connector will designate them as the X, Y, or Z axis. For a 3-axis module, repeat the process for each axis of measurement. Refer to the X↑, Y↑, or Z↑ on the module's sides to perform the process for the correct axis.

6) Click SAVE CHANGES to write the new parameters to the 33x0 device for this configuration setup.

Click PRINT from the calibrate screen as a shortcut to view these parameters in User Configuration.

LOAD DEFAULT CALIBRATION will enter the standard values for the module(s) entered in the CONNECT screen.

RESTORE CURRENT CALIBRATION resets the calibration values to the numbers previously stored for the module(s). These are the values set on the Configuration portion of the CONNECT screen.

NOTE The CALIBRATE function requires that the accelerometer module(s) be flipped from a positive G to negative G placement. If the module(s) cannot be moved, do NOT use the CALIBRATE feature.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Silicon Designs, Inc. • 13905 NE 128th Street, Kirkland WA 98034 • Phone: 425-391-8329 • support@silicondesigns.com
www.silicondesigns.com [page 12] 6-October-2023

SDILogger - SD CARD tab

This screen allows you to manage the files on the SD card as well as play back older data captures.

The SD card directory displays a listing of the files previously saved to the SD card within in the G-Logger device.

If you select a file and then click DISPLAY FILE INFO, the top right shows some of the information regarding the file's data set. The Comment text shows the comments that were entered on the ACQUIRE-SETUP page prior to starting acquisition. This can help with labeling and project descriptions.
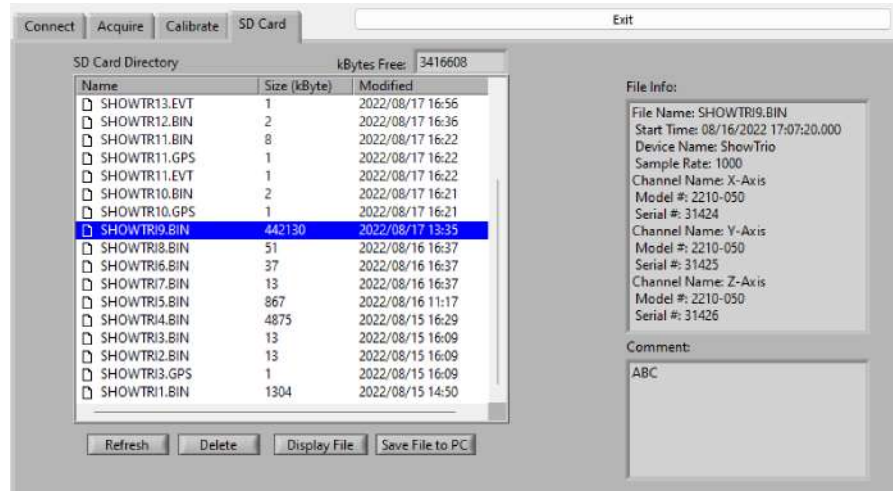
Selecting a file and then clicking DELETE will remove it from the SD card. Card size is limited to a maximum of 32 GB, and individual file size is limited to 4 GB. Removing files you no longer need allows the G-Logger to increase the maximum duration of future acquisitions. You can also delete files by removing the SD card from the G-Logger, inserting it directly into the SD memory card slot on your PC, and accessing the files through Windows Explorer.

To graphically view a file's data, select it and then click DISPLAY FILE. The Data tab will show the historical data displayed as if it were real-time. You can fast-forward, rewind, and pause the data as well as click on Spectrum or Meters tab.

If you wish to operate the 33x0 such that you directly acquire real-time data without writing the 33x0's SD card, you can invoke Direct Streaming Mode by removing the SD card. The device will report that it does not have an SD card, and will require that the total data rate is no greater than 42 Kbytes/sec (one channel at 10Khz, or three channels at 7Khz is permissible.) To exit Direct Streaming Mode, put the SD card into the SD card slot on the 33x0 device.