



## Data Logger

# Moku:Go User Manual

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The Moku:Go Data Logger instrument records time series voltages from one or two channels at rates from 10 samples per second up to 1 MSa/s. Log data to the onboard storage or stream directly to the computer using the Moku API.

The Moku:Go Data Logger also includes a two-channel embedded waveform generator.





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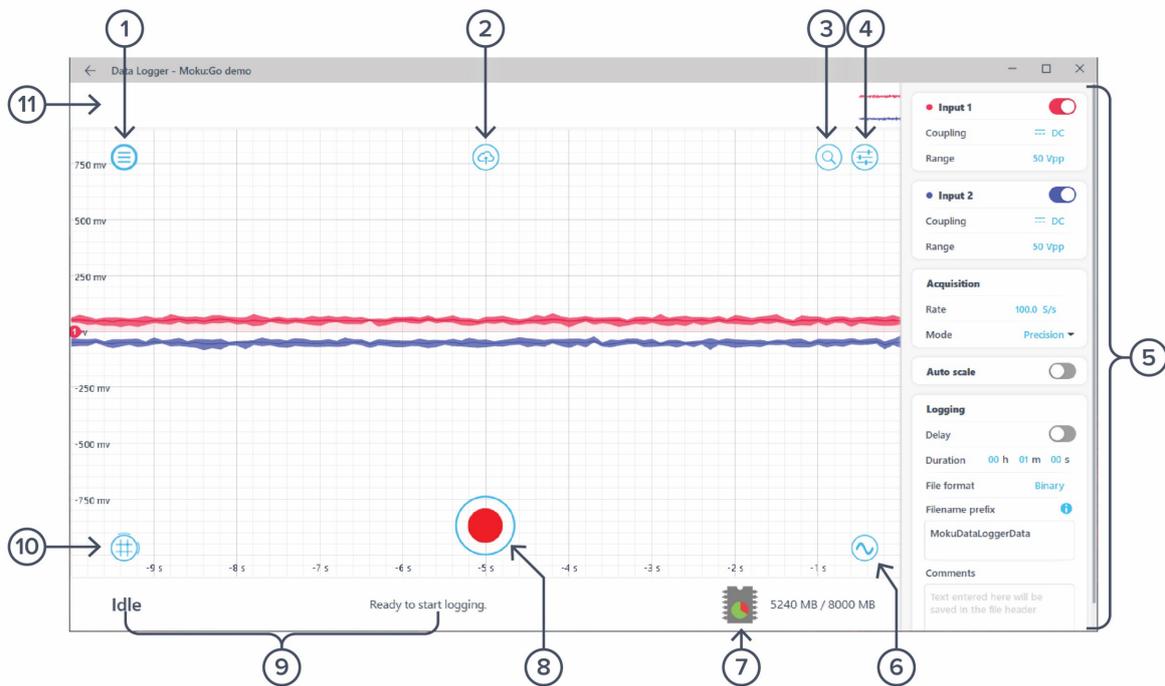


Ensure Moku:Go is fully updated. For the latest information, visit:

[liquidinstruments.com](https://liquidinstruments.com)



# User interface

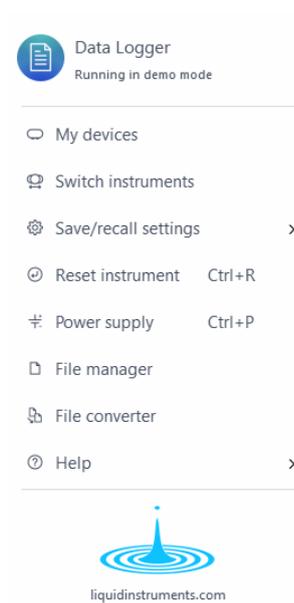


ID	Description	ID	Description
1	Main menu	7	Storage indicator
2	Save data	8	Start logging
3	Screen navigation	9	Status indicator
4	Settings	10	Cursors
5	Settings pane	11	Zoom-out preview
6	Waveform generator		



# Main menu

The **main menu** can be accessed by pressing the  icon on the top-left corner.



This menu provides the following options:

Options	Shortcuts	Description
<b>My devices</b>		Return to device selection.
<b>Switch instruments</b>		Switch to another instrument.
<b>Save/recall settings:</b>		
• <b>Save instrument state</b>	Ctrl/Cmd+S	Save the current instrument settings.
• <b>Load instrument state</b>	Ctrl/Cmd+O	Load the last saved instrument settings.
• <b>Show current state</b>		Show the current instrument settings.
<b>Reset instrument</b>	Ctrl/Cmd+R	Reset the instrument to its default state.
<b>Power supply</b>		Access the Power Supply control window.*
<b>File manager</b>		Open the File Manager tool.**
<b>File converter</b>		Open the File Converter tool.**
<b>Help</b>		
• <b>Liquid Instruments website</b>		Access the Liquid Instruments website.
• <b>Shortcuts list</b>	Ctrl/Cmd+H	Show the Moku:Go app shortcuts list.
• <b>Manual</b>	F1	Access the instrument manual.
• <b>Report an issue</b>		Report a bug to Liquid Instruments.
• <b>About</b>		Show app version, check update, or license information.

\*Power Supply is available on the Moku:Go M1 and M2 models. Detailed information about the Power Supply can be found on page 15 of this user manual.

\*\*Detailed information about the file manager and file converter can be found on page 13 of this user manual.



# Signal display navigation

## Signal display position

The displayed signal can be moved around the screen by clicking anywhere on the signal display window and dragging to a new position. The cursor will turn into a  icon once clicked. Drag horizontally to shift along the time axis and drag vertically to shift along the voltage axis.

You can move the signal display horizontally and vertically with the arrow keys.

## Display scale and zoom

Zoom in and out on the display using the scroll wheel or gesture on your mouse or trackpad. Scrolling will zoom the primary axis, while holding Ctrl/Cmd while scrolling will zoom the secondary axis. You can choose which axis is primary and secondary by clicking  the icon.

### Icons Description



Set the primary axis to horizontal (time).



Set the primary axis to vertical (voltage).



Rubber band zoom: click and drag left-to-right to zoom in to the selected region. Click and drag right-to-left to zoom out.

Additional keyboard combinations are also available.

Actions	Description
<b>Ctrl/Cmd + Scroll Wheel</b>	Zoom the secondary axis.
<b>+/-</b>	Zoom the primary axis with the keyboard.
<b>Ctrl/Cmd +/-</b>	Zoom the secondary axis with the keyboard.
<b>Shift + Scroll Wheel</b>	Zoom the primary axis toward the center.
<b>Ctrl/Cmd + Shift + Scroll Wheel</b>	Zoom the secondary axis toward the center.
<b>R</b>	Rubber band zoom.

## Auto scale

Double-click anywhere on the signal display to auto scale the trace's vertical (voltage) axis.

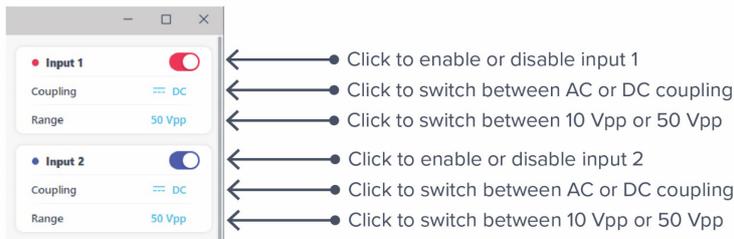


# Settings



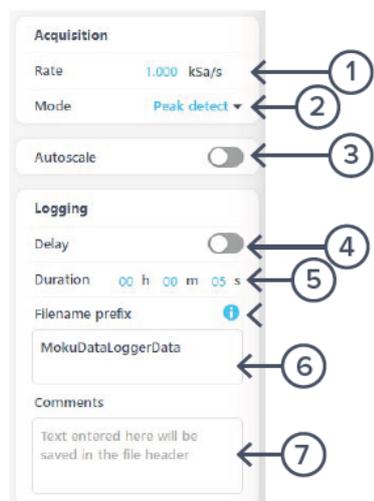
The **controls** options can be accessed by clicking the  icon, allowing you to reveal or hide the control drawer, giving you access to all instrument settings. The controls drawer gives you access to analog front-end settings and data acquisition settings.

## Analog front-end settings





## Data acquisition settings



ID	Function	Description
1	Acquisition rate	Click to configure acquisition rate.
2	Mode	Set acquisition mode as normal or precision.
3	Auto scale	Toggle continuous autoscaling on/off.
4	Delay	Click to enable or disable delayed start.
5	Duration	Click to set log duration, limited to available memory.
6	Filename prefix	Configure the prefix to be used on the data log filenames.
7	Comments	Text entered here will be saved in the file header.



# Waveform Generator

The Moku:Go Data Logger has a built-in Waveform Generator capable of generating basic waveforms on the two output channels. Find detailed instructions for the Waveform Generator instrument in the Moku:Go Waveform Generator manual.

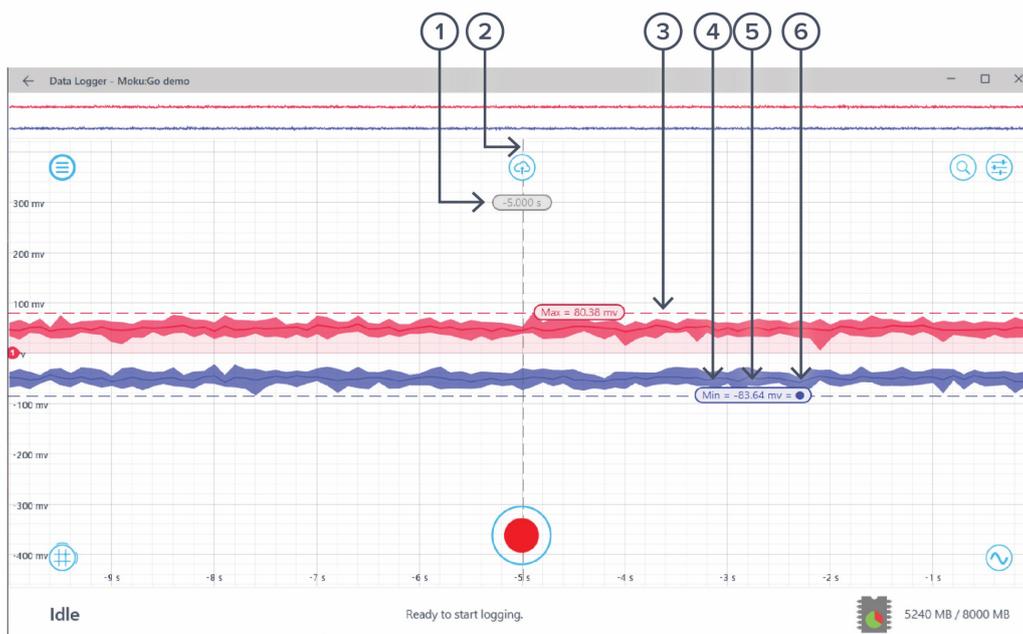
The screenshot displays the Moku:Go Waveform Generator interface. At the top, a graph shows a sine wave and a ramp waveform. The sine wave is configured with a frequency of 10.000 000 000 MHz and an amplitude of 1.0000 Vpp. The ramp waveform is configured with a frequency of 50.000 000 000 kHz and a peak-to-peak amplitude of 5000.0 mVpp. The interface includes a status bar showing "Idle" and "Ready to start logging." with a memory usage indicator of 5240 MB / 8000 MB. The right sidebar contains settings for Coupling (DC), Range (50 Vpp), Acquisition (Rate: 100.0 S/s, Mode: Precision), Auto scale (off), and Logging (Delay: off, Duration: 10.000 h 00 m 00 s, File format: CSV, Filename prefix: MokuDataLoggerData). A large green button at the bottom is labeled "Frequency" and shows the value "10.000 000 000 000 MHz".



# Cursor

The  **cursors**  can be accessed by clicking the  icon, allowing you to add a voltage cursor or time cursor, or remove all cursors. In addition, you can click and drag horizontally to add a time cursor, or vertically to add a voltage cursor.

## User interface

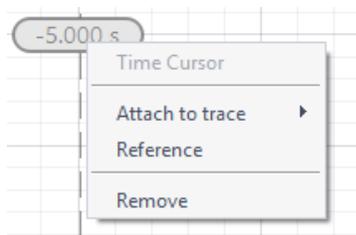


ID	Parameter	Description
1	Time reading	Right-click (secondary click) to reveal the time cursor options. Drag left or right to set positions.
2	Time cursor	The color represents the channel of the measurement (Gray – Unattached, Red – Channel 1, Blue – Channel 2).
3	Voltage cursor	Drag up or down to set positions.
4	Cursor function	Indicates the current cursor function (max, min, max hold, etc.).
5	Voltage reading	Right-click (secondary click) to reveal the voltage cursor options.
6	Reference indicator	Indicates the cursor is set as reference. All other cursors in the same domain and channel measure the offset to the reference cursor.



## Time cursor

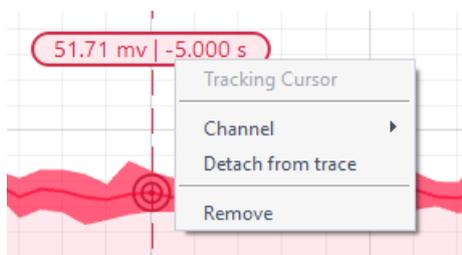
Right-click (secondary click) to reveal time cursor options:



Options	Description
<b>Time cursor</b>	Cursor type.
<b>Attach to trace</b>	Choose to attach the time cursor to input 1, input 2. Once the cursor is attached to a channel, it becomes a tracking cursor. The tracking cursor gives continuous voltage readings at the set time position.
<b>Reference</b>	Set the cursor as the reference cursor.
<b>Remove</b>	Remove the time cursor.

## Tracking cursor

Right-click (secondary click) to reveal tracking cursor options:

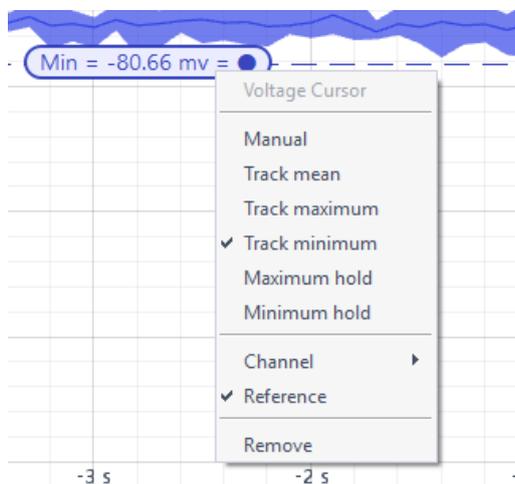


Options	Description
<b>Tracking cursor</b>	Cursor type.
<b>Channel</b>	Assign the tracking cursor to a specific channel.
<b>Detach from trace</b>	Detach the tracking cursor from a channel trace.
<b>Remove</b>	Remove the cursor.



## Voltage cursor

Right-click (secondary click) to reveal voltage cursor options:



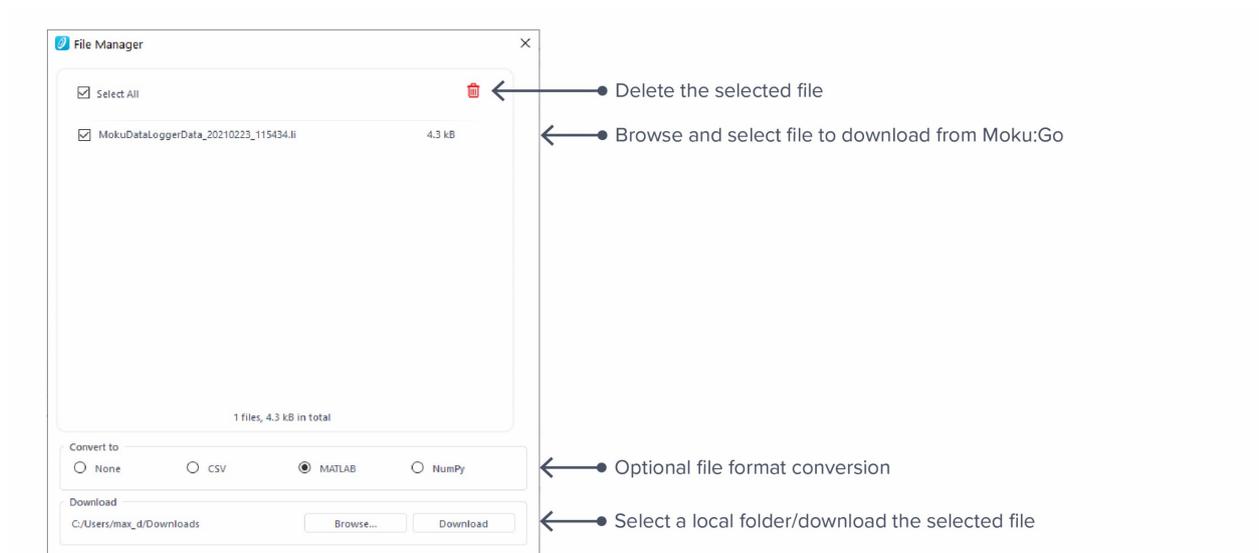
Options	Description
<b>Voltage cursor</b>	Cursor type.
<b>Manual</b>	Manually set the vertical position of the cursor.
<b>Track mean</b>	Track the mean voltage.
<b>Track maximum</b>	Track the maximum voltage.
<b>Track minimum</b>	Track the minimum voltage.
<b>Maximum hold</b>	Set the cursor to hold at the maximum voltage level.
<b>Minimum hold</b>	Set the cursor to hold at minimum voltage level.
<b>Channel</b>	Assign the voltage cursor to a specific channel.
<b>Reference</b>	Set the cursor as the reference cursor.
<b>Remove</b>	Remove the cursor.



## Additional tools

The Moku:Go app has two built-in file management tools: File Manager and File Converter. The File Manager allows you to download the saved data from Moku:Go to the local computer, with optional file format conversion. The File Converter converts the Moku:Go binary (.li) format on the local computer to either CSV, MAT, or NPY format.

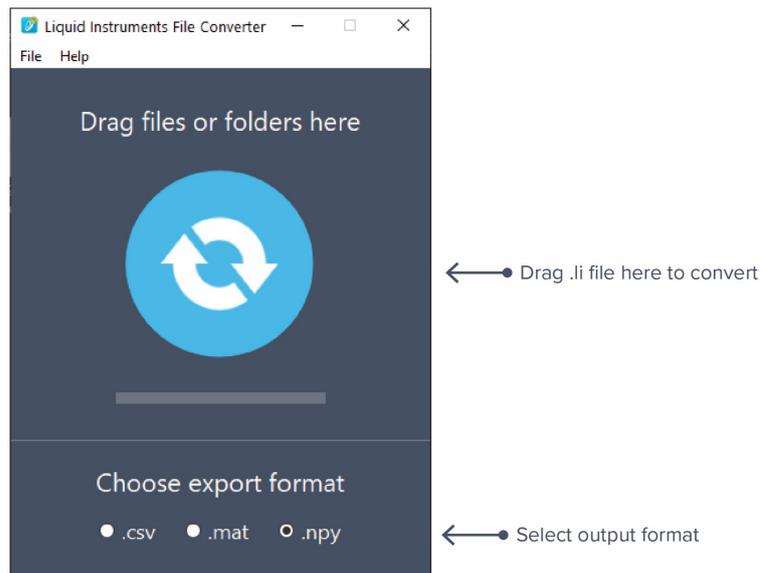
### File Manager



Once a file is transferred to the local computer, a  icon shows up next to the file.



## File Converter



The converted file is saved in the same folder as the original file.

The File Converter has the following menu options:

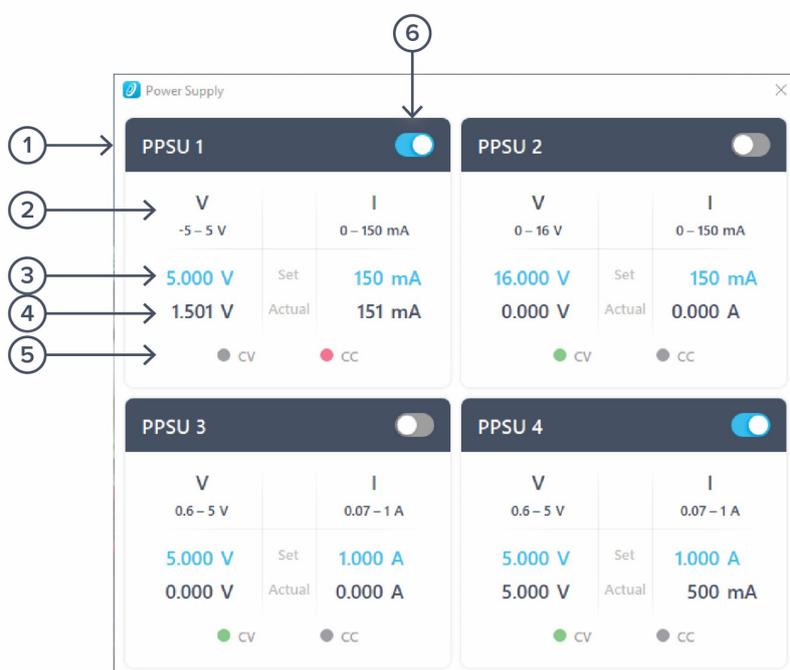
Options	Shortcut	Description
<b>File</b>		
• <b>Open file</b>	Ctrl/Cmd+O	Select a .li file to convert.
• <b>Open folder</b>	Ctrl/Cmd+Shift+O	Select a folder to convert.
• <b>Exit</b>		Close the file converter window.
<b>Help</b>		
• <b>Liquid Instruments website</b>		Access the Liquid Instruments website.
• <b>Report an issue</b>		Report a bug to Liquid Instruments.
• <b>About</b>		Show app version or license information.



# Power Supply

The Moku:Go Power Supply is available on M1 and M2 models. M1 features a two-channel Power Supply, while M2 features a four-channel Power Supply. Access the Power Supply control window in all instruments under the main menu.

Each Power Supply operates in two modes: **constant voltage (CV)** or **constant current (CC)** mode. For each channel, you can set a current and voltage limit for the output. Once a load is connected, the Power Supply operates either at the set current or set voltage, whichever comes first. If the Power Supply is voltage limited, it operates in the CV mode. If the Power Supply is current limited, it operates in the CC mode.



ID	Function	Description
1	Channel name	Identifies the Power Supply being controlled.
2	Channel range	Indicates the voltage/current range of the channel.
3	Set value	Click the blue numbers to set the voltage and current limit.
4	Readback numbers	Voltage and current readback from the Power Supply; the actual voltage and current being supplied to the external load.
5	Mode indicator	Indicates if the Power Supply is in CV (green) or CC (red) mode.
6	On/Off toggle	Click to turn the Power Supply on and off.



# Instrument reference

## Recording a Session

Recording data is done as follows:

1. Configure the channel(s) you wish to record using the acquisition sidebar. Ensure the voltage range, coupling, and impedance are all appropriate for your signals. Use the plotter window to ensure your signal is correctly connected and configured.
2. Configure the acquisition rate and acquisition mode, either normal or precision.
3. Set the recording duration and any comments you want to be saved with the file.
4. Optionally configure the waveform generator outputs.
5. Tap “record”.

### Configuring inputs

Moku:Go includes a switchable AC/DC coupling circuit on each input. This is activated from the channels tab.

For most applications, DC-coupled is the preferred option; this does not filter or modify the signal in any way.

AC-coupled acts as a high pass filter, removing the DC component of the incoming signal (and attenuating other frequency components below the coupling corner). This is useful when you are looking for a small signal on top of a large DC offset. AC coupling is more precise than simply scrolling the trace up the screen, as it may avoid activating the internal attenuator.

### Acquisition modes and sampling

The Data Logger processes data in two stages. First, data is acquired from the analog-to-digital converters (ADCs), down-sampled, and stored in memory. From there, the data is aligned relative to the trigger point and displayed on the screen.

Both operations require down- or up-sampling of the data (reducing or increasing the total number of data points). The method for doing this can provide increased precision and different aliasing behavior.

The acquisition mode refers to the process of capturing the data and storing it in the device’s internal memory. This may require down-sampling, depending on the configured timebase. The down-sampling algorithm can be selected, and is either Normal, Precision, or Peak Detect.

**Normal Mode:** Extra data is simply removed from the memory (direct down-sampled).

This can cause the signal to alias and does not increase the precision of the measurement. However, it does provide a viewable signal at all timespans and all input frequencies.

**Precision Mode:** Extra data is averaged to the memory (decimation).



This increases precision and prevents aliasing. However, if you have an unsuitable time span selected for the signal, then all points can average to zero (or close to it), making it appear like no signal is present.

**Peak Detect mode:** This mode is similar to Precision Mode, except instead of averaging samples from the high-speed ADC, the peak, or highest and lowest samples, are displayed.

### File types

The Moku:Go Data Logger can save natively to standard text-based CSV format files. CSV files contain a header that records the current instrument settings as well as any user-entered comments.

The binary file format is proprietary to Moku:Go and has been extensively optimized for speed and size. Using the binary format, Moku:Go is able to reach very high logging rates and very low memory usage.

The binary file can be converted to other formats by the file converter. This software can convert the binary file to CSV, MATLAB, or NPY formats for access in major scientific software.

### Starting the Log

The red record button should be tapped to start.

The status indicator at the top of the control panel will display logging progress.

The log will stop either when the specified duration has been reached, or when the user taps the record button again to abort.

### Data streaming

When configured through the Moku API, the Data Logger can stream over a network, instead of saving directly to the device. More streaming information is in our API documents at [apis.liquidinstruments.com](https://apis.liquidinstruments.com).



Ensure Moku:Go is fully updated. For the latest information, visit:

[liquidinstruments.com](https://liquidinstruments.com)