Data Logger
Moku:Go User Manual

Moku:Go's Data Logger instrument records time series voltages from 1 or 2 channels at rates from 1 sample per second up to 1 MSa/s. The data can be logged to RAM in a variety of formats.

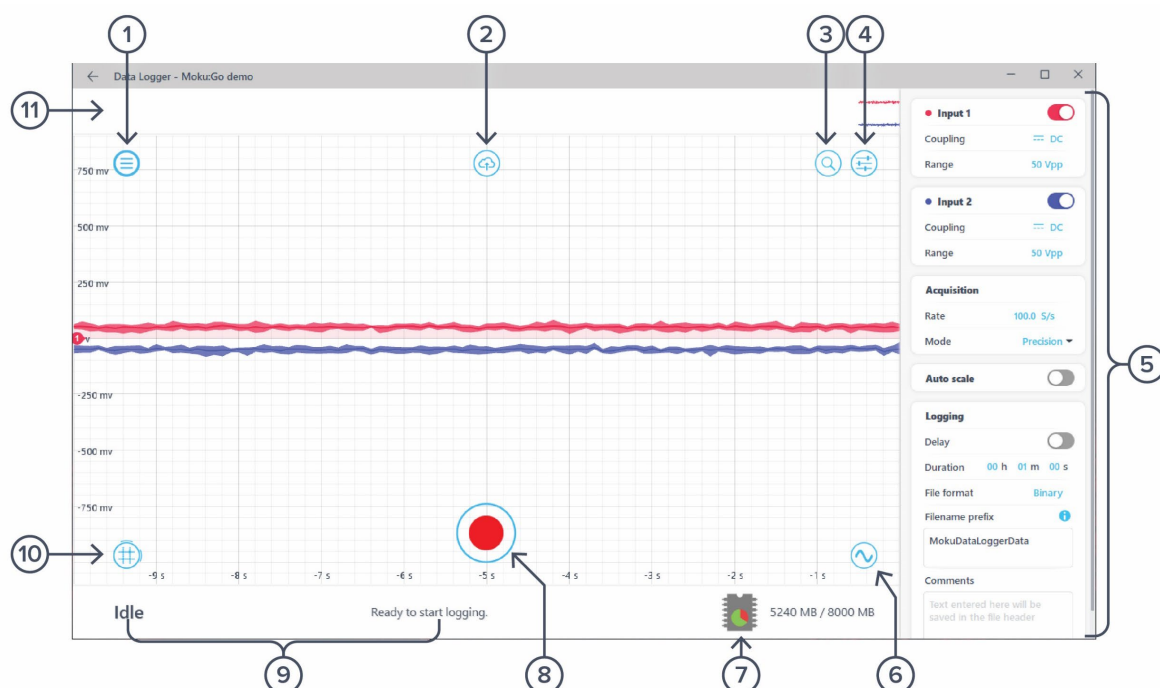Moku:Go's Data Logger also includes an embedded waveform generator.

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

www.liquidinstruments.com

User Interface

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Main Menu

The **main menu** can be accessed by pressing the ⊜ icon on the top-left corner.
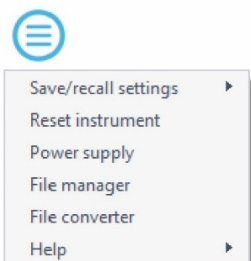
This menu provides the following options:

Options	Shortcuts	Description
Save/recall settings:		
• **Save instrument state**	Ctrl+S	Save the current instrument settings.
• **Load instrument state**	Ctrl+O	Load last saved instrument settings.
• **Show current sate**		Show the current instrument settings.
Reset instrument	Ctrl+R	Reset the instrument to its default state.
Power supply		Access power supply control window.*
File manager		Open file manager tool.**
File converter		Open file converter tool.**
Help		
• **Liquid Instruments website**		Access Liquid Instruments website.
• **Shortcuts list**	Ctrl+H	Show Moku:Go app shortcuts list.
• **Manual**	F1	Access instrument manual.
• **Report an issue**		Report bug to Liquid Instruments.
• **About**		Show app version, check update, or license information.

* Power supply is available on Moku:Go M1 and M2 models. Detailed information about power supply can be found in Moku:Go power supply manual.

**Detailed information about the file manager and file converter can be found toward the end of this user manual.

File manager

The file manager can be access by clicking the ⬆ icon, allowing saving and sharing of the captured data logs. Detailed information about the file manager and file converter can be found toward the end of this user manual.

Signal Display Navigation

Mouse actions

Navigation can made by holding and draging action with mouse. This can be accomplished by holding the primary mouse button. Once the mouse curser turns to a ✋ icon, movement can be made along the horizonal or vertical axes. Horizonal or vertical movement can also be made with arrow keys.

The screen navigation options can be accessed when the mouse cursor hovers the 🔍 icon.

Icons	Description
🔍	Assign the horizonal axis as the primary axis.
🔍	Assign the vertical axis as the primary axis.
🔍	Rubber band zoom: hold the primary mouse button to draw a region to zoom-in, release the button to execute.

Scrolling the mouse wheel zooms in and out along the primary axis.

Additional combinations

Additional navigation actions are available with keyboard, or combinations of keyboard/mouse actions.

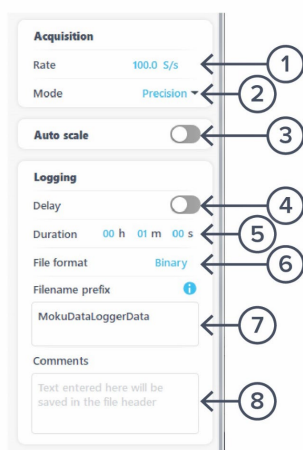| Actions	Description
Ctrl+Scroll Wheel	Zoom secondary axis.
+/-	Zoom primary axis with keyboard.
Ctrl +/-	Zoom secondary axis with keyboard.
Shift+Scroll Wheel	Zoom primary axis towards the center.
Ctrl+Shift+Scroll Wheel	Zoom secondary axis towards the center.
R	Rubber band zoom.

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
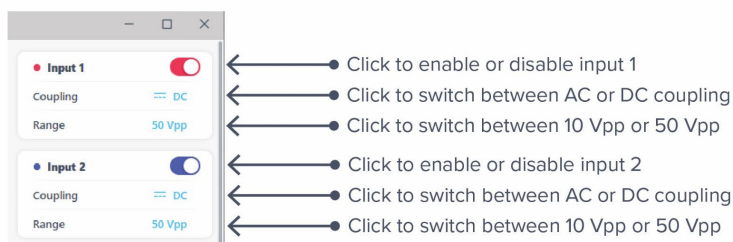
Data acquisition settings

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	File format	Click to select log format, CSV or LI binary format.
7	Filename prefix	Configure the prefix to be used on the data log filenames.
8	Comments	Text entered here will be saved in the file header.

Acquisition Parameters

The acquisition parameters refer to the logging rate and the down-sampling mode used to reduce Moku:Go's native sampling rate to the logging rate.

The logging rate must be between 10 Sa/s and 1 MSa/s. The actual maximum is only achievable with a single channel, binary file format saved to RAM; other combinations will have lower maximum rates.

Acquisition mode may be either normal or precision. Normal mode down-samples by discarding points between those needed. This causes signals to alias; not desirable for most signals but can be useful for viewing frequency components outside the logging rate.

Precision mode down-samples by averaging, increasing precision and reducing noise. This mode is preferred for most applications.

File Types

Moku:Go's 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. The binary format may also be used in Python through the Liquid Instruments Pymoku software library.

Waveform generator

Moku:Go's Data Logger has a built-in waveform generator capable of generating basic waveforms on the two output channels. Detailed instructions for the waveform generator instrument can be found in Moku:Go waveform generator manual.
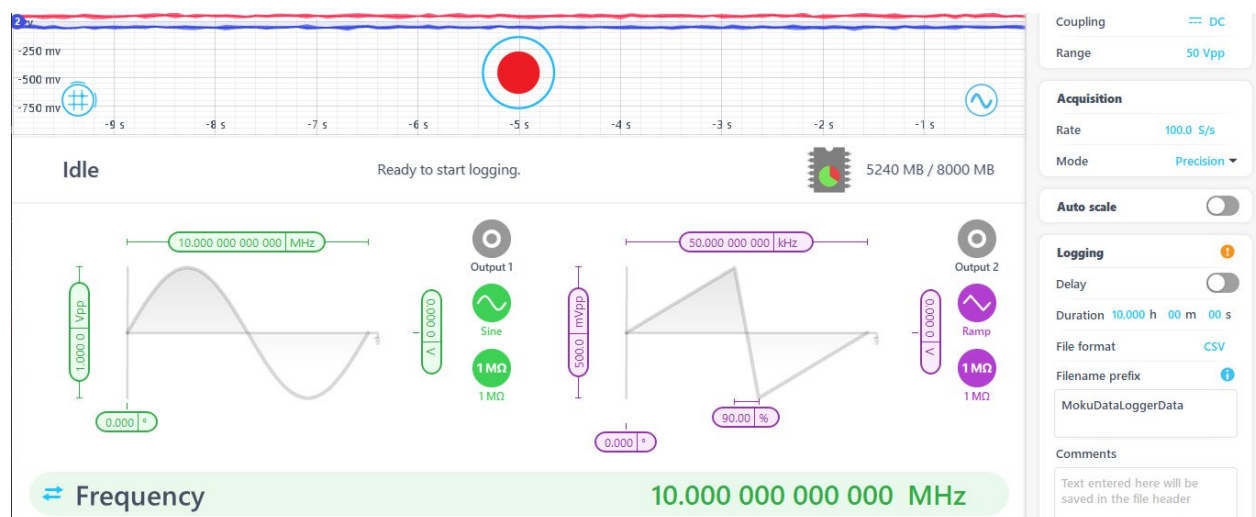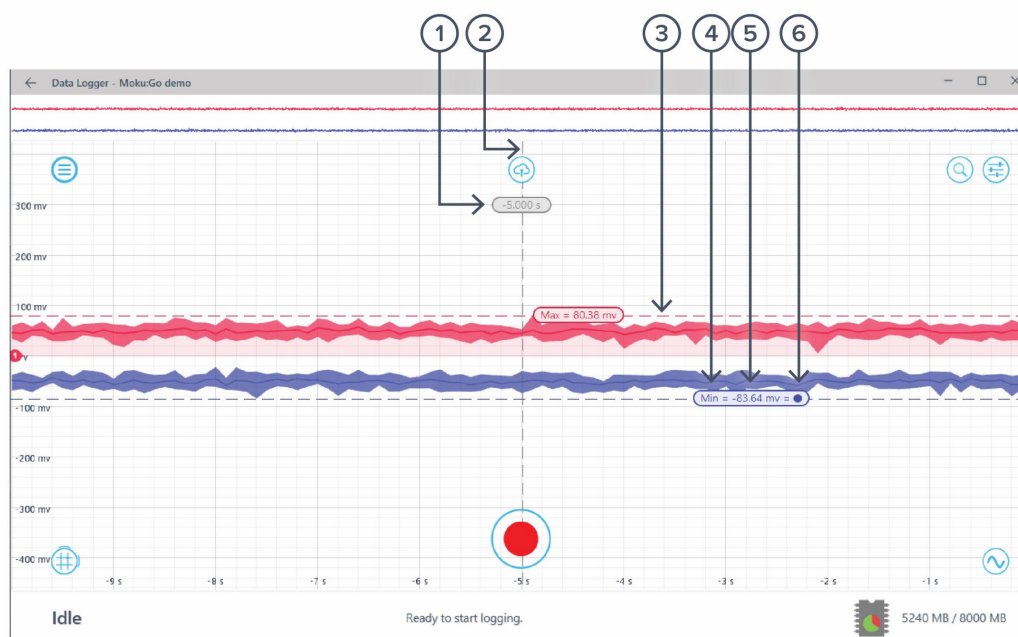
Cursor

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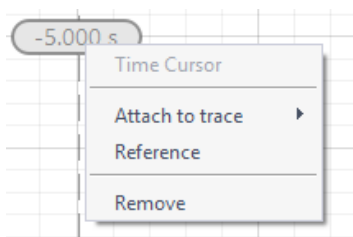
User Interface

| ID	Parameter	Description
1	Time cursor reading	Right-click (secondary click) to reveal time cursor options. Drag left or right to set positions.
2	Time cursor	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 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
Time Cursor	Cursor type.
Attach to trace	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.
Reference	Set the cursor as the reference cursor.
Remove	Remove the time cursor

Tracking Cursor

Right-click (secondary click) to reveal tracking cursor options:
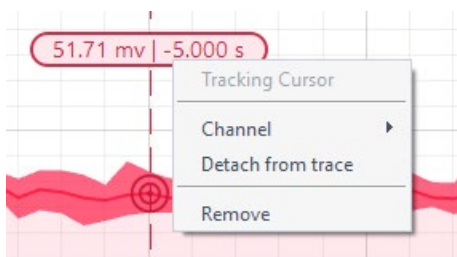
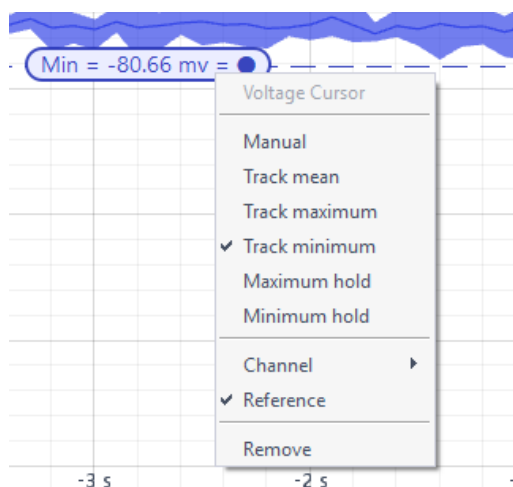| Options	Description
Tracking Cursor	Cursor type.
Channel	Assign the tracking cursor to a specific channel.
Detach from trace	Detach the tracking cursor from a channel trace
Remove	Remove the cursor

Voltage Cursor

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

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

Additional Tools

Moku:Go app has two built-in file management tools: file manager and file converter. The file manager allows user to download the saved data from Moku:Go to the local computer, with optional file format conversion. The file converter converts the Moku:Go's binary (.li) format on the local computer to either .csv, .mat, or .npy format.
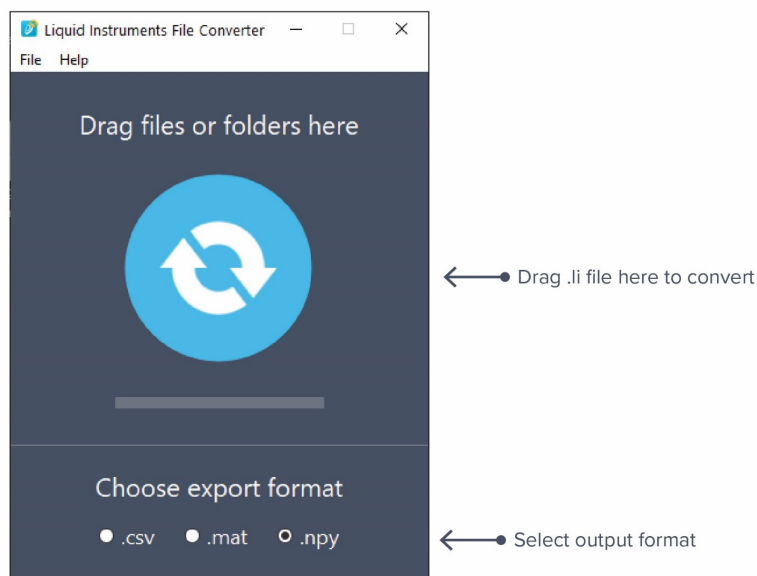
File Manager
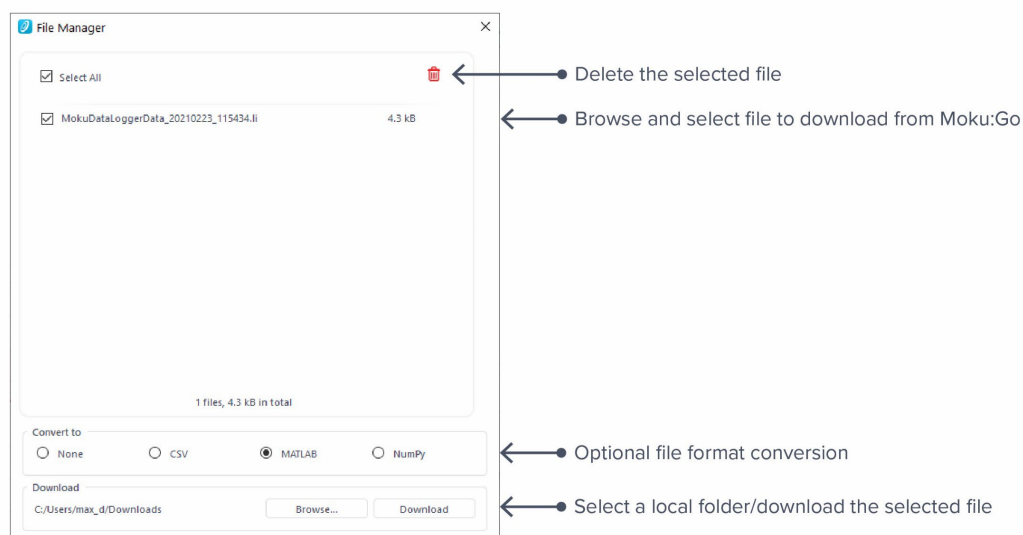
Once a file is transferred to the local computer, a 📁 icon shows up next to the file.

File Converter

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

Liquid Instruments File Converter has the following menu options:

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

Power Supply

Moku:Go Power supply is available on M1 and M2 models. M1 features a 2-channel power supply, while M2 features a 4-channel power supply. The power supply control window can be accessed in all instruments under the main menu.

The power supply operates in two modes: **constant voltage (CV)** or **constant current (CC)** mode. For each channel, the user 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.
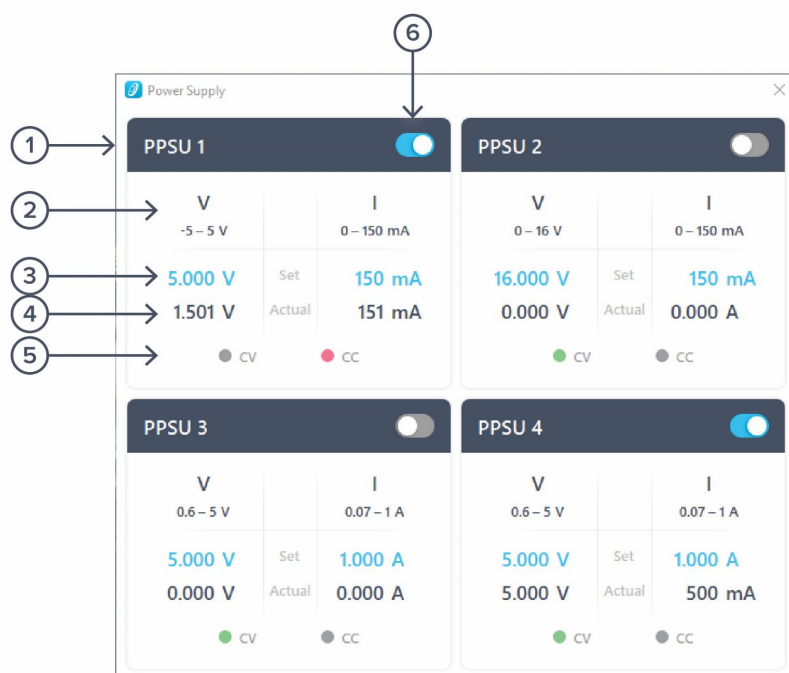
ID	Function	Description
1	Channel name	Identifies the power supply being controlled.
2	Channel range	Indicates the voltage/current range of the channel.
3	Set value	Click the blue numbers to set the voltage and current limit.
4	Readback numbers	Voltage and current readback from the power supply, the 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.

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