DAQview Operating Manual

The DAQview software displays charts and readouts of live data streamed from the control software. It can display any configured channel, or compute new channels as mathematical functions of the hardware channels.

Live data is sent from the DAQ control software to each running DAQview instance; DAQview does not connect to the DAQ hardware directly nor does it save received data to disk.

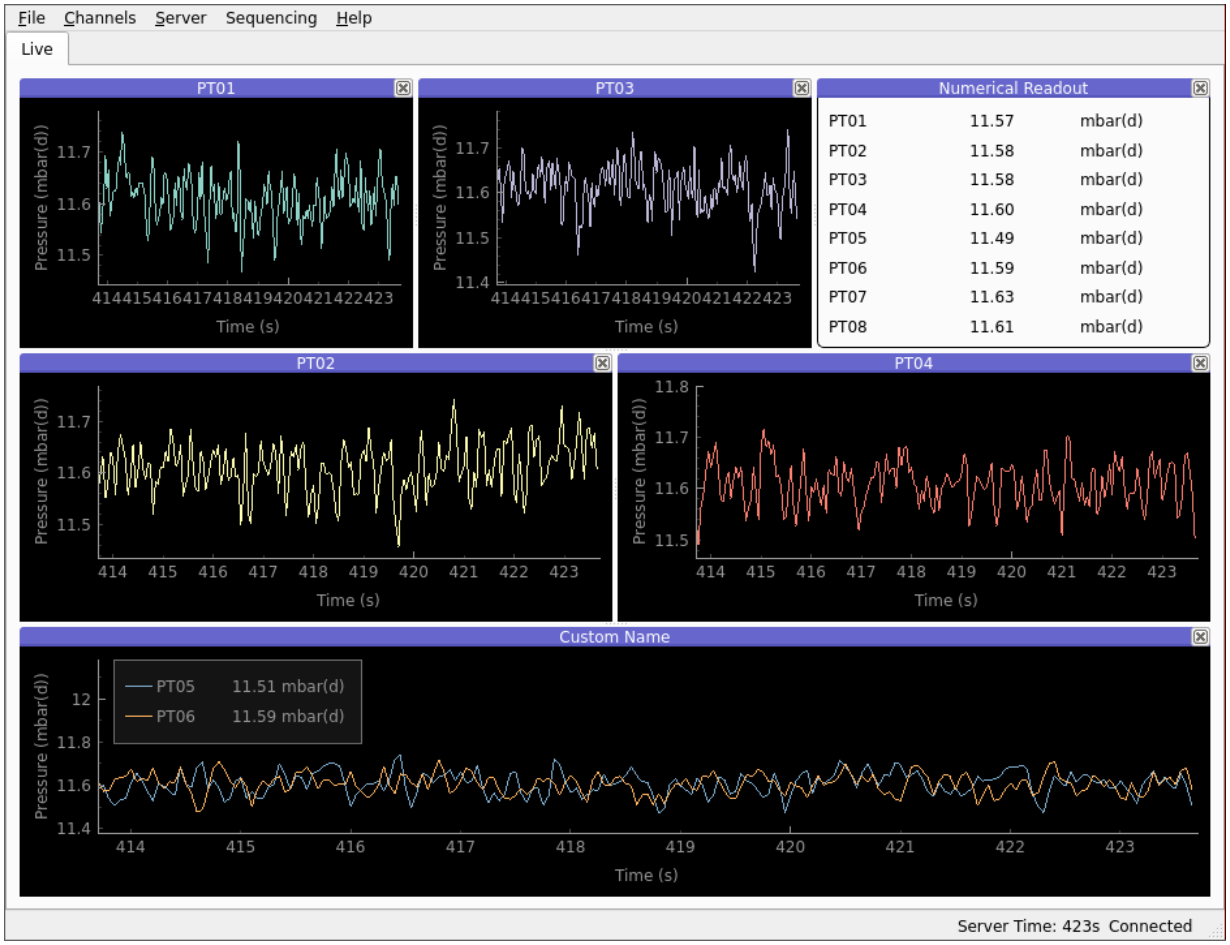

Figure 1: Screenshot of typical DAQview session

1 Features

- Connecting to, and streaming live data from, the DAQ control software
- Viewing historic datasets from previous test runs
- Exporting currently received live data to a file
- Viewing data as rolling charts or live numerical readouts
- Manual, mouse, or automatic scaling of x- and y-axes
- Flexible arrangement of charts and readouts on screen
- Measuring values from charts at specific points or over configurable regions
- Basic measurement functions over selected regions of data
- Basic Fourier analysis of selected regions of data
- Displaying multiple channels per chart, including with different units on multiple y-axes
- Exporting screenshots of the entire screen or specific charts
- Saving and restoring window layouts to files for quick reloading

2 Setup

Launch the DAQview software by double-clicking the DAQview icon on the control laptop's desktop.

The software starts in a disconnected state suitable for viewing historic datasets. To connect to the control software, ensure the `Live` tab is selected and use the `Server` menu at the top of the screen to select `Connect`. For most AEL DAQ systems, the server to connect to is the default value of `localhost:1736`.

Alternatively to view a historic dataset, use the `File` menu and select `Open Local Dataset...`, then use the file dialogue to select the required dataset. The dataset then opens in a new tab. The `Live` tab remains open for viewing live data from the server.

3 Adding Channel Charts

To add a new chart to the display, use the `Channels` menu at the top of the screen and select `Add Channel Chart`. A list of all channel groups will be displayed; select the desired channel or select `Add Entire Group` to add charts for all channels in the group. Some channels may not have been added to any groups and these are available in `Ungrouped` at the bottom of the groups list.

4 Adding Channel Readouts

To add a new readout to the display, use the `Channels` menu at the top of the screen and select `Add Channel Readout`. Channel selection is then as per Adding Channel Charts.

5 Adding Channels to Chart

To add a new channel to an existing chart, right-click the chart, and select the `Channels` menu, then `Add New Channel`. The channel group lists appears and you can select which group or channel to add. If the channel being added has different units to the channels already present, a new y-axis will be created for those units.

6 Chart Legends

When more than one channel is present in a chart, the legend will be automatically displayed. It shows the colour and name of each channel in the chart. To manually show or hide the legend, right-click the chart area and select the `Legend` option.

Additionally, when viewing live data, you may select the `Show Readout In Legend` option to show the current value of each channel in the legend.

7 Arranging Windows

Each chart or readout is displayed in a window, and windows may be rearranged on the screen to achieve a desired layout. Click and drag on the window's title bar to rearrange the window.

- Create tabbed windows: drop one window onto the central area of another
- Place a window alongside another: drop one window onto the left or right edge of the other
- Place a window above or below another: drop one window onto the top or bottom edge of the other
- Pop out a window: double click the title bar

Windows may additionally be renamed by right-clicking and selecting `Rename`. The default name is chosen depending on the initial window contents, so after adding or removing channels to the window it may be appropriate to rename it.

8 Saving and Restoring Layouts

Once a desired window layout has been created, it can be saved to a file for reuse. Open the `File` menu and select `Save Current Layout...`, then choose a layout filename and save it. Layout files are associated with a specific live server or historic dataset and will always re-open the same server or dataset.

The file contains all displayed windows, their positions and sizes, the channels being displayed in them, and channel and axis configurations. The layout files are a text-based format, so while it is not recommended, it is possible to manually edit a layout file to make small adjustments.

To open a layout file and its corresponding dataset, open the `File` menu and select `Open Layout With Dataset...`. To apply a saved layout to the currently open dataset, select `Apply Layout To Current Dataset...`.

9 Channel Configuration

For a channel on a chart, you may:

- Show/hide the channel
- Hide all *other* channels
- Highlight the channel (draws the channel in a thicker line)
- Split the channel onto a separate y-axis
- Remove the channel from the chart

For a channel on a readout, you may:

- Add a highlight to the channel
- Remove the channel from the readout list

To access the channel configuration menu, right-click on the chart or readout, and select `Channels`, then select the channel to configure.

10 Axes Configuration

The x-axis of a chart may be configured to:

- Show the last n seconds of data, for live data only
- Show all available data (`All time`)
- Show the same time-range as another open window, updating live (`Link`)
- Show a manual time range, optionally adjustable using the mouse
- Show a grid

The y-axis of a chart may be configured to:

- Autorange to the currently visible data
- Autorange to all available data
- Show a manual range, optionally adjustable using the mouse
- Show a grid

To configure an axis, right-click on the chart and select `X Axis` or `Y Axis`, as shown in the screenshots below. If there are multiple y-axis on the chart, you can configure the secondary axes by right-clicking on that axis itself.

In manual range with mouse control enabled, the mouse may be used as follows:

- Left-click and drag to pan one or both axis
- Scroll the mouse wheel to zoom in all selected axes
- Right-click and drag left/right to zoom the x-axis
- Right-click and drag up/down to zoom the y-axis

For charts with multiple y-axes, you must click and drag directly on the secondary axis you wish you scale; clicking on the main chart area will only zoom the primary y-axis.

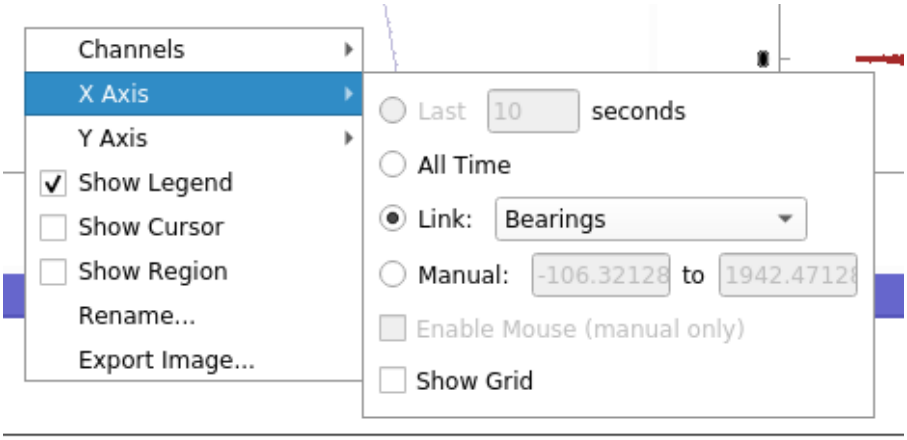

Figure 2: Screenshot of DAQview chart X-axis menu

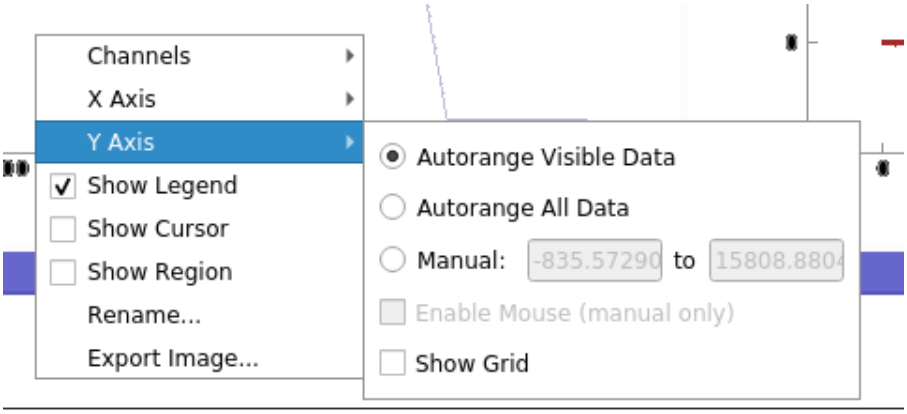

Figure 3: Screenshot of DAQview chart Y-axis menu

11 Chart Measurements

Two facilities are provided for taking measurements of chart data: cursors and measurement regions. To enable either, right-click on the chart and select `Cursor` and `Analysis Region` respectively.

The measurement cursor draws a yellow line on the measurement point, and displays the value of all channels on the chart at that point. Click and drag on the line to move the measurement point. Click and drag on the readout label to move it up or down.

If you wish to see the *current* value of live streaming data, instead of using a measurement cursor, consider enabling the legend (right-click and select `Show Legend`), then enable `Show Readout in Legend`, which will display the current value for each channel alongside their name in the legend.

The measurement region draws a box over a region of the chart. Click and drag on the body of the box to move the region, or click and drag its borders to adjust the width. The measurement readout box initially displays:

- the value of the timebase and all channels at both borders of the region (◀ and ▶)
- the change over that region ($\triangle$)
- the rate of change ($\triangle/\triangle t$)
- the average (mean) value of all data points in the region (`μ`)

Left-click and drag the measurement readout box to move it on the chart.

Right-click on the measurement readout box to configure what is measured. The `Measurements` sub-menu allows you to select a number of other numerical measurements such as min/max, variance, and period, while the `Channels` menu allows you to configure curve-fitting and FFT analysis on a per-channel basis.

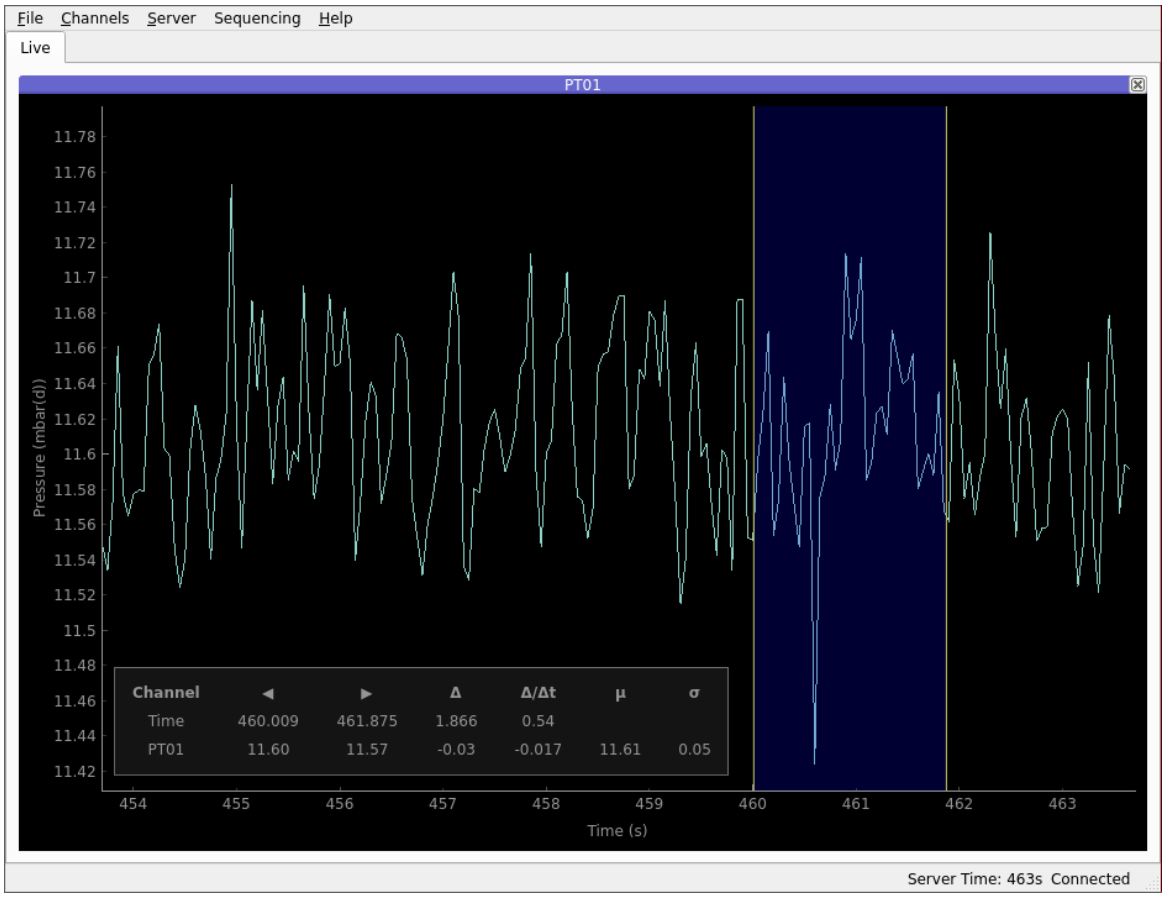

Figure 4: Screenshot of DAQview chart measurement region tool

12 Exporting Screenshots

To save a screenshot of the entire screen, open the `File` menu and select `Export Image...`. Select the file location in the file dialogue and enter a filename and press `Save`.

To export just a specific chart, right-click on that chart and then select `Export Image...`. Again select the file location, enter a filename, and press `Save`.

Ensure the image filename has an extension specified, such as `.png` or `.jpg`!

13 Server Menu

When viewing live data some additional features are available from the `Server` menu.

Clicking `Zero Timestamps` applies an offset to all displayed times such that the current moment becomes time 0. Previously received data will be displayed with negative times. This feature is useful when the DAQ system has been running for a long time without its internal timebase being reset, as the timestamps then become very large and hard to read. It can also be useful to zero timestamps to time a test, by zeroing at the start of a test.

The `Clear Live Data` option deletes all data received since connecting to the server, without changing the configured channels or layout. When a lot of channels are displayed and have been receiving data for a long time, operations on the data can become very slow, which leads to a slower screen update rate and makes the software less responsive. Clearing old live data when it is no longer required helps reduce this slow-down. Data never automatically cleared to prevent unexpected data loss.

The `Save Live Data` option saves all received live data to a file on disk. This is a backup option not intended for general use. In normal operation, the main control software is responsible for writing raw data to disk and later writing out processed datasets, which contain all the channels in the DAQ system. However if the operator has not clicked `Start Logging` on the main DAQ control software, it will not save data to disk. In that situation it can be very useful to be able to save the data received on a DAQview instance. The exported data is in the same HDF5 file format as the main DAQ control software. Note that only the data received by DAQview is saved, which is in general at a much lower sample rate than the raw data, and only contains the channels and times received by DAQview.

14 Troubleshooting

Table 1: DAQview Troubleshooting

Symptom	Possible Cause	Corrective Action
Software is slow to redraw or respond to input	Too much historic data	Click `Clear Data` in the `Server` menu.
	Too many channels being displayed	Remove some channels or run a second instance of DAQview for some channels.
Software becomes unresponsive	Software fault	Quit and restart the software.
Software displays an error message		Contact AEL with details of the error message and action you were attempting to perform.
Connection to server fails	Server not running	Confirm the control software is running.
Secondary y-axis not moving/scaling	Incorrect axis setting	Right click on the secondary axis itself and confirm y-axis mode is set to manual and mouse is enabled.
		Ensure you are operating on the secondary axis itself and not the main display area.
Axis units are incorrect	Configuration file incorrect	Contact AEL for assistance.