

Rolling Plot Module

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This article describes how to use the Rolling plot module of [imperix Cockpit](#) to interact with the user code running on imperix power converter controllers, namely the [B-Box RCP](#), the [B-Board PRO](#), the [Programmable Inverter](#) and the [B-Box Micro](#). This page provides a detailed explanation of all of the module's features.

For new users, it is recommended to read the following articles beforehand to get started with the imperix software development kit (SDK) and imperix Cockpit monitoring software:

- [Cockpit – User guide](#)
- [Programming and operating imperix controllers](#)

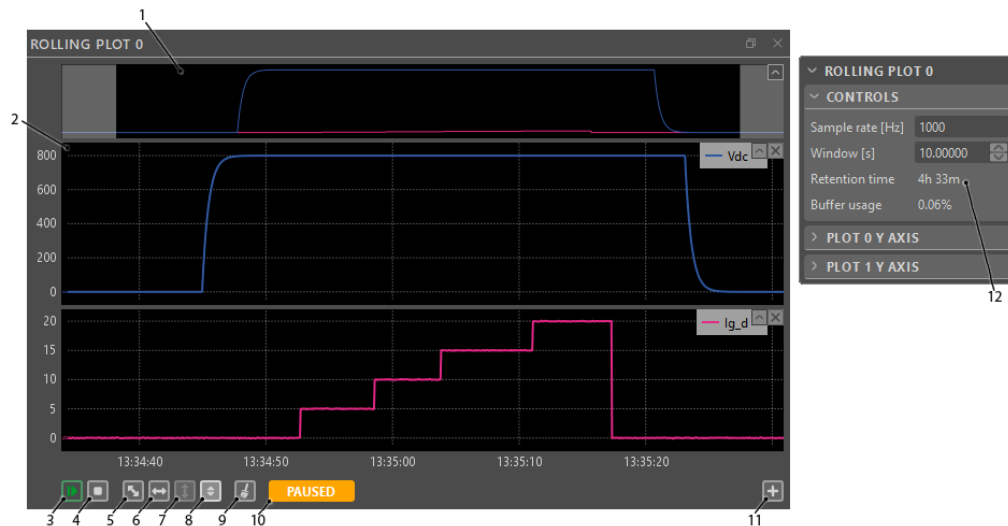
Rolling Plot basics

The rolling plot module allows for more long-term monitoring of the selected variables. A typical use case is monitoring the long-term evolution of the converter state in order to keep an eye on critical variables.

The sampling frequency of the Rolling plot can range from 10Hz up to the CPU control task frequency. The maximal amount of the recorded data depends on this value and the number of acquired variables. Once the allocated memory buffer fills up, the oldest acquired points will be deleted.

The buffer allocated to each instance of the Rolling plot module is set at 500Mb and corresponds directly to the memory occupied by the acquired data in the PC running Cockpit. Should this be insufficient, simply instantiate another Rolling plot, since their buffers are independent.

Rolling Plot interface



Rolling plot module

1 – Plot preview

The plot preview shows an overview of all of the monitored signals. The vertical axis of the preview is automatically scaled so all of the signals fit the plot. The plot preview can be collapsed to optimize space when using Cockpit on a small monitor.

2 – Plot

This is the area where the monitored signals are displayed. User variables can be dragged and dropped from the project pane into a plot to monitor them. If multiple plots are created, their x-axis will always remain synchronized, including when zooming. The user can remove a variable from a plot from the *Rolling Plot* tab of the bottom bar or through the variable plot context menu accessed by right-clicking on the plotted signal.

3 – Pause/Resume button

Pauses/resumes the rolling of the plot window. Data acquisition will continue in the background regardless of whether the plot window is rolling or not.

4 – Stop acquisition button

Stops the data acquisition of the rolling plot. Clicking on the resume button from the stopped state will restart the acquisition.

5 – Vertical and horizontal autoscale button

Autoscales both the horizontal and vertical axis, ensuring the acquired signals fit in the plots.

6 – Horizontal autoscale button

Autoscales the horizontal axis of every plot while keeping the vertical axis unchanged. Additionally, if the monitoring is paused, it will be automatically resumed.

7 – Vertical autoscale button

Autoscales the vertical axis of every plot while keeping the horizontal axis unchanged.

8 – Continuous vertical autoscale switch

When switched on, this feature continuously auto-scales every plot, ensuring that the monitored variables never go out of scope.

9 – Clear history button

Clears all of the data acquired by the rolling plot. If the Rolling plot is acquiring, the acquisition will continue.

10 – Rolling plot status

Displays the current rolling plot state. The possible states are:

- *Offline*: the target is disconnected from the host computer or the user code is not running on the target.
- *Stopped*: the acquisition is stopped. The data that was acquired before the acquisition was stopped remains on display.
- *Paused*: the rolling plot window is not rolling with the acquisition.
- *Live*: the rolling plot window is rolling with newly acquired data.

11 – Add plot button

Creates an empty plot area at the bottom of the rolling plot module.

12 – Rolling plot settings

The sampling frequency of the Rolling plot can be set through this menu. Since the lower sampling rates are achieved by downsampling, the sampling rate may be rounded to the closest value which the control task frequency is divisible by.

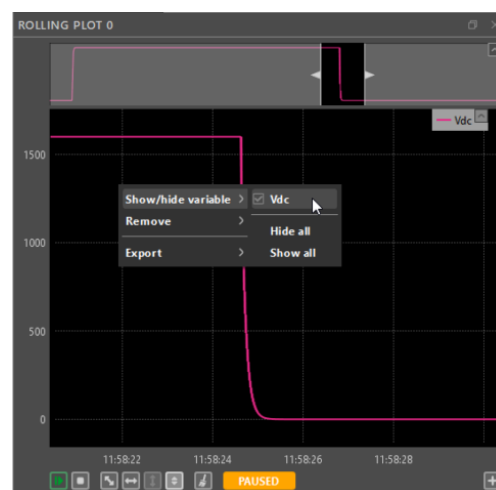
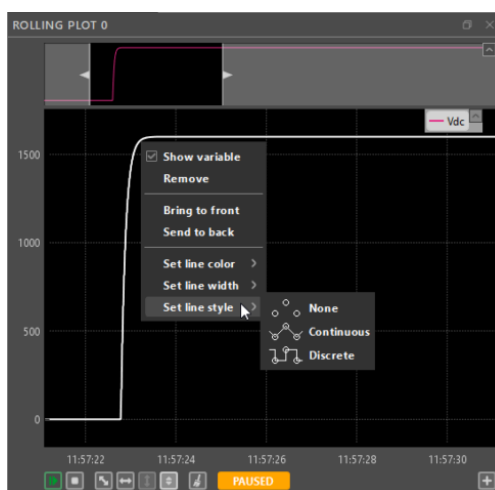
The maximal length of the recorded data in time is displayed in the 'Retention time' field. The state of the memory buffer can be tracked through the 'Buffer usage' field.

Starting from Cockpit version 2024.3, the Rolling Plot module acquisition procedure was upgraded from an approach of sampling at 20Hz in a "best-effort" manner with

no strict timing guarantees to a synchronized sampling of all variables up to the control task frequency.

Rolling Plot tips and tricks

- To **add multiple variables to a plot**, open the user variable section of the project pane. Keep the ctrl key pressed and click on the desired variables to select them. Alternatively, click on the first variable to select, keep the Shift key pressed, and click on the last variable to select. These selected variables can then be dragged and dropped into a plot all at once.
- To **zoom in and out along the horizontal axis**, place the mouse cursor where to zoom. Then, use the mouse wheel to zoom in or out around the mouse cursor.
- To **zoom in and out along the vertical axis**, place the mouse cursor where to zoom. Then, press the ctrl key and use the mouse wheel to zoom in or out around the mouse cursor.
- To **zoom on a specific area**, click and drag to draw a blue rectangle over the zoom area.
- To achieve a **horizontal autoscale**, right-click and drag horizontally. A light grey horizontal strip will appear. Release the mouse button to perform the horizontal autoscale.
- To achieve a vertical autoscale, right-click and drag vertically. A light grey vertical strip will appear. Release the mouse button to perform the vertical autoscale.
- Many of the Rolling Plot functionalities can also be accessed through **context menus** by right-clicking on a plotted variable or on the empty space in the plots.



Rolling Plot Variable context menu and plot area context menu