

2025 INSIDER EXCLUSIVE - OVERSAMPLING

FEATURE OVERVIEW

Starting with SDK 2025.2, Insiders will have direct access to the outputs of ADC and PWM channels of their imperix controllers. Oversampling enables the user to display these measurements in the Cockpit Scope module, reducing the need to set up an oscilloscope.

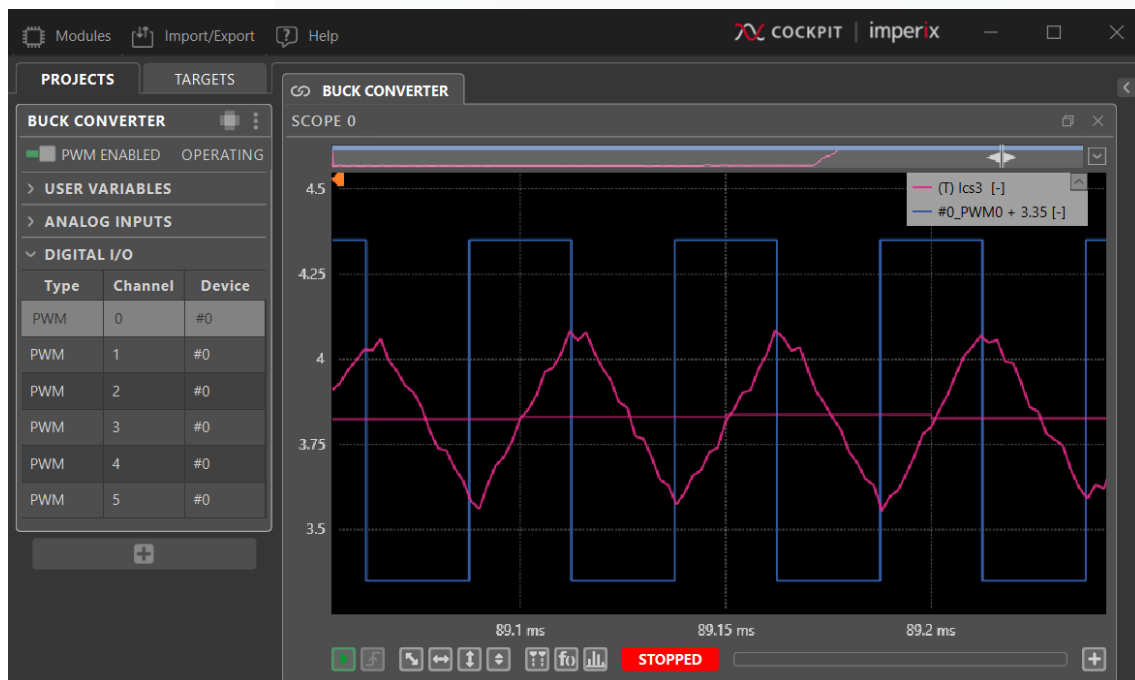


FIGURE 1 : COCKPIT SCOPE MODULE SHOWING OVERSAMPLED WAVEFORMS (FASTER THAN THE CPU RATE).

Technical specifications

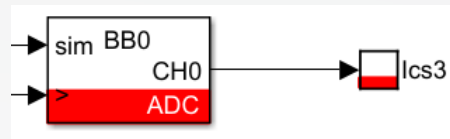
- ADC signals at 500 kSps for the BBox
- ADC at 2 MSps for the B-Board, TPI, BB-Micro
- PWM signals at 4ns resolution
- Works with any ADC or PWM block from ACG SDK
- Works with custom FPGA modulator outputs

USER GUIDE

Thanks to an upgraded scoping protocol, the user can now display ADC and PWM channel data directly in the Cockpit Scope Module. These signals are unbounded by the user code control frequency, instead being acquired at the maximum rate defined by the controller hardware.

There are three types of Oversampled signals currently available in the Scope:

- ADC channel signals
- PWM channel signals
- Oversampled probes



The first two types of signals are accessible below the User Variables list (left panel in Cockpit). They correspond to the channels defined by the ADC and various used PWM blocks in the user code. To display them in the Scope, simply drag and drop them like you would any other user variable.

⚠ The Scope module can not trigger on oversampled data. To start acquiring, the Scope module needs at least one user variable.

Finally, Oversampled probes are user variables that are connected directly to an ADC block in the user code. In the Scope, the user can choose to toggle between displaying just the data acquired at the CPU rate and a combination of user variable and ADC channel data.

All Oversampled signals are compatible with the various metrics calculated in the bottom bar. ADC channel signals and Oversampled probes are also compatible with the Formula Builder as well as the Spectral Analyzer, enabling the user to see the spectra of these signals above the Nyquist frequency defined by your control loop rate.



FIGURE 2 : SPECTRRAL ANALYZER MODULE SHOWING THE FFT OF A CURRENT WITH ITS SWITCHING HARMONINCS.

Displaying PWM signals of custom FPGA modulators

Oversampling is compatible with PWM signals generated by custom FPGA modulators. To enable Oversampling with the FPGA sandbox, download the imperix IP v3.10, revision 2, from [this link](#). For instructions on how to upgrade an existing Vivado project with the new IP, please refer to the procedure outlined in [this guide](#) on our website.