

## NovaCarts High Resolution Tracing

Simulation models for electric and hybrid vehicles and the simulation of electric motors or inductive charging processes require very small increments of a few microseconds and sometimes even down to the nanosecond range. As a rule, these models can no longer run on standard processors, but instead require high-performance FPGA boards.

Furthermore, the increasing complexity of control equipment for electric motors and the associated simulation models are placing new demands on analyzing the behavior of control equipment and models. This increases the time needed for development, and calls for a high-resolution capture of I/O signals and corresponding model variables in the FPGA. The "NovaCarts-High Resolution Tracing" software (NC-HRTRACE) assists users in capturing the time responses from these models and I/Os at high resolution, thereby allowing fast and precise analysis – even over the broadest bandwidth.

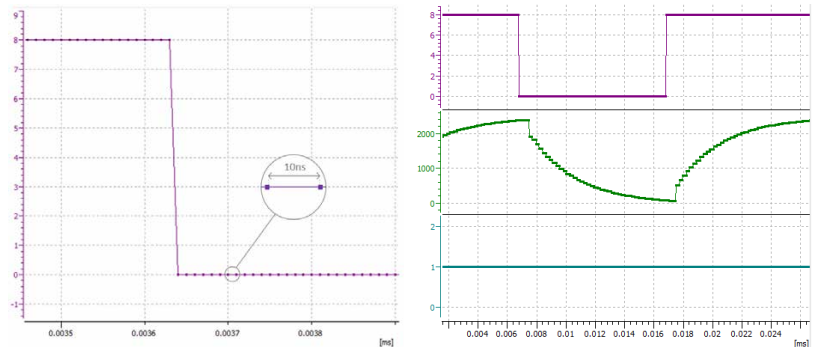
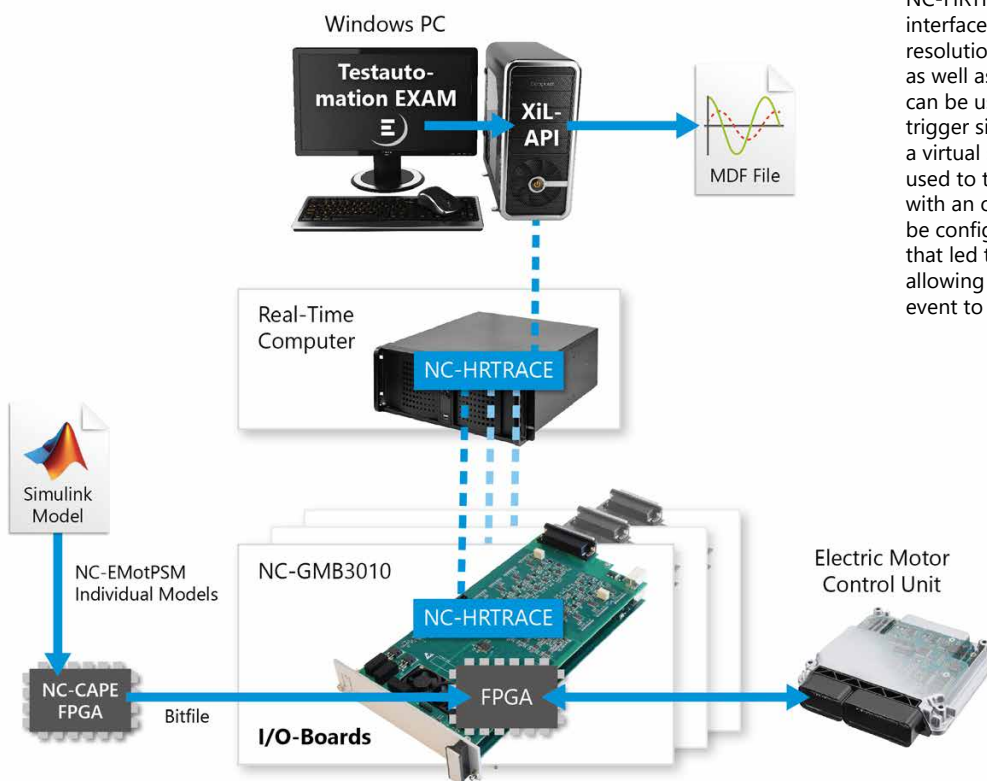


Figure 1 – Examples of high-resolution recording of signals in MDF4 format



NC-HRTRACE provides an ASAM-standardized interface (Xil API Capturing) for controlling high-resolution recording. Each I/O signal on the board as well as all defined internal model variables can be used and captured as trigger signals. The trigger signal can be added to the recorded file as a virtual signal. Threshold or edge values can be used to trigger recordings – similar to the options with an oscilloscope. Pre- and post-triggers can be configured in order to analyze a past history that led to a malfunction in a control device, thus allowing even signals prior to and after a trigger event to be recorded in a flexible manner.

Figure 2 – NovaCarts High Resolution Tracing (NC-HRTRACE), allows time responses of Simulink models and I/Os to be recorded.

## Data Sheet

Order number: **NC-HRTRACE**

Data sheet version: **1V0**

### Features

- » Supports NovaCarts I/O boards, currently NC-GMB3010 (further planned)
- » Signal types: analog, digital, float (e.g. Simulink model in FPGA)
- » Trigger conditions: level, positive edge, negative edge
- » Trigger time control: pre-trigger, post-trigger
- » Trigger syntax: ASAM GES
- » Decimation option to record signals with low resolution but with longer duration; maximum resolution increment: 10 ns
- » Longest recording period at maximum resolution: 6,710 s
- » Programming interface: XiL API 2.1
- » Format of output file: MDF4

### Specifications

Signal types	Analog I/Os on board (integer) Digital I/Os on board (integer) Internal parameters of the Simulink models (32-bit float)
Trigger conditions	Threshold value, positive/negative edge, external start via I/O signal
Trigger time control	Pre-trigger possible
Trigger syntax	GES (general expression syntax)
Decimation	1 – N
Highest-resolution recording increment	10 ns, depending on the number of channels selected (e.g. 10 ns valid for 4 analog channels or for 2 Simulink model parameters)
Longest time	6.7 s (full sampling rate without down-sampling for 1GB RAM)
Interface	ASAM XiL API 2.1 for simple, standardized operation via test automation solutions such as EXAM
Format of output file	MDF4 format (measurement data format, ASAM standard)
Trigger event	Visible as separate trigger channel of the captured MDF file (MAPort configuration of the XiL API) The trigger is additionally saved as an MDF event block in the MDF file.
Discovery	All I/O boards with the high-resolution tracing feature are automatically detected by the software. Variables for high-resolution recording are available directly at the XiL API after the launch of the HiL system.

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