

Reducing your development costs and increasing your product design-efficiency

The Galao ROIC Development Kit allows test and evaluation of IDEAS readout integrated circuits (ROICs, also referred to as ASICs). The kit consists of all the hardware, firmware and software needed for getting started with ROIC control and readout. It supports several IDEAS ROICs with different functionality and interface methods.

Kit includes

Galao board - General purpose control board with control and readout circuitry

ROIC test board - Interchangeable ROIC-specific board. Schematics also provided

IDEAS Testbench - SW for performing readouts and controlling boards and ROIC

IDEAS Packet Library – API for interfacing towards the Galao

Example scripts – Python scripts with basic readout functions in IDEAS Testbench

Test board schematic – the complete schematic for the ROIC test board

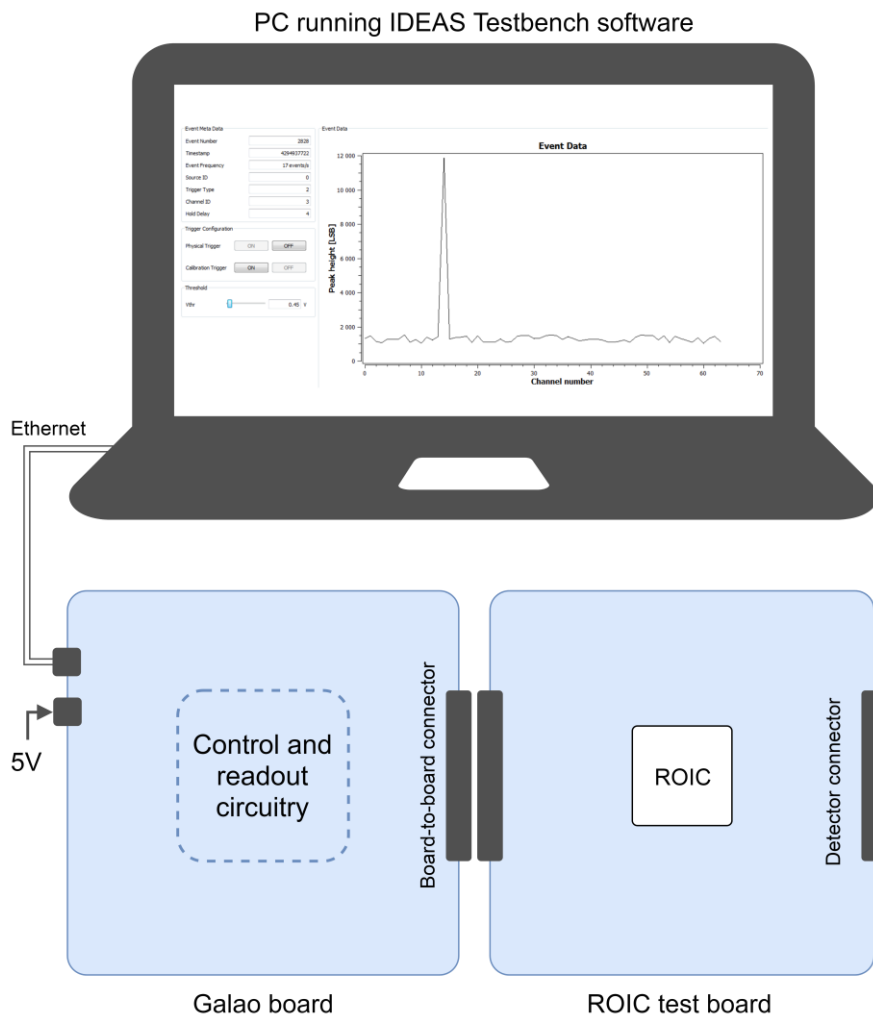


The Galao main unit

The Galao board includes a digital core with pre-installed IDEAS firmware, a calibration circuit for charge injection, trigger receivers, bias generators, and an analog receiver with 14-bit data ADC. It is powered by a single 5 V supply and controlled via Ethernet.

The ROIC test boards contain wire-bonded ROICs and circuitry needed for the specific ROICs, as well as test points for all key ROIC signals. The boards also have front-end connectors for the analog inputs. Schematic of the board is delivered along with the Galao ROIC Development Kit, giving the possibility to use it as basis for the design an application-specific ROIC readout system. This kit is not intended as a final readout solution, but rather a tool that helps the user design their readout system quickly.

IDEAS Testbench is the control and readout software created by IDEAS. It allows for configuration of ROICs, readout with data being presented in plots while being obtained, and data logging to file.



Overview of the Galao Development Kit

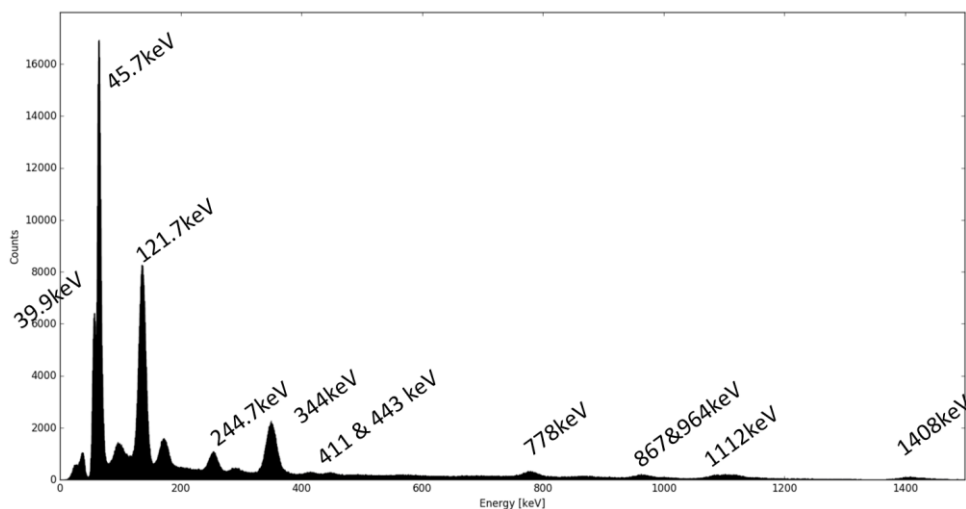
Using the Galao ROIC Development Kit

Setting up a Galao system is straightforward – attach the test board, plug in Ethernet and power, and the kit is up and running. By using the provided IDEAS Testbench Software, one can quickly start operating and reading out the ROIC.



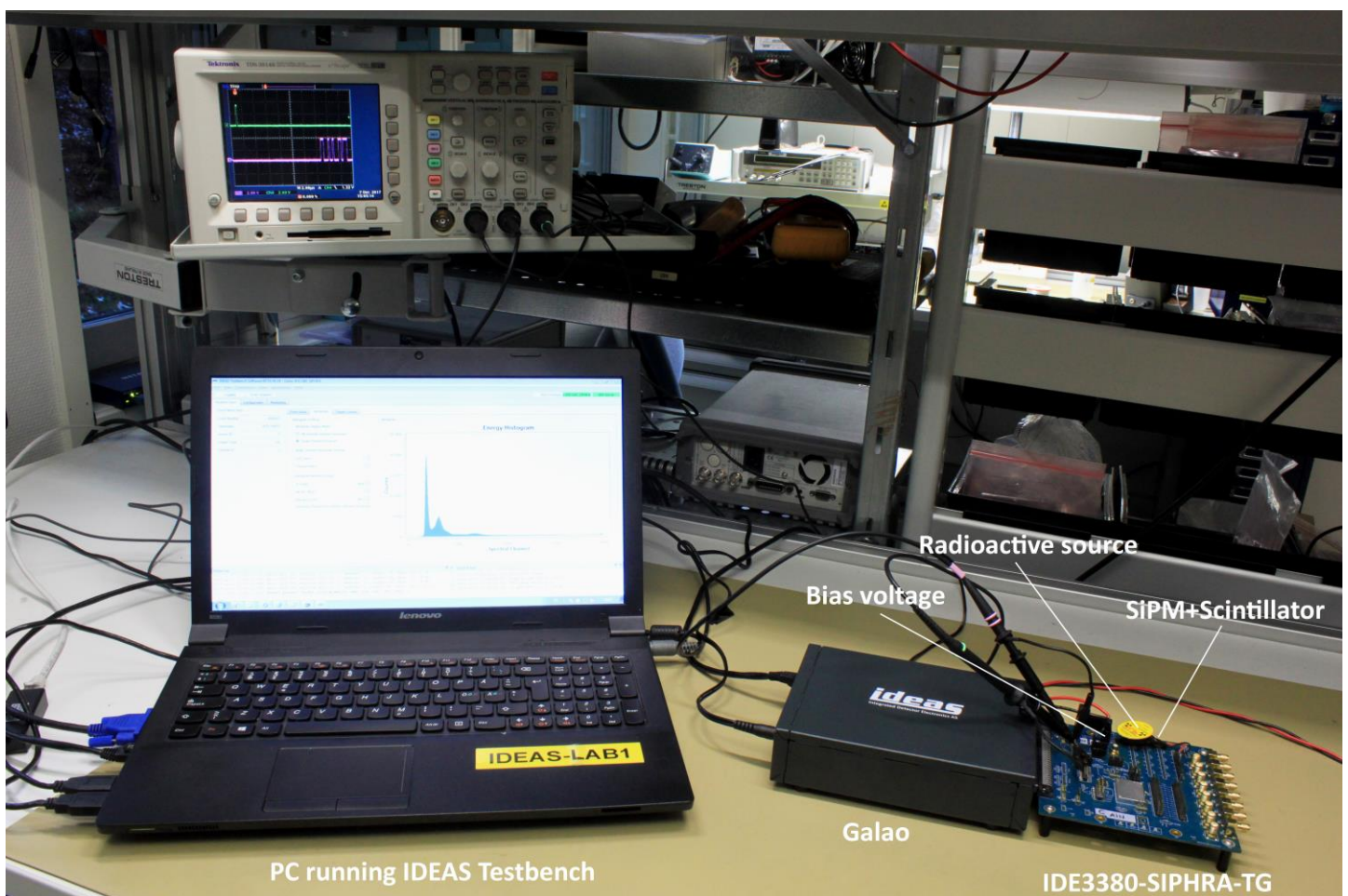
IDE3380 SIPHRA-TG attached to the Galao

The test boards are designed so that as much of the ROIC's functionality as possible can be tested and observed. Readouts can be initiated with calibration pulses from the Galao, or by external charges coming from a function generator or a detector. Signals are available on clearly marked test points. Finally, the purchase of a test board always comes with a schematic of the test board – giving the user complete information on how the ROIC has been implemented, while also serving as a reference design for the ROIC.



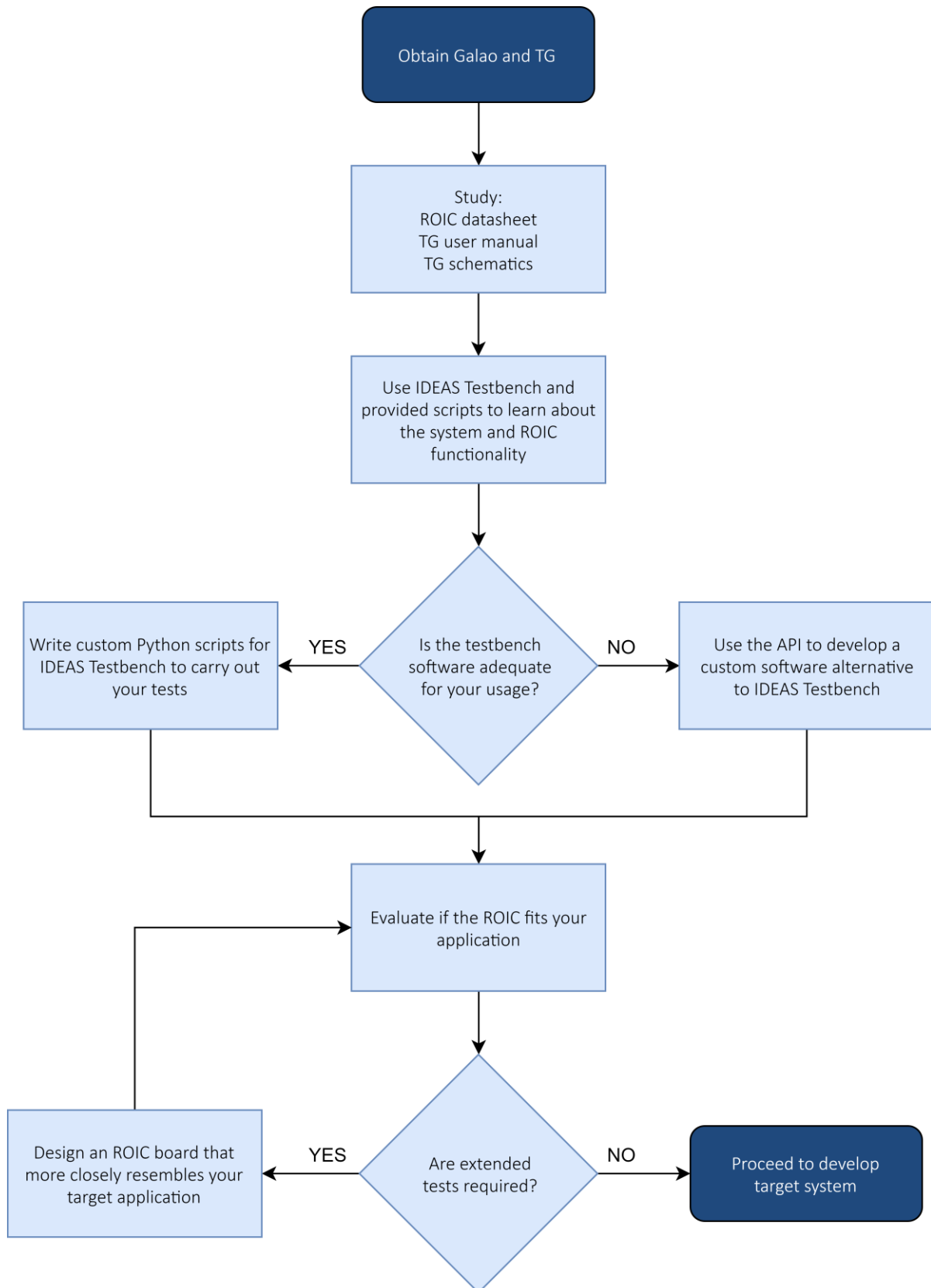
Spectrum for Eu-152 obtained with the IDE3380 SIPHRA-TG and IDEAS Testbench
(No correction for backscatter or detector geometry)

The Galao ROIC Development Kit is most commonly used in a lab setting, where one can perform readouts with the IDEAS ROIC based on for instance a small detector and a radioactive source. This can be done while probing signals of interest with an oscilloscope, and at the same time getting readout data in the form of a histogram through IDEAS Testbench on a connected computer. An example of this is shown in the picture below, where readouts are performed with an SiPM connected to the IDE3380_SIPHRA-TG. The external SiPM bias voltage generator is not seen in this photograph.



Typical lab setup of a Galao ROIC Development Kit

Typical User Flowchart

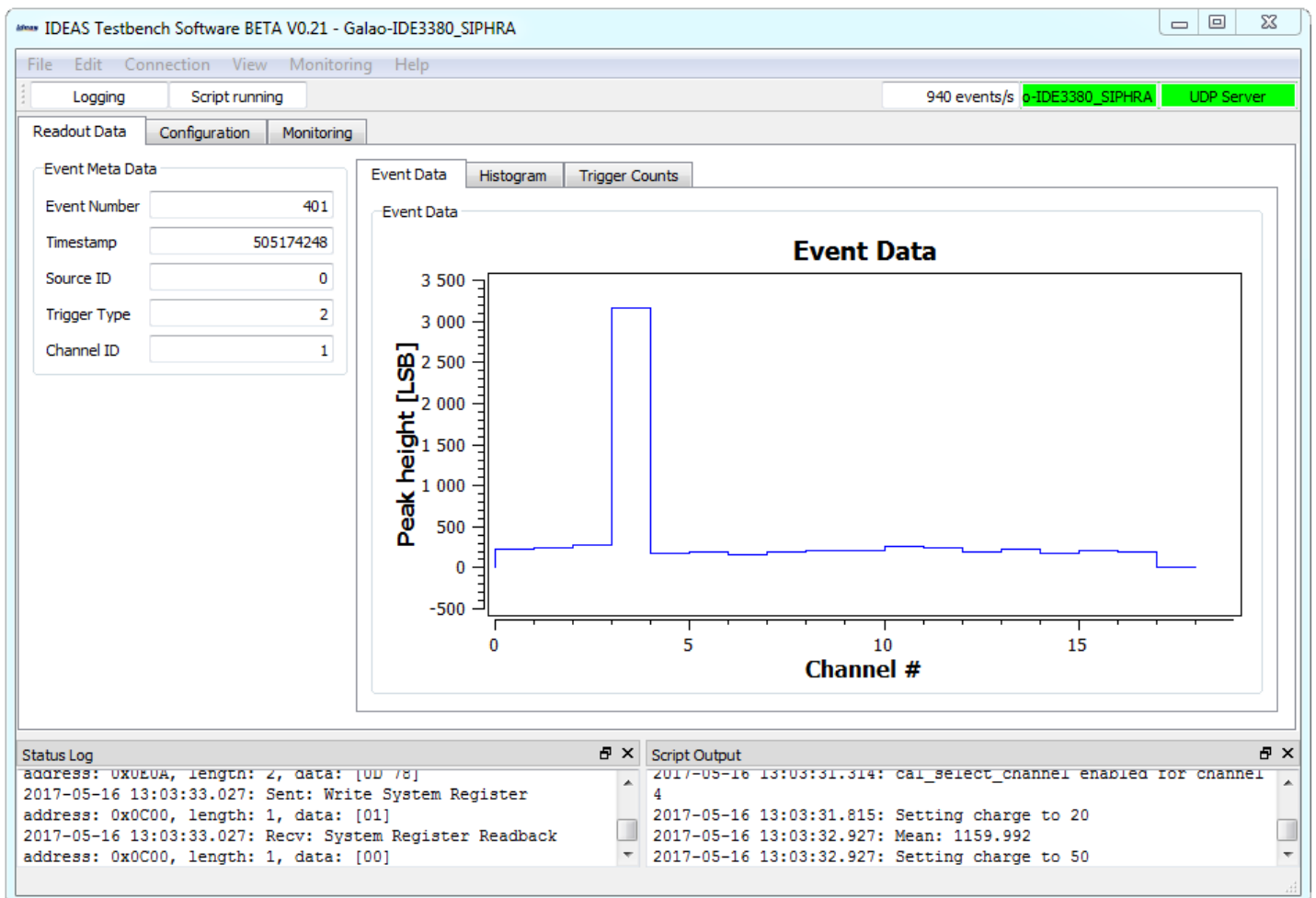


IDEAS Testbench Software

IDEAS Testbench is a GUI application that provides an easy way to access IDEAS ROICs on test boards for the Galao ROIC Development Kit. It provides an intuitive interface where one can control both Galao's features and the ROIC's configuration.

The software allows for real-time plotting and histogramming of readout data, as well as logging to file. Included in the IDEAS Testbench is a Python scripting interface, which enables users to quickly implement test scripts and automate procedures, taking use of the included IDEAS Readout and Control Packet Protocol. Example Python scripts are provided with software, demonstrating basic use of the scripting functionality.

An alternative to IDEAS Testbench is that the user develops their own software. To assist with this, IDEAS provides the IDEAS Packet Library, which is available as a multiplatform C API.



IDEAS Testbench screenshot

Test Boards

The Galao ROIC Development Kit currently supports five different IDEAS ROICs. More test boards are being successively developed.

Supported ROICs

ROIC	ROIC Test Board
VATA64HDR16	VATA64HDR16-TG
IDE3380	IDE3380 SIPHRA-TG
VATA450/VATA460 *	VATA4XX-TG
VATAGP7 **	VATAGPX-TG

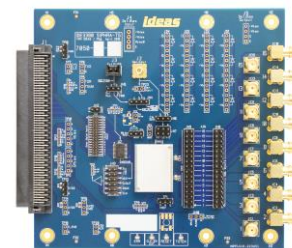
* VATA461 to be supported by this test board.

** VATAGP8 and VATAGP9 to be supported by this test board.

Please contact us about release dates for these test board variations.



VATA64HDR16-TG



IDE3380 SIPHRA-TG



VATA4XX-TG



VATAGPX-TG

The Galao product family