# CAEN Educational Handbook

## Nuclear and Particle Physics Experiments

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# SG6302F USING THE ONBOARD OSCILLOSCOPE IN SCI-COMPILER

Difficulty Execution Time **SP5650 - OPEN FPGA KIT**

## Purpose of the experiment

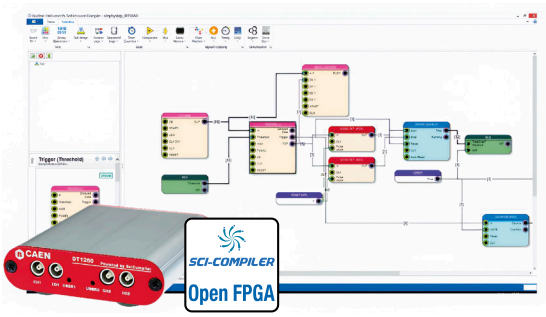
This application demonstrates how to integrate and operate the Oscilloscope block in a Sci-Compiler FPGA design on the DT1260 board, to visualize analog and digital signals in real time.

## Fundamentals

An oscilloscope captures and displays signal waveforms, enabling time-domain observation of amplitude versus time. Analog input signals (after ADC conversion) and internal digital signals inside the FPGA can be sampled and visualized through a memory-mapped interface. Triggering functions (edge detection, thresholds, pre/post trigger) stabilize the display of periodic or transient signals. A block, called “Oscilloscope”, connects FPGA logic with external visualization tools for debugging and signal validation.

## Requirements

No other tool is needed.




Experimental setup block diagram.

## Carrying out the experiment

Activate your Sci-Compiler license and set up the software installation. Plug the USB Dongle in your PC and launch Sci-Compiler. Create a project for your DT1260 unit: press New Project.

Add the Oscilloscope block to the design and connect analog (A0) and digital (D0–D3) inputs.

Configure channels, buffer size, and enable capture.

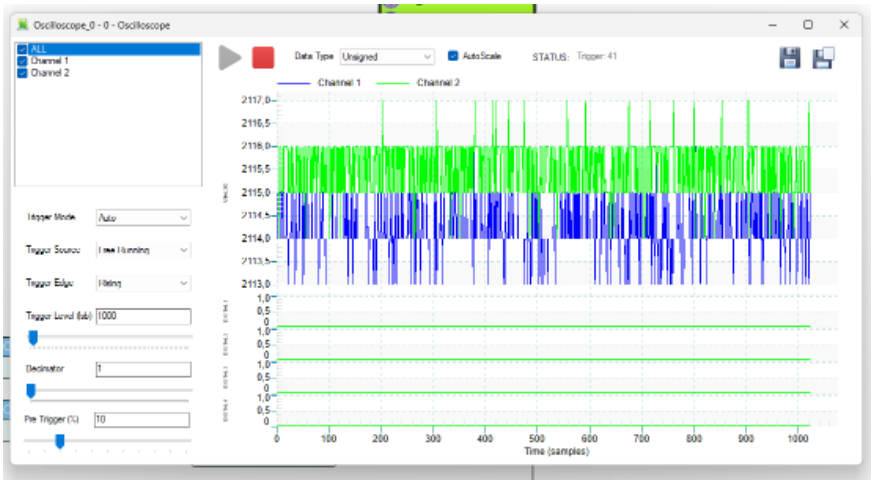
Assign memory addresses automatically, build the project, and program the DT1260.

Feed a test signal (e.g. PWM) to an input, open Oscilloscope_0 from the Resource Explorer, and set trigger source, mode, and level.

Start acquisition and adjust trigger settings to stabilize the displayed waveform.

## Results

The Oscilloscope block provides real-time observation of FPGA-generated signals without external equipment. By adjusting trigger parameters, students can stabilize periodic waveforms or capture transient events, improving signal debugging, timing verification, and system validation.




Oscilloscope Screen.