

**New**

# DTL2751

## 4 Input Channel 14 bit 1 GS/s Digitizer



## Features



- 4 independent input channels, 1 GS/s 14-bit, with individual DC offset adjustment
- Front panel readout via **USB-3.0** or **1Gb** Ethernet
- Based on Kintex UltraScale+ FPGA
- **Ready-to-Use** Firmware solutions to get time-stamped waveforms and physical quantities
- **Triggered** and **Streaming Readout** modes supported
- **SDK** provided for **Open FPGA** and **Open Arm** customizations
- **Sci-Compiler**, **WaveDump2**, and **CoMPASS** fully supported

## Description

The **CAEN Mod. DTL2751** is a **4 channel desktop digitizer** designed for high-speed acquisition and real-time digital pulse processing of signals from radiation detectors. Part of the DTL series, it combines compactness and performance, making it ideal for small experimental setups and laboratory environments.

Each channel features a **14-bit, 1 GS/s ADC** capable of digitizing analog signals from detectors such as organic, inorganic, or liquid scintillators coupled to PMTs or SiPMs, as well as from Diamond detectors. The data are processed in real time by a Kintex UltraScale+ FPGA, where several firmware options can be loaded to suit specific experimental configurations. It covers a **range of applications** such as **nuclear and particle physics, high-timing-resolution measurements, Fast Neutron Spectroscopy, and Homeland Security**.

Data acquisition is managed through trigger generation and the definition of a Region of Interest (ROI) in samples or time. Trigger sources can be local (self-trigger), external, or software-controlled. Once acquired, the waveforms are processed in the FPGA, stored in high-speed memory with timestamp and trigger ID, and transferred via fast communication interfaces for further analysis.

The DTL2751 supports multiple acquisition modes to balance throughput, latency, and data efficiency:

- **Triggered mode:** All channels acquire simultaneously upon a global trigger generated by a central logic unit that processes local discriminators. External or software triggers can also serve as global sources. Optional zero-suppression can be applied to reduce data volume by removing non-significant samples.
- **Streaming readout mode:** Each channel operates independently with its own self-trigger, defining the ROI autonomously. This mode applies automatic zero-suppression (inactive channels are skipped), maximizing acquisition rate and enabling real-time parameter extraction for high-rate applications. In addition, a **Correlated streaming** configuration can be set to validate event acquisition through coincidence or anticoincidence logic between local and external triggers.

The DTL2751 can operate using both pre-configured firmware developed by CAEN and custom user-generated firmware, offering flexibility for a wide range of applications. CAEN provides ready-to-use firmware solutions optimized for specific acquisition and processing needs:

- **Scope Firmware:** Based on full waveform recording in triggered acquisition mode. A zero suppression function is available to reduce unnecessary data readout.
- **DPP Firmware <sup>COMING SOON</sup>:** Special algorithms onboard making processing on the acquired waves to extract physical quantities, usually time and energy.

For users requiring custom acquisition and processing, the Open FPGA architecture enables firmware customization through **SCI-Compiler**. This graphical tool allows users to create personalized firmware solutions without HDL skills. In addition, **SCI-Compiler** automatically generates drivers and libraries and provides graphical utilities for developing custom DAQ software.

The Linux-based Arm processor embedded in the onboard CPU makes it possible to run automated user routines. Multi-board synchronization can be implemented via backplane or front panel easy-cabling options. Multiple communication interfaces offer flexible readout options: **USB 3.0** type-C and **1 Gigabit Ethernet**.

## Ordering Options

Code	Description	RoHS
WDTL2751XAAA	DTL2751 - 4 Ch. 14 bit 1 GS/s Digitizer, Open FPGA	RoHS

## Accessories

### A319B



Clock cable assembly from Digitizer Series 1.0 to Digitizer Series 2.0 - 20cm

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### A319A



Clock & Sync cable assembly for Digitizer Series 2.0 - 20 cm

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## Related Software

### WAVEDUMP2



Open Source Software for Digitizer 2.0 and 1.0 Series

### CAEN Toolbox



Multi-Functional Software Suite for the Upgrade of Front-end Boards, Bridges and Power Supplies

## Related Firmware

### DPP-SUP



Super Licence for CAEN Digitizers

## Related Software Libraries

### CAEN FELib Library



High level library for CAEN Digitizers 2.0

## Related Products

### D-SCOPE



Digitizer 2.0 Waveform Recording Firmware

### DT2751



16 Input Channel 14 bit 1 GS/s Digitizer with Programmable Input Gain

### VX2751



16 Input Channel 14 bit 1 GS/s Digitizer with Programmable Input Gain



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