

New

DTL2745

**8 Input Channel 16
bit 125 MS/s
Digitizer**



Features

- 8 independent input channels, 125 MS/s 16-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. DTL2745** is a **8 input channel desktop digitizer** designed for high-resolution waveform 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 **16-bit, 125 MS/s ADC** capable of digitizing analog signals from semiconductor detectors coupled with charge-sensitive preamplifiers (Si, HPGe) or scintillators coupled with PMTs (NaI, CsI). 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**, from **Neutrino Physics and Dark Matter searches** to **Nuclear and Particle Physics and Spectroscopic Imaging**.

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 DTL2745 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 and reduce the readout payload.
- **Streaming readout mode:** Each channel autonomously identifies its ROI using the self-trigger mechanism, acquiring data independently of the other channels. This mode includes automatic zero suppression (non-triggered channels are not acquired), maximizes acquisition rates, and is ideal for applications requiring real-time parameter extraction. In addition, correlation logics can be configured to validate event acquisition upon **coincidences or anticoincidences** between local and external triggers.

The DTL2745 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:** 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
WDTL2745XAAA	DTL2745 - 8 Ch. 16 bit 125 MS/s Digitizer, Open FPGA RoHS

Accessories

A319A



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

A319B



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

Related Software

CAEN Toolbox



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

WAVEDUMP2



Open Source Software for Digitizer 2.0 and 1.0 Series

Related Firmware

DPP-SUP



Super Licence for CAEN Digitizers

Related Software Libraries

CAEN FELib Library



High level library for CAEN Digitizers 2.0

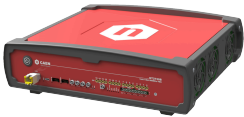
Related Products

D-SCOPE



Digitizer 2.0 Waveform Recording Firmware

DT2730



32/16 Input Channel 14 bit 500 MS/s Digitizer with Programmable Analog Gain

V2730



16 Input Channel 14 bit 500 MS/s Digitizer with Programmable Analog Gain

VX2730



32/16 Input Channel 14 bit 500 MS/s Digitizer with Programmable Analog Gain

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