

V1782

Octal Digital Multi Channel Analyzer



Features



- Eight independent 32k digital MCA in VME form factor
- Perfectly suited for high resolution gamma ray spectroscopy with single and segmented HPGe, Clover and Silicon detectors and compatible with medium-fast scintillator like NaI, CsI, BGO
- Software selectable coarse gain (x1, x2, x4, x8)
- Jumper selectable x0.2 attenuation
- 10 μ s AC coupling jumper selectable for TRP detectors
- Digital oscilloscope for an easy acquisition parameters setup and signal monitoring
- Features Digital Pulse Processing for PHA, providing Energy and Timestamp in list mode
- Software adjustable digital shaping filter, baseline restoration and fine gain
- Online pile-up rejection and software dead time evaluation
- Suited also for high count rate application
- Configurable coincidence or anti-coincidence of the input analog signals for background rejection and anti-compton shield
- VME and Optical Link communication interface
- Drivers, libraries and API for Windows and Linux 32/64 bit
- **CoMPASS** software to manage the acquisition and perform basic spectrum analysis

Description

The CAEN **Mod.V1782** is the new **Octal 32k digital MCA**. Designed for high energy resolution semiconductor detector is perfectly suited for those application in which the number of input channels start becoming relevant such as when segmented HPGe, Clovers and silicon detectors are involved.

The V1782 provides four steps of software selectable coarse gain and two possible jumper selectable dynamical ranges (0.2-0.4-0.8-1.6 Vpp and 1-2-4-8 Vpp).

It is also compatible with Transistor reset preamplifier thanks to the jumper selectable 10

μ

s AC coupling.

Like the other members of the **x781 family**, the V1782 integrates advanced firmware algorithm for the processing of any kind of exponential signal or coming from charge sensitive preamplifier and can be easily adapted to different detectors and application ensuring an effective processing even at high count rates. These algorithms includes advanced tools for the baseline restoration and pile-up rejection.

Thanks to the multiple input simultaneous acquisition, the module is able to manage coincidence and anticoincidence logic between segment of the same detector or different detectors, allowing the user to take advantage of background rejection or anti-Compton techniques.

The V1782 provides at the same time energy, time stamp and, if required, digitized pulse in a configurable acquisition windows in order to perform further off line analysis.

Acquisition settings and simple analysis operation are performed using **CoMPASS** software that provides energy spectra up to 32k channels. The spectra can be exported and imported in ASCII or N42.42 compliant files.

CAEN provides also the drivers for the supported communication interfaces, C and Labview libraries (**CAENComm**, **CAENDigitizer**, **CAENDPP**) demo application and utilities.

Technical Specifications

MECHANICAL

- **Form Factor:** 2-unit wide VME 6U module
- **Weight:** 800 g

ENVIRONMENTAL

- **Operational Conditions:** 0 to 50°C Temperature Range
- **Compliance:** EMC compliant

ANALOG INPUT

Number of Inputs: 8

Input Features:

- BNC connector
- Single ended, DC and 10 μ s AC coupling hardware selectable
- Impedance: 1 k Ω
- Positive and negative signals accepted
- Analog Coarse Gain: x1, x2, x4, x8 software selectable (Gain 1 = 1 Vpp); gain attenuation x0.2 by on-board jumper
- Programmable DC offset adjustment on each input in the full-scale range

ADC

- **Resolution:** 16 bits
- **Sampling Rate:** 100 MS/s (simultaneously on each input)

DIGITAL SIGNAL PROCESSING

- Trapezoidal filter for the energy calculation: adjustable rise time 0.02 to 40 μ s; flat top 0.02 to 40 μ s
- Trigger and Timing filter based on integrative-derivative component (30-bit time stamp, 10 ns resolution, 10 s range, 64-bit extension by software, roll-over tracking event)
- Trigger threshold adjustment
- Digital fine gain: 1 to 2.2 in steps of 0.0001
- Trapezoid tail correction; decay time 0.1 to 650 μ s
- Trigger time tag discrimination by RC-CR2 filter; shaping time 0.01 to 2.4 μ s
- Trigger hold-off (imposed dead-time) to prevent after pulses: 0 to 40 μ s
- Programmable Pile-up Guard duration: 0 to 80 μ s beyond the end of the flat top
- Baseline restorer: fast, medium, slow

OPERATING MODES

- Pulse Height Analysis (PHA): 1k-2k-4k-8k-16k-32k pulse height histogram built at software level
- List mode: pulse height and time stamp for each event
- Oscilloscope mode: signal inspection of input pulses and internal filters outputs

TRIGGER MODES

- Uncorrelated: each channel operates independently (based on channel self-trigger)
- Correlated: coincidence/anticoincidence among channels and/or an external trigger (TRG-IN)
- External: channels are triggered by external trigger only (TRG-IN)

FRONT PANEL I/Os

- **CLK-IN (3-pin AMPMODU II):** AC-coupled differential clock input LVDS, ECL, PECL, LVPECL, CML (single-ended NIM/TTL adaptor orderable); Jitter < 100ppm requested
- **CLK-OUT (3-pin AMPMODU II):** AC-coupled differential clock output
- **TRG-IN (LEMO):** General purpose single-ended digital input Software programmable functions NIM/TTL, $Z_{in} = 50 \Omega$
- **TRG-OUT (LEMO):** General Purpose Digital output Software programmable functions NIM/ TTL, $Z_{in} = 50 \Omega$
- **S-IN (LEMO):** TTTReset/AcqStartStop digital Input NIM/TTL, $Z_{in} = 50 \Omega$
- **LVDS I/O (32-pin AMPMODU II):** 16 general purpose differential LVDS I/O; An input pattern from the LVDS I/O can be associated to each trigger as an event marker Multiple functions configurable by register

ANALOG MONITOR OUTPUT

- 12-bit / 100MHz DAC FPGA controlled
- 1 Vpp dynamics, 50 Ω termination
- Configurable for test signals

COMMUNICATION INTERFACE

- **Optical Link**
CAEN CONET proprietary protocol, Up to 80 MB/s transfer rate; Daisy chain capability by connecting up to 8 or 32 ADC modules to a single Optical Link Controller (**A4818** or **A5818** respectively)
- **VME**
VME 64X compliant interface, Data transfer mode: BLT32, MBLT64 (70 MB/s using CAEN Bridge)
CBLT32/64, 2eVME, 2eSST (up to 200 MB/s)

FIRMWARE

- DPP-PHA firmware can be upgraded via VMEbus/Optical Link

SOFTWARE

- Fully controlled by CoMPASS spectroscopy software (up to 32k PHA histogram supported).
- General purpose C libraries with demo samples available for developers Windows® and Linux® OS supported

CONSUMPTIONS

- 5.6 A @ +5V;
- 0.320 A @ +12 V;
- 0.180 A @ -12V

Ordering Options

Code	Description	
7V1782XAAAAA	V1782 - Octal 32K Digital Multi Channel Analyzer	RoHS
WV1782XAAAAA	V1782 - Octal 32K Digital Multi Channel Analyzer	RoHS

Accessories

A1422



Low-Noise Fast-Rise-Time Charge-Sensitive Preamplifiers (Boxed)

A954



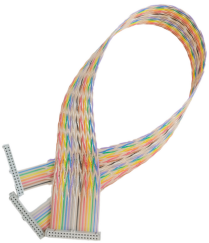
Cable assembly 2.54mm 34 pin female to two 2.54mm 16 pin female - 50 cm

A1424



Scintillation Preamplifier

A953



Cable assembly 2.54mm 34 pin female to two 2.54mm 34 pin female - 50 cm

A317



Cable assembly for Clock distribution 3-pin AMPMODU IV female terminations - 18 cm / 25cm

A318



Adapter for Clock signal FISCHER S101A004 male to 3-pin AMPMODU IV female - 10 cm

A952



Cable assembly 2.54mm 34 pin female to 2.54mm 34 pin female - 50 cm

DT4700



Clock Generator and FAN-OUT

Related Software

COMPASS



Multiparametric DAQ Software for Physics Applications

Related Software Libraries

CAENComm Library



Interface library for CAEN Data Acquisition Modules

CAENDigitizer Library



Library of functions for CAEN Digitizers high level management

Related Products

V4718



VME to USB 3.0/Ethernet/Optical Link Bridge

VME8004X



2U 4 Slot VME64X Mini Crate

VME8011



7U 21 Slot VME64 Low Cost Crate

VME8100



8U 21 Slot VME64/64X Enhanced Crate Series

VME8008B



4U 8 Slot VME64 Mini Crate

VME8010



7U 21 Slot VME64 Low Cost Crate

VME8004B



2U 4 Slot VME64 Mini Crate

NV8020A



7U CRATE VME/NIM 8 slot VME64 365W, 5 slot NIM 150W

VME8008X



4U 8 Slot VME64X Mini Crate

VME8200



9U 21Slot VME64X Enhanced Crate series

A4818



USB 3.0 to CONET2 Adapter

V3718



VME to USB 2.0 / Optical Link Bridge

VME8001



1U 2 Slot VME64 Mini Crate

A2818



PCI CONET Controller

A5818



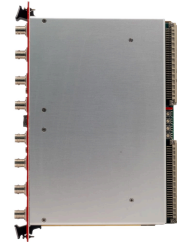
CONET2 Controller based on PCI Express Gen 3 interface

A3818



PCI Express CONET2 Controller

Gallery



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