

CondorEight

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 CoMPASS software to manage the acquisition and perform basic spectrum analysis



Overview

The **CondorEight** is the new CAEN India **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 ConderEight 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 us AC coupling.

ConderEight 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 ConderEight 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 o N42.42 compliant files.

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

Technical Specifications

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| MECHANICAL | Form Factor: 2-unit wide VME 6U module Weight: 800 g |
| ENVIRONMENTAL | Operational Conditions: 0 to 50°C Temperature Range Compliance: EMC compliant |



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|---------------------------|---|
| ANALOG INPUT | <p>Number of Inputs: 8 Input</p> <p>Features:</p> <ul style="list-style-type: none"> • BNC connector • Single ended, DC and 10 μs AC coupling hardware selectable Impedance: 1 kΩ • 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 | <p>Resolution: 14 bits</p> <p>Sampling Rate: 100 MS/s (simultaneously on each input)</p> |
| DIGITAL SIGNAL PROCESSING | <ul style="list-style-type: none"> • Trapezoidal filter for the energy calculation: adjustable rise time 0.02 to 40 μs; flat top 0.02 to 40 μs • Trigger and Timing filter based on integrative-derivative component (30-bit time stamp, 10 ns resolution, 10 s range, 64bit 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 μs • Trigger time tag discrimination by RC-CR2 filter; shaping time 0.01 to 2.4 μs • Trigger hold-off (imposed dead-time) to prevent after pulses: 0 to 40 μs • Programmable Pile-up Guard duration: 0 to 80 μs beyond the end of the flat top • Baseline restorer: fast, medium, slow |
| OPERATING MODES | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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, Zin = 50 Ω • TRG-OUT (LEMO): General Purpose Digital output Software programmable functions NIM/ TTL, Zin = 50 Ω • S-IN (LEMO): TTTReset/AcqStartStop digital Input NIM/TTL, Zin = 50 Ω • 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 OUPPUT | <p>12-bit / 100MHz DAC FPGA controlled</p> <p>1 Vpp dynamics, 50 Ω termination</p> <p>Configurable for test signals</p> |
| COMMUNICATION INTERFACE | <p>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 (A2818 or A3818 respectively)</p> <p>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)</p> |
| 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 |

Accessories

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| 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 |
| DT4700 | Clock Generator and FAN-OUT |
| A952 | Cable assembly 2.54mm 34 pin female to 2.54mm 34 pin female - 50 cm |
| A953 | Cable assembly 2.54mm 34 pin female to two 2.54mm 34 pin female – 50 cm |
| A954 | Cable assembly 2.54mm 34 pin female to two 2.54mm 16 pin female - 50 cm |

Ordering Options

| Code | Description | |
|--------------|--|------|
| WV1784XAAAAA | V1784 - CondorEight Octal 16K Digital Multi Channel Analyzer | RoHS |



CAEN SpA

Via Vetraria 11
55049 - Viareggio • Italy
Phone +39.0584.388.398
Fax +39.0584.388.959
info@caen.it
www.caen.it

CAENspa India Private Limited

B205, BLDG42, B Wing,
Azad Nagar Sangam CHS,
Mhada Layout, Azad Nagar, Andheri West
Mumbai, Maharashtra 400053, India
info@caen-india.in
www.caen-india.in

CAEN GmbH

Klingenstraße 108
42651 - Solingen • Germany
Phone +49.212.2544077
Fax +49.212.2544079
info@caen-de.com
www.caen-de.com

CAEN Technologies, Inc.

1 Edgewater Street - Suite 101
Staten Island, NY 10305 • USA
Phone +1.718.981.0401
Fax +1.718.556.9185
info@caentechnologies.com
www.caentechnologies.com