

DPP-PSD

**Digital Pulse
Processing for
Charge Integration
and Pulse Shape
Discrimination**



Features



- Digital solution equivalent to Dual Gate QDC + Discriminator + Gate Generator
- Implemented in the digitizer families:
 - **720** (12-bit @ 250 MS/s)
 - **725** (14-bit @ 250 MS/s)
 - **730** (14-bit @ 500 MS/s)
 - **751** (10-bit @ 1 GS/s)
 - **2740** (16-bit @ 125 MS/s)
 - **2745** (16 bit @ 125 MS/s with VGA)
 - **2730** (14 bit @ 500 MS/s with VGA)
 - **2751** (14 bit @ 1 GS/s with VGA)
 - **DT5790** Digital Pulse Analyzer (12 bit @ 250 MS/s)
- Fully supported by the **CoMPASS** software
- **NSCLDAQ Supported**
- Double charge integration for Pulse Shape Discrimination
 - Programmable width and position of the two gates
- Single gate integration for energy spectra calculation
- Self-Gating (no discriminator) with digital noise filtering
 - No delay line is needed to fit the position of the pulse inside the gate
- Automatic baseline subtraction (pedestal)
- Digital Constant Fraction Discrimination for fine time stamp interpolation (pico-second intrinsic resolution)
 - Timing information (pulse time-stamps)
- No conversion time to reduce the dead-time of the acquisition
- On-line coincidences/anti-coincidences acquisition mode among channels
- Free downloadable firmware trial version

Description

Free downloadable DPP-PSD Trial version for 720, 725, 730, 751, 2740, 2745, 2730 and 2751 series.

- The user can download and install DPP-PSD firmware without any license key and use it with time frame limitation: every 30 min the user have to restart (Power off/power on) the board
- To get time-unlimited operating DPP-PSD the user should purchase a License
- x790 Digital Pulse Analyzers are factory provided with time-unlimited operating DPP-PSD firmware and don't require licensing

DPP-PSD (Digital Pulse Processing for Charge Integration and Pulse Shape Discrimination)

firmware is fully controlled by **CoMPASS**, the CAEN multiparametric spectroscopy software for Physics applications.

A digitizer running the DPP-PSD firmware becomes a multichannel data acquisition system for nuclear physics or other applications requiring radiation detectors. The digitizer accepts signals directly from the detector and implements a digital replacement of Dual Gate QDC, Discriminator and Gate Generator. All these functions are performed inside the board FPGA without any use of external cables, nor additional boards or delay lines. Therefore, a single compact system takes care of the acquisition, replacing the traditional analog boards.

It is also possible to realize multi-board systems: the front panel clock, the trigger and the general-purpose LVDS I/Os connectors (VME only) make possible the synchronization of multiple boards.

Software Firmware Features	720 (1)	725	730	751	2740 ⁽²⁾	2745 ⁽²⁾	2730 (2)	2751 ⁽²⁾
ICH (Independent channels)	✓	✓	✓	✓	✓	✓	✓	✓
WV (Waveforms)	✓	✓	✓	✓	✓	✓	✓	✓
TS (Timestamp)	✓	✓	✓	✓	✓	✓	✓	✓
TDC (Time to Digital Converter)		✓	✓	✓	✓	✓	✓	✓
Compass DPP-PSD								
QDC (Charge to Digital Converter)	✓	✓	✓	✓	✓	✓	✓	✓
CFD (Constant Fraction Discriminator)		✓	✓	✓	✓	✓	✓	✓
PSD (Pulse Shape Discrimination)	✓	✓	✓	✓	✓	✓	✓	✓

⁽¹⁾ ONLY versions: E/F/G (VME) - E/F (Desktop) - E/F (VME64X) - B/C/D/E (NIM)

⁽²⁾ For comprehensive information on available firmware for the 'Digitizer 2.0' family and the organization of programming files (.CUP), please consult the FAQ **CUP files for Digitizer 2.0**

Applications

- Spectroscopy with scintillation organic/inorganic detectors
- SiPM readout systems
- Neutron physics with liquid scintillation detectors
- Acquisition from phoswich detectors
- Time-dependent spectroscopy
- Precise timing for Time of Flight measurements
- Homeland security
- Neutron imagine
- PET
- Tagged neutron for inspection systems

Ordering Options

Code	Description
WFDPPNGAA20	DPP-PSD - Digital Pulse Processing for Pulse Shape Discrimination (8ch x 720)
WFDPPNGAA25	DPP-PSD - Digital Pulse Processing for Pulse Shape Discrimination (16ch x 725)
WFDPPNGAA30	DPP-PSD - Digital Pulse Processing for Pulse Shape Discrimination (16ch x 730)
WFDPPNGAA51	DPP-PSD - Digital Pulse Processing for Pulse Shape Discrimination (8ch x 751)
WFDPPNGAD20	DPP-PSD - Digital Pulse Processing for Pulse Shape Discrimination (4/2ch x 720)
WFDPPNGAD25	DPP-PSD - Digital Pulse Processing for Pulse Shape Discrimination (8ch x 725)
WFDPPNGAD30	DPP-PSD - Digital Pulse Processing for Pulse Shape Discrimination (8ch x 730)
WFDPPNGAD51	DPP-PSD - Digital Pulse Processing for Pulse Shape Discrimination (4ch x 751)

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

V1751



4/8 Input Channel 10 bit 2/1 GS/s Digitizer

N6725 / N6725S



8 Channel 14-bit 250 MS/s Digitizer

VX1720



8 Input Channel 12bit 250 MS/s Digitizer

VX1751



4/8 Input Channel 10 bit 2/1 GS/s Digitizer

V1720



8 Input Channel 12bit 250 MS/s Digitizer

V1725 / V1725S



16/8 Input Channel 14-bit 250 MS/s Digitizer

DT5751



2/4 Input Channel 10 bit 2/1 GS/s Digitizer

N6720



4 Channel 12 bit 250 MS/s Digitizer

VX1725 / VX1725S



16/8 Input Channel 14-bit 250 MS/s Digitizer

V1730 / V1730S



16/8 Channel 14 bit 500 MS/s Digitizer

DT5725 / DT5725S



8 Input Channel 14-bit 250 MS/s Digitizer

N6730 / N6730S



8 Channel 14-bit 500 MS/s Digitizer

VX1730 / VX1730S



16/8 Input Channel 14 bit 500 MS/s Digitizer

DT5720



4/2 Input Channel 12bit 250 MS/s Digitizer

DT5730 / DT5730S



8 Input Channel 14 bit 500 MS/s Digitizer

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CAEN S.p.A.

Via Vetraia 11
55049 - Viareggio
Italy

Phone +39.0584.388.398

Fax +39.0584.388.959

info@caen.it

www.caen.it

CAEN GmbH

Brunnenweg 9
64331 Weiterstadt, Germany

Phone +49 (0)212.254.4077

Mobile +49 (0)151.16.548.484

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

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

