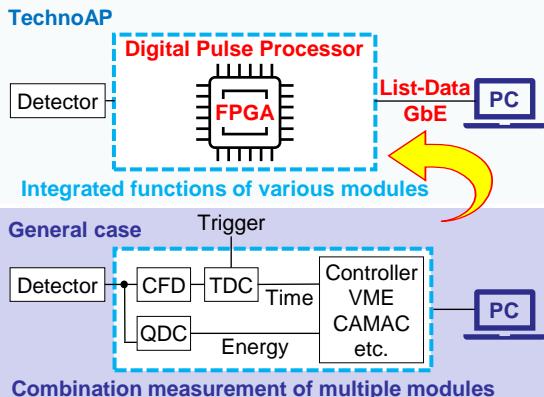# Digital Pulse Processor

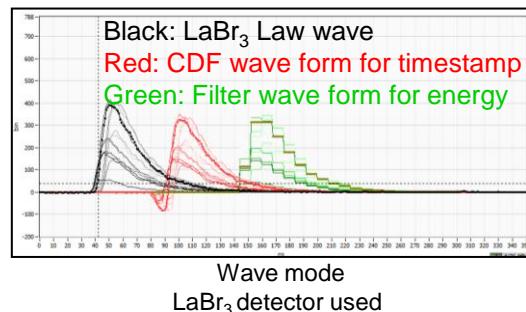**TechnoAP**

APV8108-14 — 1Gsps, Input 8ch.

VME

Features

- **ADC** — 1Gsps, 8 channels , Resolution: 14-bit
- **Time resolution** — Coarse: 1 ns | Fine: 3.9 ps, LSB
- **Throughput** — 1Mcps and more / channel
- **Analyze more** — List(TDC+QDC), Wave, Histogram
- **Functions** — (digital)CFD, TDC, QDC, PSD, **List-Wave** [1] **Coincidence** [1]
- **Communication I/F** — TCP/IP, Gigabit ethernet
  - Data transfer: 10MByte (Gigabit) / second more
- **Usage example** — Multi channel system using plastic scintillator
  - Multi channel system using scintillators and wire chamber etc.

[1] Addition of options, specification change is possible.

TechnoAP

Digital Pulse Processor

FPGA

List-Data GbE → PC

Integrated functions of various modules

Detector

General case

Trigger

Detector — CFD — TDC — Time / QDC — Energy — Controller VME CAMAC etc. → PC

Combination measurement of multiple modules

Wave mode
LaBr$_3$ detector used
Black: LaBr$_3$ Law wave
Red: CDF wave form for timestamp
Green: Filter wave form for energy

List data example

*TDC 1digit is 3.9 ps

| 80	15	11	0
Event#1	TDC[63..0]	CH[3..0]	QDC[11..0]
Event#2	TDC[63..0]	CH[3..0]	QDC[11..0]
Event#N	TDC[63..0]	CH[3..0]	QDC[11..0]

Usage example using multi board

List mode measurement
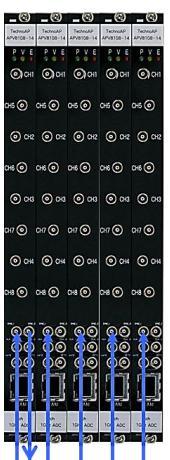
Connect Sync-CLR of board #0 to other Sync-CLR-I

List-Com mode measurement

NIM-CLR or Fast-Signal

*Option
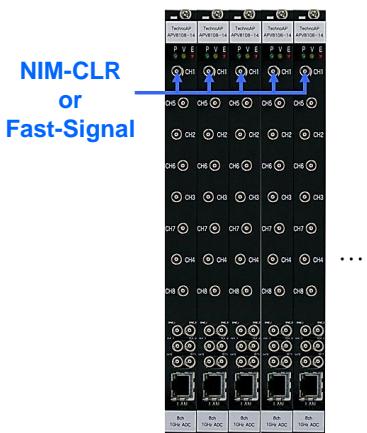
Repeated CLR is entered, and when measuring the time difference spectrum from T_0, input CLR to CH 1 of each board.
Use a fast rise signal such as NIM.
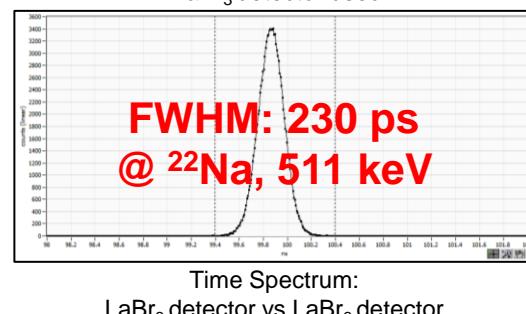
FWHM: 230 ps @ ^{22}Na, 511 keV
Time Spectrum:
LaBr$_3$ detector vs LaBr$_3$ detector
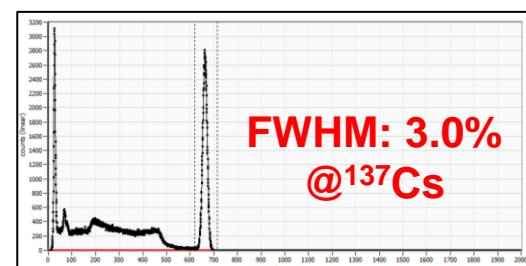
FWHM: 3.0% @^{137}Cs
Energy Spectrum
LaBr$_3$ detector used

*Images is for illustration purpose.
*Please note that contents may change without prior notice.