

# quadADC

The **quadADC** is an Embedded Linux based high performance ADC and multi-channel analyzer. It connects to the 0-10 V unipolar signal coming from the main amplifier, analyzes the signal using a 1  $\mu$ s sliding-scale ADC and stores the events in a pulse-height spectrum with up to 65536 channels.

The **quadADC** connects to the PC using Ethernet (TCP/IP) and USB. Due to the TCP/IP protocol used the quadADC can be connected locally but also over the Intranet or Internet allowing an arbitrary distance between PC and detector.

The **quadADC** also features external start/stop inputs, several sample changer inputs and outputs (TTL), USB-Host and RS-232 interfaces for external instruments control and supports several trigger signals.

The **quadADC** not only offers PHA acquisition but also list and multi spectrum scaling modes. In list mode, the data includes a time stamp (0.5  $\mu$ s timer resolution) which can be used to detect coincidences between several detectors when analyzing the data.

The list-mode based architecture also makes it possible to acquire spectra for gate/PUR anticoincidence and gate/PUR coincidence simultaneously.



## Housing

- ▶ 2U wide NIM module, 221.3 x 68.7 mm
- ▶ Power supply over NIM rack

## Front panel connectors and LED's for each input

- ▶ Signal input (0-10 V, positive)
- ▶ Busy input for dead time correction (3.3 V TTL, 5 V tolerant)
- ▶ Gate / Pile-up rejector input (3.3 V TTL, 5 V tolerant)
- ▶ Green LED indicating correct functioning
- ▶ Yellow LED blinking shortly for each event detected
- ▶ Red LED indicating a running acquisition
- ▶ Common for all inputs

## PC Connection

- ▶ USB client (USB-B) and Ethernet (RJ45) interface

## Back panel D-SUB37 connector containing

- ▶ 4 Trigger inputs (status changes of these inputs will be inserted into the data stream)
- ▶ 4 secondary gate inputs
- ▶ 8 Sample changer outputs
- ▶ 8 Sample changer inputs
- ▶ Serial interface (RS-232) for debugging purposes
- ▶ Additional serial interface reserved for special applications

- ▶ USB host connector (USB-A) useable for HV control, amplifier control or for special applications. (e.g. spectrum storage on an USB stick)
- ▶ Standard NIM power connector

## Acquisition modes

- ▶ PHA acquisition, external start/stop available, spectrum size 256-65536 channels software selectable
- ▶ List mode: The raw channel data will be stored. Each event will have the real time associated. The timer resolution is 0.5  $\mu$ s.
- ▶ Multi-spectrum-scaling mode: This mode is implemented based on the list mode and the WinnerScan software. The events are sorted in different time slices after some external start event. The durations of the time slices are multiples of 0.5 $\mu$ s, the number of time slices is practically unlimited. This mode is useful in decay studies.

## Conversion time

- ▶ 1  $\mu$ s

## Maximum data rate

- ▶ > 100000 counts/sec per inputs
- ▶ > 250000 counts/sec cumulated

## Software compatibility

- ▶ Compatible with InterWinner
- ▶ Example programs and drivers available for Windows and Linux

## Power consumption

- ▶ 1000 mA at +6 V
- ▶ 200 mA at -12 V



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