

Quad MCA with 32k ADC resolution.

Fast signal conversion with more than 1 Million events per sec on each input.



1-4 - input MCA with 32k resolution, > 1 M events / sec on each channel, MCS mode, RTC (option). Scope mode for monitoring input signal wave forms.

Description:

The MCA4 series is a family of USB-connected, software controlled Multichannel Analyzers. The design is capable of converting incoming analog pulses (PHA mode) on up to 4 channels at virtually no conversion induced dead-time. PHA data is transferred via the USB 2.0 interface

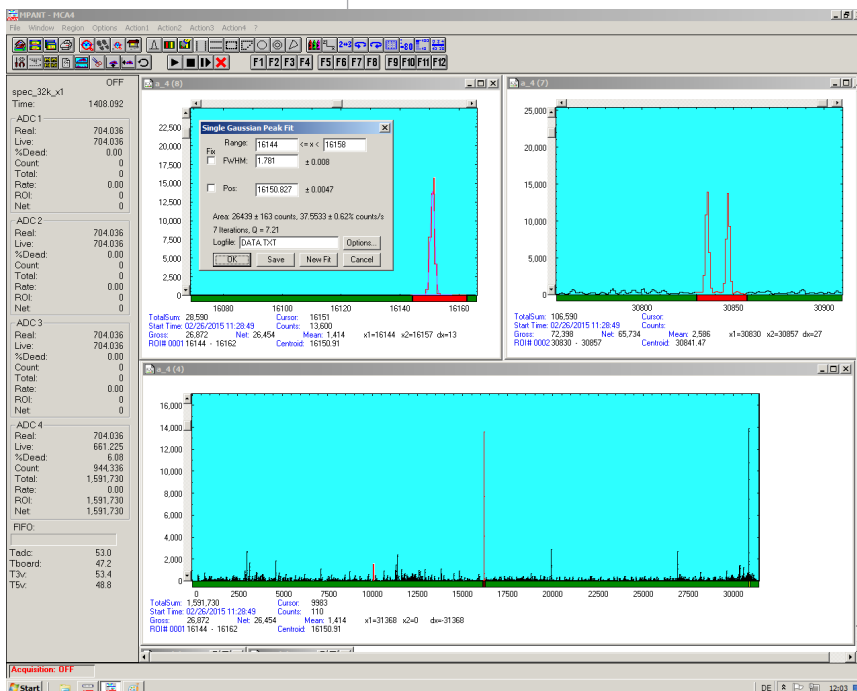
in list-mode at a max. rate of > 1 M events / sec on each input. Four continuously every 8 ns sampling 16 bit ADCs with **extraordinary stability** enable **32k resolution** for PHA mode. In MCS mode the internal memory is used to accumulate spectra of up to 16M bins. An automatic sequential mode allows to acquire up to 65536 sequential spectra – each with a pre-settable number of sweeps – with no dead-time between each cycle or synchronized with external signal. The maximum count rate is 400 MHz, dwelltime is ≥ 30 ns for one STOP input or ≥ 50 ns for two STOP inputs.

An 8 bit digital I/O port provides controlling external devices or to react on additional external signals. It can be used as 8 TAG bits that are sampled with 2.5 μ sec.

The "GO-LINE" compatibility allows to synchronize start and stop of the experiment across many measurement devices.

The 32 bit or 64 bit MPANT Windows Software is able to handle 6 MCA4 providing up to 24 MCA channels. In-field upgrade options enable upgrading of MCS mode, more MCA channels, 8 ns RTC time tagging, and multiparameter coincidences for 2 or 4 ADCs including Replay of list files.

Pulsar test spectrum @ 32k resolution. Expanded view shows lines with width of ~ 2 ch FWHM.

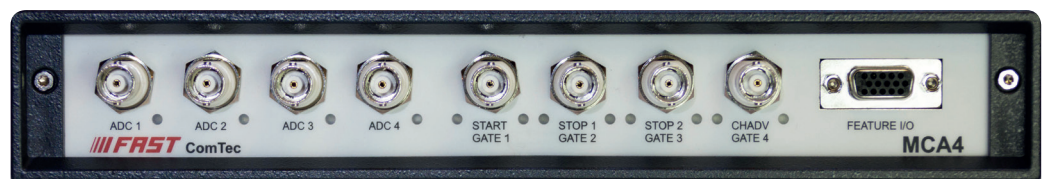


Applications:

- Nuclear- and X-ray spectroscopy
- LIDAR
- Mössbauer Spectroscopy
- Dynamic Desorption Studies
- Cross-correlation measurements
- Scanning Mass Spectroscopy
- Fluorescence Lifetime Studies
- Time-correlated Single Photon and Ion Counting
- Laser induced chemical reactions
- Portable Spectrum Analysis
- Setup of experiments in High-Energy Physics
- OEM-applications
- Remote Spectrum Acquisition

Features

- Complete versatile MCA data acquisition system
- Several operating modes:
 - PHA (pulse height analysis) using 1 to 4 inputs
 - SVA (sampled voltage analysis) mode
 - SCOPE mode using 1 to 4 inputs (32...262µs)
 - FFT mode using 1 to 4 inputs (0...62.5MHz)
 - Simultaneous SCOPE / FFT / PHA usage
 - MCS (multichannel scaling) using 1 or 2 inputs
- 4 on board 125MHz sampling, virtually dead-time-less pulse height analyzing 16 bit ADCs
- > 1 M PHA events per second on each channel
- ADC resolution 32k/16k(64k), optional 2k, 4k, 8k
- 4 ADC buffer memories allow storage of up to 8 analogue pulses (depending on pulse widths) each providing virtually dead-time-less data acquisition
- Several optimized pulse height analysis fitting algorithms (absolute maximum, for Gaussian pulses, for flat-top pulses, future kinds optional)
- ADC input range switchable (0...+10V or ±5V) (optional 0...+8V or ±4V ranges)
- GATE inputs and SCA outputs
- Easy experimental setup due to simultaneous-SCOPE, FFT, PHA data acquisition possibility
- Digital stabilizer for gain and zero stabilization
- Sum spectrum shifted according to individual calibrations enables forming a super-detector
- MCS mode offers two inputs with programmable (fast/slow NIM, rising/falling edge) discriminators
 - Maximum MCS count rates of 400MHz
 - Dwell time from 30ns for 1 input and 50 ns for 2 inputs up to 781 h in steps of 10 ns or external
 - No dead-time between channels, no double counting, no end-of-sweep dead-time
 - Automatic sequential mode for up to 65536 sequential MCS spectra
 - On board MCS memory (16M x 32bit)
- 8 bit digital I/O lines can be used as 8 TAG bits, sampled with 2.5 µsec
- 4 Single Channel Analyzer (SCA) outputs, software programmable for several SYNC signals
- GO-LINE compatible with other FAST products
- Available in various configurations, options and firmware in-the-field upgradable
- 1 ms real time clock (RTC) tagging standard,
- 8 ns RTC optional for each ADC
- Dualparameter coincidence mode optional
- Four parameter coincidence mode including Replay of list files optional



Mode	BNC 1	BNC2	BNC3	BNC4	BNC5	BNC6	BNC7	BNC8	Description
MCA: (PHA)	ADC1 pulse input	ADC2 pulse input	ADC3 pulse input	ADC4 pulse input	Gate 1 Input	Gate 2 Input	Gate 3 Input	Gate 4 Input	multichannel analyzer pulse height analysis
SVA:	ADC1 voltage input	ADC2 voltage input	ADC3 voltage input	ADC4 voltage input	Sample 1 trigger	Sample 2 trigger	Sample 3 trigger	Sample 4 trigger	sampled voltage analysis
Scope mode	ADC1 pulse input	ADC2 pulse input	ADC3 pulse input	ADC4 pulse input	Ext. Trigger			-	display of digitized signal wave form
MCS:	-	-	-	-	START	STOP 1	STOP 2	CHADV	multichannel scaling



Specifications

PHA (SVA) mode:

ADC: 4x 125MHz continuously sampling, Software programmable ULD, LLD and THRESHOLD

ADC inputs: 4x BNC, $Z_{IN} > 1k\Omega$, 0...+10V / $\pm 5V$ range (0...+8V / $\pm 4V$ optional)

GATE input: 4 x BNC, $Z_{IN} = 50\Omega$ or $Z_{IN} = 4.7k\Omega$ pullup (+3.3V) or pull-down, (TTL), coincidence or anticoincidence in Gate mode, +/- edge sensitive when used as sampling input for **SVA**

Memory: 32k ADC sample buffer memory (segmentable in up to 8 segments) for virtually dead- time-less pulse height analysis (each input)

List-mode storage of analyzed PHA data

Max. rate: > 1 M events per sec on each input without loss

Time Tags: Each input pulse tagged with 1ms or **RTC** with 8ns time resolution (option)

Real- / Live-Time / Event counter: 1 ms resolution, presettable, one for each input channel

8 bit digital I/O lines: external control / sample-changer, status
Optional as 8 TAG inputs, sampled with 2.5 μ sec.

MCS mode:

MCS inputs: START, STOP 1 & 2, Channel Advance MCS inputs: 4x BNC, $Z_{IN} = 50\Omega$ or $Z_{IN} = 4.7k\Omega$ pull-up (+3.3V) or pull-down, fast NIM (-300mV) or slow NIM / TTL (+1.3V) thresholds, 400 MHz max

On board histogramming memory: 16M x 32bit

Dwell time modes: software selectable internal, or external channel advance

Dwell time / bin: 30 ns for 1 and 50 ns for 2 inputs...781h settable in steps of 10 ns. ($2^{48} \times 10$ ns)

Dead-time between time bins: zero

End-of-sweep dead-time: 10ns

Spectrum length: up to 16M time bins

Sweep Counter: 48 bit, presettable

Sequential mode: 1...65536 spectra with no dead- time between each cycle or synchronized with external signal

8 bit digital I/O lines: for external control / sample- changer, status

Connectors:

Analog signal inputs: 4x BNC

GATE / MCS inputs: 4x BNC

FEATURE I/O: 15 pin high density, female D- SUB (Analog Ground, 8 bit Digital I/O, GO-Line, 4x SCA)

12V Supply: 2.1mm center pin (rear panel)

USB 2.0: rear panel) Type A

Power Requirements:

+11...+14V / 12W power supply enclosed

Physical: aluminum case, 260mm x 48mm x 275mm, 1.7 kg

Shipping case:

420mm x 320mm x 290mm, 4 kg

Order Information

Model	Description	Order No.
MCA4	Multichannel Analyzer (4ch) + dual fast MCS, int. ADC (32k), MPANT Software	MCA4
MCA4M2	2 channel multiparameter version, 2 ADC inputs, incl. 2 RTC, Replay, MPANT Software	MCA4M2
MCA4M4	4 channel multiparameter version, 4 ADC inputs, 4 RTC, Replay+Ex, MPANT Software	MCA4M4
MCA41	Multichannel Analyzer (1ch), int. ADC (32k), MPANT Software	MCA41
MCA42	Multichannel Analyzer (2ch), int. ADC (32k), MPANT Software	MCA42
MCA43	Multichannel Analyzer (3ch), int. ADC (32k), MPANT Software	MCA43
MCA44	Multichannel Analyzer (4ch), int. ADC (32k), MPANT Software	MCA44
MCS4	2ch fast MCS, 30 ns dwell time, MPANT Software	MCS4
MCA4MCS	2ch fast MCS, 30 ns dwell time option MCA4-x, included in MCA4	MCA4MCS
MCA4TAG	Option TAG input, 8 bit, stored with ADC data, sampled with 2.5 μ sec (FEATURE I/O)	MCA4TAG
MCA4RTC	Option RTC 8 ns for one ADC channel	MCA4RTC
MCA4S1	DLL for LabVIEW, "C", Visual Basic	MCA4S1
MCA4S2	LINUX Driver for MCA4 family	MCA4S2
MCA4S4	Multi parameter software for 2 channels	MCA4S4
MCA4S5	Multi parameter software for 4 channels	MCA4S5
MCA4S3	Replay software for MCA4 incl. Dongle	MCA4S3