

Model 7072 Dual ADC ADC / SVA



FEATURES

- Two individually selectable modes of operation for each input channel:
 - ADC mode with 500 ns Fixed Conversion Time
 - ADC/SVA (Analog Sampled Voltage Analysis) mode
- Full 8k Conversion Gain and Range
- Dual 10-LED Indicator bar for Instantaneous Dead-Time display, level setting
- Lower Level and Upper Level Discriminator on each ADC input
- Two modes of operation independently selectable for each input channel: Pulse Height Analysis with automatic peak detection and Analog Input Sampling selectable by frontpanel switch
- Single-Channel Analyzer Output
- Designed for easy interfacing to our MCA-3, the SPA-3 and MPA-3 Systems but also MCA's from other manufacturers (special cable and external ADC interface required) and Computers

In the SVA mode a voltage level or waveform can be sampled when a gate signal is applied.



DESCRIPTION

The Model 7072 is a unique dual channel device that can operate either as an ultra fast analog-to-digital converter with a fixed conversion time of 500 ns*, or an analog SVA. Each channel has its own ADC and will operate independently of the other ADC channel. The design is optimized for a short conversion time, excellent stability and high data throughput.

The 7072 is ideally suited for applications requiring very high counting rates.

The built-in Single Channel Analyzer has a separate output on the front panel. This output can be used in the ADC (pulse-height-analysis) mode.

The built-in Single Channel Analyzer has a separate output on the front panel. This output can be used in the ADC and SVA mode.

*) Conversion time of ADC. For dead time calculation add time-to-peak and 100 ns transfer time to data buffer

Model 7072 Rev3 21062003



SPECIFICATIONS

INPUTS (front panel)

Signal Inputs: BNC-Connector accepts +25mV to +10V (standard / +8V optional) linear pulses, $Z_{in} = 1k \text{ Ohm}$, risetime: $\geq 100\text{ns}$ to $100\mu\text{s}$, fall time: 200ns to $100\mu\text{s}$ (optimized for gaussian shaped pulses with shaping times from 250 ns to $25\mu\text{s}$, dc coupled or a varying voltage level when used in SVA mode).

Gate/Start inputs: BNC-Connector accepts positive TTL for the Gate mode

OUTPUTS (front panel)

SCA: TTL output in PHA and SVA mode (TTL pulse of approx. $0.5\mu\text{s}$ duration. One output pulse for each input signal that falls between the ULD and LLD setting),

Outputs monitor levels in adjustment mode

OUTPUTS (rear panel)

Data: 13 bit binary data lines and data transfer commands, 25-pin female D-Sub-connector.

Front Panel Controls by Mode Select push-button

Conversion Range: Push button switch selects quantization of 256, 512, 1k, 2k, 4k, or 8k channels for full scale input.

Coincidence/Anticoincidence: Push button switch selects COINCIDENCE/ANTICOINCIDENCE mode

LLD: adjustment by up/down pushbutton sets the lower level discriminator. The voltage is displayed on the DEADTIME/LEVEL LED indicator and output on the monitor connector for precise adjustment

ULD: adjustment by up/down pushbutton sets the upper level discriminator. The voltage is displayed on the DEADTIME/LEVEL LED indicator and output on the monitor connector for precise adjustment

Front Panel Mode Controls

PHA: Pulse Height Analysis mode.

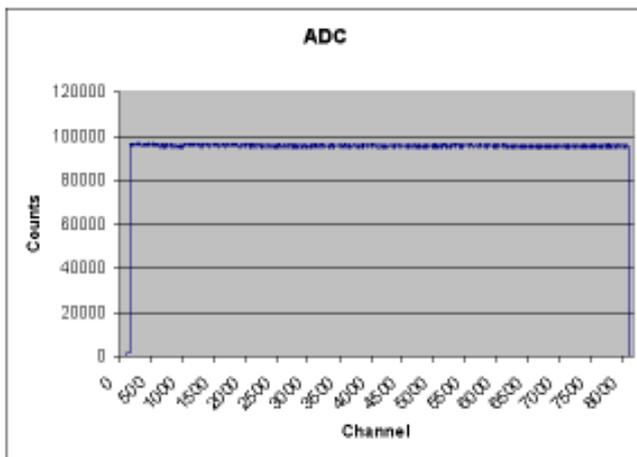
SVA: Analog Sampled Voltage Analysis

Indicators

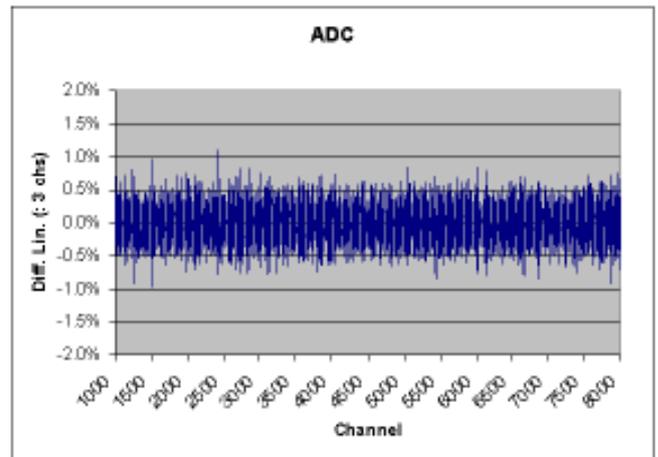
DEADTIME/LEVEL: Dual 10 LED-bar indicates activity of the ADC. Range 0 to 100% deadtime or actual voltage level indication of ULD and LLD setting

RANGE/MODE: ADC range 256 to 8k in binary steps

ADC Performance	Conv. Range	
	4k	8k
Resolution: 500 ns flattop pulses		$\leq 3.4 \text{ chan FWHM}$
Integral Nonlinearity lin. fit, top 99% of useable ch.	+/-0,16% typical	+/-0,16% typical
Differential Nonlinearity incl. Effects of int.NL	+/-0,7%	+/-1,1%
Differential Nonlinearity for 99% of useable channels	+/-0,5%	+/-0,7%
Counting Rate Capability with MCD-2 MCA	$> 1.000.000 \text{ events/s}$	
Peak shift up to 700 kcounts/s SVA mode		+/-0,006%
Peak shift up to 1.000 kcounts/s SVA mode		+/-0,08%
Unused channels	approx. Top 1% of range	



PHA, typical noise spectrum



ADC, typical differential linearity plot

PERFORMANCE

Conversion Time: 500 ns fixed conversion time

ADC Deadtime: time-to-peak + 500 ns fixed conversion time + data transfer time of 100 ns to buffer (there could be an additional dead time if the MCA can not accept the data rates generated by the 7072T - this depends on MCA used)

Typical ADC deadtime for fast rising input pulses is less than 2 μ s per event using FAST ComTec MCA's

Gain stability: better than 50 ppm/ $^{\circ}$ C

Baseline stability: 50 μ V/ $^{\circ}$ C

General

Temperature range: 0 $^{\circ}$ C to +50 $^{\circ}$ C storing

Power Requirements

+24V, 100mA, -24V, 90 mA, +12V, 150mA, -12V, 200 mA, +6V, 700mA, -6V, 430 mA

Physical

Size: single width NIM module (1.35 x 871 inches; 3.43 x 22.13 cm) as per TID - 20893 (rev.)

Shipping weight: 1.8 kg (net 1.0 kg)