

Model 7070

Analog-to-Digital Converter

FEATURES

- Wilkinson ADC with 100 MHz clock rate
- Full 8k Conversion Gain and Range
- Digital Offset in 256 channel increments
- Instantaneous Dead-Time display
- Lower Level and Upper Level Discriminator
- Pulse Height Analysis with automatic peak-detection
- Simultaneous Single- Channel Output for Mössbauer Experiments
- Designed for easy interfacing to Computers

DESCRIPTION

The model 7070 is a Wilkinson-type Analog-to-Digital Converter with a 100 MHz clock rate. The 7070 is ideally suited for applications in nuclear- and X-ray Spectroscopy. The upper- and lower-level discriminator has a separate output on the rear panel. This output can be used as a Single-Channel Analyzer in such applications as Mössbauer Spectroscopy.

SPECIFICATIONS

INPUTS (front panel)

Signal Input: BNC-Connector accepts +25mV to +8V (standard / +10V optional) linear pulses, $Z_{in} = 1k \text{ Ohm}$, risetime: > 100ns to 100 μ s, fall time: 200ns to 100 μ s, 0.5 μ s flat top width, dc coupled.

Gate: BNC-Connector accepts positive TTL

OUTPUTS (rear panel)

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

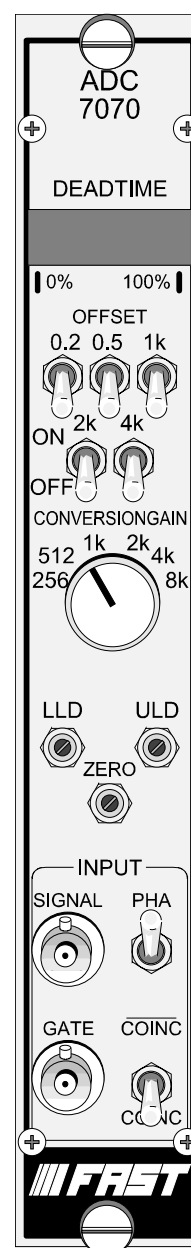
SCA-output: BNC-connector, TTL pulse approx. 0.5 μ s duration. One output pulse for each input signal that falls between the ULD and LLD setting.

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Front Panel Controls

Offset: Digital Offset, range 0 to 8k in steps of 256 channels.

Conversion Gain: Six position rotary switch selects



Front Panel Controls

Offset: Digital Offset, range 0 to 8k in steps of 256 channels.

Conversion Gain: Six position rotary switch selects quantisation of 256, 512, 1k, 2k, 4k, or 8k channels for full scale input. Data is compressed to 8, 9, 10, 11, 12 and 13 bits.

LLD: Precision potentiometer sets the lower level discriminator.

ULD: Precision potentiometer sets the upper level discriminator.

Zero: Precision potentiometer sets the "zero" level from 0 to +/-200mV.

PHA: Pulse Height Analysis mode.

Coinc/Coinc: Toggle switch selects coincidence or anticoincidence mode.

Indicators

DEADTIME: LED-bar indicates activity of the ADC. Range 0 to 100% deadtime

PERFORMANCE

Conversion Time: $(1.0 + 0.01N)$ μ s, where N is the channel address generated by the 7070 ADC (including digital offset)

ADC Deadtime: time-to-peak + 1 μ s + conversion time.

Typical ADC deadtime using a Gamma-spectrum containing I-131, Ru-103, Cs-137 and Cs-134g measured with a Germanium detector:

Conversion Gain Average deadtime/conversion

1024	3,7 μ s
2048	7,1 μ s
4096	13,9 μ s
8192	27,4 μ s

Integral non-linearity: less than +/-0.05% of full scale over top 99% of selected range.

Differential non-linearity: less than +/-0.75% over top 99% of selected range.

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

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

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

Power Requirements

+24V, 80mA, -24V, 120mA, + 6V, 600mA, -6V, 20 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: 1.2 kg (net 0.8 kg)