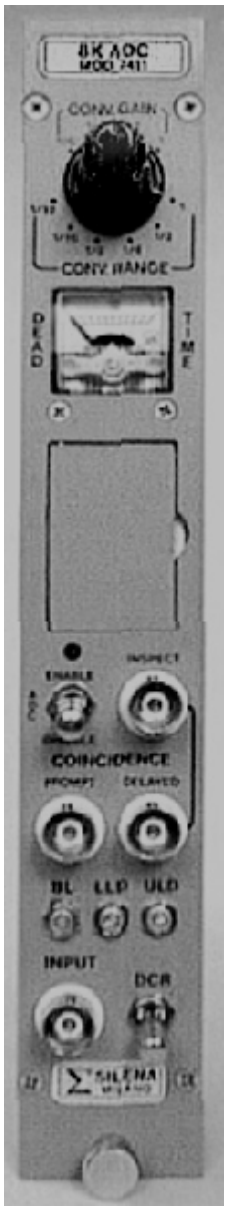
Model 7411 Analog-to-Digital Converter

The Model 7411 is a Wilkinson-type analog-to-digital converter ideally suited for applications in nuclear and X-ray spectrometry.
It is intended to offer the ultimate in resolution, stability and linearity to meet the most sophisticated requirements of today's nuclear scientists. The Model 7411 is compatible with SILENA MCAs and with many existing data processing systems.



- Input ranging from 20 mV to 8,2 V
- Conversion gain selection of 1024, 2048, 4096 or 8192 channels full scale
- Input: either DC or through a passive DC restorer
- 100 MHz clock rate
- Digital backbias
- Rise Time protection or peak detector mode
- Fixed or variable dead time
- Dead time displayed on meter
- Lower level and upper level discriminators
- Two inputs available for spectra stabilization (zero line and gain)
- Single-width NIM standard module
- Polarity Positive or bipolar (positive portion leading)
- Range 20 mV to 8,2 Volt into 1000 W
- Rise Time 50 ns to 31,5 mS (longer on request)
- Fall Time 50 nS to 200 mS
- Top width 0,5 mS
- Input mode DC Coupling; passive DC Restorer Sampling
- Conversion mode Rise Time Protection or Peak Detector RTP switch-selectable from 0,5 to 31,5 mS in 0,5 mS steps

PERFORMANCE

- Integral non-linearity 0.025% over 99.5% of range measured with 2 msec flat top pulses
- Integral non-linearity: 0.035% over 99.5% of range measured with 0.5 msec flat top pulses
- Differential non-linearity ± 0.3% over 99.5% of range
- Gain stability 0.002% °C
- Baseline stability 100 mV/°C
- Conversion rate 100 MHz crystal-controlled
- Count rate shift (in D.C. input mode) Less than 1/2 channel at rates of 50 KHz

DEAD TIME

- Variable (1,28+0.01 N) mS where N=address generated for a given amplitude (N includes digital backbias selection, if any)
- Fixed 84 mS with Conversion Gain in "8k", 43 mS with Conversion Gain in "4k", 22 mS with Conversion Gain in "2k" and 12 mS with Conversion Gain in "1k"
- System dead time RTP or Time to Peak + Conversion Time + Processor Storage Time

FRONT PANEL CONTROLS

- Conversion Gain Four-position rotary switch selects full scale resolution of input signal. Selections of 8192-4096-2048 or 1024 channels for 8,2 V input signal
- Range (Digital Overflow): Six-position rotary switch selects 8192-4096-2048-1024-512 or 256 addresses full scale for storage
- Digital Backbias Five-position dip switch provides digital backbias from 256 to 7936 channels in steps of 256 channels
- Dead Time Two-position internal switch selects variable dead time or fixed dead time
- Coincidence Ready and delayed coincidences or anticoincidences can be used simultaneously. The coincidence delay is selected by means of the “Rise Time Protection” switch. Pulse or DC level requirements:
  False OV<VF<0,5V
  True 2V <VT<5V

- Two internal switches are provided to select coincidence/anticoincidence. To facilitate use of the ADC in the "Multiparameter Coincidences" mode, two additional lines are provided:
  Conversion Status Output Line (Optional): indicates that a conversion has resulted from a coincidence or an anticoincidence
  Coincidence Override Input Line: if TRUE permits conversion of a pulse even in the absence of prompt or delayed coincidence or anticoincidence signals. If this occurs, the "Conversion Status line remains FALSE.
- L.L.D. (Lower Level Discriminator): Twenty-turn potentiometer sets minimum input amplitude acceptance level; continuously adjustable from 20 mV to 8,2 V
- U.L.D. (Upper Level Discriminator): Twenty-turn potentiometer sets maximum input amplitude acceptance level; continuously adjustable from 8.2 V to 20 mV
- Conversion Mode: At peak detection or end of Rise Time Protection, selectable by means of a two-position dip switch
- RTP: Six-position dip switch selects RTP from 0,5 mS to 31.5 mS in steps of 0.5 mS. This allows considerable delayed coincidence to be achieved even if short pulses are being analysed.
- Base Line (Zero Energy Intercept): Twenty-turn control varies the "zero level" from 0 to 200 mV
- ENABLE-DISABLE: An appropriate switch is provided on the front panel. When set to "ENABLE" the lamp is lighted.
- Single Channel Analyzer: The pulses falling within the window of variable width selectable by appropriate adjustment of the lower and upper level discriminators generate a pulse available at the rear-panel connector having the following characteristics:
  FALSE: 0 V
  TRUE: 5 V
- Open collector TTL output with 1k pull
- Pullup resistor to +5V

POWER REQUIREMENTS

Positive	24V; 0.16A
Negative	24V; 0.13A
Positive	6V; 0.35A
Negative	6V; 0.48A

DC Voltages as per Standard Nuclear Instruments Modules TID 20893 (Rev. 2,Jan. 1968) Because of the high density circuit package, ample air flow must beassured to provide adequate cooling as specified in "Standard Nuclear Instruments Modules" (Rev. 2, Jan. 1968-page 7-point 5)

PHYSICAL DIMENSIONS

Single-width NIM standard module
Weight 1.1 kg.