

Target U100

Technical Data

Page - 1/3

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Website

<http://target-sg.com>

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Fully Integrated Ultra High Speed PMT-Base for Scintillation Detectors

General Description

The Target U100 is the most advanced digital tube base for a variety of scintillator based radiation measurement applications. It provides outstanding performance in single detector monitoring applications as well as in highly sophisticated multi-parameter settings. Two high precision 310 MHz ADCs digitize both anode and dynode signals with 14 bit resolution. The unique design allows for digital signal processing accuracy and features which have not been available in conventional systems. Thus a dynamic range of 1:1,000,000, e.g. 100 eV to 100 MeV, can be achieved with a single detector attached. The timing accuracy with external triggering is in the picosecond range. Time tagged events are transferred as list mode data over the Gigabit Ethernet connection at more than 1 million cps throughput.

A ground breaking patented gain stabilization works without LEDs or radioactive sources. It compensates for PMT temperature effects as well as high count rate shifts. The onboard dual core ARM processor runs the built-in browser based MCA software package. No external drivers or other software packages are required. Any web browser application connected via Ethernet is sufficient. The Target U100 comes with a HTTP REST interface for state of the art integration into third party application software and larger multi-parameter system structures.



Target U100

Technical Data

Page - 2/3

Features

Supports fast and slow scintillator materials
($\text{Cs}_2\text{LiYCl}_6$, CeBr_3 , $\text{LaBr}_3(\text{Ce})$, $\text{NaI}(\text{Tl})$, PVT, etc.)

Ultra high speed digital signal processing with up to 2 x 310 MHz sampling rate

Gbit PoE Ethernet interface

Network accessible embedded MCA software

Picosecond timing resolution

List mode data acquisition

Novel gain stabilization (patents pending)

Easy system integration by HTTP REST interface

Positive or negative detector supply, up to 1500 Volt

8 - 10 dynodes support

Configurable voltage divider chains

Performance

Energy range (Gamma)	10 keV - 20 MeV (CeBr_3)
Linearization	Real-time linearization of gamma energy
Spectrum length	512, 1024, 2048, 4096, 8192 channels
Typical resolution at 662 keV with NaI detector at 20 °C	6 % - 8 % FWHM
Max throughput in PHA mode	>1000 kcps (CeBr_3)
Max throughput in List mode	>1000 kcps (CeBr_3)
Integral non-linearity	<0,01%
Differential non-linearity	<0,02%
Dead time accuracy	<1 % up to 100k cps
Detector high voltage	0 - 1500 V in steps of 0,05 V
Offset drift	<5 ppm/°C
Gain drift	<50 ppm/°C
True triangular shaping time	50 ns - 50 μs
Timing accuracy (Sigma)	<100 ps for CeBr_3 @ 1 MeV



Target U100

Technical Data

Page - 3/3

Presets	Livetime	0 - 10 ¹⁰ s in 10 ns increments
	Realtime	0 - 10 ¹⁰ s in 10 ns increments
Physical	Dimensions	Ø 64 mm x 156 mm (Ø 2,5" x 6,1")
	Weight	≤ 600 g
	Housing material	Aluminum, anodized
Environmental	Operating temperature	10 °C - 35 °C (50 °F - 95 °F)
	Storage temperature	5 °C - 50 °C (40 °F - 120 °F)
	Relative humidity	10 – 80 %, non condensing
	Protection rating according to IEC 60529	IP10
Power Supply	PoE (power over Ethernet)	48 V
	Typical power consumption	5 W
	Maximum power consumption	PoE Class 3
Input/Output	Socket	B14A Diheptal socket for 2" PMT base
	Network	1 Gbit Ethernet
	Sync	Digital input with Schmitt-Trigger for external clock signal
	Analog	Output for amplified detector signal or input for additional external detector signal
	D-Out	Digital trigger output
	D-In	Digital input for coincidence and gating