SDIG60 single board.

The SDIG60 single module is specially designed as spectrometric amplifier. This module has gain 60 dB, zero pole, differential and integration circuits (fig.1,2). The timing of circuit has been choused for best signal to noise resolution for specific application with CA05 preamplifier. The spectrometric chain CA05 preamplifier and SDIG60 give equivalent noise about 200 electrons. Input equivalent noise of shaper for 3us (integration) and 3us (differential)) signal time constant is less than 7 uV.

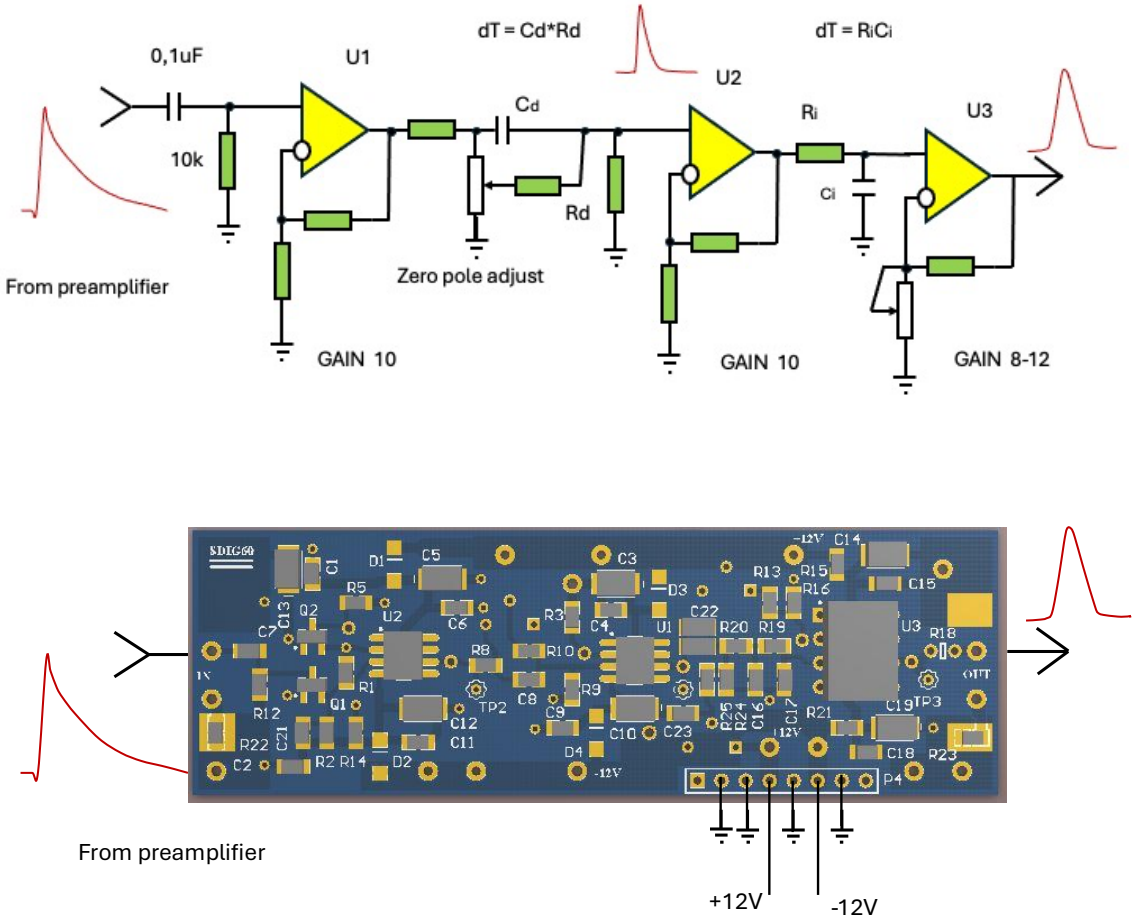

Fig.1 Circuit block diagram.

The module SDIG60 can be used in different applications where the signal to noise resolution is important parameter. The pole-zero cancellation with different timing to shape of input signal permit use this module board in energy spectroscopy with different detectors of particle measurement.

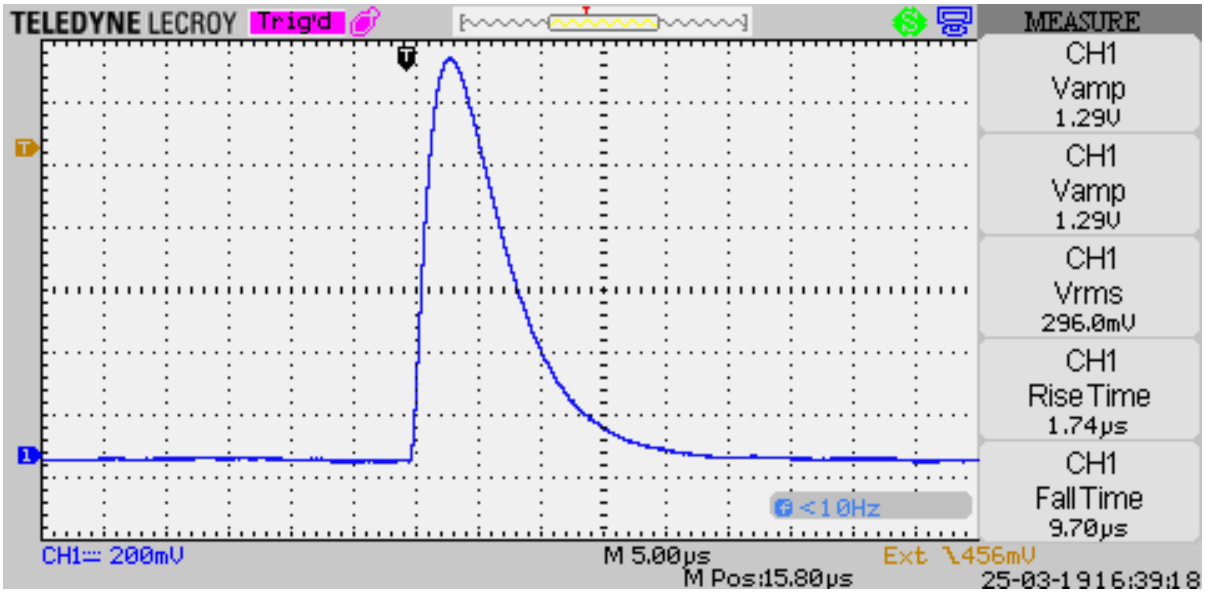

Fig.2. Waveform of output signal.

There are 3 trimmers on the SDIG60 board:

1. Trimmer R11 is pole-zero cancellation resistor.
2. Trimmer R7
3. adjust gain value +/- 20 %.
4. Trimmer R26 adjustment of output voltage offset.

Table 1. Pinout of connector P4.

Pin	Description
1,8	NC
2,3,5,7	GND
4	+12V
6	-12V

PERFORMANCE

INPUT AMPLITUDE RANGE	Maximum input range 0 to ±30mV; positive or negative polarity; input amplitude; protected to ±6 V dc; impedance 10 k**Ω**, DC coupled. The range can be changed according to custom request).
OUTPUT AMPLITUDE RANGE	Unipolar non inverted. Amplitude of output signal 0 to ±10 V (without termination). Output impedance Zo = 100 **Ω**. Output Offset voltage less than +/- 2 mV. The output can be terminated to 50-**Ω** load.
NOISE RMS	less than ≤ 7 μV.
RISE TIME	1,9 us.
FALL TIME	9,8 us.
NONLINEARITY	≤±0.05% not over ±10 V range. Variation of nonlinearity in over range signal is less then 0,1%.
TEMPERATURE INSTABILITY DC	Level ≤±25 μV/C referred to the output (in range 0 to 50°C).
COARSE GAIN	1000.
FINE GAIN	+/-20% by 25 turns trimmer.
GAIN STABILITY	less then 0,01 %/C in full range.
POLE ZERO ADJ	25-turn Trimmer. Adjustment to compensate for the preamplifier decay time constant from 25us to ∞.
Output Offset ADJ	14-turn Trimmer.
TIME CONSTANT	Two stage integrate RC time constants - 3 us. Differentiate RC time constant - 3 us.

Note:
The RC time can be adjusted in fabric according user request.

POWER SUPPLY REQUIREMENTS:

Table 2.

P. Voltage (V)	Current (mA)
+12	55
-12	55

DIMENSIONS:

85x28x1,6 mm

WEIGHT:
Net 14,2 g.