- **Fast, low noise inverting preamplifier specifically designed for Scintillation Detectors**
- **Variable sensitivity from 0.8 to 10 mV/pC**
- **Fast output for timing measurements**
- **Test input for calibration**

The **A1424** is a preamplifier specifically designed for **Scintillation Detectors** widely used in Nuclear and High Energy Physics where low noise, fast response and high counting rates are required.

The **A1424** relies on an inverting Charge Sensitive Preamplifier which integrates both positive and negative input charge pulses coming from the Photodetector (e.g. PMT) coupled to the Scintillator.

It provides a voltage signal in the ±4 V range on 50 Ω termination (±8 V on 1 kΩ) with exponential decay (τ= 50 µs) as Energy output (ENERGY). The height of the resulting pulse is proportional to the integrated charge. The sensitivity of the Charge Sensitive Preamplifier can be set via a 10 position rotary switch ranging from **0.8** to **10 mV/pC**.

The **A1424** is provided with a non-inverting buffer (gain ~ 1) which reproduces the input signals coming from the detector as fast output being useful for timing measurements (FAST). Moreover, a test input accepts positive and negative signals for calibration purposes (TEST).

Specification

Input Sensitivities
0.8, 0.9, 1.1, 1.3, 1.5, 1.7, 2.5, 3, 5, 10 mV/pC selectable via Rotary Switch.

Rise Time
ENERGY Out < 60 ns
FAST Out < 2.3 ns

Fall Time
Energy Out 50 µs

Integral Nonlinearity
Energy Out < ±0.02%

Temperature Coefficient
±0.01% /C°

Noise (Energy Out)
Max. sensitivity (10 mV/pC) < 3.2 fC
Min. sensitivity (0.8 mV/pC) < 8.5 fC

Counting Rate
Gain shift < 0.15% on 130 mV pulses on IN input (sensitivity: 3 mV/pC), adding on TEST input 60 mV @40 kHz random pulses.

Inputs

IN
Accepts positive and negative input charge pulses from Scintillation detectors. Maximum Input Voltage: ±4 V, input impedance: 50 Ω, **LEMO-00** connector.

TEST
Positive or negative inputs for the energy calibration via Ctest = 100 pF; **LEMO-00** connector.

Power
Input Power through a 2.1 m cable with a **D-type 9 pin** male connector.

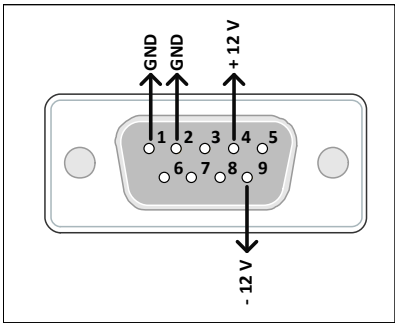

Fig. 2: Power Supply Connector pin out.

Outputs

ENERGY
± 8V (on 1 kΩ), 50 Ω back termination. The output voltage is proportional to the amount of input charge, **LEMO-00** connector.

FAST
Reproduces the input signals (gain ~ 1) coming from the detector as fast output for timing measurements. 50 Ω back termination, **LEMO-00** connector.

Packaging
Shielded Box
Dimensions: 55 mm x 25 mm x 95 mm
Weight: 260 g (with Power Supply cable)

Power Requirements
+12 V 15 mA
- 12 V 15 mA

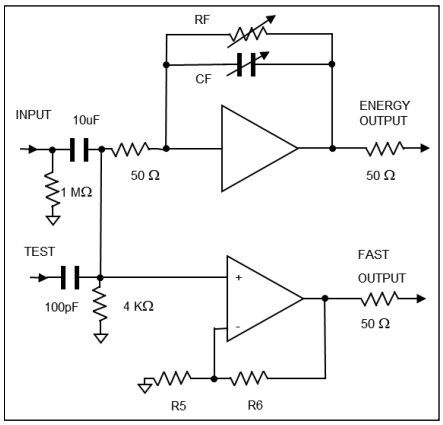

Fig. 1: A1424 block diagram.

Ordering Option

Ordering code	Description
WA1424XAAAAA	A1424 - Scintillation Preamplifier

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