



**4-channel Monopolar
Charge-Integration
Picoammeter/Electrometer**



AH401D

- **Compact high-resolution 4-channel charge-integrating picoammeter with 8 different selectable input ranges**
 - **Designed as the turnkey solution for photon BPM systems as diamond detectors, ion chambers and blade gap-monitors**
- **Designed to achieve extreme sensitivity range with the best low-noise performance for this class of instrumentation**

FEATURES

- **From 50 pA to 2 μ A full-scale current range**
- **Up to 1 kHz sampling frequency**
- **20-bit ADC conversion with noise reduction digital filter**
- **Less than 7 ppm full-scale range noise @ 200 pC**
- **4-channel simultaneous sampling**
- **Ethernet 10/100 Mbit/s connectivity**
- **Trigger Input**
- **Lightweight and compact design**
- **Oscilloscope software available**

APPLICATIONS

- **Beam Position Monitoring**
- **Ion Chambers Readout**
- **Ultra-low Current Measurements**
- **Diamond Detector Readout**
- **Radiation Monitoring**

AH401D. The AH401D is a compact 4-channel low noise picoammeter. It is composed of an extremely sensitive charge-integration input stage for low-current sensing, combined with a 20-bit sigma-delta AD converter with an integrated noise reduction digital filter.

This device is suited for very low current measurements, with 8 selectable input ranges spanning from 50 pA (with a 50-aA resolution) up to 2 μ A (with a 2-pA resolution). Integration time is user selectable and ranges from 1ms up to 1s.

Each input channel has two integrator stages so that the current-to-voltage conversion can be performed continuously

during ADC conversion, avoiding any dead time in the data output. The simultaneous sampling of the 4 independent channels make this instrument ideal for beam position monitor applications or multichannel acquisition.





The new AH401D is housed in a light and extremely compact box that can be placed close to the signal sources in order to reduce cable lengths and minimize possible noise pick-up. Low temperature drift, good linearity and very low noise allow very high-precision current measurements.

The picoammeter can be remotely controlled via a standard Ethernet 10/100 communication interface: integration time, range, data format, type of acquisition and



About Us

ELS Instruments (formerly CAEN ELS) is a leading company in the design of power supplies and state-of-the-art complete electronic systems for the Physics research world, having its main focus on dedicated solutions for the particle accelerator community and high-end industrial applications.

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-  Precision Current Measurements
-  Beamline Electronics Instrumentation
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10/100 Mbit Ethernet



Oscilloscope



many other parameters can be easily set and monitored. The AH401D has an external TRIGGER input signal in order to synchronize the acquisition of the picoammeter with external events (e.g. laser triggering).

Furthermore, digital samples can be transferred either using ASCII format or RAW binary data format for fast data transmission. The low-noise 9-V power supply is included in the package in order to guarantee all the specifications.

Technical Specifications

AH401D

Input Channels	4
Current Measuring Range	8 ranges - from 50 pA to 2 μA
Current Polarity	Positive (-0.4 % Negative is allowed)
Data rate	up to 1 ksample/s
Integration Time	from 1 ms to 1 s
Resolution	20 bit
Noise (@1 ms, 200 pC)	7 ppm/FS
Communication Interface	Ethernet 10/100 TCP/IP or UDP
I/O Signal	TRIGGER input, CONV output
Supply Voltage	9 V
Dimensions	155 x 165 x 42 mm
Weight	500 g
Input Connectors	BNC
Status Indicators	1LED



AH401D - Rear View