



4-channel Fast Interface
Bipolar Picoammeter with
Integrated Bias Voltage Source

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T e t r A M M

- The TetrAMM is a 4-channel picoammeter designed for quad monitoring applications - e.g. photon Beam Position Monitors
- 4-channel simultaneous sampling with a 24-bit Analog-to-Digital conversion resolution and 100 kHz sampling frequency
- Integrated Bias Voltage Source for detector biasing

FEATURES

- 4-channel simultaneous sampling
- Up to 100 kHz sampling frequency
- 24-bit ADC conversion
- Bipolar current ranges from ± 120 nA to ± 120 μ A - custom ranges available
- 10/100/1000 Ethernet Connectivity
- Low-noise Integrated Bias Voltage Source
- Firmware Remote Update
- External Trigger I/O and Interlock
- Auto-ranging functionality
- On-board FPGA and soft-processor computations
- SFP Link
- Compact mechanical dimensions
- Oscilloscope software available
- Compatible with BEST stabilization system

APPLICATIONS

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

TetrAMM. The TetrAMM ("Tetra AMMeter") is a 4-channel picoammeter designed for quadrature monitoring applications, such as photon beam position monitors and diamond detectors.

The device consists of a carrier board and two plug-in modules: the front-end board and the bias voltage board.

The front-end board performs analog signal conditioning and analog-to-digital conversion. Input currents range from ± 120 μ A down to ± 120 nA full scale in the standard configuration, and are simultaneously digitized with 24-bit resolution at sampling rates up to 100 kHz.

The bias voltage module, particularly designed for detector biasing applications, provides

an output of +500 V at 1 mA in the TetrAMM standard model. The bias source can be factory-configured over a wide range of voltage outputs, ranging from 5 V to 4 kV, depending on the ordering options.





The TetrAMM is housed in a light and extremely compact box that can be placed close to the detector, i.e. the signal source, minimizing cable lengths and reducing noise pickup from external sources and parasitic effects. Low-noise, high stability and excellent linearity enable very high-precision current measurements.

A 10/100/1000 Mbit Ethernet connection over TCP/IP, with SCPI-like command support, enables fast data transmission and easy integration with all major operating systems and programming environments.



About Us

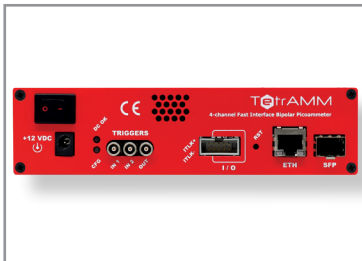
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-  Power Supply Systems
-  Precision Current Measurements
-  Beamline Electronics Instrumentation
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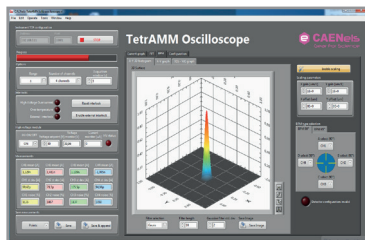
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TetrAMM - Rear View



Oscilloscope Software

Technical Specifications

TetrAMM/ WTETRAMM05PX

Input Channels	4
Current Polarity	Bipolar
Current Measuring Range	RNG0: $\pm 120 \mu\text{A}$ RNG1: $\pm 120 \text{nA}$
Current Resolution	RNG0: 15 pA RNG1: 15 fA
Analog Bandwidth	4 kHz
Data rate	up to 100 ksamples/s
Equivalent Input Noise (@ 1 ksps)	RNG0: 1 ppm/FS RNG1: 6 ppm/FS
Equivalent Input Noise (@ 100 ksps)	RNG0: 6 ppm/FS RNG1: 25 ppm/FS
Communication Interface	Ethernet 10/100/1000 Mbit TCP-IP UDP via SFP - Small Form-factor Pluggable
Temperature Coefficient	RNG0: $< 0.001 \%/FS/K$ RNG1: $< 0.002 \%/FS/K$
I/O Signals	Configurable Trigger input Configurable Trigger output External Interlock input
Additional Features	Auto-Ranging Firmware Remote Upgrade Configurable Sampling Frequency Bias Voltage Output Current/Voltage Readback Bias Voltage Overcurrent Protection
Bias Voltage Output	Bias Voltage Source 500 V @ 1 mA - standard configurable with different ordering options
Dimensions	174 x 175 x 44 mm
Connectors	BNC for current inputs SHV for Voltage Bias Source $\geq 500 \text{ V}$ BNC for Voltage Bias Source $< 500 \text{ V}$
Weight	850 g
Supply Voltage	+12 V
Status Indicators	5 LEDs

Ordering code	Range	BIAS	BW	Description
WTETRAMMNOHV	$\pm 120 \mu\text{A}$, $\pm 120 \text{nA}$	n.a.	4 kHz	4-channel Fast Interface Bipolar Picoammeter without Integrated HV Source
WTETRAMM05PX	$\pm 120 \mu\text{A}$, $\pm 120 \text{nA}$	+500 V	4 kHz	4-channel Fast Interface Bipolar Picoammeter with Integrated +500 V HV Source
WTETRAMM05NX	$\pm 120 \mu\text{A}$, $\pm 120 \text{nA}$	-500 V	4 kHz	4-channel Fast Interface Bipolar Picoammeter with Integrated -500 V HV Source
WTETRAMM20PX	$\pm 120 \mu\text{A}$, $\pm 120 \text{nA}$	+2 kV	4 kHz	4-channel Fast Interface Bipolar Picoammeter with Integrated +2 kV HV Source
WTETRAMM20NX	$\pm 120 \mu\text{A}$, $\pm 120 \text{nA}$	-2 kV	4 kHz	4-channel Fast Interface Bipolar Picoammeter with Integrated -2 kV HV Source
WTETRAMM40PX	$\pm 120 \mu\text{A}$, $\pm 120 \text{nA}$	+4 kV	4 kHz	4-channel Fast Interface Bipolar Picoammeter with Integrated +4 kV HV Source

To view the complete list of ordering codes visit our website:

www.els-instruments.com/product/tetramm/