LIBERA

Libera Current Meter

Http server with integrated WebGUI directly accessible from a local PC or mobile device.

The Libera Current meter is a **general-purpose current measuring device** compatible with high impedance current sources and capable of measuring currents from pA to mA in six different current ranges that can be set manually or automatically.

Each channel is factory-calibrated using a known voltage source. It is available with 4 or 12-channel input with BNC or TRIAX connectors (this last option allows a high voltage bias up to 150 V).

Data rates from MHz to 10 Hz

Data from the ADC are available at a 2 MSPS data rate with a triggering option for fast pulse measurement. Intermediate streams are available at 100 kSPS and 1 kSPS. DC current measurement can be performed with a 10 S/s data rate.
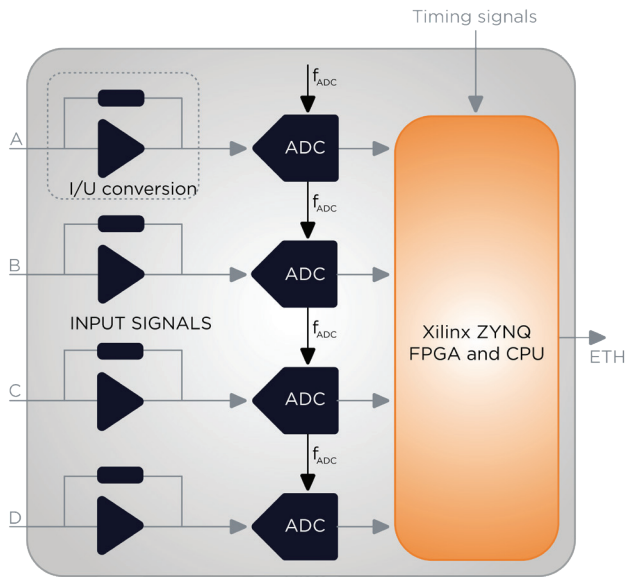
CURRENT RANGE	BANDWIDTH	RMS NOISE			
		2 MS/s	**100 kS/s**	**1 kS/s**	**10 S/s**
± 60 nA	> 15 kHz	< 160 pA	< 125 pA	< 3 pA	< 1.2 pA
± 200 nA	> 10 kHz	< 250 pA	< 160 pA	< 5 pA	< 3 pA
± 2 uA	> 60 kHz	< 1.3 nA	< 470 pA	< 45 pA	< 40 pA
± 20 uA	> 70 kHz	< 6 nA	< 2.3 nA	< 400 pA	< 380 pA
± 200 uA	> 90 kHz	< 28 nA	< 16 nA	< 4.1 nA	< 3 nA
± 2 mA	> 80 kHz	< 270 nA	< 140 nA	< 39 nA	< 32 nA

INSTRUMENTATION TECHNOLOGIES

Low-power and no maintenance required

The Libera Current Meter is based on the Xilinx Zynq SoC family with low power consumption, which allows the devices to be powered via Ethernet (PoE standard) and allows for passive cooling.

The input current is converted to voltage and amplified using a transimpedance amplifier. The ADCs sample the data and provide the output to the FPGA.

Technical Specifications

4-channel version	Available with BNC or Triax Connectors
12-channel version	Available only with BNC connectors without high voltage bias
Max high voltage bias	150 V
Trigger signal level and Connector	3.3 V TTL, LEMO connector (available only on the 4 channel version)
ADC conversion	2 MSPS—18 bit
FPGA / CPU	Zynq-7020 / ARM Cortex-A9
Booting	From Micro_SD or TFTP server
Power	PoE
Cooling	Passive
Dimensions (4 channel version)	44 mm x 210 mm x 210 mm

Network connection and supported interfaces

Data are accessible through an http server or different data acquisition tools:
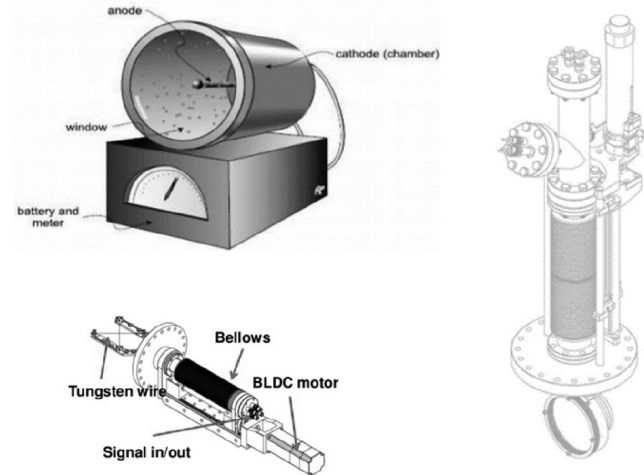

FPGA / Software code availability

The Libera Current Meter can be further extended by the user with modifications to the FPGA and software code (available under a non-disclosure agreement). Additional features or functionalities can also be added by our developers. For more information contact us at **support@i-tech.si.**

Use cases for particle accelerators

Compatible with blade monitors, diamond detectors, wire scanners, and Faraday cups.

Use cases for nuclear research reactor
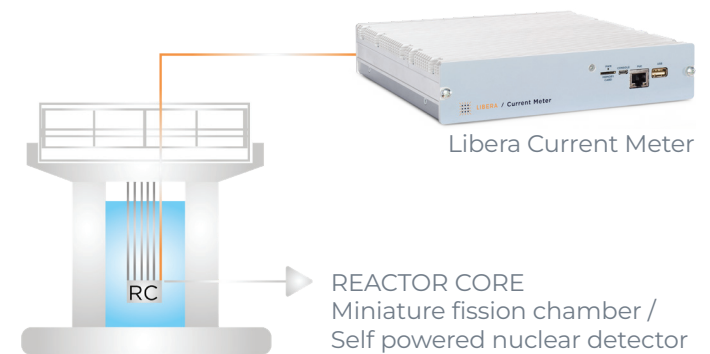
Pulse and steady state neutron flux measurement using SPNDs (self-powered neutron detectors—BNC version) and MFCs (miniature fission chambers—requires TRIAX version with high voltage bias.

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REACTOR CORE
Miniature fission chamber / Self powered nuclear detector