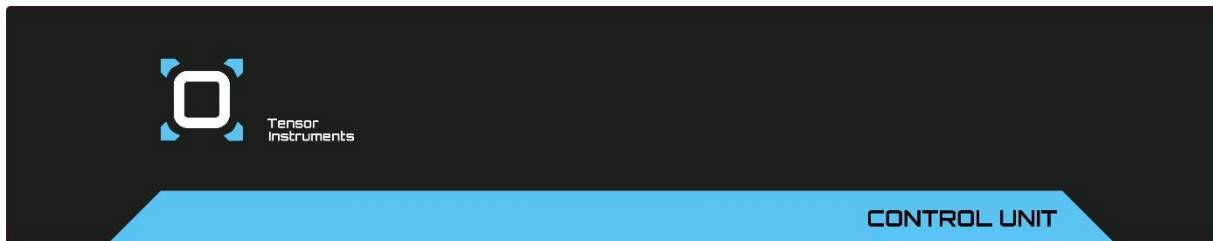# Tensormeter Control Unit model CU1

Automated temperature and magnetic field control

Tensormeter Control Unit CU1 front panel

The Tensormeter Control Unit model CU1 is designed for the automated temperature and magnetic field control. It can be used with any external variable temperature insert (temperature sensor and heater) and external magnet set-up (magnetic field sensor and electromagnet).

Magnetic field control

- Magnetic field control via universal +/- 10 V analogue signal (BNC connectors)
- Compatible with most electromagnets and magnet power supplies (list of suitable electromagnet suppliers on request)
- Maximum magnetic field is determined by the choice of electromagnet and power supply
- Connection for passive 4-pole Hall probe for magnetic field measurement
- Compatible with Tensor Instruments Passive Hall Probe (not included) or most other available Hall probes; for highest sensitivity and drift/offset resilience use Tensor Instruments Active Hall Probe (not included)
- Precision of the magnetic field measurement typ. 1 µT in full measuring range (3 Tesla)
- Fully continuous magnetic field control, possibility of sub-µT steps
- Tensormeter Magnetotransport Measurement software for Windows PC controls all parameters and coordinates electric measurements with Tensormeter

Temperature control

- Temperature / heater control via adjustable DC power output 0-240 W (Speakon socket)
- Maximum voltage standard 24 V; 36 V or 48 V optional selectable (specify upon ordering)
- Available temperature range is determined by the choice of the external variable temperature insert
- Connection for a passive 4-wire resistance temperature sensor
- Compatible with most available temperature sensors, e.g. PT100 (not included)
- Tensormeter Magnetotransport Measurement software allows for feedback coupling of the power output to sensor setpoints for heater control

Magnetotransport Measurement Software

The proprietary Tensormeter Magnetotransport Measurement software for Windows PCs combines the control of the ambient parameters temperature and magnetic field (using the Control Unit CU1) with the electric / magnetotransport measurements (using the Tensormeter RTM1).
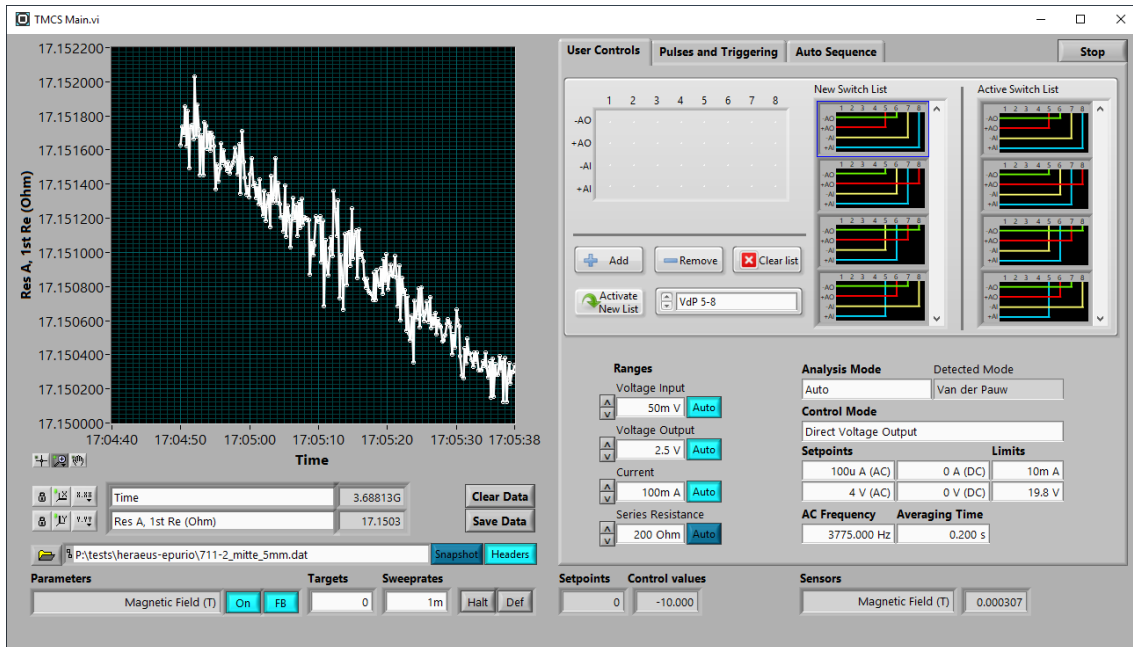
Graphical user interface of proprietary Tensormeter Magnetotransport Characterization software

Electrical Specifications

USB connector voltage to GND	-0.3 … 5.5 V
AC mains voltage	90 … 264 VAC
Control Outputs to GND	-10.3 … 10.3 V
Control Outputs current	-2 … 2 mA
Power Output current	0 … 10 A
Periphery Connector current	-10 … 10 mA per pin
Sensor Connector current	-10 … 10 mA per pin

Hardware specifications

Size	19" rack-mountable device, 2 height units, 32 cm depth
Power demand, Controller	< 2 W, 5 VDC supplied via USB Type B PC connector
Power demand, Periphery	< 500 W, supplied via C14 AC mains connector
Operation range	0°C – 70°C, non-condensing humidity
Cooling	Free convection (can be closed at expense of warmup time)

Rear periphery connectors
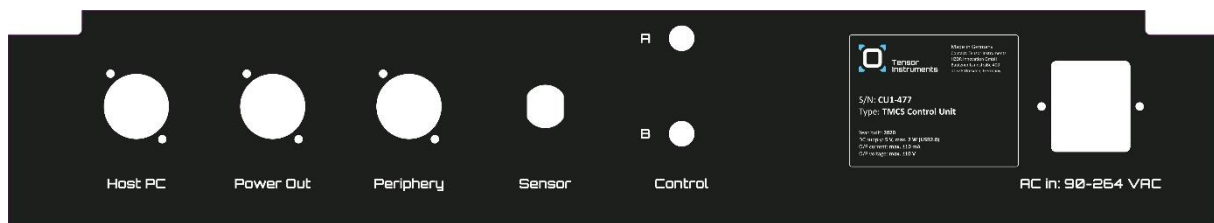
Tensormeter Control Unit CU1 rear panel with connectors

Host PC	USB2.0 Type B
Power Out	Speakon socket, DC power output 0-240 W to be used for DC power supply of peripheral devices, e.g. heater, cooling device, magnet or motor
Sensor	M12, 8 pin, A-coded standard connector: to be used with a passive 4-wire Hall Probe or any other 4-wire sensor, e.g. temperature sensor
Periphery	SubD, 15 pin, High Density standard connector: to be used with various sensors, e.g. temperature sensor, or for interlock or medium power signals
Control	BNC, 50 Ω standard connectors: to be used for analog voltage control of peripheral devices, e.g. magnet power supply.
AC In	Type F mains plug

Scope of delivery

- Tensormeter Control Unit CU1 19" rack-mountable device
- Tensormeter Magnetotransport Measurement software for Windows
- User Guide
- USB cable
- AC cable with Type F mains plug (specify other region type when ordering)