Datasheet

kolibrik

High-power EIS Analysis System

For fuel cell stacks
For electrolyzers
Simultaneous multi-channel EIS Acquisition

MegaEIS Product Family

Up to 1000 V | 2000 A | 20/250 kW | 1000 EIS channels

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Applications

Typical applications include hydrogen fuel cells, water electrolyzers, solid-oxide cells, redox-flow batteries, and lithium batteries with high-current and high-power requirements. Additionally, EIS is utilized in applied research, manufacturing testing, and quality control.

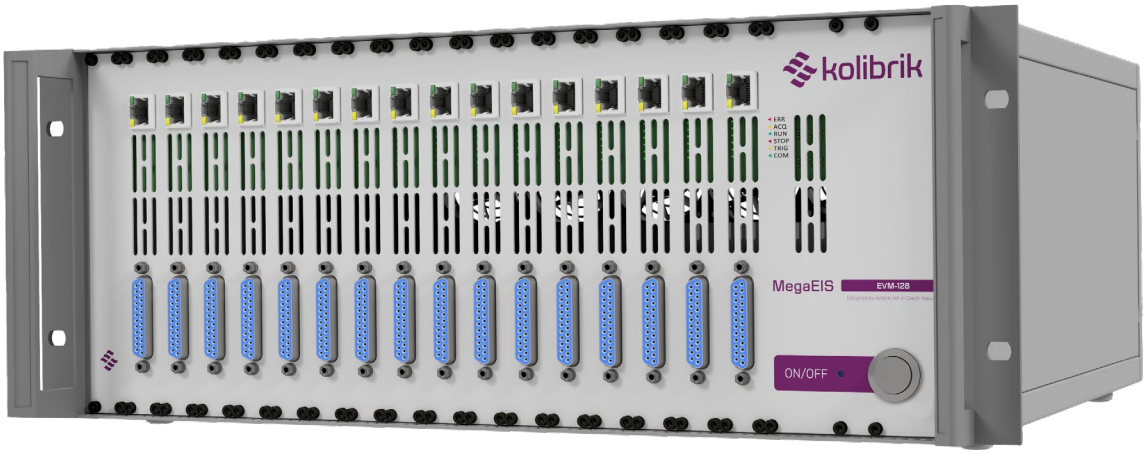
MegaEIS Product Family Description

MegaEIS product family is a precise modular testing system for **EIS analysis** of **fuel-cell stacks** and **electrolyzers**. System consists of power stage which handles the power, and EIS acquisition system which can perform impedance spectroscopy analysis at all cells simultaneously.

For fuel-cell stacks, power stage is built from EIS load modules. Your stack can have up to **1 000 cells** and provide current up to **2 kA**. System is designed for cooperation with external DC load which may handle most of the stack power (up to 300 kW). Maximum internal power dissipation of StackEIS-M power stage can be up to **20 kW**. System is **water-cooled**.

For electrolyzers, power stage is extended by internal or external power supply, so the system works as regulated power source, capable of EIS measurement.

EIS acquisition runs simultaneously on all channels, so the system is suitable for rapid and precise analysis in R&D, for QA in manufacturing, or in service diagnostics. StackEIS-M also provides DC **cell voltage monitoring** and enables characterization using important electrochemical methods – **Polarization Curves, Chronopotentiometry** and **Chronoamperometry, Load Cycling, Current Interrupt** Technique, etc.



Unlock Power with EIS Analysis

Electrochemical Impedance Spectroscopy (EIS) analysis is the ultimate technique to unlock the secrets of your electrochemical devices. Whether you are working with hydrogen fuel cells, electrolyzers, batteries, or any other system that involves electric current and chemical reactions,

EIS analysis can give you a complete picture of what's going on inside your devices. A standout feature of the EIS method is its unique ability to analyze your device seamlessly, during its standard operating conditions.

Technical Parameters

Power supply	110 … 230 VAC / 50 … 60 Hz, 3x 400 VAC for high-power devices
Dimensions	Modular design for 19“ rack cabinet
Protection rating	IP20
Input voltage	Up to 1000 V *)
Total input current (internal + external load)	Up to 2000 A *)
Internal load current	Up to 1200 A *)
Maximum internal load power dissipation	24 kW *)
Cooling	Water
Stack electrometer voltage range	Up to ± 1000 V
Sampling	24-bit ADCs, low-noise 50/60 Hz filtered sampling for DC measurements 24-bit ADCs, up to 1.25 Msps for EIS measurements
Measurement resolution	0.001% of selected range
Accuracy Voltage	Voltage ≤ 0.1% of range + 0.1% of reading Current ≤ 0.1% of range + 0.5% of reading
Acquisition methods	constant V, I, open circuit, manual control chronoamperometry, chronopotentiometry linear sweeps, polarization curves, current interruption load cycling/profiling EIS – electrochemical impedance spectroscopy programmable sequences of all available methods
EIS frequency	1 mHz … 100 kHz
EIS amplitude	Up to 20% of maximum internal current for < 1 kHz
EIS channel voltage range	± 3 V (can be customized)
Number of EIS channels	Up to 1000 (limited by max. voltage) 8 channels per one module
Connection	USB 2.0, Ethernet
Software	Control software for MS Windows Features: measurement setup and control, data acquisition, processing and visualization, pascal or python scripting, remote control by TCP/IP server for integration with top-level control system, examples for remote control using python or LabVIEW.

*) According to particular model

Standard products / configurations

Multi-channel EIS analyzers with source / load / bi-directional

Model	Numer of channels	Type	Current	Voltage	Maximum power	Applications
ME-10S270x20	2–10	Source	270 A	20 V	6 kW	Electrolyzers
ME-10S500x20	2–10	Source	500 A	20 V	10 kW	Electrolyzers
ME-42L200x50	2–42	Load	200 A	50 V	4 kW	FC stacks
ME-130L500x200	2–130	Load	200 A	200 V	4 kW	FC stacks
ME-42L500x50	2–42	Load	400 A	200 V	8 kW	FC stacks, redox-flow
ME-130L2000x200	2–130	Load	2000 A	200 V	20 kW	FC stacks
ME-514L400x800	2–514	Load	400 A	800 V	20 kW	FC stacks
ME-42SL200x200	2–42	Source / Load	±200 A	200 V	4 kW	FC stacks, electrolyzers, redox-flow, batteries
ME-42SL400x80	2–42	Source / Load	±400 A	80 V	8 kW	FC stacks, electrolyzers, redox-flow, batteries

Single-channel EIS analyzers

Model	Maximum current	Maximum voltage	Maximum power	P/G *) module	Mode *)	Applications
ME-2ZLP200	200 A	10 V	2 kW	5 V, 100 A	Zeroload + P/G	Electrolyzers
ME-2ZL400	400 A	75 V	4 kW	-	Zeroload	Fuel cells

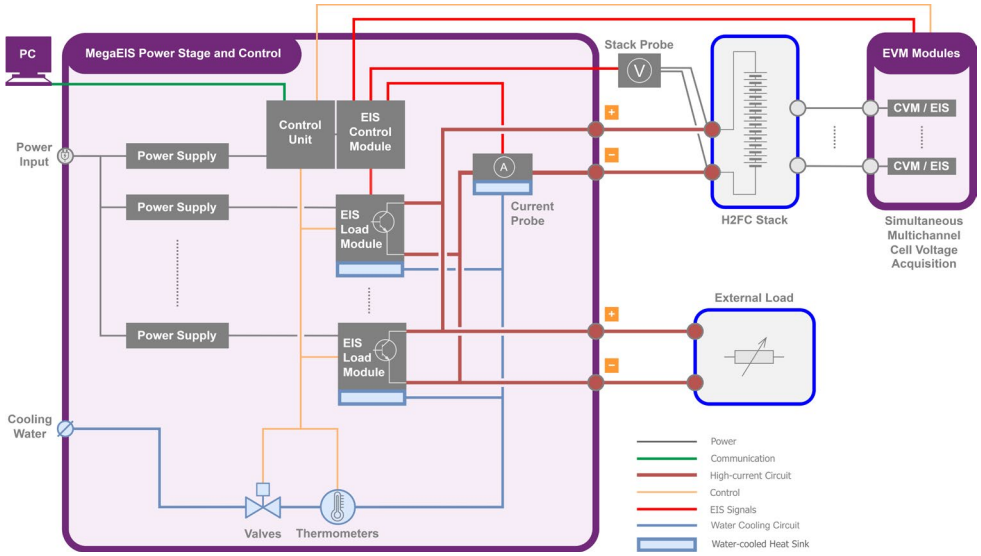
*) P/G – Full 4-quadrant Potentiostat/Galvanostat. Zeroload – optional true zero-voltage operation for single cells.

Product customization

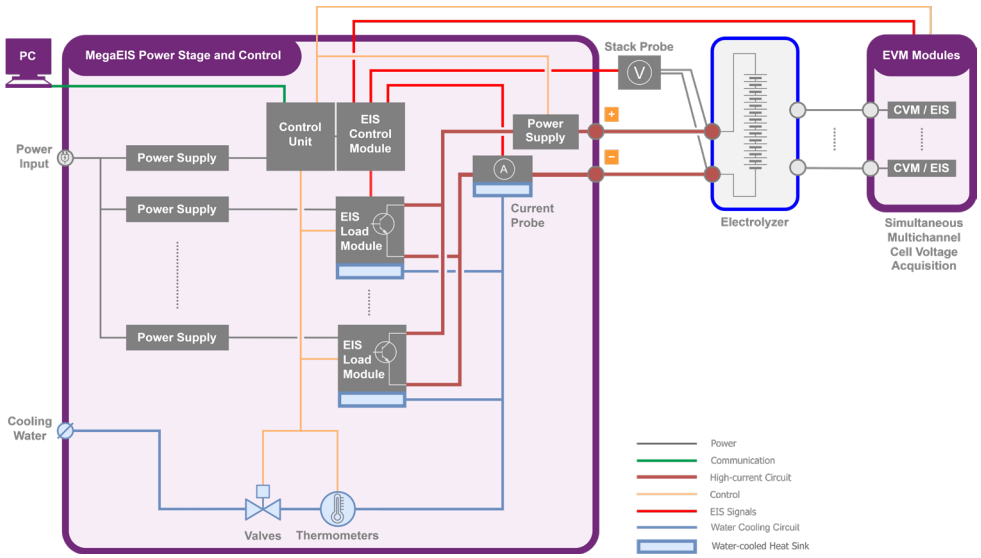
Standard configurations can be tailored for your specific needs.

Parameter/propriety	Value
Number of channels	2–1026 channels, step of 8
Voltage	Up to 1000 V
Internal current	Up to 1200 A
Booster	Up to 2000 A
Source mode	Up to 20 kW / up to 70 V
Load mode	Up to 24 kW

MegaEIS for Fuel-cell Stacks



Block diagram of system configuration for fuel-cell stacks.
External load connection and CVM / EIS blocks are optional.



Block diagram of system configuration for electrolyzers.
Power supply can be optionally external. CVM / EIS blocks are optional.