

# KiloPotentiostat

## KiloPTC-10100EW-ZL1500

High-power H2FC potentiostat  
with zero-voltage load booster

Version 1.3  
2019-03-22  
Preliminary



[kolibrík.net](http://kolibrík.net)

## Quick summary

❖ Potentiostat/Galvanostat	±10 V, ±100 A, max. 500 W
❖ Load booster	0..+10 V, 0..-1 500 A, max. 4 kW
❖ Current ranges	1 mA .. 1 500 A
❖ Impedance spectroscopy	1 mHz .. 100 kHz (1 MHz)
❖ Cooling	Water

---

## KiloPotentiostat

is a new range of high-power fuel-cell potentiostats/galvanostats equipped with a high-current booster that helps to increase the current in the load mode. This system is primarily designed for use with high-power hydrogen fuel cells and short stacks capable of supplying hundreds of amperes or even more than one kiloampere.

Such high currents are possible with hydrogen fuel cells in only one quadrant, whereas the currents required in 4-quadrant measurements are much lower. This is why the system consists of 100 A complete potentiostat with impedance spectroscopy and zero-voltage load booster available from 200A up to 2kA.

Electrochemical Impedance Spectroscopy (EIS) measurement is possible with a full DC current of booster while the AC component is generated by the potentiostat. The maximum amplitude of the AC component depends on the frequency and impedance of the fuel cell.

EIS module is capable to generate and measure frequencies up to 1 MHz, it has high sensitivity and the high-current path is made to have lowest possible inductance and skin effect. Device is equipped with precise low-inductance and low-skin-effect current sense resistor, internally calibrated with high-precision hall-effect sensor.

# KiloPotentiostat

## KiloPTC-10100EW-ZL1500

High-power H2FC potentiostat  
with zero-voltage load booster

Version 1.3  
2019-03-22  
Preliminary



[kolibrík.net](http://kolibrík.net)

### Block diagram

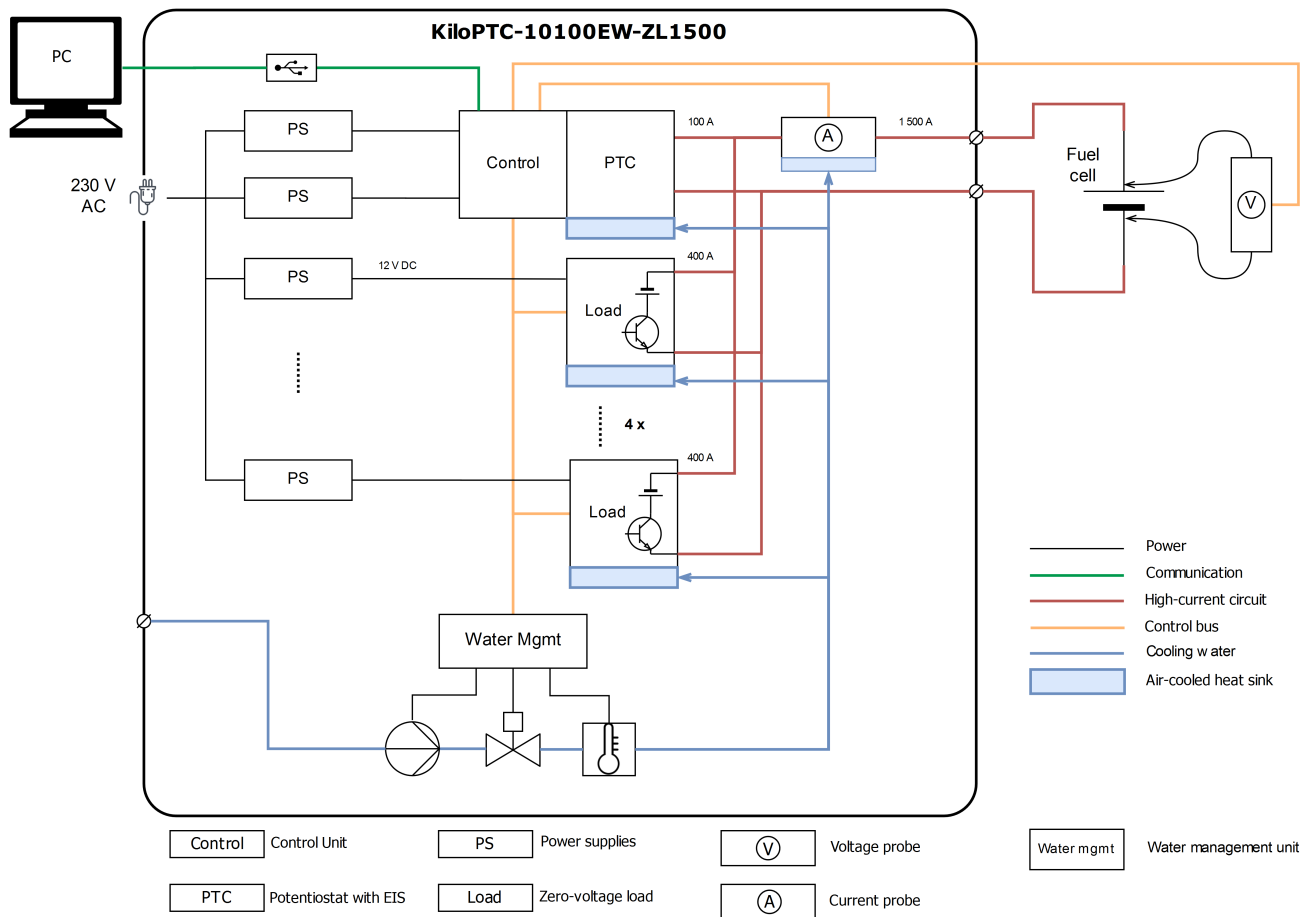


Image 1: Block diagram of KiloPTC-10100EW-ZL1500 model

# KiloPotentiostat

## KiloPTC-10100EW-ZL1500

High-power H2FC potentiostat  
with zero-voltage load booster

Version 1.3  
2019-03-22  
Preliminary



[kolibrík.net](http://kolibrík.net)

## Technical Parameters

Power supply	230V AC / 50..60 Hz
Dimensions	19" rack cabinet, 11U height, 800mm depth
Cooling	Water
Protection rating	IP20
Electrometer Input voltage range	-10 V ... +10 V
Compliance / Output voltage	-10 V ... +10 V
Compliance / Output current	-100 A ... +100 A for output potential $\pm 1$ V -50 A ... +50 A for output potential $> \pm 5$ V
Zero-voltage load booster	Sink up to 1 500 A from voltage 0..+10 V
Current ranges	7 current ranges (1 mA .. 100 A, 1 500 A)
Sampling	24-bit ADCs, 3 ksps internal, 50 sps low-noise filtered sampling 14-bit ADCs, up to 20 Msps for EIS measurements
Measurement resolution	0.001 % of selected range for $\leq 3$ ksps sampling
Accuracy	Voltage $\leq 0.1$ % of range + 0.1 % of reading Current $\leq 0.1$ % of range + 0.5 % of reading Current calibration by 12 ppm precision current transducer
Acquisition methods	constant V, I, open circuit, manual control chronoamperometry, chronopotentiometry linear sweeps, I/V characteristics cyclic voltammetry pulse voltammetry - differential, square, normal impedance spectroscopy  programmable sequences of all available methods
EIS frequency	1 mHz .. 100 kHz (1 MHz for $< 1$ A)
EIS amplitude	1 .. 1000 mV, up to 100 A for $< 1$ kHz
Connection	USB 2.0 optionally ethernet