

## Gensoric's Use of PalmSens EmStat

### The PalmSens EmStat OEM is an integrated part of Gensoric's ThermoLab™-System.

The ThermoLab™-System is a device to heat electrochemical work-electrodes directly with a high frequency current (see figure 1) while measuring a low-direct current for analytical application.

This allows controlling the temperature on the surface of an electrode.

With pulsing techniques temperatures above boiling point in an aqueous solution is possible.



Figure 1: ThermoLab™-System

### Why heating electrodes directly?

For more information visit us at [www.gensoric.com](http://www.gensoric.com)

### Why using the EmStat?

#### EmStat is actually the best solution to solve the calibration problem:

The temperature of the electrode surface cannot be directly or precisely measured by electrical sensors such as temperature probes/sensors and may vary for different electrode designs for same heating power configurations.

#### This results in following challenge:

How to show the customer what temperature will be achieved at his/her custom electrochemical electrode design?

#### Solution:

Using the temperature calibration techniques by Flechsig et al.:

While a zero current potentiometry the drift of the potential curve depends on the surface temperature of the electrode. Therefore you can calculate the temperature of the electrode with this potential drift. Applying several heat pulses with varying power to the electrode allows you to

determine the power-temperature-dependency for an electrode (see Figure 2). This calibration method takes several minutes and can be automated because the procedure is the same for every kind of electrode. To achieve this we looked for a small and a low priced OEM potentiostat with a custom communication interface which we could integrate in our prototypes. We found a fitting solution in Palmsens EmStat. The OEM EmStat device is a cheap and powerful potentiostat and due to its design easily implementable in prototypes. With the easy-to-use communication protocol of the EmStat, the Palmsens PStTrace SDK and the very friendly and helpful support service we could quickly built up own software applications such as the automated calibration method for our Thermalab™-System. Other applications will follow.

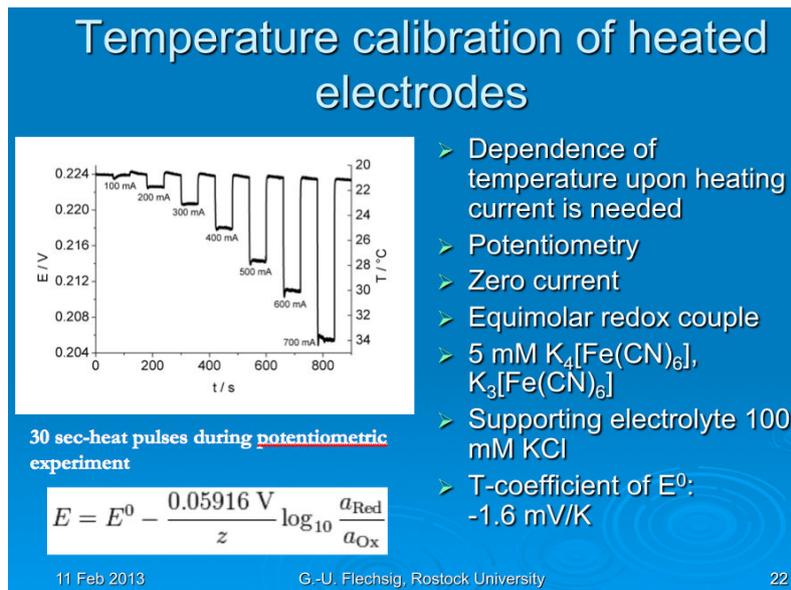


Figure 2: Temperature calibration of directly heated electrodes

## How is the EmStat OEM integrated Gensoric Thermalab™-System?

The OEM EmStat is integrated in the Thermalab™-System via USB-connection. We used an OEM USB-HUB to combine the Thermalab™ USB with the EmStat USB connection. We shielded the OEM EmStat with a custom-made metal-based case to ensure the EMC (see Figure 3).

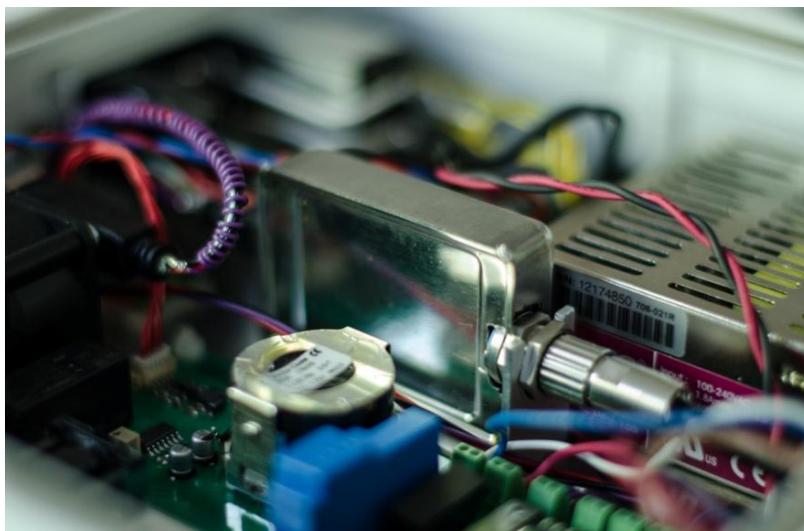


Figure 3: EmStat in metal case

### **Gensoric's Testimonial to PalmSens**

"The EmStat OEM is currently the best choice for specialized tasks that need an automated electrochemical measurement/Potentiostat."