EmStat GO ™

Tailored potentiostat for sensor applications

PalmSens
Compact Electrochemical Interfaces

Contents

EmStat Go potentiostat

The EmStat Go is a battery powered*, handheld potentiostat which consists of a standard base unit and a customer-specific Sensor Extension module. The extension module can be equipped with one or more sensor connectors, temperature sensor, or other interface units you require for your sensor application.

Drop Detection
The EmStat Go can be equipped with automatic drop detection to have a PC or mobile app start the measurement automatically as soon as the droplet is present.

The EmStat Go allows you to go to market as soon as your electrochemical sensor is ready for it.

battery is optional

Your product name

Optional Buetooth

USB-C for comms powering and/or charging

Rugged and lightweight aluminium body

Optional Li/Ion battery

Optional sleeve

Sensor Extension module

The Sensor Extension module can simply just host a screen-printed electrode connector, or a wide range of extra functions can be added. Options include switching between different electrodes/sensors, temperature sensing and drop detection.

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Sleeves in any color

The sleeve can be produced in any color, to give the EmStat Go a unique appearance that matches your brand identity.

Modular design

The EmStat Go's modular design allows the Sensor Extension module to be easily replaced in the field. This enables your customers to upgrade the reader they already have without the need to send it back.

Optional battery for connecting via Bluetooth

A battery compartment for replaceable Li-Ion battery is optional.
A fully charged battery allows the EmStat Go to run >6h of continuous measurements.

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Reduce your time-to-market

The EmStat Go can be used with our **PSTrace software** for generic research. This means that as soon as your application is solid, we can provide you with a custom potentiostat and dedicated software or an app in a short amount of time. The universal base unit allows us to provide you with your own hardware for economical prices at low minimum order quantities.
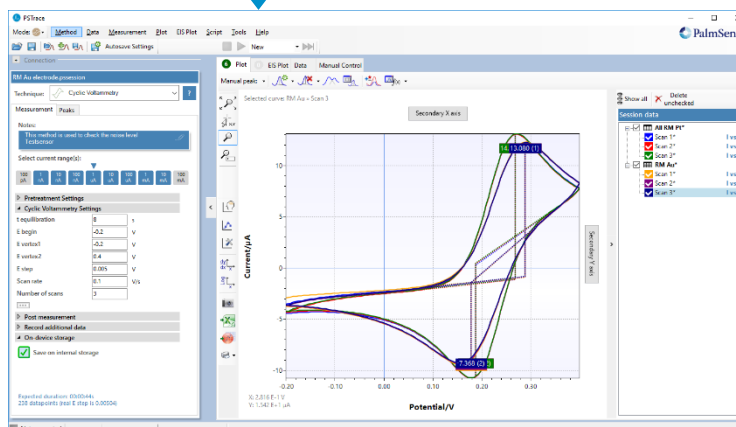
Supported techniques

The following techniques are supported by the EmStat Go:

Voltammetric techniques
- Linear Sweep Voltammetry   LSV
- Differential Pulse Voltammetry   DPV
- Square Wave Voltammetry   SWV
- Normal Pulse Voltammetry   NPV
- Cyclic Voltammetry   CV

The above-mentioned techniques can also be used for stripping voltammetry.

Techniques as a function of time
- Amperometric Detection /   AD
  Chronoamperometry   CA
- Chronocoulometry   CC
- Pulsed Amperometric Detection   PAD
- Multiple Pulse Amperometric Detection   MPAD
- Open Circuit Potentiometry   OCP
- Multistep Amperometry   MA

Where possible, the electrochemical techniques can be applied using **auto ranging** which means that the instrument automatically sets the optimal current range. The user can specify a highest and lowest current range in which the most appropriate range is selected automatically.

See page 5 for system specifications.

Custom software options

With the PalmSens SDKs you can develop user friendly software for use with EmStat Go in a short amount of time.

Using the PalmSens SDK for Xamarin you can create an Android (mobile) application for your EmStat Go. The SDK comes with working code examples which can be used as a basis for your application.

The PalmSens SDK for WinForms or WPF allows you to build a Windows application for either Bluetooth or USB connected devices.
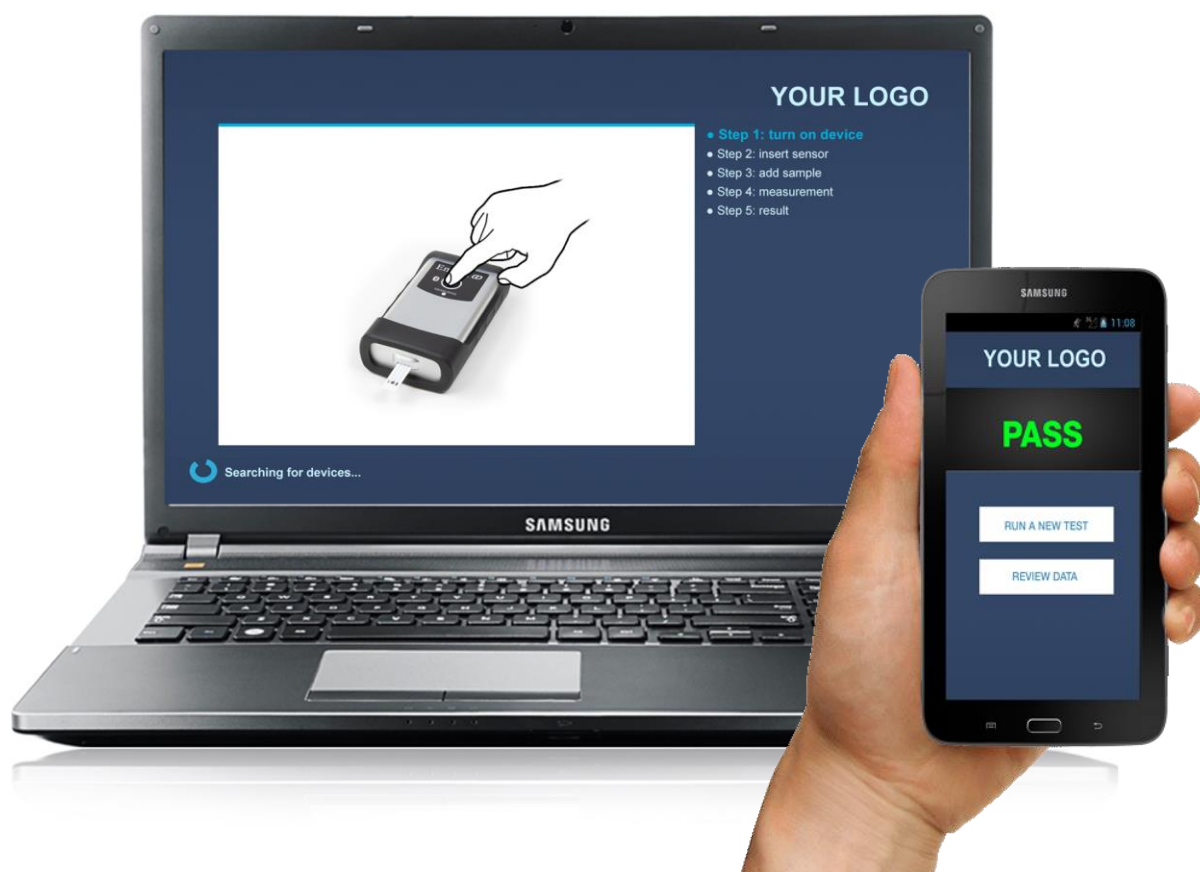
Specifications of general parameters

General pretreatment
Apply conditioning, deposition or begin potential for: 0 – 1600 s

General voltammetric parameters

Potential range:	-3.000 V to +3.000 V
Step potential:	0.125 mV to 250 mV
Pulse potential:	0.125 mV to 250 mV

Limits of some technique specific parameters for EmStat Go

NPV and DPV:	Scan rate:	0.025 mV/s (0.125 mV step) to 50 mV/s (5 mV step)
	Pulse time:	5 ms to 300 ms
SWV[1]:	Frequency:	1 Hz to 500 Hz [1]
LSV and CV:	Scan rate:	0.01 mV/s (0.1 mV step) to 5 V/s (5 mV step)
AD:	Interval time:	1 ms to 300 s
	Run time:	1 s to hours
PAD:	Interval time:	50 ms to 300 s
	Pulse time:	1 ms to 1 s
	Run time:	10 s to hours
MPAD:	Pulse times:	100 ms to 2 s
	Run time:	10 s to hours
	Number of potential levels:	3
Potentiometry at open circuit (OCP):	Interval time:	1 ms to 30 s
	Maximum run time:	hours
Multistep Amperometry:	Interval time:	1 ms to 30 s
	Number of potential levels:	1 to 255
	Number of cycles:	1 to 20000
	Maximum run time:	hours / weeks / months (depending on interval)

[1] *PSTrace provides the option to measure forward and reverse currents separately.*
Note: some limits of parameters are set for practical reasons and can be modified on request.

System specifications

General

▪ dc-potential range	± 3.000 V
▪ compliance voltage	± 5 V
▪ maximum measured current	± 20 mA typical and ± 15 mA minimum
▪ measured potential resolution	1 mV
▪ measured potential accuracy	≤ 0.1 %, max 2 mV offset
▪ max. acquisition rate	1000 points/s

Potentiostat (controlled potential mode)

▪ applied dc-potential resolution	0.1 mV
▪ applied potential accuracy	≤ 0.2 % max. 2 mV offset
▪ current ranges	1 nA to 10 mA (8 ranges)
▪ current accuracy	≤ 1 % of current range at 1 nA ≤ 0.5 % at 10 nA ≤ 0.2 % at 100 nA to 100 µA ≤ 0.5 % at 1 mA, 10 mA and 100 mA with max. 0.2 % offset error
▪ measured current resolution	0.1 % of active current range 1 pA on lowest current range

Electrometer

▪ electrometer amplifier input	> 100 GOhm // 4 pF
▪ rise time	approx. 100 µs

Other

▪ housing	118 x 69 x 33 mm aluminium body with silicone sleeve
▪ weight	±250 g (depending on configuration)
▪ power supply	battery or USB-powered
▪ communication	Bluetooth or USB
▪ digital and analog options for extension module	- analog input and output (0 - 4.096 V, 12 bit) - 4 digital outputs, 1 digital input (5 V) - 5 V output (max. 50 mA), digital and analog ground
▪ temperature range	0 ℃ to +40 ℃
▪ battery life	>6 hours with cell on at 10 mA current (can be extended to >24 hours with external power bank) charging up to 80% takes approx. 3.5 hours a full charge takes approx. 5 hours

Please do not hesitate to contact PalmSens for more details:
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