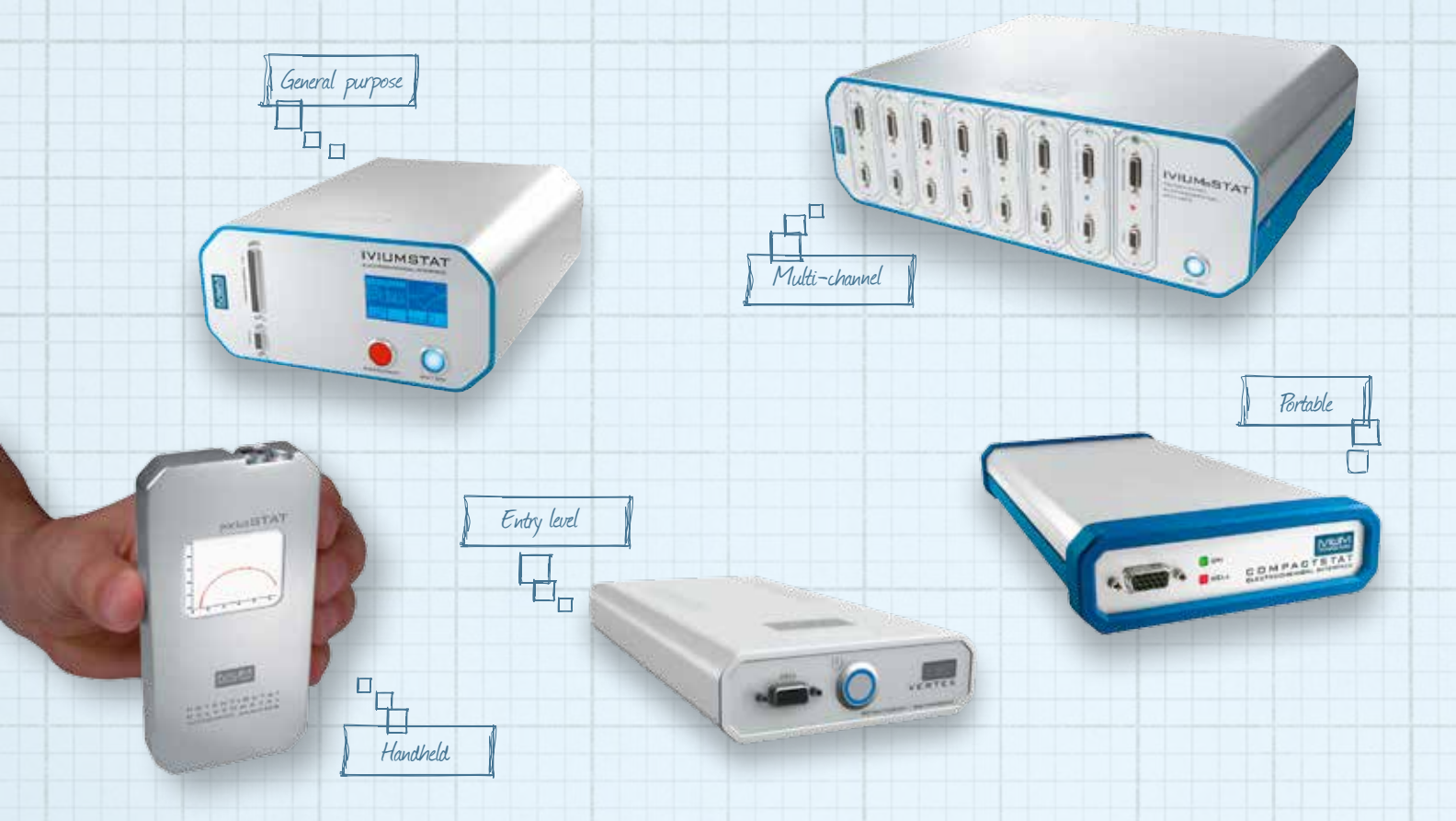


# Discover: Our complete range of instruments



Ivium Technologies offers a full range of potentiostat/galvanostat/ZRA instruments:

- **POCKETSTAT** Handheld, 10mA/4V, FRA/EIS 10 $\mu$ Hz to 100kHz, full colour display
- **COMPACTSTAT** USB powered, 30mA/10V, expandable to 800mA and 100V, FRA/EIS 10 $\mu$ Hz to 3MHz
- **IVIUMSTAT** High power bench top, 5A/10V, expandable to 100A and 100V, FRA/EIS 10 $\mu$ Hz to 8MHz
- **IVIUM-N-STAT** Multi-channel potentiostat, 16 channels per frame, expandable up to 64 channels  
Available: 500mA/2A/2.5A/5A/10A and 5V/10V/20V; FRA/EIS 10 $\mu$ Hz to 250kHz (1MHz optional)  
Expandable with power boosters to 100A and 100V
- **VERTEX** Entry level instrument, power options: 100mA/1A/2A/5A/10A and 10V/20V  
Optional FRA/EIS 10 $\mu$ Hz to 1MHz

All Ivium instruments include a full suite of IviumSoft electrochemistry software.  
Various additional options and modules are available.



innovative solutions for electrochemical research



# pocketSTAT<sup>™</sup>

## Handheld potentiostat/galvanostat/ZRA with integrated impedance analyser

The pocketSTAT is a complete electrochemical measurement instrument which is the size of a smart phone. It has been specifically designed for (field) measurements such as corrosion and analytical electrochemistry.

### HANDHELD

The pocketSTAT has the size and weight of a smart phone. It can be controlled via USB connection from any netbook, laptop or PC that is Windows operated.

### KEY SPECIFICATIONS

- Size: 115.2 x 58.5 x 12.5mm
- Weight: 140g
- Scan range:  $\pm 4V \pm 10mA$
- 3 electrode connection: RE/WE/CE and GND lead
- Max. acquisition rate: 5000 pnts/s

### RUGGED DESIGN

The pocketSTAT has a housing made of strong, yet light weight, aluminium. The instrument enclosure is waterproof and complies with the ip44 rating. It is equipped with a full color display that shows the basic information, such as voltage, current and technique.

### ALL TECHNIQUES

All standard electrochemical techniques are available, including impedance analysis and corrosion techniques. The pocketSTAT includes a full suite of IviumSoft control and data analysis software.

### APPLICATION

As the pocketSTAT is USB powered and it has a very small footprint, as well as the integrated impedance analyser, it is ideally suited for:

- Field measurements
- Corrosion
- Coating testing
- Analysis

### System Performance

Current compliance	$\pm 10mA$
Maximum output voltage	$\pm 8V$
3 electrodes	WE, CE, RE
Potentiostat bandwidth	$> 1MHz$
Stability settings	High Speed, Standard, and High Stability
Programmable response filter	1MHz, 100kHz, 10kHz, 1kHz, 10Hz
Signal acquisition	Dual channel 16 bit ADC, 5000 samples/s
Electrode connection	RE/WE/CE and GND lead, 2mm banana plugs

### Potentiostat

Applied potential range	$\pm 4V$ at 0.125m resolution
Applied potential accuracy	0.2% or 2mV
Current ranges	$\pm 1nA$ to $\pm 10mA$ in 8 decades
Measured current resolution	0.015% of current range, minimum 0.15pA
Measured current accuracy	0.2%

### Galvanostat

Applied current resolution	0.0125% of applied current range
Applied current accuracy	0.2%
Potential ranges	$\pm 0.4mV$ , $\pm 4mV$ , $\pm 40mV$ , $\pm 0.4V$ , $\pm 4V$
Measured potential resolution	0.003% of potential range, minimum 16nV
Measured potential accuracy	0.2% or 2mV

### Impedance analyser

Frequency range	10 $\mu$ Hz to 100kHz
Amplitude	0.015mV to 1.0V, or 0.03% to 100% of current range
DC offset	16 bit DC offset subtraction, and 2 DC-decoupling filters

### Electrometer

Input impedance	$> 1000Gohm // < 20pF$
Input bias current	$< 10pA$
Bandwidth	$> 2MHz$

### Environment

Power requirements	via USB
Interfacing	USB
Size	w x d x h = 11.5 x 5.85 x 1.25cm
Weight	140g
PC requirements	Windows XP/7/8/10, with free USB port



## Portable USB powered potentiostat/galvanostat/ZRA with integrated impedance analyser

The CompactStat can be operated via the USB port of a laptop or PC without additional power supply. With its small footprint (<600 gram) and low power consumption, the CompactStat provides a truly mobile electrochemical measurement station. Among its many applications are corrosion, analytical, nano, bio, and battery/fuel cell testing.

### THE COMPACTSTAT IS AVAILABLE IN 4 POWER CONFIGURATIONS

- ± 30mA @ ±10V
- ± 800mA @ ±10V\*
- ± 250mA @ ±20V\*
- ± 30mA / ±100V\*

\*) With internal power booster.

### EXPANDABILITY

The CompactStat is fully compatible with all options and modules, including: integrated Bipotentiostat and True Linear Scan, the MultiWE32, ModuLight, multiplexer, FastScan, etc.

### LOW NOISE AND GALVANIC ISOLATION

The CompactStat is electrically isolated from power lines and PC. It has a superior noise immunity and is capable of determining very small signals, required in nanotechnology applications. Additionally, the instrument can be applied in situations where the sample must be disconnected from a common ground (floating).

### COMPLETE SOLUTION

The CompactStat offers a complete package. The hardware includes a built-in high-performance Frequency Response Analyser and all the standard electrochemical techniques. Complete measurement and dataprocessing software is included.

### AUTOMATION

Multiple analog and digital input and output ports are available that can be used to monitor and control peripheral equipment. The software integrates this functionality.

### System Performance

Current compliance  
Maximum output voltage  
4 electrodes  
Potentiostat bandwidth  
Stability settings  
Programmable response filter  
Signal acquisition

### Standard (30mA / 10V)

±30mA  
±10V  
WE, CE, RE, S  
>3MHz  
High Speed, Standard, and High Stability  
1MHz, 100kHz, 10kHz, 1kHz, 10Hz  
Dual channel 24 bit ADC, 100,000 samples/s

### Potentiostat

Applied potential range  
Applied potential accuracy  
Current ranges  
High sensitivity current ranges  
Measured current resolution  
Measured current accuracy

±4V, 0.01mV resolution (20bits)/±10V, 0.02mV resolution  
0.2% or 1mV  
±10nA to ±1A in 9 decades  
±1pA, ±10pA, ±100pA, ±1nA  
0.00001% of current range, minimum 0.6aA  
0.2%

### Galvanostat

Applied current resolution  
Applied current accuracy  
Potential ranges  
Measured potential resolution  
Measured potential accuracy

0.00013% of applied current range  
0.2%  
±0.4mV, ±4mV, ±40mV, ±0.4V, ±4V, ±10V  
0.00001% of potential range, minimum 0.05nV  
0.2% or 1mV

### Impedance analyser

Frequency range  
Amplitude  
DC offset  
Dynamic range

10µHz to 3MHz  
0.015mV to 1.0V, or 0.03% to 100% of current range  
16 bit DC offset subtraction, and 2 DC-decoupling filters  
0.05nV to 10V, and 0.2aA to 30mA

### Electrometer

Input impedance  
Input bias current  
Bandwidth

>1000Gohm // <8pF  
<10pA  
>16MHz

### Special functions

Ohmic drop compensation  
Safety features

2V/current range, 16 bit resolution  
Automatic disconnect on internal/external limits

### Peripheral connections

8 analog in, and 2 analog out  
2 digital inputs, and 3 digital outputs  
I-out and E-out  
AC-out  
Channel-X and Channel-Y inputs

0 to +4V, 16 bit resolution  
0 to +5V  
Analog monitor for cell current and potential  
±0.5V sinewave 10µHz-3MHz with variable attenuation  
±4V: to record impedance from peripheral devices

### Environment

Power requirements on USB power  
External adapter  
Interfacing  
Size  
Weight  
PC requirements

Standard 5V, 500mA  
100-240V, 45-65Hz, 500mA  
USB  
w x d x h = 12 x 26 x 2.5cm  
0.6kg  
Windows XP/7/8/10, with free USB port

### CompactStat.h with booster\*

#### System performance

Current compliance  
Maximum output voltage  
Additional applied range  
Additional measured range  
Power requirements (adapter powered only)  
Weight

#### h10800 800mA/10V

±800mA  
±10V  
-  
-  
100-240V, 50-60Hz, 700mA  
0.7kg

#### h20250 250mA/20V

±250mA  
±20V  
±20V, 0.04mV resolution  
±20V  
100-240V, 50-60Hz, 700mA  
0.7kg

#### h10030 30mA/100V

±30mA  
±100V  
±100V, 0.2mV resolution  
±100V  
100-240V, 50-60Hz, 700mA  
0.7kg

\*All other specs same as standard model.



## Entry level potentiostat/galvanostat/ZRA

The Vertex is an entry level potentiostat/galvanostat/ZRA with optional FRA/EIS. Its price easily matches its application in educational and applied electrochemistry. The Vertex is capable of all standard electrochemical techniques and includes a complete suite of IviumSoft control and data processing software.

### THE VERTEX IS AVAILABLE IN 5 POWER CONFIGURATIONS:

- $\pm 100\text{mA} / \pm 10\text{V}$
- $\pm 1\text{A} / \pm 10\text{V}$
- $\pm 5\text{A} / \pm 10\text{V}$
- $\pm 10\text{A} / \pm 10\text{V}$
- $\pm 2\text{A} / \pm 20\text{V}$

### KEY SPECIFICATIONS

- Current ranges: 10nA to 1A (10A)
- WE/RE/S/CE 4-electrode configuration
- Floating operation
- Data acquisition rate 100kHz
- Optional FRA/EIS: 10 $\mu$ Hz to 1MHz

### EXPANDABILITY

The Vertex can be expanded with an optional True Linear Scan module and FRA/EIS. The Vertex is also compatible with other Ivium modules, such as the multiplexer and current interrupt module.

### WIDE APPLICATION RANGE

The robust design, wide range of available models, floating operation and the availability of all standard electrochemical techniques makes the Vertex ideal for a variety of applications, including: educational, routine electrochemistry and analysis, batteries and fuel cells, corrosion, sensors and biotechnology.

### System Performance

Current compliance  
Maximum output voltage  
4 electrodes  
Potentiostat bandwidth  
Stability settings  
Programmable response filter  
Signal acquisition

### Potentiostat

Applied potential range  
Applied potential accuracy  
Current ranges  
Measured current resolution  
Measured current accuracy

### Galvanostat

Applied current resolution  
Applied current accuracy  
Potential ranges  
Measured potential resolution  
Measured potential accuracy

### Electrometer

Input impedance  
Input bias current  
Bandwidth

### Impedance analyser (optional)

Frequency range  
Amplitude  
DC offset

### Special functions

Ohmic drop compensation

### Peripheral Connections

Shared input/output

### Environment

Power requirements  
Interfacing  
Size  
Weight  
PC requirements

### Vertex.100mA

$\pm 100\text{mA}$   
 $\pm 10\text{V}$   
WE, CE, RE, S  
>500kHz  
High Speed, Standard, and High Stability  
1MHz, 100kHz, 10kHz, 1kHz, 10Hz  
Dual channel 16 bit ADC, 100,000 samples/s

$\pm 10\text{V}$ , 0.333mV resolution  
0.2% or 2mV  
 $\pm 10\text{nA}$  to  $\pm 100\text{mA}$  in 8 decades  
0.015% of current range, minimum 1.5pA  
0.2%

0.033% of applied current range  
0.2%  
 $\pm 10\text{mV}$ ,  $\pm 100\text{mV}$ ,  $\pm 1\text{V}$ ,  $\pm 10\text{V}$   
0.003% of potential range, minimum 0.4 $\mu$ V  
0.2% or 2mV

>100Gohm // <20pF  
<20pA  
>5MHz

10 $\mu$ Hz to 1MHz  
0.015mV to 1.0V, or 0.03% to 100% of current range  
16 bit DC offset subtraction, and 2 DC-decoupling filters

2V/current range, 16 bit resolution

User selectable input or output  
 $\pm 10\text{V}$ , 16 bit, bandwidth 40kHz

100-240V, 45-65Hz, 700mA  
USB  
w x d x h = 13 x 27 x 4cm  
1.5kg  
Windows XP/7/8/10, with free USB port

Vertex*	1A 1A/10V	5A 5A/10V	10A 10A/10V	2A 2A/20V
<b>System performance</b>				
Current compliance	$\pm 1\text{A}$	$\pm 5\text{A}$	$\pm 10\text{A}$	$\pm 2\text{A}$
Additional current ranges	$\pm 1\text{A}$	$\pm 1\text{A}, \pm 10\text{A}$	$\pm 1\text{A}, \pm 10\text{A}$	$\pm 1\text{A}$
Maximum output voltage	$\pm 10\text{V}$	$\pm 10\text{V}$	$\pm 10\text{V}$	$\pm 20\text{V}$
Additional (applied) potential range	-	-	-	$\pm 20\text{V}$ , 0.667mV resolution
Peripheral connections	*)	**)	**)	**)
Power requirements	100-240V, 50-60Hz 700mA	100-240V, 50-60Hz 2A	100-240V, 50-60Hz 4A	100-240V, 50-60Hz 2A
Weight	1.5kg	2kg	3kg	2kg

\*) All other specs same as standard model.

\*\*\*) **Peripheral connections:**

2 Analog in  $\pm 10\text{V}$ , 16 bit resolution, bandwidth 40kHz  
1 Analog out  $\pm 10\text{V}$ , 16 bit resolution  
1 Digital input, 3 Digital outputs 0 to +5V

I-out, and E-out analog monitor for cell current and potential  
AC-out  $\pm 0.5\text{V}$  sinewave 10 $\mu$ Hz-1MHz with variable attenuation  
Channel-X, and  $\pm 4\text{V}$ : to record impedance from peripheral devices  
Channel-Y inputs



## High power general purpose potentiostat/galvanostat/ZRA with integrated impedance analyser

The IviumStat is well-suited for applications requiring a wide dynamic range.

The high current capability combined with its complete range of options enables application in research, corrosion, battery/fuel cell testing, analysis and bio- and nano-electrochemistry.

### THE IVIUMSTAT IS AVAILABLE IN 3 POWER CONFIGURATIONS:

- $\pm 5A / \pm 10V$
- $\pm 10A / \pm 10V$
- $\pm 2A / \pm 50V$
- Current and voltage boosters available

### EXPANDABILITY

The IviumStat is fully compatible with all options and modules, including: integrated Bipotentiostat and True Linear Scan, the MultiWE32, ModuLight, multiplexer, FastScan and all current and voltage boosters.

### AUTOMATION

Multiple analog and digital input and output ports are available that can be used to monitor and control peripheral equipment. The software integrates this functionality.

### SAFETY

The compliance (maximum current or potential) of the instrument can be defined by the operator. This allows samples to be protected and unsafe situations prevented.

### COMPLETE SOLUTION

The IviumStat offers a complete package. The hardware includes a built-in high-performance Frequency Response Analyser and all the standard electrochemical techniques. Complete measurement and data processing software is included.

### System Performance

Current compliance  
Maximum output voltage  
4 electrodes  
Potentiostat bandwidth

Stability settings  
Programmable response filter  
Signal acquisition

### Potentiostat

Applied potential range  
Applied potential accuracy  
Current ranges  
High sensitivity current ranges  
Measured current resolution  
Measured current accuracy

### Galvanostat

Applied current resolution  
Applied current accuracy  
Potential ranges  
Measured potential resolution  
Measured potential accuracy

### Impedance analyser

Frequency range  
Amplitude  
DC offset  
Dynamic range

### Electrometer

Input impedance  
Input bias current  
Bandwidth

### Special functions

Ohmic drop compensation  
Safety features

### Peripheral connections

8 analog in, and 2 analog out  
2 digital inputs, and 3 digital outputs  
I-out, and E-out  
AC-out  
Channel-X, and Channel-Y inputs

### Environment

Power requirements  
Interfacing  
Size  
Weight  
PC requirements

### Standard (5A / 10V)

$\pm 5A$   
 $\pm 10V$   
WE, CE, RE, S  
8MHz for small signals  
300kHz for large signals  
High Speed, Standard, and High Stability  
1MHz, 100kHz, 10kHz, 1kHz, 10Hz  
Dual channel 24 bit ADC, 100,000 samples/s

$\pm 10V$  with 0.02mV resolution (20bits)  
0.2% or 1mV  
 $\pm 10nA$  to  $\pm 10A$  in 10 decades  
 $\pm 1pA$ ,  $\pm 10pA$ ,  $\pm 100pA$ ,  $\pm 1nA$   
0.00001% of current range, minimum 0.6aA  
0.2%

0.00013% of applied current range  
0.2%  
 $\pm 0.4mV$ ,  $\pm 4mV$ ,  $\pm 40mV$ ,  $\pm 0.4V$ ,  $\pm 4V$ ,  $\pm 10V$   
0.00001% of potential range, minimum 0.15nV  
0.2% or 1mV

10 $\mu$ Hz to 8MHz  
0.015mV to 1.0V, or 0.03% to 100% of current range  
16 bit DC offset subtraction, and 2 DC-decoupling filters  
0.05nV to 10V, and 0.2aA to 30mA

>1000Gohm // <8pF  
<10pA  
>16MHz

2V/current range, 16 bit resolution  
Automatic disconnect on internal/external exceptions

0 to +4V, 16 bit resolution  
0 to +5V  
Analog monitor for cell current and potential  
 $\pm 0.5V$  sinewave 10 $\mu$ Hz-8MHz with variable attenuation  
 $\pm 4V$ : to record impedance from peripheral devices

100-240V, 47-63Hz, 150VA  
USB  
w x d x h = 26 x 33 x 12cm  
4.2kg  
Windows XP/7/8/10, with free USB port

### IviumStat\*

#### System performance

Current compliance  
Maximum output voltage  
Additional (applied) potential range  
Power requirements  
Weight

### XRi

#### 10A / 10V

$\pm 10A$   
 $\pm 10V$   
-  
100-240V, 45-63Hz, 300VA  
5.3kg

### XRe

#### 2A / 50V

$\pm 2A$   
 $\pm 50V$   
 $\pm 50V$ , 0.1mV resolution  
100-240V, 45-63Hz, 300VA  
5.3kg

\*) All other specs same as standard model.

# Ivium-n-Stat<sup>™</sup>



## High power multi-channel potentiostat/ galvanostat/ZRA with integrated impedance analyser

The Ivium-n-Stat is a state-of-the-art multi-channel potentiostat/galvanostat with integrated impedance analyser in each channel. It can be operated in grounded or in floating mode. The variety of different channels, the high sensitivity, and the separate or synchronous control of channels allow the Ivium-n-Stat to be used in a wide range of applications from research to production testing.

### VARIOUS CHANNELS AND FRAMES

#### AVAILABLE:

Single channel sModule

- $\pm 2.5A / \pm 10V$  (optional Bipotentiostat)
- $\pm 5A / \pm 10V$  (optional Bipotentiostat)
- $\pm 10A / \pm 5V$
- $\pm 2A / \pm 20V$

Dual channel dModule

- $2 \times \pm 500mA / \pm 10V$
- $2 \times \pm 2.5A / \pm 10V$

Integrated EIS

All channels include integrated FRA/EIS as standard  $10\mu Hz - 250kHz$  (Optional High Frequency upgrade to  $1MHz$ )

Main frame

- 40A
- max. 8 modules / 16 channels per frame
- Stackable up to 64 channels



### EXPANDABILITY

The Ivium-n-Stat main frame contains 8 slots for a maximum of 16 channels and can be stacked up to 8 frames and a maximum of 64 channels. Modules are encased for easy handling so that users can upgrade the number of channels in a simple plug and play manner. With the exception of the dual channel module, an integrated peripheral port with multiple analog and digital input and output ports is available that can be used to monitor and control peripheral equipment. The software integrates this functionality.

### SIMULTANEOUS CONTROL

The IviumSoft control software allows control of separate channels or all channels simultaneously with synchronized start. Data can be plotted per channel or simultaneously for all channels on a single screen.



# Ivium-n-Stat<sup>™</sup>

## Available Channel modules:

Channel Performance	Single channel sModules				Dual channel dModules	
	2.5A / 10V	5A / 10V	10A / 5V	2A / 20V	500mA / 10V	2.5A / 10V
Number of channels in module	1	1	1	1	2	2
Current compliance	±2.5A	±5A	±10A	±2A	±500mA	±2.5A
Maximum output voltage	±10V	±10V	±5V	±20V	±10V	±10V
Floating operation available	Yes	Yes	Yes	Yes	Module floating	Module floating
<b>Potentiostat</b>						
Applied potential range	±10V	±10V	±5V	±20V	±10V	±10V
Resolution	0.33mV	0.33mV	0.33mV	0.667mV	0.33mV	0.33mV
Applied potential accuracy	0.2%, or 2mV	0.2%, or 2mV	0.2%, or 2mV	0.2%, or 2mV	0.2%, or 2mV	0.2%, or 2mV
Current ranges	±10nA to ±10A	±10nA to ±10A	±10nA to ±10A	±10nA to ±10A	±10nA to ±1A	±10nA to ±1A
#	10 ranges	10 ranges	10 ranges	10 ranges	9 ranges	9 ranges
Measured current resolution	0.015% of range	0.015% of range	0.015% of range	0.015% of range	0.015% of range	0.015% of range
Minimum	1.5pA	1.5pA	1.5pA	1.5pA	1.5pA	1.5pA
Measured current accuracy	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
<b>Galvanostat</b>						
Applied current resolution	0.033% of range	0.033% of range	0.033% of range	0.033% of range	0.033% of range	0.033% of range
Applied current accuracy	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Potential ranges	Yes	Yes	Yes	Yes, and ±20V	Yes	Yes
±10mV, ±100mV, ±1V, ±10V						
Measured potential resolution	0.003% of range	0.003% of range	0.003% of range	0.003% of range	0.003% of range	0.003% of range
Minimum	400nV	400nV	400nV	400nV	400nV	400nV
Measured potential accuracy	0.2%, or 2mV	0.2%, or 2mV	0.2%, or 2mV	0.2%, or 2mV	0.2%, or 2mV	0.2%, or 2mV
<b>Peripheral connections</b>						
	Yes	Yes	Yes	Yes	No	No

## All Channels:

### Peripheral connections

2 analog in	±10V, 16 bit resolution, bandwidth 40kHz
1 analog out	±10V, 16 bit resolution
1 digital input, and 3 digital outputs	0 to +5V
I-out, and E-out	Analog monitor for cell current and potential
AC-out	±0.5V sinewave 10µHz-250kHz with variable attenuation
Channel-X, and Channel-Y inputs	±4V: to record impedance from peripheral devices

### Special functions

Ohmic drop compensation	2V/current range, 16 bit resolution
-------------------------	-------------------------------------

### Dimensions

Size	w x d x h = 3 x 35 x 13cm
Weight	0.8kg

### Channel Performance

4 Electrodes	WE, CE, RE and S
Potentiostat bandwidth	>500kHz
User selectable response filters	High Speed, Standard, and High Stability
Programmable response filter	1MHz, 100kHz, 10kHz, 1kHz, 10Hz
Dual Channel signal acquisition	Dual channel 16 bit ADC, 100,000 samples/s

### Impedance Analyser

Frequency range	10µHz to 250kHz (optional: 10µHz to 1MHz)
Amplitude	0.015mV to 1.0V, or 0.03% to 100% of current range
DC offset	16 bit DC offset subtraction, and 2 DC-decoupling filters

### Electrometer

Input impedance	>1000Gohm // <8pF
Input bias current	<10pA
Bandwidth	>5MHz



## Specifications: Ivium-n-Stat main frame

Slot positions	Can mount up to 8 Modules
Frame capability	40A max. for 8 slots
Common connectors	GND and combined EMO: emergency off control monitor
Power requirements	100-240V, 47-63Hz, 600W
Interfacing	USB
Size	w x d x h = 47 x 36 x 14cm
Weight	6.2kg (no modules) ca. 12kg (with 8 modules)

# Software to match every research application

One software to control all Ivium instruments: IviumSoft includes all standard electrochemical techniques and allows integrated data processing and analysis. The software is feature rich, yet intuitive to use. All functions are directly available from the principle user interface. The full software is shipped with all Ivium instruments and is included as standard in the price. Installation is not limited to a maximum number of Windows operated PCs.

## IviumSoft User Interface

Menu bar: device, software & file control  
 Method tree: select your method  
 Analysis menu: select your data analysis method  
 Project: Store data files in a project folder of your choice

Method parameters: construct your method

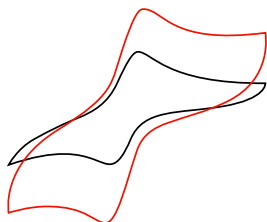
Results: graphic or numeric data representation

History list: quick access to recently stored or opened data files

- Scan rate 1 $\mu$ V/s to 10,000V/s
- Minimum time interval 10 $\mu$ s
- Continuous scan at 500 points/s
- Transients up to 255 levels
- Transients with user selectable dynamic cut-off
- Single sine/multi sine impedance 10 $\mu$ Hz to 8MHz
- Simultaneous peripheral I/O control and data acquisition
- Open Cell Potential measurement
- Ohmic drop compensation
- Batch processing for automation and sequencing
- Signal view monitoring
- Pulse generator
- Instrument diagnostics
- Software development driver for LabView<sup>™</sup>, delphi, C, etc.



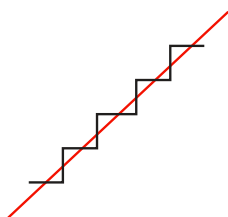
# Options and Modules



## BIPOTENTIOSTAT

The bipotentiostat (BiStat) is an option that enables a second working electrode (WE2). It is used for various applications, including RRDE measurements. The bipotentiostat is fully integrated in IviumSoft and its data is recorded simultaneously with the primary channel.

- 2 configurations
  - "standard": WE2 at a fixed potential w.r.t. RE
  - "scanning": WE2 at a fixed offset potential w.r.t. the primary WE
- Applied offset potential range  $\pm 2.0V$ , resolution 0.0625mV
- Maximum current  $\pm 30mA$
- Current ranges: 1pA to 10mA in 11 decades



## TRUE LINEAR SCAN

The True Linear Scan is a hardware option that applies a smooth analog ramp, instead of the standard staircase sweep of digital potentiostats. The True Linear Scan option is designed to be used in those cases where the nature and speed of the electrochemical processes lead to information loss when a standard digital staircase signal is applied (fast transient behaviour, absorption,  $\alpha$ -characteristics).

- Scan range same as controlling potentiostat
- Scanrate  $1\mu V/s - 10,000V/s$
- Available in the techniques LSV and CV

5 MHz  
20 MHz

## QUICKSCAN/FASTSCAN

Ivium Technologies offers 2 modules for high speed signal application and data sampling. The **FastScan** is an external module that connects to the peripheral port of the potentiostat and a USB port of the computer. The **QuickScan** is placed inside the housing of the potentiostat. Both modules use a built-in memory for data storage before sending it to the PC. The functionality is integrated in IviumSoft in the techniques CA, CP and CV.

	<b>QuickScan</b>	<b>FastScan</b>
• Max. acquisition speed	5 Msamples/s	20 Msamples/s
• Scan rate	1,000,000V/s	10,000,000V/s
• Measurement data memory	4,000,000 points	10,000,000 points
• Applied data memory	4,000,000 points	64,000 points
• Applied voltage range	$\pm 4V$	$\pm 4V$
• ADC/DAC	16 bit	16 bit



## PERIPHERAL INTERFACING PORT/PPE/PDA

An analog/digital I/O port is available on most Ivium potentiostats for interfacing with external equipment (RDE, EQCM, etc.) and signals (temp, pH, etc.). The peripheral port is accessed via a connector on the instrument. The PPE (Peripheral Port Expander) is a junction box that offers easy connection to the peripheral port via 4mm bananas. The Peripheral Differential Amplifier (PDA) offers the same junction box, but adds high impedance differential inputs  $>10^{12}$  Ohm to the regular analog inputs of the peripheral port. Thus the PDA module allows the simultaneous recording of differential bipolar high-ohmic external voltages, such as reference electrodes or pH meters.



## HIMUX MULTIPLEXER

The HiMUX is a multiplexer that controls consecutive individual cells with 2, 3 and 4 electrodes and an optional WE2 (Bipotentiostat). Each multiplexer has 8 channels and multiplexers can be stacked so that up to 64 channels can be controlled sequentially by a single potentiostat. Automatic channel selection is fully integrated in the IviumSoft.

2 Types of multiplexers are available:

HiMUX.XR

- Each channel with its own electrometer; compliance  $\pm 5A$  and  $\pm 20V$
- Fast channel switching because RE&S are always connected
- Driven shields ensure excellent high frequency performance
- Each electrometer  $>1000Gohm // <8pF$  and bandwidth  $>16MHz$
- Each channel switches with relays; can be used with all potentiostats including 50V and 100V versions, at 5A max.

uMUX



### CURRENT INTERRUPT MODULE

The Current Interrupt Module (CIM) facilitates the measurement of the IR-drop via the current-interrupt technique.

- 5A version (separate module)
- 10A version (integrated in cell cable)
- Interrupt time <math><2\mu\text{s}</math>



### HIZ: HIGH IMPEDANCE POTENTIAL PRE-AMPLIFIER

Improves electrometer performance of the potentiostat to a higher input impedance and lower leakage:  $>10^{15}\text{ohm}/0.2\text{pF}$

Two versions available:

- 10V (1x voltage gain)
- 200mV (50x voltage gain, minimum 0.3nV resolution)



### THERMOCOUPLE MODULE

Connects a K-type thermocouple directly to the peripheral port of the potentiostat. Temperature measurement fully integrated in IviumSoft.



### PLT

Peripheral Level Transformer for increasing the analog input voltage range of IviumStat/CompactStat to  $\pm 10\text{V}$ .



### MULTIWE32

This 32-channel potentiostat module can operate up to 32 working electrodes simultaneously that share a single counter electrode and reference electrode. That means that it applies a potential across all channels continuously. Moreover, the potentials for each working electrode have an independent programmable offset. During measurement all channels are sampled simultaneously. The maximum applied potential is determined by the controlling potentiostat

Modules can be stacked up to 256 channels. It is designed especially for applications with low power/current requirements, such as nanotechnology, sensor development, analytical electrochemistry, biotechnology, medical research, etc.

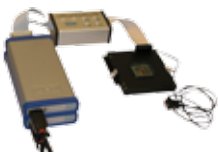
- Max. current  $\pm 1\text{mA}/\text{channel}$
- Potential offset max.  $\pm 2\text{V}$ , 0.0625mV resolution
- Sequential or simultaneous mode
- CV/LSV/DPV/SQWave/CA
- Max. 10 samples/s (0.1s interval)
- FRA/EIS available in sequential mode

### HISENS32

Pre-amplifier modules for MultiWE32 to increase sensitivity down to sub-pA level

Full scale ranges:

- 1nA
- 100pA
- 10pA



### MUX32/MEA

The MUX32 is a 32-channel multiplexer that facilitates the connection of a single channel Ivium potentiostat to a Multi Electrode Assembly (MEA). Multiple MUX32 modules can be combined to create any custom MEA.

Each MUX32:

- 32 channels/WEs sharing a single CE/RE for each MUX32
- Max. current  $\pm 1\text{mA}/\text{channel}$
- Multiple MUX32 can be combined to create any custom MEA
- FRA/EIS available for each channel
- Functionality fully integrated in IviumSoft



### MCF CELL

Magnetic Corrosion Flat-cell designed for use both in the laboratory and in the field. It can be clamped to any (magnetic) steel object, in any position. Ideal for impedance measurement on coatings in the field.

- 12.5cm<sup>2</sup> Steel 316L electrode
- Soft silicon seal allows high surface roughness
- Allows use of reference electrodes
- Sold in sets of 2

## Solar Simulators



### IVISUN

Programmable LED light source capable of 1,000W/m<sup>2</sup>. The light intensity can be fixed manually, or modulated using the FRA output of your Ivium potentiostat. The light box can be positioned freely from the control unit of the instrument and contains an LED array with an area of 15 x 15cm (= 5.9 x 5.9inch). Control and data analysis are fully integrated in IviumSoft, but the instrument can also be operated stand alone.

Stand alone: The light intensity can be manually fixed at 0 - 125% output  
 IviumSoft: Controlled from your Ivium potentiostat. The light intensity can be fixed or modulated using the FRA output of your potentiostat.



### MODULIGHT

Programmable light source designed to investigate solar cells and photo-electrical devices. The ModuLight contains 7 LEDs with wavelengths ranging from 460-740 nm. On request LEDs can be exchanged for others from the same product range, including UV and IR.

Extensive Solar cell applications are integrated in the Iviumsoft. These allow a full characterization of the solar cell, including E/I curves as function of the light intensity, IMVS/IMPS, and solar cell modelling.



### MODUSENS/LIGHTSENS

Light sensor that connects to the ModuLight/IvISUN for measurement of the light intensity at the cell, for example for IPCE evaluation.



### OPTICAL PLATFORM

Aluminium bench for the fixation of the Ivium ModuLight at a precise distance from the illuminated object (glass cell optional).

## Compatibility table of Ivium instruments

	Vertex					pocketSTAT	CompactStat				IviumStat			Ivium-n-Stat							
	Current: Voltage: FRA/EIS:	0.1A 10V	1A 10V	2A 20V	5A 10V	10A 10V	10mA 8V 100kHz	Standard 30mA 10V	h20250 250mA 20V	h10800 800mA 10V	h10030 30mA 100V	Standard 5A 10V	XRi 10A 10V	XRe 2A 50V	sModule 2.5A 10V	5A 10V	10A 5V	2A 20V	500mA 10V	2.5A 10V	
Options:																					
Bipotentiostat																					
True Linear Scan																					
IviumBoost1040 (10V/40A)																					
IviumBoost1001 (100V/0.6A)																					
IviumBoost205 (20V/5A)																					
IviumBoost1010 (10V/10A)																					
IviumBoost10012 (12V/100A)																					
PDA/PPE																					
mPDA/sPDA																					
HiMUX.XR multiplexer																					
uMUX multiplexer																					
MultiWE32 (+HiSens32)																					
MUX32/MEA																					
FastScan/QuickScan																					
Current Interrupt Module																					
TCM-K: thermocouple module																					
Peripheral Level transformer																					
ModuLight (+ModuSens)																					
IvISUN solar simulator																					
LightSens																					
HiZ: enhanced electrometer																					
DataSecure																					

\*) Optional

## DATASECURE

### Data Storage & Connection Module

The DataSecure module stores data from your entire running experiment, independent from your PC, e.g. even if your computer fails, your data will be saved on the DataSecure module. Your data will never be lost! During your experiment you can "log-on" at any time to stream the available data to your PC. Or just stay connected and stream data real-time.

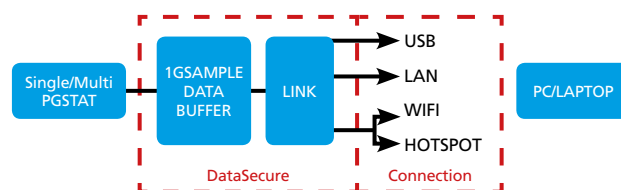
The DataSecure module is the connection link between the Ivium potentiostat and your computer. Next to direct wired USB or LAN connection, the DataSecure can connect directly to your WI-FI network to be accessed from anywhere in the WI-FI covered area. If desired the DataSecure can also create its own hotspot, making password protected connection possible.

#### DATASECURE Data storage and back-up, never lose your data

- Data is stored independent of your PC
- Data storage of up to 1,000,000,000 datapoints
- "Log-on" any time with your PC to stream available data
- Compact size: 1 x w x h = 15 x 12 x 5.5cm

#### CONNECTION WIFI | LAN | USB | REMOTE/DIRECT

- Wireless connection access anywhere: ideal for connection in fume hood or glove box
- Direct (hard wired) connection also possible
- Compatible with single Ivium potentiostats and for Ivium-n-Stat with full complement of channels
- Password protected connection possible



## IVIUMBOOST

### Power boosters for Ivium potentiostats

Ivium manufactures a range of power boosters to increase the potential and/or current of our potentiostat/galvanostat/ZRAs. The IviumBoost is connected in front of the potentiostat/galvanostat in-line with the cell cable. The operation is fully integrated in IviumSoft.

- Full Potentiostat/Galvanostat compliance
- Impedance 10 $\mu$ Hz - 100kHz
- All electrochemical techniques available
- Bandwidth > 100kHz
- Rise time < 50 $\mu$ s

#### AVAILABLE IN THE IVIUMBOOST SERIES:

- $\pm 10V @ \pm 40A$
- $\pm 12V @ \pm 100A$
- $\pm 100V @ \pm 0.6A$
- $\pm 20V @ \pm 5A$
- $\pm 10V @ \pm 10A$



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innovative solutions for electrochemical research