

IVIUM TECHNOLOGIES

Experts in Electrochemistry



innovative solutions for electrochemical research



Low cost all-round potentiostat/galvanostat/ZRA

The Vertex.One is an all-round potentiostat/galvanostat/ZRA with optional FRA/EIS. It has been specifically designed to be an affordable and robust instrument making it ideal for, among others, educational and basic electrochemistry, battery research and sensor development. The cell is connected via standard 4mm banana plugs (a 1m shielded cell cable is included) allowing the user to simply use their own off-the-shelf banana leads to supplement or extend the cell cable. The Vertex.One is capable of all standard electrochemical techniques and includes a complete suite of IviumSoft control and data processing software.

KEY SPECIFICATIONS

- Current ranges: 100pA to 100mA
- WE/RE/S/CE 4-electrode configuration
- User selectable grounded/floating operation
- Data acquisition rate: 100kHz
- Optional FRA/EIS: 10μHz to 250kHz
- Optional True Linear Scan function
- Convenient banana cell connection

STACKABILITY

The Vertex.One is equipped with a selector switch that allows master-slave control. In this way it can be easily stacked, for example, to create a multi-channel configuration or a bi-potentiostat.

WIDE APPLICATION RANGE

The robust design, versatility, convenient cell connection, and the availability of all standard electrochemical techniques makes the Vertex.One ideal for a variety of applications, including: educational, basic electrochemistry, batteries and fuel cells, corrosion, sensors and biotechnology.

System Performance	Vertex.One
Current compliance	±100mA
Maximum output voltage	±21V
4 electrodes	WE, CE, RE, S
Potentiostat bandwidth	>250kHz
Stability settings	High Speed, Standard, and High Stability
Programmable response filter	1MHz, 100kHz, 10kHz, 1kHz, 10Hz
Signal acquisition	Dual channel 16bit ADC, 100,000 samples/s
Potentiostat	
Applied potential range	±10V, 0.333mV resolution
Applied potential accuracy	0.2% or 2mV
Current ranges	±100pA to ±100mA in 10 steps
Measured current resolution	0.015% of current range, minimum 0.01pA
Measured current accuracy	0.2%
Galvanostat	
Applied current resolution	0.033% of applied current range
Applied current accuracy	0.2%
Galvanostatic current ranges	±10nA to ±100mA in 8 steps
Measured potential resolution	0.003% of potential range, minimum 0.4μV
Measured potential accuracy	0.2% or 2mV
Electrometer	
Input impedance	>1000Gohm//<10pF
Input bias current	<10pA
Bandwidth	>5MHz
Impedance analyser (optional)	
Frequency range	10μHz to 250kHz
Amplitude	0.015mV to 1.0V, or 0.03% to 100% of current range
DC offset	16bit DC offset subtraction, and 2 DC-decoupling filters
Special functions	
Ohmic drop compensation	2V/current range, 16bit resolution
Peripheral Connections	
Shared input/output	User selectable input or output ±10V, 16bit, bandwidth 40kHz
Environment	
Power requirements	100-240V, 45-65Hz, 4VA via 5V supply (included)
Interfacing	USB
Size	w x d x h = 10 x 19 x 2.5cm
Weight	500g
PC requirements	Windows 7/8/10, with free USB port



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:

- ±100mA / ±10V
- ±1A / ±10V
- ±5A / ±10V
- ±10A / ±10V
- ±2A / ±20V

KEY SPECIFICATIONS

- Current ranges: 10nA to 1A (10A)
- WE/RE/S/CE 4-electrode configuration
- Floating operation
- Data acquisition rate: 100kHz
- Optional FRA/EIS: 10μHz 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 multiplexers 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	Vertex.100mA
Current compliance	±100mA
Maximum output voltage	±10V
4 electrodes	WE, CE, RE, S
Potentiostat bandwidth	>500kHz
Stability settings	High Speed, Standard, and High Stability
Programmable response filter	1MHz, 100kHz, 10kHz, 1kHz, 10Hz
Signal acquisition	Dual channel 16bit ADC, 100,000 samples/s
Potentiostat	
Applied potential range	±10V, 0.333mV resolution
Applied potential accuracy	0.2% or 2mV
Current ranges	±10nA to ±100mA in 8 decades
Measured current resolution	0.015% of current range, minimum 1.5pA
Measured current accuracy	0.2%
Galvanostat	
Applied current resolution	0.033% of applied current range
Applied current accuracy	0.2%
Potential ranges	±10mV, ±100mV, ±1V, ±10V
Measured potential resolution	0.003% of potential range, minimum 0.4μV
Measured potential accuracy	0.2% or 2mV
Electrometer	
Input impedance	>1000Gohm // <10pF
Input bias current	<10pA
Bandwidth	>5MHz
Impedance analyser (optional)	
Frequency range	10μHz to 1MHz
Amplitude	0.015mV to 1.0V, or 0.03% to 100% of current range
DC offset	16bit DC offset subtraction, and 2 DC-decoupling filters
Special functions	
Ohmic drop compensation	2V/current range, 16bit resolution
Peripheral Connections	
Shared input/output	User selectable input or output ±10V, 16bit, bandwidth 40kHz
Environment	
Power requirements	100-240V, 45-65Hz, 700mA
Interfacing	USB
Size	w x d x h = 13 x 27 x 4cm
Weight	1.5kg
PC requirements	Windows 7/8/10, with free USB port

Vertex*	1A 1A/10V	5A 5A/10V	10A 10A/10V	2A 2A/20V
System performance				
Current compliance	±1A	±5A	±10A	±2A
Additional current ranges	±1A	±1A, ±10A	±1A, ±10A	±1A
Maximum output voltage	±10V	±10V	±10V	±20V
Additional (applied) potential range	-	-	-	±20V, 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 ±10V, 16bit resolution, bandwidth 40kHz
1 Analog out ±10V, 16bit resolution
1 Digital input, 3 Digital outputs 0 to +5V

I-out, and E-out analog monitor for cell current and potential
AC-out ±0.5V sinewave 10μHz-1MHz with variable attenuation
Channel-X, and Channel-Y inputs ±4V: to record impedance from peripheral devices



pocketSTAT™

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, but suits any low current electrochemical application.

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: 11.5 x 5.85 x 1.25cm
- Weight: 140g
- Scan range: ±4V ±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	±10mA
Maximum output voltage	±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 16bit ADC, 5000 samples/s
Electrode connection	RE/WE/CE and GND lead, 2mm banana plugs

Potentiostat

Applied potential range	±4V at 0.125mV resolution
Applied potential accuracy	0.2% or 2mV
Current ranges	±1nA to ±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	±0.4mV, ±4mV, ±40mV, ±0.4V, ±4V
Measured potential resolution	0.003% of potential range, minimum 16nV
Measured potential accuracy	0.2% or 2mV

Impedance analyser

Frequency range	10µHz to 100kHz
Amplitude	0.015mV to 1.0V, or 0.03% to 100% of current range
DC offset	16bit 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 7/8/10, with free USB port

CompactStat™



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 6 POWER CONFIGURATIONS

- ± 30mA @ ±10V
 - ± 1.25A @ ±6V*
 - ± 800mA @ ±10V*
 - ± 250mA @ ±20V*
 - ± 30mA @ ±100V*
 - ± 15mA @ -20 to +200V*
- *) 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	±30mA
Maximum output voltage	±10V
4 electrodes	WE, CE, RE, S
Potentiostat bandwidth	>3MHz
Stability settings	High Speed, Standard, and High Stability
Programmable response filter	1MHz, 100kHz, 10kHz, 1kHz, 10Hz
Signal acquisition	Dual channel 24bit ADC, 100,000 samples/s

Potentiostat

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

Galvanostat

Applied current resolution	0.00013% of applied current range
Applied current accuracy	0.2%
Potential ranges	±0.4mV, ±4mV, ±40mV, ±0.4V, ±4V, ±10V
Measured potential resolution	0.00001% of potential range, minimum 0.05nV
Measured potential accuracy	0.2% or 1mV

Impedance analyser

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

Electrometer

Input impedance	>1000Gohm // <8pF
Input bias current	<10pA
Bandwidth	>16MHz

Special functions

Ohmic drop compensation	2V/current range, 16bit resolution
Safety features	Automatic disconnect on internal/external limits

Peripheral connections

8 analog in, and 2 analog out	0 to +4V, 16bit resolution
2 digital inputs, 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-3MHz with variable attenuation
Channel-X and Channel-Y inputs	±4V: to record impedance from peripheral devices

Environment

Power requirements on USB power	Standard 5V, 500mA
External adapter	100-240V, 45-65Hz, 500mA
Interfacing	USB
Size	w x d x h = 12 x 26 x 2.5cm
Weight	0.6kg
PC requirements	Windows 7/8/10, with free USB port

CompactStat.h with booster*

System performance

	h06125	h10800	h20250	h10030	h20015
Current compliance	±1.25A	±800mA	±250mA	±30mA	±15mA
Maximum output voltage	±6V	±10V	±20V	±100V	-20 to +200V
Additional applied range	-	-	±20V, 0.04mV res.	±100V, 0.2mV res.	+200V, 0.4mV res.
Additional measured range	-	-	±20V	±100V	+200V
Power requirements	100-240V, 700mA 50-60Hz	100-240V, 50-60Hz, 700mA	100-240V, 50-60Hz, 700mA	100-240V, 50-60Hz, 700mA	100-240V, 50-60Hz, 700mA
Weight	0.7kg	0.7kg	0.7kg	0.7kg	0.7kg

*All other specs same as standard model.

Ivium-n-Stat



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

Four channel qModule

- 4 x $\pm 30mA / \pm 10V$

Integrated EIS

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

Main frame

- 40A
- Maximum 8 modules
- Stackable up to 64 channels

EXPANDABILITY

The Ivium-n-Stat main frame contains 8 slots for a maximum of 32 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

Available Channel modules:

	Single channel sModules				Dual channel dModules		Four channel qModule
Channel Performance	2.5A / 10V	5A / 10V	10A / 5V	2A / 20V	500mA / 10V	2.5A / 10V	30mA / 10V
Number of channels in module	1	1	1	1	2	2	4
Current compliance	$\pm 2.5A$	$\pm 5A$	$\pm 10A$	$\pm 2A$	$\pm 500mA$	$\pm 2.5A$	$\pm 30mA$
Maximum output voltage	$\pm 10V$	$\pm 10V$	$\pm 5V$	$\pm 20V$	$\pm 10V$	$\pm 10V$	$\pm 10V$
Floating operation available	Yes	Yes	Yes	Yes	Module floating	Module floating	Module floating
Potentiostat							
Applied potential range	$\pm 10V$	$\pm 10V$	$\pm 5V$	$\pm 20V$	$\pm 10V$	$\pm 10V$	$\pm 10V$
Resolution	0.33mV	0.33mV	0.33mV	0.667mV	0.33mV	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	0.2%, or 2mV
Current ranges	$\pm 10nA$ to $\pm 10A$	$\pm 10nA$ to $\pm 10A$	$\pm 10nA$ to $\pm 10A$	$\pm 10nA$ to $\pm 10A$	$\pm 10nA$ to $\pm 10A$	$\pm 10nA$ to $\pm 1A$	$\pm 10nA$ to $\pm 10mA$
#	10 ranges	10 ranges	10 ranges	10 ranges	9 ranges	9 ranges	7 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	0.015% of range
Minimum	1.5pA	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%	0.2%
Galvanostat							
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	0.033% of range
Applied current accuracy	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.3%
Potential ranges	Yes	Yes	Yes	Yes, and $\pm 20V$	Yes	Yes	Yes, and $\pm 1mV$
$\pm 10mV, \pm 100mV, \pm 1V, \pm 10V$							
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	0.003% of range
Minimum	400nV	400nV	400nV	400nV	400nV	400nV	40nV
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	0.2%, or 2mV
Peripheral connections	Yes	Yes	Yes	Yes	No	No	Yes*

*Analog input: $\pm 10V$, 16bit resolution, bandwidth 40kHz

All Channels:

Peripheral connections	
2 analog in	$\pm 10V$, 16bit resolution, bandwidth 40kHz
1 analog out	$\pm 10V$, 16bit 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	$\pm 0.5V$ sinewave 10 μ Hz-250kHz with variable attenuation
Channel-X, and Channel-Y inputs	$\pm 4V$: to record impedance from peripheral devices
Special functions	
Ohmic drop compensation	2V/current range, 16bit 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
Stability settings	High Speed, Standard, and High Stability
Programmable response filter	1MHz, 100kHz, 10kHz, 1kHz, 10Hz
Dual Channel signal acquisition	Dual channel 16bit ADC, 100,000 samples/s
Impedance Analyser	
Frequency range	10 μ Hz to 250kHz (optional: 10 μ Hz to 1MHz)
Amplitude	0.015mV to 1.0V, or 0.03% to 100% of current range
DC offset	16bit DC offset subtraction, and 2 DC-decoupling filters
Electrometer	
Input impedance	>1000Gohm // <10pF
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
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)
PC requirements	Windows 7/8/10, with free USB port

OctoStat



High performance rack-mountable battery test system with integrated impedance analyser

The OctoStat is a multi-channel test system with a fixed number of 8 channels per unit. Each channel is equipped with its own dedicated FRA/EIS and an input for temperature measurement. The OctoStat has an integrated DataSecure that stores all data independent of the PC to ensure that in the event of communication loss or computer crash, the measurement will continue and measurement data is never lost. This system stability makes the OctoStat a perfect system for long term testing applications. The OctoStat is built into a 19inch rack mountable housing.



AVAILABLE

- OctoStat30: $\pm 30\text{mA}/\pm 10\text{V}$ per channel
- OctoStat200: $\pm 200\text{mA}/\pm 10\text{V}$ per channel
- OctoStat5000: $\pm 5\text{A}/\pm 10\text{V}$ per channel

POWERBOOSTER

- OctoBoost16000: $\pm 16\text{A}/\pm 10\text{V}$ each channel can be combined to increase power, for example 4 x $\pm 32\text{A}$, 2 x $\pm 64\text{A}$, 1 x $\pm 64\text{A}$ and 4 x $\pm 16\text{A}$, 1 x $\pm 128\text{A}$, etc.

CONNECTION

- USB
- LAN / Ethernet

EXPANDABILITY

Different OctoStats can be combined in the same rack and connected/controlled from the same computer. Each rack and channel can be assigned a freely user selectable number or name for easy recognition.

19INCH RACK MOUNTABLE HOUSING

Each OctoStat unit is built into a 19inch rack mountable housing. Multiple units and combinations of OctoStats can be built into the same rack.

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.

Each Channel

- Dedicated embedded FRA/EIS
- Dedicated software for battery testing
- Capable of EIS during DC charge/discharge
- Overload handled via clamping (not shut-off) so measurements continue



OctoStat

	OctoStat30	OctoStat200	OctoStat5000	OctoBoost16000 (Booster for OctoStat)
System				
Current compliance	$\pm 30\text{mA}$	$\pm 200\text{mA}$	$\pm 5\text{A}$	$\pm 16\text{A}$
Maximum output voltage	$\pm 10\text{V}$	$\pm 10\text{V}$	$\pm 10\text{V}$	-2 to +9V, or $\pm 5\text{V}$
FRA/EIS	10 μHz to 100kHz	10 μHz to 100kHz	10 μHz to 100kHz	10 μHz to 10kHz
Analog I/O	16bit analog I/O channel	16bit analog I/O channel	16bit analog I/O channel	No
Channel combination	No	No	No	Yes*
Potentiostat				
Applied potential range	$\pm 10\text{V}$	$\pm 10\text{V}$	$\pm 10\text{V}$	-2 to +9V, or $\pm 5\text{V}$
Resolution	0.33mV	0.33mV	0.33mV	0.33mV
Applied potential accuracy	0.2%, or 2mV	0.2%, or 2mV	0.2%, or 2mV	0.2%, or 2mV
Current ranges	$\pm 10\text{nA}$ to $\pm 10\text{mA}$	$\pm 10\text{nA}$ to $\pm 100\text{mA}$	$\pm 10\text{nA}$ to $\pm 10\text{A}$	$\pm 10\text{nA}$
Measured current resolution	16bits min. 1pA	16bits min. 1pA	16bits min. 1pA	defined by controlling potentiostat
Measured current accuracy	0.2%	0.2%	0.2%	0.2%
Galvanostat				
Applied current resolution	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%
Measured potential resolution	16bits, min. 400nV	16bits, min. 400nV	16bits, min. 400nV	16bits, min. 400nV
Measured potential accuracy	0.2%, or 2mV	0.2%, or 2mV	0.2%, or 2mV	0.2%, or 2mV
Dimensions				
Width	44.2cm	44.2cm	44.2cm	44.2cm
Height	1U	1U	2U	3U

All Channels

Channel Performance

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

Impedance Analyser

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

Electrometer

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

Connection

Connectors GND and combined EMO: emergency off control
 Communication USB/LAN (Ethernet)
 Integrated DataSecure Data acquisition time: 2ms minimum
 Stored no. of data points: 20M each channel

*Channels can be combined to increase current, for example 4 x $\pm 32\text{A}$, 2 x $\pm 64\text{A}$, 1 x $\pm 64\text{A}$ and 4 x $\pm 16\text{A}$, 1 x $\pm 128\text{A}$, etc.





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 limited 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 24bit 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 μ Hz to 8MHz
0.015mV to 1.0V, or 0.03% to 100% of current range
16bit DC offset subtraction, and 2 DC-decoupling filters
0.05nV to 10V, and 0.2aA to 30mA

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

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

0 to +4V, 16bit resolution
0 to +5V
Analog monitor for cell current and potential
 $\pm 0.5V$ sinewave 10 μ 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 7/8/10, with free USB port

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 unlimited so there is no maximum to the number of operating Windows 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
Batch programming for easy sequencing of events
Multi-channel control: multiple channels synchronised

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

Results: graphic or numeric data representation

Method parameters: construct your method

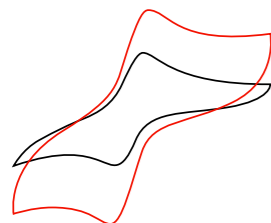
File	Scan#	Wscan	Date	Description	Technique	SN	Chen	Cycle	Status	File
	0000	1	2005/04/28 12:43:55	Fe in KNO3	CV Std	0	0	100%		C:\IviumStat\data\lec\cv500mV\id
	0000	1	2005/04/28 12:43:01	Fe in KNO3	CV Std	0	0	100%		C:\IviumStat\data\lec\cv500mV\id
	0173	1	2004/05/07 12:29:56	scan 1	CV Galv	V21502	1	1	100%	C:\IviumStat\data\imp\lec\01731405CVscan1V21502\id
	0172	1	2004/05/07 12:32:59	scan 1	CV Galv	V21100	1	1	100%	C:\IviumStat\data\imp\lec\01721405CVscan1V21100\id
	0171	1	2004/05/07 12:16:12	scan 1	CV Galv	V72210	1	1	100%	C:\IviumStat\data\imp\lec\01711405CVscan1V72210\id
	0170	1	2004/05/07 11:47:27	scan 1	CV Galv	S55440	1	1	100%	C:\IviumStat\data\imp\lec\01701405CVscan1S55440\id

IviumStat*	XRi	XRe
System performance	10A / 10V	2A / 50V
Current compliance	$\pm 10A$	$\pm 2A$
Maximum output voltage	$\pm 10V$	$\pm 50V$
Additional (applied) potential range	-	$\pm 50V$, 0.1mV resolution
Power requirements	100-240V, 45-63Hz, 300VA	100-240V, 45-63Hz, 300VA
Weight	5.3kg	5.3kg

*) All other specs same as standard model.

- Scan rate 1 μ V/s to 10,000V/s
- Minimum time interval 10 μ 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 μ 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™, delphi, C, etc.

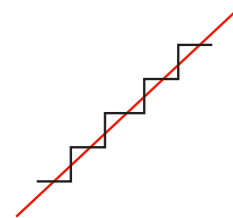
Options and Modules



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 $\pm 2V$, 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, α -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.

	QuickScan	FastScan
• 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	16bit	16bit



PERIPHERAL INTERFACING PORT AND MODULES

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. Various standard modules are available for connection:

- PPE: The Peripheral Port Expander is a junction box that offers easy connection via 4mm bananas.
- PDA: 8-Channel Peripheral Differential Amplifier that offers the same junction box, but adds 8 high impedance differential inputs $> 10^{12} \Omega$, allowing simultaneous recording of differential bipolar high-ohmic external voltages, such as reference electrodes or pH meters.
- s/mPDA: 2-Channel Peripheral Differential Amplifier.
- TCM-K: For connection of a K-Type thermocouple.
- PDA-T: Combination of a PDA channel with a K-type thermocouple channel.
- PLT: Peripheral Level Transformer for increasing the analog input voltage range of IviumStat/CompactStat to $\pm 10V$.
- More modules available on request.



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 $< 2\mu s$



HIZ: HIGH IMPEDANCE POTENTIAL PRE-AMPLIFIER

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

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



LOW CURRENT RANGE MODULE

The LC module adds 3 real current ranges below the available current ranges of an Ivium potentiostat, increasing the current resolution by a factor of 1000. It is an analog module and is compatible with almost all Ivium potentiostats, including our 24bit instruments.

- Applied voltage $\pm 10V$
- Maximum current 100mA
- Minimum current resolution 0.06aA
- Measured current accuracy 0.2% of range
- Input impedance $> 100T\Omega / 8pF$
- Electrometer bandwidth $> 1MHz$



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 $\pm 1mA/channel$
- Potential offset max. $\pm 2V$, 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



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
- uMUX
- Each electrometer $> 1000G\Omega / < 8pF$ and bandwidth $> 16MHz$
 - Each channel switches with relays; can be used with all potentiostats including 50V and 100V versions, at 5A max.

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 $\pm 1mA/channel$
- 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.

- 12.5cm² Steel 316L electrode
- Soft silicon seal allows high surface roughness
- Allows use of reference electrodes
- Sold in sets of 2



BATTERY HOLDERS

To facilitate easy connection of batteries for testing, Ivium offers two types of battery holders:

- 1) For connection to the cell cable via 4mm banana sockets
- 2) For direct connection to the cell connector

- Coin cell
- AAA cell
- AA cell
- 18650 cell

SOLAR SIMULATORS



IvISUN

Programmable LED light source capable of 1,000W/m². 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 460-740nm. 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).

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: l x w x h = 15 x 12 x 5.5cm

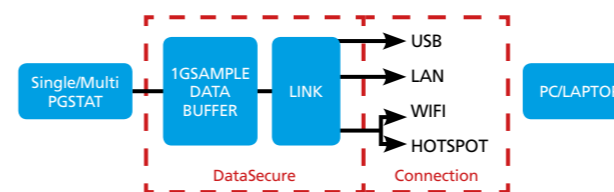
CONNECTION WIFI | LAN | USB | REMOTE/DIRECT

- Wireless connection access anywhere: ideal for connection in fume hood or glove box
- Direct (hard wired) connection also possible
- Compatible with both single- and multi-channel Ivium potentiostats
- Password protected connection possible



ALSO AVAILABLE: µDATASECURE

The µDataSecure offers all the same advantages as the DataSecure, but does not have the WIFI connection/Hotspot functionality. This will makes it ideal for applications where wireless signals may be undesirable.



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 10µHz - 100kHz
- All electrochemical techniques available
- Bandwidth > 100kHz
- Rise time < 50µs

AVAILABLE IN THE IvIUMBOOST SERIES:

- ±0.6A @ ±100V
- ±5A @ ±20V
- ±10A @ ±10V
- ±40A @ ±10V
- ±100A @ ±12V



Compatibility table of Ivium instruments

	Vertex One	Vertex					pocketSTAT	CompactStat					IviumStat			Ivium-p-Stat					OctoStat			OctoBoost									
		Current:	100mA	0.1A	1A	2A		5A	10A	10mA	Standard	h06125	h10800	h20250	h10030	h20015	Standard	XSt	XRe	5A	10A	2A	2.5A		5A	10A	2A	5A	10A	500mA	dModule	qModule	30
Current:	100mA	0.1A	1A	2A	5A	10A	10mA	Standard	h06125	h10800	h20250	h10030	h20015	Standard	XSt	XRe	5A	10A	2A	2.5A	5A	10A	2A	5A	10A	500mA	dModule	qModule	30	200	500	15-128A	
Voltage:	21V	10V	10V	20V	10V	10V	8V	30mA	1.25A	800mA	250mA	100V	200V	10V	10V	50V	10V	10V	10V	10V	10V	10V	10V	10V	10V	10V	10V	10V	10V	10V	10V	9V	
FRAMES:	250kHz*	1MHz*	1MHz*	1MHz*	1MHz*	1MHz*	100kHz	10V	6V	10V	20V	100V	200V	10V	10V	50V	10V	10V	10V	10V	10V	10V	10V	10V	10V	10V	10V	10V	10V	10V	10V	10kHz	
Options:																																	
Bipolar/Stat																																	
True Linear Scan																																	
IviumBoost1001 (100V/0.6A)																																	
IviumBoost2015 (20V/5A)																																	
IviumBoost1010 (10V/10A)																																	
IviumBoost1040 (100V/40A)																																	
IviumBoost10012 (12V/100A)																																	
IviumBoost16000 (9V/16-128A)																																	
PDA/PPE																																	
mPDA/pPDA																																	
HMMX-KR multiplier																																	
uMIX multiplier																																	
MultiWE32 (4HSense32)																																	
Low CR Module																																	
MUX32/MEA																																	
FastScan/QuickScan																																	
Current Interrupt Module																																	
TCM-K Thermocouple Module																																	
Peripheral Level Transformer																																	
Modulight (f-Moosens)																																	
hSIN solar simulator																																	
LightSens																																	
HiZ enhanced electrometer																																	
Database/JavaScripture																																	

*) Optional

Ivium Technologies was founded in 2001 and is based in Eindhoven, the Netherlands, at the heart of the 'Brainport region', named smartest region in the world 2011.

We develop and supply equipment for electrochemical research all over the world. We have grown to where we are today by combining modern design techniques and state-of-the-art components with efficient manufacturing and swift customer service. We understand the needs of electrochemical researchers and are focused on developing the products and support to meet those needs. Our dedication to developing solutions for electrochemical research has resulted

in high performance instrumentation for a wide variety of applications. Ivium potentiostats can be found in academic, industrial, and government laboratories around the world. Our unique USB powered portable potentiostats are frequently used in the field and remote locations. With five families of potentiostats, a multichannel potentiostat and a range of battery testers, we can meet virtually any application and budget

- Ivium offers 3 years warranty on our instruments
- IviumSoft is included for free with each potentiostat purchase



Ivium Technologies
Eindhoven, The Netherlands
www.ivium.com
info@ivium.com

innovative solutions for electrochemical research



2017 © Specifications subject to change