



Metrohm Autolab

Portfolio Overview

Why Metrohm Autolab Potentiostats/Galvanostats?

For more than 40 years, we have maintained our position as a market leader in Electrochemistry Instrumentation, fueled by our continuous commitment to innovation. Each instrument was created based upon decades of customer insight to meet the requirements of electrochemical research and improve the efficiency of your daily workflow.

Our instruments cater to various electrochemistry fields such as Energy, Electrocatalysis, Corrosion, Sensors, and more. Customers utilize our tools for both fundamental and applied research, aiming to understand and enhance electrochemical processes to develop superior materials with future potential. Being trusted by our loyal customers, Metrohm Autolab instruments have been cited in more than 130,000 peer-reviewed journal articles worldwide, positioning Metrohm Autolab as one of the most frequently cited manufacturers of electrochemistry instrumentation. Additionally, Metrohm Autolab is ISO9001 certified, ensuring the highest standards of quality management and customer satisfaction.

RELIABILITY

Each component within our instruments undergoes traceable testing, with over 400 quality checks conducted during the manufacturing process. Our installed instruments maintain an average uptime of 99% within the first 5 years of installation[^].

VERSATILITY

Our instruments are designed to meet the diverse needs of electrochemical research. The built-in features and modular designs allow for flexibility and expansion, while optional modules can be installed to extend the standard configuration, offering additional measurement capabilities.

EFFICIENCY

With INTELLO and NOVA software, data acquisition and analysis are streamlined. These robust platforms come equipped with essential procedures and customizable options, enabling maximum laboratory throughput.

SUPERIOR SERVICE

We offer industry-leading warranty and support for all our instruments, modules and accessories. Our dedicated distribution and service network ensures a swift response to any technical, service, or application support questions within 48 hours.

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[^] based on European markets and most widely sold instruments.

Explore beyond the known in Energy research

Electrochemical processes are the fundamentals of a wide range of energy storage devices such as batteries and super-capacitors. Metrohm Autolab electrochemical instruments and accessories are enabling the most efficient and safest research in energy storage applications allowing the evaluation of the batteries' performances with the highest accuracy and precision.

Versatility with High-Power solutions

- High-energy density testing **up to 6 A** (standard for VIONIC) or using optional **boosters up to 10 A or 20 A***
- Higher current (>20 A)** available with third party programmable power supplies or electronic loads*

Efficiency with high-throughput multiple-cell testing

- Upgradeable** with up to **12 channels** per cabinet (Multi Autolab M204)
- Expandable with **EIS, Booster10A, Temperature** measurement options as your research evolves

Simplicity with ready-to-use procedures and commands

- Constant-current / constant-voltage (**CC, CC-CV**) cycling as well as **GITT / PITT, internal resistance** measurement techniques
- User-defined **end conditions**
- Dynamic sampling** for data reduction
- True analog (linear) scan** for supercapacitors
- Automated data analysis and plotting:** Capacity (charge, discharge, total), Coulombic efficiency, Capacity retention, dQ/dV plots*

Safety at the core of your experiments

- Customizable safety limits, rules** and **cell isolation** with **emergency switch** for high power solutions
- Data can be continuously and **automatically exported** with **onboard memory** supporting up to **10 Million data points***

New discoveries with the most accurate Impedance Spectroscopy (EIS)

- Real-time monitoring of **State-of-Health (SoH)** and **State-of-Charge (SoC)** throughout battery cycling
- EIS at both anode and cathode** (with a second sense S2) with an **accuracy up to 99.75%** with **fit and simulation***
- Up to **10 MHz** for solid-state electrolytes resistance measurements*

* Does not apply to all instrument models. See instrument specification sheet for more details



CONFIGURABLE SETUP FOR ENERGY RESEARCH FROM METROHM AUTOLAB

CHOOSE YOUR INSTRUMENT



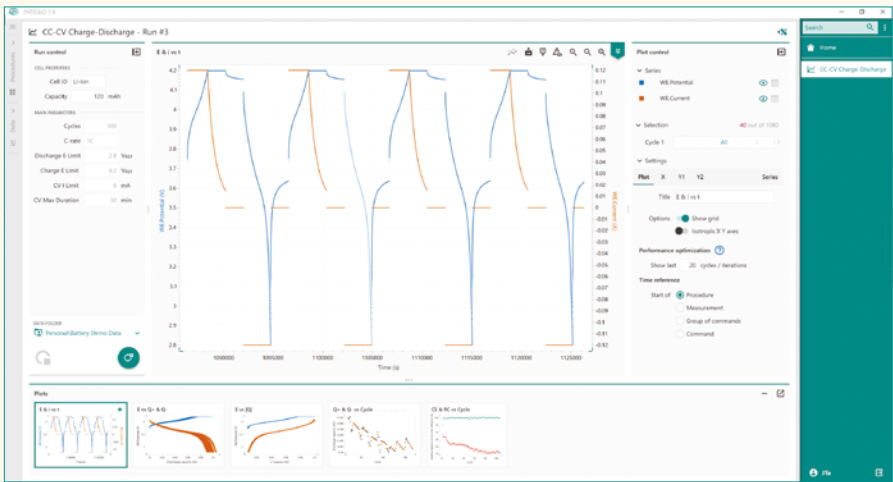
VIONIC powered by INTELLO
Most advanced all-in-one instrument with the highest combined specifications



Multi Autolab M204
Multichannel instrument for the highest throughput



BUNDLE WITH INTUITIVE SOFTWARE



Cycling methods with convenient, automatic data analysis and plotting.



ADD YOUR CHOICE OF ACCESSORIES



Current Boosters



Temperature-controlled cells



DynLoad interface / Voltage multiplier



Holder for two coin-cells, with 4-point gold contacts



EXPLORE BEYOND THE KNOWN TOGETHER WITH METROHM AUTOLAB

Explore beyond the known in Electrocatalysis and Fuel Cells research

Metrohm Autolab is the obvious choice when looking for instrumentation for electrocatalysis and energy conversion research. It offers the most versatile, reliable, and accurate equipment, accessories, and software, complemented by rapid and expert technical and application support. This combination ensures hassle-free studies of reaction mechanisms, kinetics, and electrochemical interface characterization.

Versatility and efficiency for any ECAT and energy conversion lab

- **Suitable power for any type of measurements** or samples: up to ± 50 V compliance, ± 6 A max current standard, ± 20 A with boosters*. **Higher current (>20 A) available** with third party programmable power supplies or electronic loads*
- **Optional modules***, R(R)DE*, cells and electrodes
- **Routine and exploratory workflows supported by ready-to-use** but editable procedures
- Instrument access in a **network for easy collaboration***
- Dynamic interface with **real-time status display**

Simplicity with ready-to-use procedures and commands

- **EIS, Hydrodynamic EIS and Mott-Schottky analysis**
- **Analog (linear) scan and staircase CV and LSV** with hydrodynamic control
- **Fast and standard Chrono methods**

New discoveries of electrocatalytic processes and materials are enabled by

- Integrated control of the **noise-free and ultra-clean Autolab RDE and RRDE***
- **True analog scan** for the most accurate results for interfacial processes
- **Most accurate (99.75%) EIS up to 10 MHz** for any samples and processes with EIS data **fit and simulation**
- Automatic **iR drop measurement and correction**
- **Second voltage sense (S2)** to follow simultaneous processes on 2 electrodes in the same cell
- In-situ **Temperature, pH monitoring**
- **SDK for integration and control** in external setups*
- **Seamless measurements** for gap-free cell control and data acquisition*

Safety at the core of your experiments:

- **Customizable safety limits**, rules and **cell isolation***
- **Oscillation detection and cell protection** with Cell On/Off switch
- **Continuous data export** with onboard memory up to 10 M data points*

* Does not apply to all instrument models.
See instrument specification sheet for more details



CONFIGURABLE SETUP FOR ECAT AND FUEL CELLS RESEARCH FROM METROHM AUTOLAB

CHOOSE YOUR INSTRUMENT



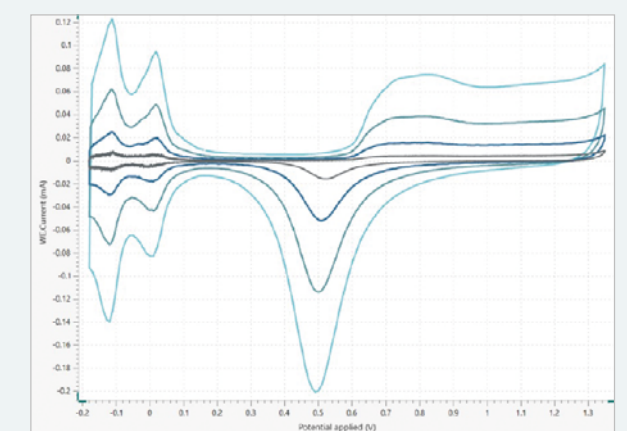
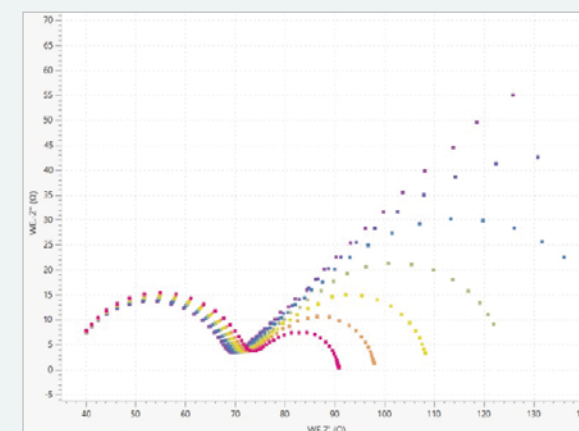
VIONIC powered by INTELLO
Most advanced all-in-one instrument with the highest combined specifications



AUT302N
Maximum modularity, future-proof your research



BUNDLE WITH INTUITIVE SOFTWARE



Wide variety of measurements and plots such as hydrodynamic EIS and analog (linear) scan CV at different scan rates.



ADD YOUR CHOICE OF ACCESSORIES



GC, Pt, Au, Ag disk and ring-disk electrodes



R(R)DE with special 250 mL RRDE cell



Current Boosters



DynLoad interface / Voltage multiplier



Temperature-controlled cells



EXPLORE BEYOND THE KNOWN TOGETHER WITH METROHM AUTOLAB

Explore beyond the known in Corrosion research

Metrohm Autolab instruments, combined with a wide range of accessories and advanced software packages, provide a complete and flexible system for advanced corrosion research in the lab. Maximize efficiency with automated workflows for measuring corrosion rates, investigating corrosion mechanisms, analyzing coating properties or screening for the best corrosion inhibitor, all with ASTM compliance.

COMPLIANT WITH THE MOST IMPORTANT ASTM STANDARDS:
ASTM G5, G59, G61, G100, B825, G150, G102, G106, G148, G185, G199, F2129, F746.

Versatility for low- and high-impedance corrosion research

- Suitable power for any corrosion applications with ± 50 V dual mode compliance voltage*
- **Upgradeable** with optional modules including high accuracy EIS (99.75%) and low current amplifier*
- Full range of accessories including **corrosion cells, electrodes, sample holders** and **rotators**
- **Expandable systems** with additional potentiostat channels*

Simplicity with ready-to-use procedures and commands

- **Linear polarization (LP)** procedure
- **EIS at OCP**, programmable at any time during the experiment
- **Normalized current density** signal
- **Electrochemical Noise (ECN, ZRA)** measurements for galvanic coupling

Efficiency and high throughput for multiple-cell testing

- Automatic **sequentially multiplexed measurements** for 64 full cells or 256 samples*
- **Routine** and **exploratory** workflow for any type of investigation
- **Computer-free operation** (untethering) with internal memory in VIONIC

New discoveries enabled by countless configurations

- Couple with **pH and temperature measurements**
- Monitor the **voltage on the counter electrode** with the second sense (S2) or the additional differential amplifier of the pX1000 module
- Gain new insights with **hyphenation (EC-Raman, XRD, FTIR, SECM)**. All our devices come with **digital and analog I/O connectors** for controlling external devices



Use any cell you want in any way you want. With the **Selectable Floating Modes of VIONIC**, you can immediately **connect to any type of electrochemical cells** independently of its grounding state: **standard cells, grounded working electrode, grounded counter electrode** or **grounded cell body**. Do not limit your research and your discovery.

* Does not apply to all instrument models. See instrument specification sheet for more details

CONFIGURABLE SETUP FOR CORROSION RESEARCH FROM METROHM AUTOLAB

CHOOSE YOUR INSTRUMENT



VIONIC powered by INTELLO
Most advanced all-in-one instrument with Selectable Floating Feature



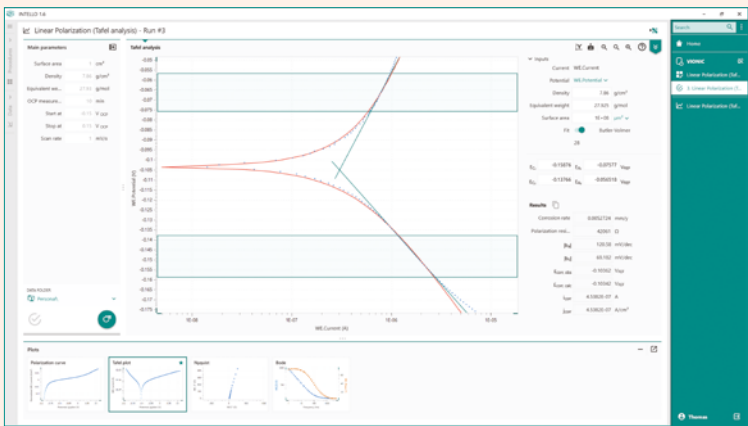
AUT302N
Maximum modularity, future-proof your research



AUT204
Space-saving solution for corrosion research and testing



BUNDLE WITH INTUITIVE SOFTWARE



Wide variety of analysis options for corrosion including: Tafel analysis, Butler–Volmer fit & polarization resistance.



ADD YOUR CHOICE OF ACCESSORIES



1 L Corrosion cell



250 mL Corrosion cell



Flat Sample Platform



Rotating cylinder or disk electrode (RCE, RDE)



EXPLORE BEYOND THE KNOWN TOGETHER WITH METROHM AUTOLAB

Explore beyond the known in Sensors development

Metrohm Autolab electrochemical instruments and accessories, will meet any requirements for electrochemical sensor applications. A wide range of electrochemical techniques are used to characterize new sensing materials, gain a better understanding of the specific processes and reaction mechanisms, test and optimize new electrochemical sensors for future commercial applications.

Versatility for any requirements in new discoveries

- Optional modules including low **current amplifier** (ECD), **electrochemical quartz crystal microbalance** (EQCM), **pH and Temperature** monitoring (pX1000)*
- Large variety of accessories such as **electrochemical cells**, **screen-printed electrodes** and **(micro)electrodes**

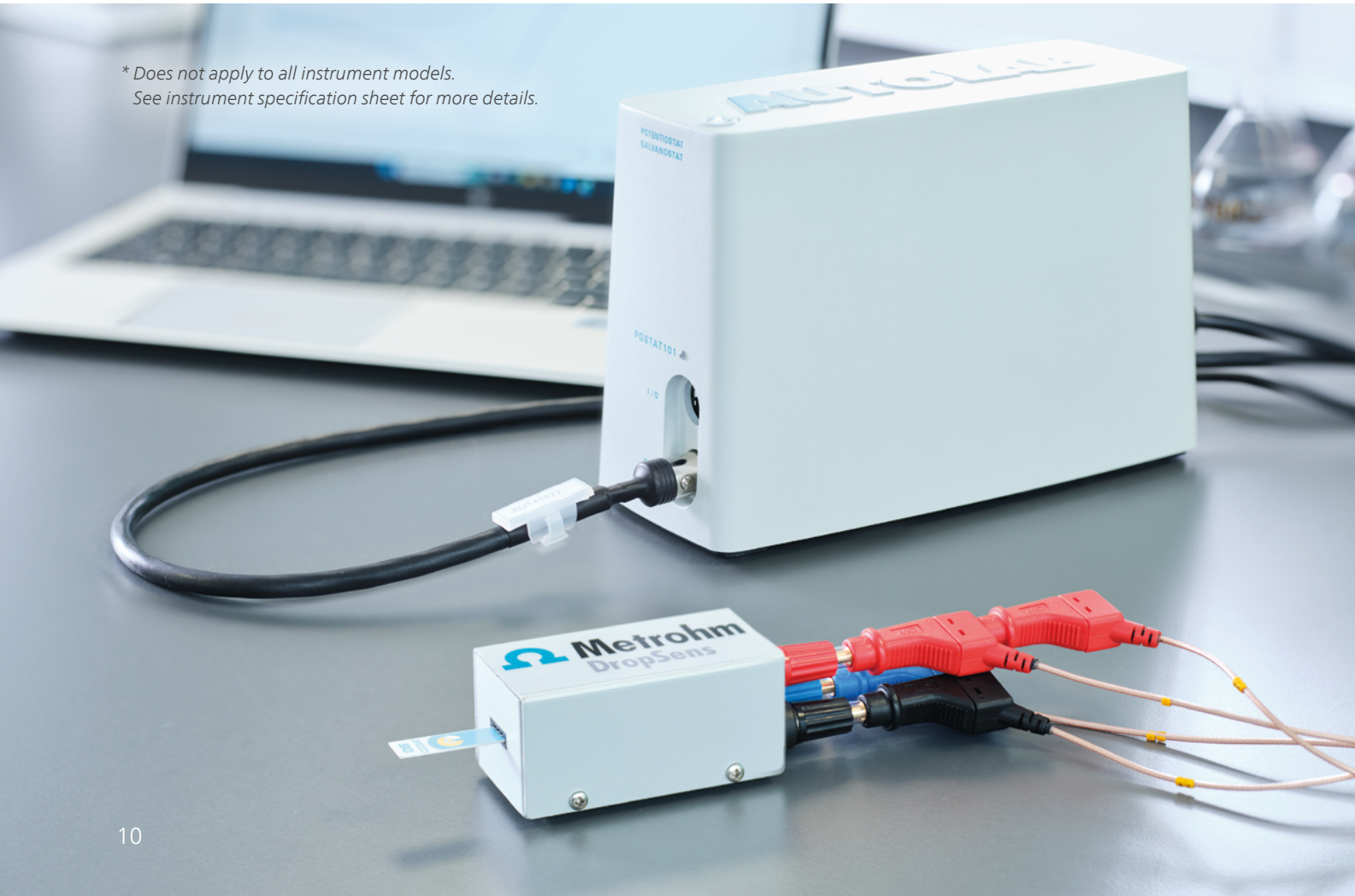
New discoveries for sensor development

- Perform **EIS measurements up to 10 MHz** with EIS data **fit and simulation** for impedimetric sensor development and testing*
- Gain new insights with **hyphenation**, combining electrochemistry with any other technique like: **Raman, XRD, FTIR, SECM, EQCM and UV-VIS**

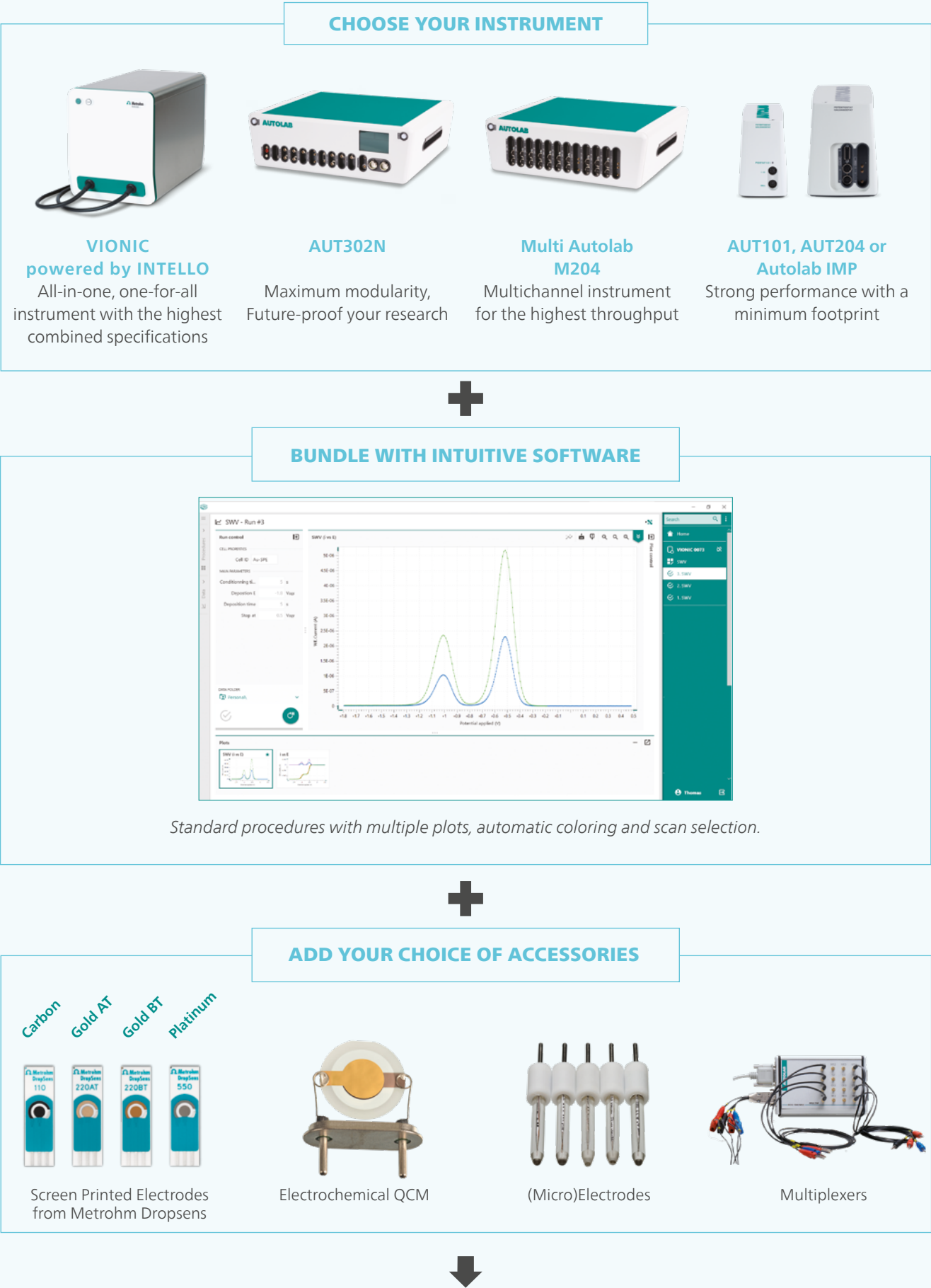
Efficiency for any type of sensor research and testing

- Multichannel potentiostat configurations for **simultaneous measurements on multiple electrochemical cells**
- MultiBA configuration for **independent screening up to 6 working electrodes** in the same cell*
- Automatic **sequential measurements on up to 64 complete electrochemical cells or 256 working electrodes***
- Ready-to-use voltammetric analysis techniques** such as differential-pulse voltammetry (DPV) and square-wave voltammetry (SWV)
- Integrated control of Metrohm liquid handling devices** such as dosing units and sample changers*
- Data analysis and plotting include **peak search, peak height and area** determination, with the possibility of baseline correction and subtraction

* Does not apply to all instrument models.
See instrument specification sheet for more details.



CONFIGURABLE SETUP FOR BIO(SENSOR) RESEARCH FROM METROHM AUTOLAB



EXPLORE BEYOND THE KNOWN TOGETHER WITH METROHM AUTOLAB

VIONIC powered by INTELLO

All-in-one, one-for-all instrument

SUCCESSOR OF AUTOLAB MODULAR LINE

Building on the success and customer insights of the AUT302N, **VIONIC powered by INTELLO** combines advanced hardware features with intuitive software – all included in one package, with no need for additional modules. Explore new possibilities with this cutting-edge technology, designed to evolve with your research needs.

HIGHEST COMBINED BUILT-IN SPECIFICATIONS

VIONIC powered by INTELLO offers the highest combined specifications available on the market: ± 50 V compliance voltage, 11 current ranges from 1 nA to ± 6 A, and EIS with the maximum frequency up to 10 MHz, enabling you to perform a wider range of experiments.

THE MOST COMPLETE DATA

VIONIC's fast sampling (1 μ s sampling interval) and seamless measurements (0 ns gap between commands) for both applied and measured signals ensure no data points are missed.



VERSATILITY

- Dual-mode compliance voltage: ± 10 V / ± 50 V
- Maximum EIS frequency: 10 MHz
- Maximum current: ± 6 A
- Dynamic current ranging: 1 nA - 6 A
- Minimum sampling interval: 1 μ s
- RDE / RCE control

DISCOVERY

- Selectable Floating: grounded WE, CE, cell body
- Second Sense (S2) for EIS
- Analog scan
- Seamless (no-gap) measurements
- Hyphenation possibility (TTL)
- Temperature logging with thermocouple

EFFICIENCY

- Ethernet connection in a network
- Real-time dynamic interface
- Computer-free operation (untethering)
- Small footprint: 20x27x40 cm (WxHxD)

SAFETY

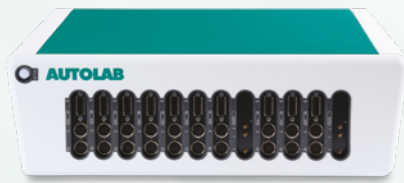
- Cell On/Off button
- Automatic data saving
- Oscillation detection and protection
- Cell isolation for error states
- Cell protection center
- 10 million points internal memory



Explore INTELLO software features on Pages 18-19

Trusted solutions for decades

NOVA software compatible



	AUT302N	M204	M101	AUT204	Autolab IMP	AUT101
Product Line	Modular line	Multichannel line		Compact line		
Description	Highest versatility with optional modules	Maximum throughput with versatility		Space-saving solution		
Compliance voltage	± 30 V	± 20V	± 10 V	± 20V	± 10 V	± 10 V
Current	± 2 A Booster option: ± 20 A	± 400 mA Booster option: ± 10 A	± 100 mA	± 400 mA Booster option: ± 10 A	± 100 mA	± 100 mA
EIS	1 MHz, 10 MHz, optional	1 MHz, optional	1 MHz, optional	1 MHz, optional	1 MHz, built-in	-
	<ul style="list-style-type: none">– Modular design, configurable with 8 of the 11 optional modules* available and an external current booster for any application– RRDE control and measurements with the Bipotentiostat (BA) module for reaction mechanism studies in electrocatalysis and sensor research	<ul style="list-style-type: none">– Multichannel design with up to twelve channels, each of which can be customized with one of the 5 optional modules to support a wide range of applications.– The Multi Autolab M204 can be upgraded with an external 10A current booster for energy research– RRDE control and measurements with the Bipotentiostat (BA) module for reaction mechanism studies in electrocatalysis and sensor research		<ul style="list-style-type: none">– AUT204 is customizable with one of the 5 optional modules* for a wide range of applications and an external 10A current booster for energy research– RRDE control and measurements with the Bipotentiostat (BA) module for reaction mechanism studies in electrocatalysis and sensor research	<ul style="list-style-type: none">– Combines compactness with built-in EIS functionality, ideal for educational settings and entry-level research	<ul style="list-style-type: none">– Compact and cost saving option which provides essential features for basic electrochemical measurements
Software	Explore the powerful NOVA software features on the pages 18-19			Explore the powerful NOVA software features on the pages 18-19		

* Detailed descriptions of optional modules are listed on pages 16-17

Optional modules



Additional capabilities that can be added to the **modular AUT302N**, the **compact AUT204** as well as the **Multi Autolab M101** and **M204** to meet a wide range of electrochemical application needs.

Optional Module	AUT302N	AUT204/M204	M101
FRA32M	●	●	●
ECI10M	●	-	-
SCAN250	●	-	-
ADC10M	●	-	-
BA	●	●	●
Booster10 A	●	●	-
Booster20 A	●	-	-
ECD	●	-	-
EQCM	●	●	●
MUX	●	●	●
F120	●	-	-
pX1000*	●	●	●
ECN*	●	-	-

* please ask for details if ECN and pX1000 must be installed together in the same instrument

<div><div></div><div>New materials</div></div> <div><div></div><div>Battery</div></div> <div><div></div><div>Supercaps</div></div> <div><div></div><div>Fuel cells</div></div> <div><div></div><div>ECAT</div></div> <div><div></div><div>Sensors</div></div> <div><div></div><div>Corrosion</div></div> <div><div></div><div>Plating</div></div> <div><div></div><div>Fundamental</div></div>	<div><div>Electrochemical impedance spectroscopy (EIS) (FRA32M)</div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div><div><div>High-accuracy EIS module with a wide frequency range (10 μHz to 1MHz)</div><div><div>Automatic Amplitude Correction algorithm (AAC) for maximized resolution and accurate measurements</div><div>Access to the raw signals (time-domain and Lissajous plots) and Kramers-Kronig tests to assess the quality of the results</div><div>Complete EIS data fit and simulation</div></div></div></div>
<div><div>High frequency EIS (ECI10M)</div><div><div></div><div></div><div></div></div></div>	<div><div>Extended frequency range for EIS measurements up to a maximum of 10 MHz</div><div>Ideal for solid-state electrochemistry and mechanistic studies of ultra-fast reactions</div></div>
<div><div>True analog (linear) scan generator (SCAN250)</div><div><div></div><div></div><div></div><div></div><div></div></div></div>	<div><div>True analog scan generator (for linear cyclic voltammetry)</div><div>Scan rates up to 250 kV/s (in combination with ADC10M module)</div><div>Ideal for interfacial electrochemistry on platinum, molecular electrocatalysis, fast reactions and accurate measurement of capacitive currents</div></div>
<div><div>Ultra fast sampling (ADC10M)</div><div><div></div><div></div><div></div></div></div>	<div><div>Fast sampling interval, down to 100 ns (i.e., 10 Million samples per second) for 2 signals</div></div>
<div><div>Dual-mode bipotentiostat (BA)</div><div><div></div><div></div><div></div><div></div></div></div>	<div><div>Bipotentiostat (BA) with independent control of 2 working electrodes in the same cell</div><div>Dual mode: independently fixed potential or scanning mode</div></div>
<div><div>External Booster 10 A/ 20 A (Booster10A) (Booster20A)</div><div><div></div><div></div><div></div><div></div><div></div><div></div></div></div>	<div><div>Increase the applied and measured current up to ± 10 A / ± 20 A</div><div>Compatible with FRA32M for EIS measurements on batteries and fuel cells</div><div>Four-quadrant operation* and fast response time</div></div>
<div><div>Low current amplifier (ECD)</div><div><div></div><div></div><div></div><div></div></div></div>	<div><div>Decrease the lowest measurable currents with high accuracy (built-in amplifier)</div><div>Measure current down a few pA by using the 100 pA current range</div><div>Integrated signal filter with selectable time constant</div></div>
<div><div>Electrochemical Quartz Crystal Microbalance (EQCM)</div><div><div></div><div></div><div></div></div></div>	<div><div>In-situ monitoring of the mass variation during the electrochemical reaction</div><div>Measurements of ng/cm² are possible on a 6 MHz AT-cut gold crystal</div></div>
<div><div>Multiplexer module (MUX)</div><div><div></div><div></div><div></div><div></div><div></div><div></div></div></div>	<div><div>Increase throughput with automated sequential measurements</div><div>Multiplex complete electrochemical cells (MULTI4), voltage difference and EIS (SCNR8), or individual working electrode (SCNR16)</div></div>
<div><div>Analog filter and integrator (F120)</div><div><div></div><div></div><div></div><div></div><div></div><div></div></div></div>	<div><div>The analog filter removes external noise and interference from the measured signal, with increased accuracy and smoothing options</div><div>The analog integrator monitors in real time the charge in Coulomb for the most accurate coulometric measurements.</div></div>
<div><div>Voltage, Temperature and pH measurement (pX1000)</div><div><div></div><div></div><div></div><div></div><div></div><div></div></div></div>	<div><div>Simultaneous and highly accurate pH or additional voltage, and temperature measurements</div><div>Set customized safety limits based on voltage or temperature</div></div>
<div><div>Electrochemical Noise, ZRA (ECN)</div><div><div></div><div></div></div></div>	<div><div>Ideal for in-depth understanding of localized corrosion by in-situ detection of stochastic electrochemical noise</div><div>Analysis of the measured noise at open circuit</div></div>

* (Booster10 A) x: ± 10 V & y: ± 10 A (Booster20 A) x: ± 10 V & y: ± 20 A

Software – NOVA & INTELLO

Developed by electrochemists for electrochemists and built on over three decades of user experience, Autolab software offers the following key features designed to address your research challenges.

Highly versatile: Adaptable to diverse experimental needs

Safety assured: Reliable protection for your data, your cell and your lab

Enhanced efficiency: Streamline workflows for faster results

Expanded discovery: Unlock new possibilities in electrochemical research

VERSATILITY

Comprehensive set of electrochemical techniques & analysis

General Electrochemistry

- Cyclic and linear sweep voltammetry
- Chronopotentiometry, amperometry, coulometry
- Pulse voltammetry
- Open circuit potential monitoring

Electrochemical Impedance spectroscopy (EIS)

- Potentiostatic and Galvanostatic EIS
- Integrated EIS fit and simulation tool
- Mott-Schottky analysis

Batteries and supercapacitors

- Cycling capabilities
- GITT/PITT
- Dynamic sampling

Corrosion

- Linear polarization
- Butler-Volmer fitting and Tafel analysis
- Polarization resistance

Electrocatalysis

- Hydrodynamic Voltammetry, with remote control of rotators

Flexible procedure editor with a command-based drag-and-drop interface for customizable experiment design – no scripting required.

Simplify complex procedures with advanced repeat loops and grouping of commands.

EFFICIENCY

- **Library of Ready-to-use procedures** to get started in no time
- **Multi-plot display during experiments** to monitor progress in real time
- **Complete data handling and analysis** integrated into the measurement sequence for automatic execution

SAFETY

- **User-defined rules and cutoffs** for cell safety
- **Data safety with export** in a user-defined location
- **Immediate validation** to check if the procedure will run as intended before starting

DISCOVERY

- **Advanced hardware and software settings** for optimal configuration
- **Easy hyphenation or synchronization** with external devices (XRD, spectrometers...) using DIO triggers



And with NOVA:

compatible with instruments on pages 14-15

- **Schedule** a series of experiments on multiple channels or instruments
- Access to **EIS time-domain data**
- **Software development kit (SDK)** to integrate Autolab instruments into your own software environment
- **Easily control external devices** such as electronic load or power supplies
- **IMVS , IMPS** for solar-cell research

INTELLO also means:

compatible with instrument on pages 12-13

- **Seamless** (0 ns gap) measurements
- **Computer-free operation** (untethering)
- **Continuous and automated data saving** in the INTELLO database
- **A complete battery testing environment** (including CC and CCCV cycling, C-Rate capability testing) and integrated data analysis tools (such as dQ/dE plots, capacity and coulombic efficiency calculations)
- **Data and procedure libraries** can be shared by several users
- **Set up routine workflows** with fully customizable main parameters, whatever the procedure

Hyphenated Metrohm EC-Raman solutions

Hyphenated spectroelectrochemistry, with simultaneous and synchronized optical and electrochemical measurements, **opens new possibilities** for a more complete analysis of **electron transfer** processes and **complex redox reactions**, characterization of **reaction products and intermediates** bringing **additional structural and functional information** about the materials.

The **hyphenated EC-Raman** synchronizes your **electrochemical measurements with Raman spectroscopy** providing simultaneous structural and functional **in-situ and operando** information in a wide range of applications:

- Electrocatalysis
- Battery and materials research
- Corrosion and coatings
- Sensor development



Versatility, Flexibility, and Ease of use

- Two **independent instruments for electrochemistry and spectroscopy** usable as hyphenated or stand-alone solutions
- **Freedom to choose** the electrochemical instrument and spectrometer that best suit your needs
- **Ready-to-use spectroelectrochemistry procedures** in NOVA and INTELLO software
- The Dynamic interface of VIONIC can be switched off to **avoid optical interference** with the light source
- Benefit from the **outstanding local Metrohm support** for configuring, using, and troubleshooting the complete hyphenated solution

Compatible B&W Tek Raman systems:

- i-Raman Plus 785S or 785H (785 nm)
- i-Raman Prime 785H or 785S
- i-Raman Plus 532H (532 nm)
- i-Raman Prime 532H
- i-Raman EX (1064 nm)

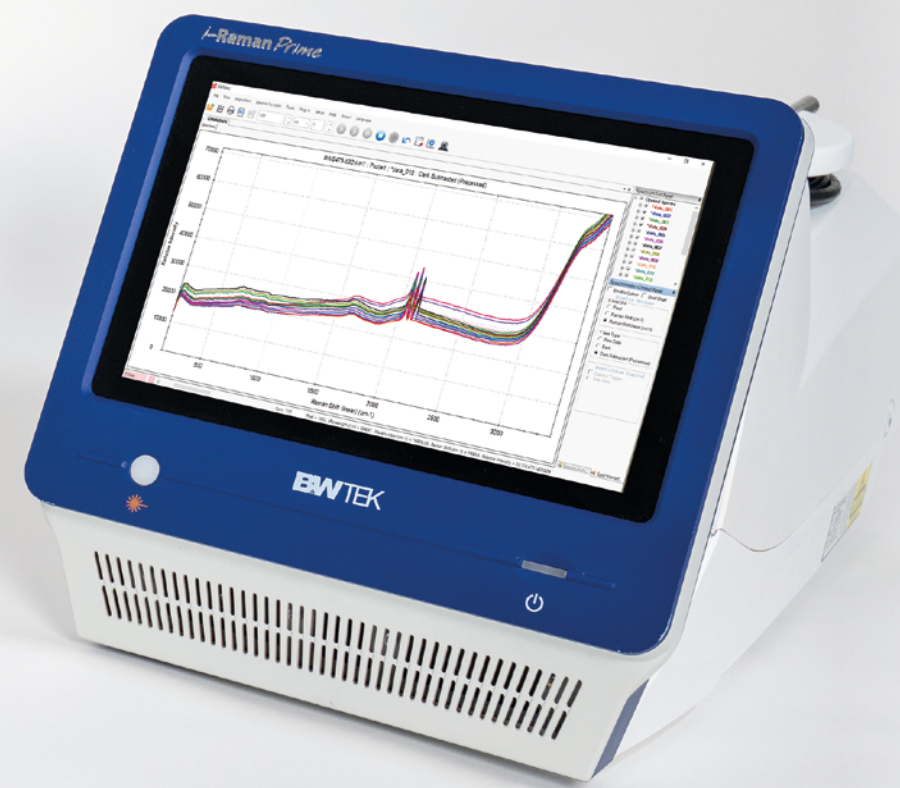
Select the **laser excitation wavelength** (532 nm, 785 nm, or 1064 nm) of the B&W Tek system with a **wide spectral coverage** and **high resolution**, with the possibility to enhance the signal (Surface-Enhanced Raman Spectroscopy, **SERS**) for the optimal measurement of samples ranging from biologics, carbon materials, chemical mixtures, active pharmaceutical ingredients and more.

Optical accessories:

- **Video Microsampling System** can accommodate a variety of cell sizes up to 30 mm high.
- A **video camera** provides real-time sample observation and coaxial LED illuminator for precise laser alignment.
- Two **objectives for macro and micro perspective** (20x & 50x)

Compatible Metrohm Autolab instruments:

- VIONIC powered by INTELLO
- AUT302N modular instrument
- AUT M204 and M101 multichannel line
- AUT204, Autolab IMP, AUT101 compact line



Hyphenated Autolab UV-VIS Spectroelectrochemistry

Metrohm Autolab supplies a **complete UV-VIS-NIR spectroscopy** setup as well as the electrochemical instruments **with total flexibility in the choice of potentiostat**, all controlled from the NOVA software package.

Versatility, Flexibility, and Ease of use

- One integral software package in NOVA
- Accurately **synchronized electrochemical signals and spectra**
- **Dark and blank** spectrum subtraction
- **Absorbance and transmittance** calculations
- Automatic and manual **shutter control**
- Flexible and **programmable methods**
- Selectable integration time

The experimental method includes but it is not limited to:

- **Dark spectrum collection** with the light off
- **Reference spectrum collection** in supporting electrolyte with light on
- The **electrochemical measurement** (i.e. CV, LSV or Chrono) **with spectra** collected at user defined intervals
- Data is collected and represented as **overlay of absorbance or transmittance spectra and electrochemical signal** in 2D or 3D plots
- The changes in the spectra as a function of electrochemical environment can be **analyzed in NOVA**



Compatible Metrohm Autolab instruments:

- AUT302N modular instrument
- Multichannel line (M204 and M101)
- AUT204, Autolab IMP, AUT101 compact line

Metrohm Autolab Spectrophotometers:

Metrohm Autolab UV/VIS/NIR

- UV/VIS/NIR Spectrometer, wavelength range 200-1100 nm

Metrohm Autolab Light Source

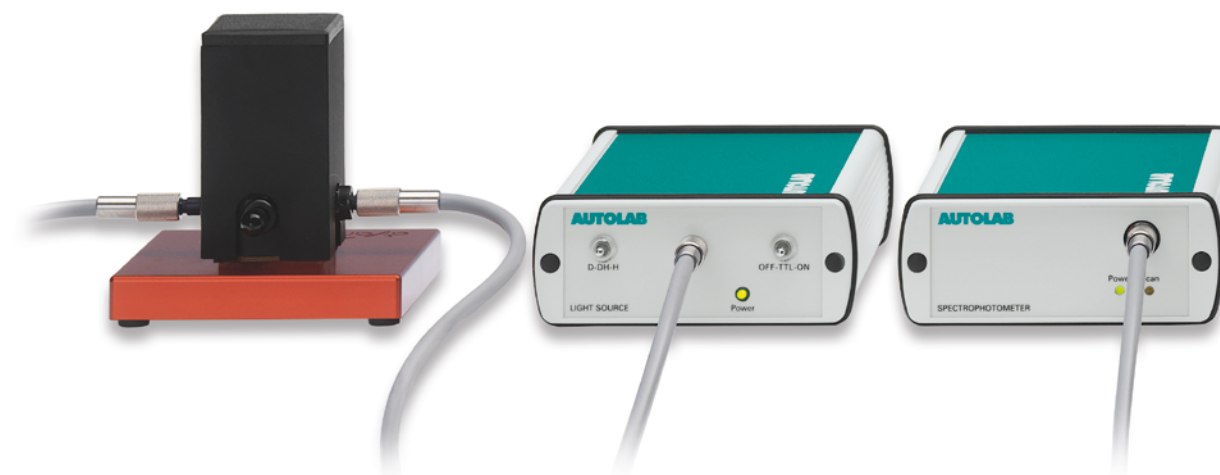
- Deuterium Halogen Compact (DHC) Light source, 200-2500 nm

Gain new insights with hyphenation: UV-VIS, EC-Raman, XRD, FTIR, SECM, EQCM, DEMS and more.

Connect your Autolab instrument and **synchronize the electrochemical signal with any external device** which best fits your application requirements.*

All Autolab instruments come with **digital and analog connectors** and **software support** for controlling and synchronizing electrochemistry measurements with complementary techniques recorded with external devices.

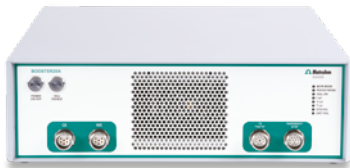
* Please contact your local Metrohm Autolab office for additional support.



Accessories

Current Boosters

For energy storage and energy generation applications: upgrade the maximum applied and measured current of your potentiostat with our 10 A and 20 A boosters.



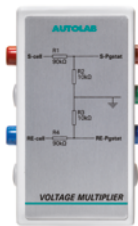
Optical bench

To study the electrochemical behavior of photovoltaic cells and other photoelectrochemical devices with DC and AC (EIS) modulation of light intensity with a wide range of LED colors, from 470 to 655 nm and calibrated photodiode with NIST traceable certificate.



Dynamic load interface and Voltage Multiplier

For the electrochemical characterization of high-power devices using both DC and EIS techniques: control third party electronic loads or power supplies to use extra high-currents (> 20 A) and extend the applied and measured voltage with a voltage multiplier up to the compliance limit of your potentiostat.



Hydrogen permeation cell

This cell consists of two electrochemical compartments in which hydrogen is produced in the load cell and detected in the oxidation cell. It can be used to evaluate hydrogen uptake, permeability and transport in a variety of metal membranes, among other applications.



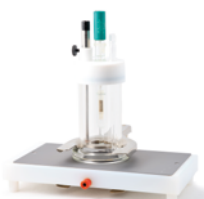
1L Corrosion cell



400 mL Corrosion cell



250 mL Corrosion cell



Flat Sample Platform



Flat Corrosion cell

Corrosion Cells

For any electrochemical corrosion applications: from ASTM compliant 1L cell design to more compact cells or cells which can accommodate large sample sizes. Most cells are available with thermostatic jacket and with possibility of in-situ temperature and pH monitoring.

Temperature-controlled Cells

Conductivity vs. Temperature studies on electrolytes, ionic liquids, gels, membranes and solid cell.



Autolab DuoCoin Cell Holder

For high-precision DC and EIS characterization of coin cell batteries: with 4-point Kelvin gold-plated contacts to assure the highest-precision measurements, accommodating all standard sizes.



Rotating disk electrode (RDE)



Rotating ring-disk electrode (RRDE)



Rotating cylinder electrode (RCE)

Hydrodynamic Electrochemistry with Autolab RDE/RRDE/RCE

Extremely low signal noise due to friction-less liquid contacts with the most accurate and precise rotation control and automated measurements of Levich and Koutecký-Levich plots. The rotator is designed to fit perfectly on the standard conical fitting of the RRDE cell lid.

	RDE	RRDE	RCE
Rotation speed (rpm)	10,000	10,000	5,000
Electrode types	Disk	Ring-Disk; Disk	Cylinder; Disk
Active electrode size	3mm, 5mm disk	5mm disk & 375µm ring; 3mm, 5mm disk	12mm OD, 8mm Height
Electrode materials	GC, Pt, Au, Ag, Cu, and others, blank	GC-Pt, Au-Pt & Pt-Pt	CS1018, SS304
No. of contacts	1	2	1
Low signal noise	✓	✓	✓



Accessories

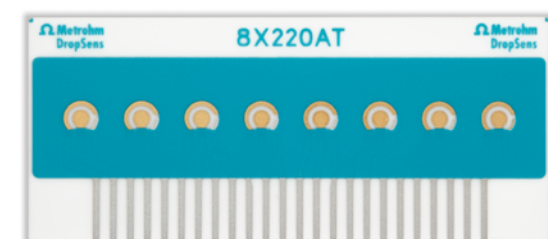
Screen-Printed Electrodes

All Autolab instruments are compatible with Metrohm Dropsens Screen-printed electrodes. Suitable for working with microvolumes, for decentralized assays or to develop specific sensors. Please inquire at your local Metrohm office for the complete offering of Metrohm Dropsens SPEs and relevant accessories.

Carbon Gold AT Gold BT Platinum



A mix of screen-printed electrodes with various working electrode materials. Ideal for conducting tests and develop specific applications.



8X Screen-printed electrodes

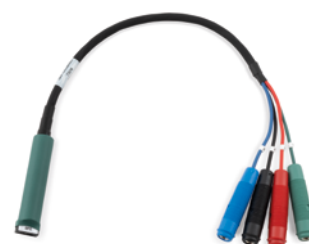
Multi-analysis configuration

Key features:

- Inexpensive single use sensors that eliminate electrode maintenance
- High reproducibility between electrodes
- Easy-to-use, small, and robust solution for in-situ experiments
- Versatile and customizable: many configurations, sizes, and materials available
- Wide variety of working-electrode materials: carbon, gold, platinum, silver, palladium, lead, tin, aluminum, transparent materials, modified with mediators, nanomaterials, biomaterials, oxides, particles...
- Ceramic, glass, transparent or white plastic and FR4 substrates available

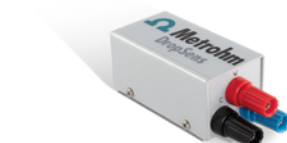
Cable connector

Flexible cable as an interface/ adapter between screen-printed electrodes and Metrohm Autolab potentiostats.



Boxed connector

An interface between screen-printed electrodes and the Metrohm Autolab potentiostats.



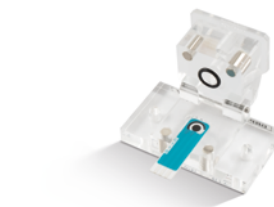
Wall-jet flow cell

For 8X format screen-printed electrodes.



Wall-jet flow cell

For one single screen-printed electrode.

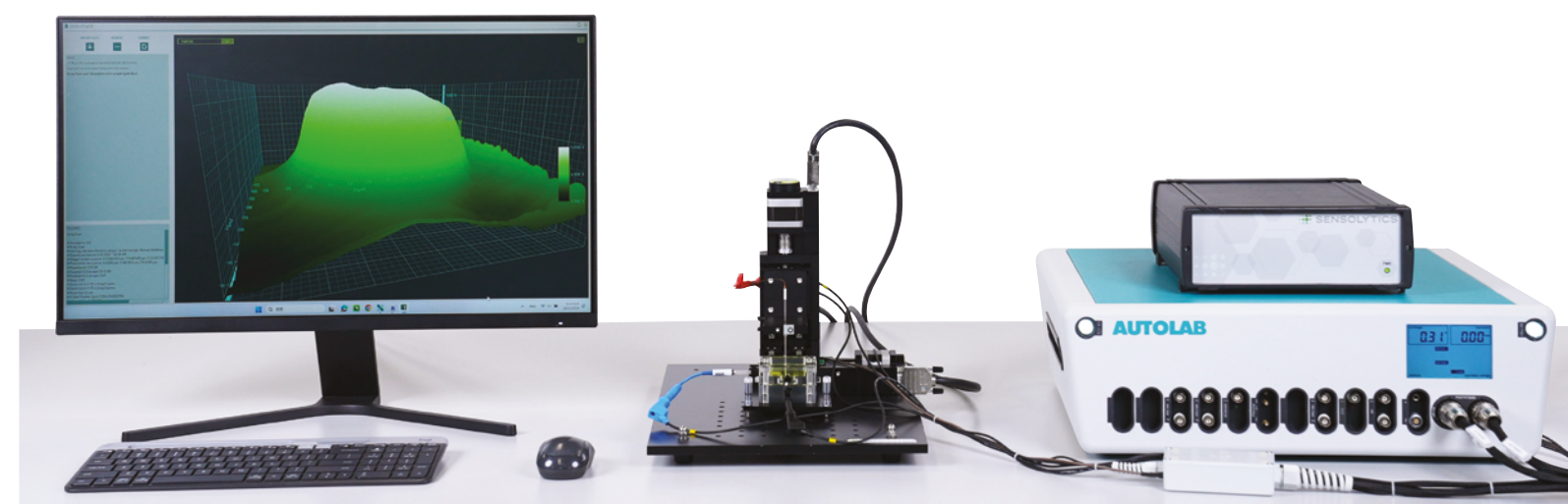


Solutions for Localized Electrochemistry – Scanning Electrochemical Microscopy (SECM)

Metrohm Autolab potentiostats can hyphenate with Sensolytics SECM instruments to address localized micro-electrochemical questions by visualizing the local electrochemical activity of a sample surface. The combination of Autolab and Sensolytics SECM instruments is ideal for investigating local electrochemical effects in areas such as corrosion, batteries, electrocatalysis, biosensors, and more.

The main advantages of Metrohm Autolab and Sensolytics SECM hyphenation:

- Integrated control of the Metrohm Autolab potentiostat within the Sensolytics software
- Modular and customizable system, upgradable at any time
- Scanning Droplet Cell (SDC), Scanning Electrochemical Microscopy (SECM) and capillary-based techniques (SECCM) are available
- Software-based tilt compensation, AC-SECM, multidimensional techniques (EC methods at each grid point) and localized photoelectrochemical methods
- High-resolution SECM with nanoelectrodes and constant-distance mode SECM (Option Shearforce)
- Compact size



PEOPLE
YOU
CAN
TRUST



Notes

Explore valuable resources

We are here when you need us



How-to-videos

Metrohm Autolab Youtube channel – in addition to introductory videos, we also have a range of other instructional videos that will guide you through the data acquisition and analysis procedures.

www.youtube.com/@MetrohmAutolab/videos



Stay on top of our latest news

LinkedIn – follow Metrohm Autolab on LinkedIn to receive the latest updates on electrochemistry webinars, campaigns, and exclusive access to our newest application notes, whitepaper and insights into the latest industry trends.

www.linkedin.com/company/metrohm-autolab



Our global presence

With our global presence spanning 80 countries through Metrohm subsidiaries, our dedicated distribution and service network guarantees a prompt response to technical, service, or application support inquiries **within 48 hours**.

We also offers a **10-year** spare parts availability guarantee, and a **5-year** PC software support warranty, calculated from the date of delivery.

www.metrohm.com/en/contact.html



Online resources

Application Notes, White Papers & Blog Post

We have all kinds of materials that assist you in understanding the full potential of our potentiostats.

Visit Metrohm.com or scan the QR Code(s).



AN & WP

Metrohm Autolab



The research and development of Metrohm Autolab instruments are based on over 30 years of customer insights. Each feature was created to meet the requirements of electrochemical research and improve your day-to-day discoveries.

Metrohm Autolab provides an industry-leading **3 year warranty** on all instruments and accessories.*

*Conditions apply.

Benefits	
Efficiency	INTELLO and NOVA software are bursting with time-saving features that optimize any workflow.
Versatility	Metrohm Autolab instruments are designed to meet the diverse needs of electrochemical research.
Safety	Smart hardware and software safety features protect your cell, your lab, and your data.
Discovery	Our instruments offer a unique combination of features that monitor electrochemical processes in real time, with no gaps or missed information: complete data, pure discovery.

Metrohm Autolab is an ISO 9001 certified company.

Dedicated to research
metrohm.com/electrochemistry