

# Ultima Expert

Ultimate ICP-OES Spectrometer  
Best Performance & Ease-of-Use

## Designed to Handle the Most Challenging Applications

**HORIBA Scientific has been developing and manufacturing high-performance ICP-OES spectrometers for more than 40 years.**

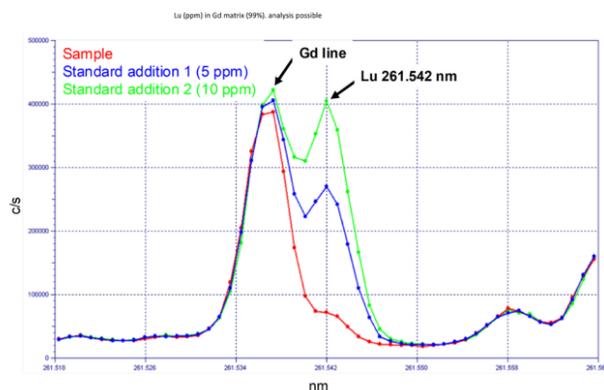
The new Ultima Expert is a unique combination of ultimate performance with comprehensive assistance tools designed to simplify method development.

Ultima Expert integrates high efficiency Jobin Yvon optical designs to achieve optimal performance for a large variety of sample types and matrices.

Ultima Expert is driven by the powerful ICP-Neo software featuring a large variety of analytical functionalities for tailored control and analysis.

The robustness of the Ultima Expert makes it ideal for applications common to mining, chemicals manufacture, salt production, wear metals in oil analysis, petrochemical, metallurgical production and precious metal refining.

Gain in efficiency with the Ultima Expert for your most demanding needs!



With resolution better than 5 pm even the most challenging spectral interferences can be separated

# Ultima Expert

Superior Performance in ICP-OES

## Total Plasma View for the Most Versatile and Accurate Analyses

**Due to optical components made by HORIBA, we developed this system, where measurement of the whole normal analytical zone is done without any height observation – Total Plasma View. There is no need for axial or dual view. The result is unrivaled sensitivity and reduced matrix effect.**

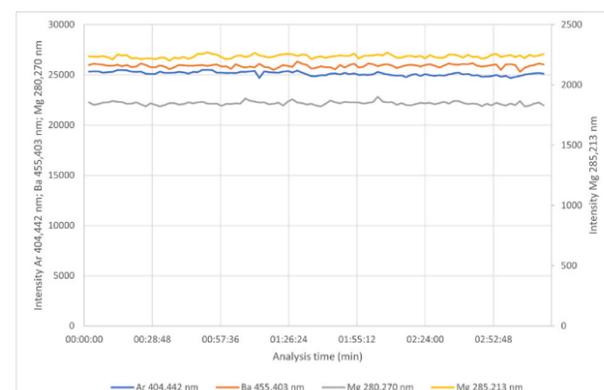
Ultima Expert uses a Total Plasma View design with radial viewing mode to allow viewing of the entire normal analytical zone.

The vertical torch, the original sheath gas device and the wide injector enable the Ultima Expert to handle difficult matrices, with robust operation and minimal maintenance.

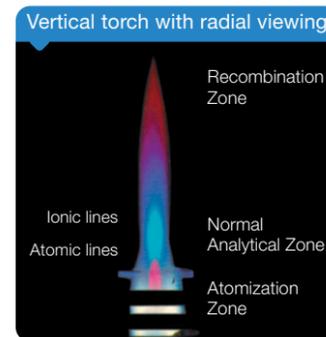
Ultima Expert ensures the lowest detection limits even with the most challenging samples, such as high salt content, brines, dissolved solids and complex organics.

Its water-cooled high-efficiency 40.68 MHz solid-state generator enhances the ability to handle a large range of samples, reduces warm-up time down to 15 minutes, and improves stability and reliability.

All these features make the Ultima Expert the most versatile, accurate and robust ICP-OES spectrometer available.



Example of excellent stability of the system with long term variation less than 0.75%



## High Resolution and Full Wavelength Coverage

Ultima Expert delivers the highest resolution with **less than 5 picometers** for the UV range and less than 10 picometers for the Visible range. Such resolution is achieved due to the unique optical design of the Ultima Expert, which integrates a high-density holographic grating and one-meter focal length optics.

**True simultaneous internal standardization with the integrated high stability device provides unrivaled repeatability.**

Full wavelength coverage from 160 to 800 nm is offered to satisfy all the requirements for elemental analysis. An optional Far UV kit is available to extend coverage down to 120 nm for analysis of halogen elements.

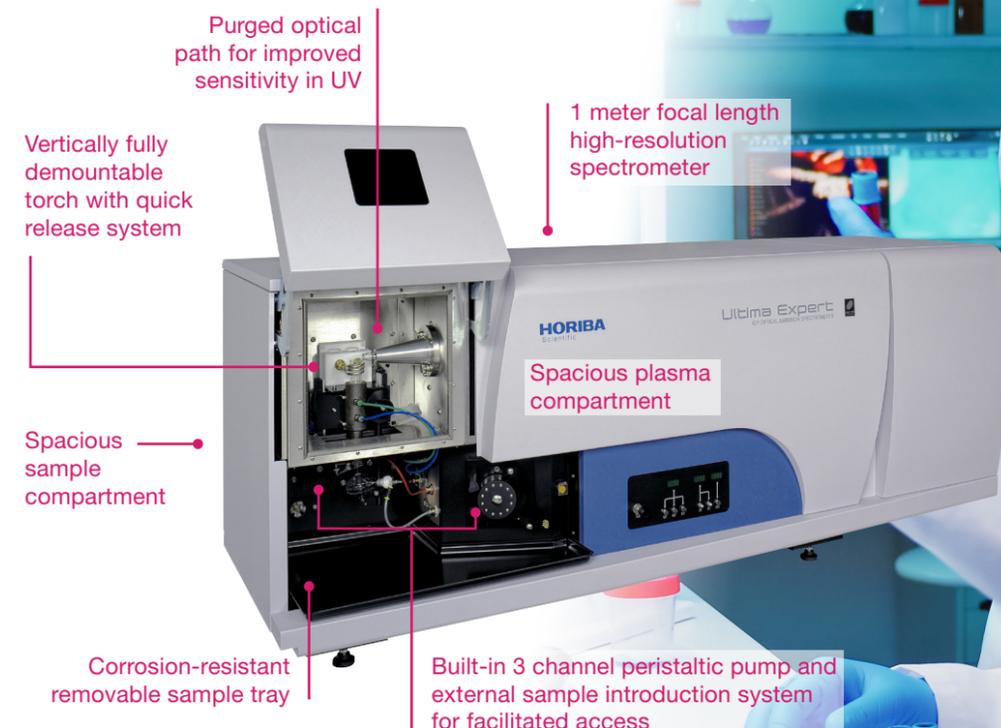
High resolution and excellent sensitivity allow elements with high, low and trace concentrations to be measured accurately, giving you maximum confidence in your results.

## Easy to Handle, Easy to Maintain

Spacious compartments for sample and plasma are designed to facilitate sample handling.

Quick release, fully demountable torch with no adjustment required facilitates multi-user operation and provides excellent reproducibility.

The system is equipped with a corrosion-resistant removable plastic tray for easy cleaning and protection of the instrument against corrosive samples.



# High Performance Design

## For Demanding Applications

> Resolution  
> Stability  
> Accuracy

> Repeatability  
> Robustness

### Material, Chemical and Petrochemical

Designed to deliver accurate results even on complex matrices, the robust performance of Ultima Expert meets the tough demands of production.

- High sensitivity, accuracy and stability even on difficult matrices, such as brines, high total dissolved solids matrices or organic solvents;
- Unrivaled detection limits, stability and reduced memory effects, even on high salt matrices;
- Minimized spectral interferences on complex matrices;
- Standard torch that adapts to all applications;
- Optional introduction systems for organic matrices or samples containing HF;
- **Ability to measure chlorine and bromine with extended UV range.**

### Metallurgy, Geology and Mining

For elemental analysis in the presence of line-rich spectrum elements such as iron, tungsten or rare earth elements, the Ultima Expert delivers the highest performance.

- **Extended high resolution range for Rare Earth Elements applications with the optional dual grating system;**
- Enlarged dynamic range for major elements and exceptional sensitivity for trace elements, even in high dissolved solids matrices;
- Elimination of spectral interferences, even for trace element analysis in line-rich matrices;
- Full wavelength coverage provides broad flexibility in wavelength selection;
- Exceptional long term stability with the 3 mm internal diameter injector and the original sheath gas device, even on high total dissolved solids matrices.

### Precious Metals

Ultima Expert is the only ICP-OES spectrometer on the market to provide ultimate accuracy for major precious metals analysis.

- Accurate trace elements analysis in precious metals matrices capability;
- Exceptional repeatability with true simultaneous internal standard measurement with the integrated high stability device;
- Improved accuracy of measurements with the integrated bracketing mode.

### Environmental, Food and Agriculture

Major and trace elements analysis in varying matrices, along with reliability and confidence in the final results. Ultima Expert incorporates comprehensive tools for high performance to satisfy even the most demanding requirements.

- Improved accuracy of the results within the large variety of samples analyzed;
- High sensitivity and large dynamic range for facilitated trace and major elements analysis;
- Specific tools for semi-quantitative analysis, method development, automated QC tests and uncertainty calculation.

### Corrosion

AESEC (atomic emission spectroelectrochemistry) gives real-time elemental dissolution rates for material/electrolyte combinations.

- AESEC gives direct insight into how specific elements of an alloy interact with one another, or how specific additives in a surface treatment solution will affect different alloying elements of different phases;
- Standard ICP-OES system combined with polychromator;
- Use of GD-OES software for data treatment;
- Fast data acquisition necessary for corrosion studies.

### Dismantling

HORIBA's unique adaptation for glove box integration for both monochromator and polychromator systems ensures easy maintenance, with minimal parts inside the glove box.

- Nuclear dismantling and nuclear waste treatment;
- Optimised HORIBA design for easy integration with glove boxes;
- More than 30 years' experience in glove box systems for nuclear decommissioning.

## Powerful Software with Unique Comprehensive Assistance Tools

ICP Neo software for HORIBA Scientific ICP-OES spectrometers is designed to facilitate method development, sample measurements and results management.

Complemented with Image Navigator for qualitative and semi-quantitative analysis of unknown samples based on full spectrum acquisition, S<sup>3</sup>-base and MASTER for facilitated method development. The ICP Neo software provides full instrument control and advanced features for method development, analysis and results management.

Delivering accurate results has never been easier using the Ultima Expert!

# Bringing Expertise in All Laboratories For Every Application

## Performance Through a Simplified Method Development

- Interference-free lines by visual display using S<sup>3</sup> wavelengths database;
- Unique HDD mode to remove the need for optimization of high voltage;
- Multiple measurement parameters with Gaussian, maximum and mean modes;
- Multiple calibration mode.

## Flexibility and Automated Analysis

- SmartRinse for automatic monitoring of rinse efficiency between two samples;
- Automatic control of the quality with limits on correlation coefficient and on recalculated concentrations;
- Use of multiple methods in a single sequence.

## Results Management

- Archive capability;
- Reprocess capability with integrity of raw results;
- Reports with user's selectable data;
- Customization of reports with logo, instrument name...
- Print and export results for LIMS.

## Quality control Protocols

- Fully US EPA-compliant QC protocols with ICV, CCV, LCS, Interference check, Paired samples, Spikes, and more;
- Automated actions in case of out-of-specification values, from stop analysis to calibrate and repeat samples from the last valid QC;
- Audit trail implemented;
- IQ/OQ/SQ, 21 CFR Part 11 compliance module available.

## Perform your ICP Analysis Faster and Easier!

### Unique and Proprietary S<sup>3</sup>-base

With more than 50,000 lines identified and combined with their spectroscopic data, the Single-element Spectra Spectroscopic S<sup>3</sup> database was developed especially for ICP-OES and is based on real spectra acquisition.

This extensive database, exclusively available for HORIBA Scientific ICP-OES spectrometers, provides reliable information on wavelengths, relative intensities, and detection limits.

### MASTER, Software for Easy Method Development

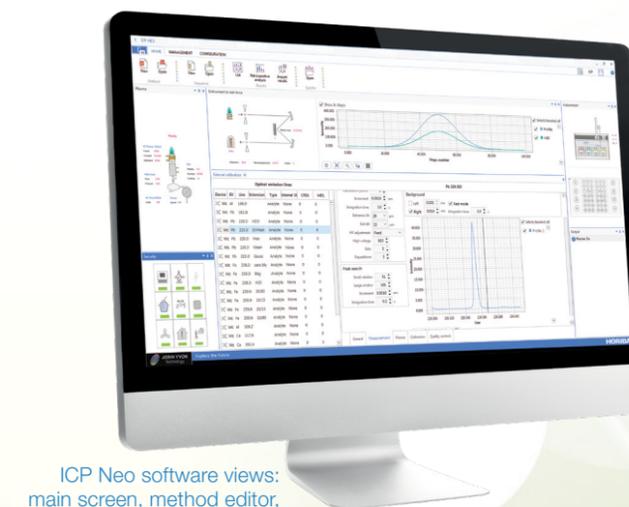
By using the spectroscopic data of S<sup>3</sup>-base, MASTER facilitates method development and ensures the right choice of analytical lines.

With the list of elements and the expected concentration range information, synthetic spectra are displayed with the most suitable lines for your analysis.

Information is not only given on emission lines, but also on molecular emission and background structure, facilitating the selection of the wavelengths.

### Image Navigator for Full Spectrum Display

New, redeveloped software fully integrated in ICP Neo software for an easy-to-use simplified handling of unknown samples.



ICP Neo software views:  
main screen, method editor,  
plasma control, autosampler  
control window



MASTER main  
screen display

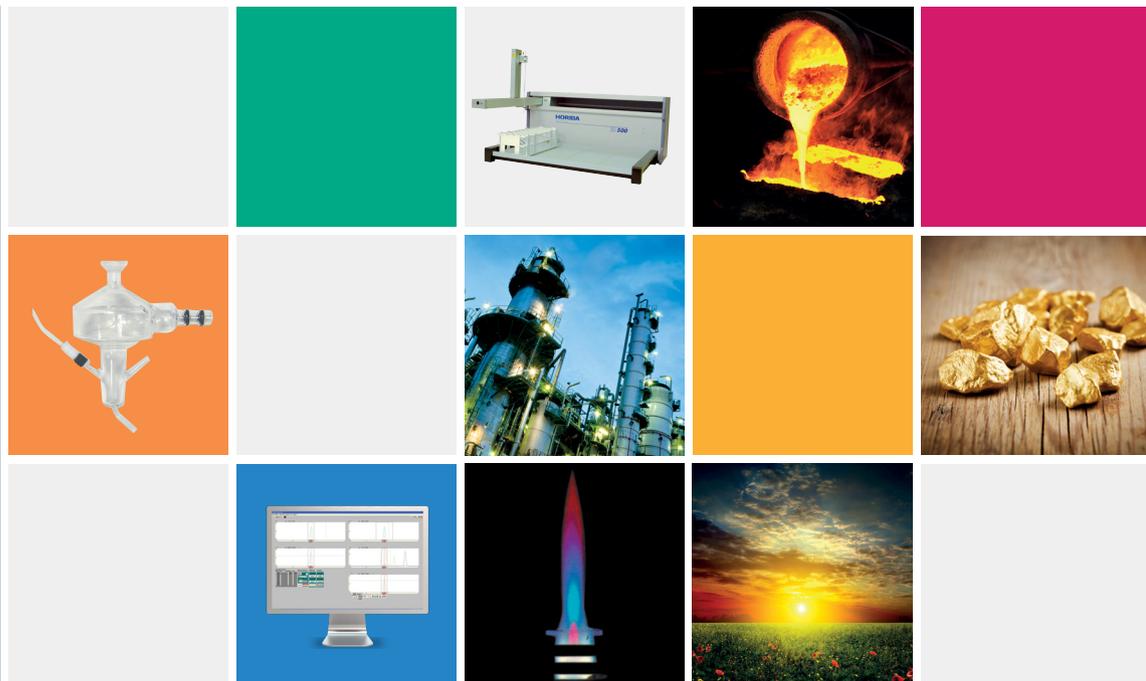


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# Ultima Expert Specifications

## Standard Configuration

Generator	Radio-frequency, solid-state 40.68 MHz, water-cooled
Spectral range	160 – 800 nm
Spectrometer	Thermally stabilized, 1-meter focal length with 2400 g/mm grating used in the 1st and 2nd order
Resolution	<5 pm for 160-320 nm and <10 pm for 320-800 nm
Plasma torch	Fully demountable torch with 3 mm i.d. alumina injector and quartz tubes
Sample introduction	Concentric glass nebulizer and glass cyclonic spray chamber, 3 channel peristaltic pump

## Facility requirements

Dimension (WxDxH)	1696 x 698 x 604 mm (66.8 x 27.5 x 23.8 inches)
Weight	205 kg (452 lb)
Power supply	Single phase, 220-240 V, 50-60 Hz, 4 kVA
Environmental	20 to 80 % humidity, 18-24°C at ± 2°C
Argon	99.995 % purity
Nitrogen	160 to 190 nm, 99.999 % purity 120 to 160 nm, 99.9995 % purity
Exhaust	250 m³/h (150 cfm)

## Options

Instrument	Dual back-to-back gratings (4320 g/mm and 2400 g/mm) used in the 1st order offering resolution <6 pm for 160-450 nm and <10 pm for 450-800 nm
Accessories	Far UV kit to extend measurement capability down to 120 nm for halogen elements analysis
	Autosampler AS-500 with optional rinse station
	Argon humidifier
	Introduction system kits for improved performance (small volume, organics, Hydrofluoric acid, high total dissolved solids)
	Concomitant Metals Analyzer for simultaneous measurement of hydride forming elements and other elements
	Oxygen kit for alkali elements in organics

The Ultima Expert is also available in LT version. Configuration and options are slightly different. Contact us for more information.