

HARDWARE SOLUTIONS

Your partner for spectroscopic applications from lab to production: UV-Vis, NIR and Raman spectrometers

OUR VISION,
OUR KNOW-HOW

We supply non-invasive optical solutions for the supervision, development and real-time inspection of processes and complex solid and liquid products.



THE CHAUVIN ARNOUX GROUP MEASUREMENT EXPERTS

6 measurement Tech companies



100
million euros
in sales revenues

1000
staff

11% of revenues
invested in R&D

10 subsidiaries
spread across the world

8 R&D departments
worldwide

8 production
sites

Founded in 1893 by **Raphaël Chauvin** and **René Arnoux**, CHAUVIN ARNOUX is an expert in measurement of electrical and physical quantities in the industrial and tertiary sectors. Total control of product design and manufacturing in-house enables the Group to propose its customers a very broad product and service offering which meets all their needs.

The Group's quality policy ensures that the products delivered comply with its commitments and with both the national and international standards in terms of metrology, the environment and user safety.



Since its creation in 1893, CHAUVIN ARNOUX has been a pioneer in the development of measurement instruments, notably supporting the ground-breaking work of Marie Curie. At Indatech, we are proud to carry forward this remarkable legacy, continually advancing the science and technology of today and tomorrow.

As part of the CHAUVIN ARNOUX Group, Indatech specializes in innovative spectroscopy solutions tailored to meet the diverse needs of our clients in the pharmaceutical, biotechnological, and chemical industries. This catalogue highlights our range of analysers, covering UV-Visible, near-infrared and Raman spectroscopy. Whether you are looking for a benchtop system to take your laboratory analyses to the next level or a reliable high-throughput system to be used in a rugged production environment, our portfolio of spectroscopic solutions can cover your needs.

Building on decades of expertise, we provide technologies and approaches that enable precise measurements for a wide variety of liquid and solid products. Our spectroscopic solutions are engineered to ensure accuracy, reliability, and ease of use across even the most challenging applications.

Should you have specific requirements not covered by our standard offerings, our in-house engineering team is ready to develop custom solutions tailored to your needs. Please feel free to reach out to us directly for more information or to discuss your project.

Together, let's shape the future of process analysis.

UV-VISIBLE SPECTROSCOPY: ASURYAN



UV-Visible spectroscopy is an analytical method focusing on the electronic transitions of the products of interest. The technology offers very high sensitivity (up to 10 to 100 times that of NIR or Raman spectroscopy), which is one of the reasons why the pharmacopeia recommend it for both qualitative and quantitative studies. Acknowledged as an indispensable tool in the laboratory for decades, the technology is gaining increasing popularity for online measurements in a production environment.

A VERSATILE TOOL THAT CAN ADAPT TO YOUR NEEDS

Asuryan allows for fast spectral acquisitions and offers excellent stability thanks to a simultaneous measurement of the light source spectrum. Several spectrometers can be integrated into one Asuryan unit in order to perform measurements on several key phases of the process simultaneously, thus giving an immediate snapshot of your whole process. Alternatively, the multi-channel system can be exploited to connect multi-angle immersion probes or multi-path length flow cells for the inspection of complex media. This flexibility proves essential in process design and manufacturing, especially for products of high added value.

Compatible with pharmacopoeia standards (USP857, Ph.Eur. 2.2.25), Asuryan can adapt to a large number of sensors (transflexion or transmission immersion probes with different optical trajectories, flow cells with multiple optical path lengths, multi-angle probes for inspecting complex media or ATR immersion probes for strongly absorbing products) to allow flexibility when measuring diverse products of interest in diverse media.



TWO POSSIBLE CONFIGURATIONS

Two configurations are available, depending on your requirements:

- one-channel configuration: one single measurement channel offering a cost-effective solution for standard applications.
- three-channel configuration: three measurement channels offering a versatile tool allowing to connect multi-angle sampling interfaces or inspect multiple processes at the same time.

Both systems are equipped with an additional internal spectrometer that checks the stability of the light source and automatically corrects any fluctuations.

TECHNOLOGY INCORPORATING MEASUREMENT AND ANALYSIS SOFTWARE

The integrated Asuryan Ready software lets you modulate measurement acquisitions, particularly in terms of the integration time and number of scans. 21 CFR part 11 compliant, the user-friendly GUI allows to visualize and export the data under various formats. It can be used either in stand-alone mode or controlled via the OPC-UA communication protocol. The software also enables you to develop and apply univariate prediction models and/ or to integrate chemometric models such as PCA, PLS, ANN or SVM from external software packages such as PLS_Toolbox (Eigenvector Research) or SIMCA-Q (Sartorius).



TECHNICAL SPECIFICATIONS

Technology	Continuous, non-destructive UV-Visible analysis of (agro)chemical, pharmaceutical and biotechnological media
Illumination source	Deuterium (UV) and halogen (Vis) light bulb with optical shutter
Spectrometers	1 or 3 measuring spectrometers and 1 additional spectrometer for internal light source measurement
Spectral range	190 - 1000 nm
Spectral resolution (FWHM)	< 2.5 nm
Acquisition time	10 - 1000 ms
Analyses	Real-time display of the spectra of the sample measured, by means of the in-house developed Asuryan Ready software. Possibility to create and apply univariate models directly in the software. Possibility of importing models from PLS_Toolbox (Eigenvector) and SIMCA-Q (Sartorius). Communication via OPC-UA for any external prediction and automation.
Temperature	5 – 40 °C
PC	Automation PC integrated inside the Asuryan unit
Dimensions	Stainless-steel unit, H 350 x W 190 x D 475 mm
Certification	CE

RAMAN SPECTROSCOPY: VISERION



Raman spectroscopy is based on inelastic scattering of the incident laser beam of a low number of photons at different frequencies. Due to the vibrational transitions involved, this spectroscopic method ensures high specificity by analyzing the re-emission bands specific to the chemical groups. It is particularly suited to aqueous liquid media due to the near-inactivity of water in Raman emission because of its very low polarizability, but can also be of added value for the characterization of solid samples.

A SYSTEM SUITABLE FOR THE LABORATORY AND FOR INDUSTRIAL ENVIRONMENTS

Viserion enables *in situ*, non-destructive analyses of both solid and liquid samples. Two excitation wavelengths are proposed:

- **785 nm Raman laser:**

The most popular excitation wavelength, offering a good compromise between Raman signal intensity, sensitivity to fluorescence, measurement range, cost and overall performance.

- **830 nm Raman laser:**

A wavelength minimizing fluorescence which is more suitable for certain dark-colored samples (dyes, oils, colored polymers), but which also increases the integration time and affects the measurement range.

The system is equipped with a low-temperature thermoelectric cooling unit, ensuring low-noise measurements. This detector provides a great compromise between measurement speed, sensitivity and implementation costs. The analyzer is compatible with pharmacopoeia standards (USP858, Ph.Eur. 2.2.48).



TWO POSSIBLE CONFIGURATIONS

- one-channel configuration: one single measurement channel offering a cost-effective solution for standard applications.
- four-channel configuration: four simultaneous measurement channels, each equipped with their own laser, offering a flexible tool that can analyze batches or continuous processes in a more rugged way.

TECHNOLOGY INCORPORATING MEASUREMENT AND ANALYSIS SOFTWARE

Both Viserion systems include an industrial PC with the Viserion Ready firmware. This 21 CFR part 11 compliant GUI allows to:

- Modulate the acquisition parameters such as integration time and number of scans, power of the laser(s).
- Integrate chemometric models (eg PCA, PLS, ANN, SVM) from external software packages such as PLS_Toolbox (Eigenvector) or SIMCA-Q (Sartorius).
- Communicate via OPC-UA or TCP/IP to enable full production automation and implementation of feedback loops to guarantee process performance and quality at all times.



TECHNICAL SPECIFICATIONS

Technology	Non-destructive Raman analyzer for (agro)chemical, pharmaceutical and biotechnological media.
Illumination source	Up to 4 Raman lasers with a max. power of 500 mW. 785 or 830 nm emission wavelengths
Spectral range 1-CH @785 NM	240 – 2700 cm^{-1}
Spectral range 1-CH @830 NM	100 – 2000 cm^{-1}
Spectral range 4-CH @785 NM	250 – 3400 cm^{-1}
Spectral range 4-CH @830 NM	300– 2700 cm^{-1}
Spectral resolution 1-CH @785 NM	8 cm^{-1} (0.55 nm)
Spectral resolution 1-CH @830 NM	8 cm^{-1} (0.55 nm)
Spectral resolution 4-CH @785 NM	6 cm^{-1} (0.4 nm)
Spectral resolution 4-CH @830 NM	6 cm^{-1} (0.4 nm)
Acquisition time	Integration time between 0.1 and 60 s for 1-CH, between 0.1 and 300 s for 4-CH.
Analyses	Real-time display of the spectra from the sample measured by means of the Viserion Ready firmware, with integration of specific models and data predictions. Compatible with SIMCA-Q (Sartorius) and PLS_Toolbox (Eigenvector).
Temperature	5 – 40 °C
PC	Industrial PC integrated in the Raman unit
Dimensions	Stainless-steel unit, H 600 x W 250 x D 400 mm for 1-CH, H 700 x W 250 x D 500 mm for 4-CH
Laser safety	Compliant with EN-NF 60825-1: • Class IV regulatory marking • Interlock system on the probe and the door of the casing • Manual re-initialization of interlock if interlock circuit broken • Key to activate/deactivate the laser (one per laser) • Emergency stop button
Certification	CE

HIGH-THROUGHPUT MULTIPOINT NIR SPECTROSCOPY: HY-TERNITY



Near-infrared (NIR) spectroscopy is a molecular spectroscopic technique that records the sample absorbance of light at each wavelength of the electromagnetic spectrum between 780 and 2500 nm. In this particular spectral range, molecular overtone and combination bands of -CH, -NH, -OH and -SH functional groups can be witnessed, resulting in absorption bands that are generally broad and overlapping. A very large number of samples are amenable to NIR analysis, which can easily be performed in-line at high speed to offer real-time information on Critical Quality Attributes (CQAs).

SAM-SPEC® NIR: MULTIPOINT SPECTROSCOPIC METHOD TO BRING PRODUCTS TO MARKET FASTER AND MORE SAFELY

An acknowledged player in spectroscopy and the owner of numerous patents, Indatech has designed and developed the patented SAM-Spec® technology, combining NIR spectroscopy with hyperspectral imaging. Based on Spatially Resolved Spectroscopy (SRS), it performs multiple measurements simultaneously at different distances from the light source. Integrated into the powerful pharmacopoeia-compliant optical analyzer Hy-Ternity, this multipoint technology can be used for quick, reliable in-line testing of powders' and other solids' physical and chemical properties, as well as for the characterization and quality control of complex liquids.



A FLEXIBLE SOLUTION

Different sampling interfaces can be coupled to the Hy-Ternity system in view of adapting to the customers needs and processes. For liquid applications, multiple probes and flow cells can be connected to the Hy-Ternity unit simultaneously. This can be standard one-channel cells based on transmission or innovative multi-angle solutions providing information from both transmission and diffusion angles. For solid applications, our patented SAM-Spec probe measuring up to 13 channels simultaneously allows for in-depth analysis of tablets, capsules and powders.

TECHNOLOGY INCORPORATING MEASUREMENT AND ANALYSIS SOFTWARE

The Hy-Ternity analyzer is equipped with a 21 CFR part 11 compliant in-house developed software. It can be controlled through communication protocols such as TCP/IP or OPC-UA for full integration into a complete automated solution. In stand-alone version, the acquisition and processing software SRS Ready allows to define the acquisition parameters such as integration time and number of scans, display and export acquired data, integrate chemometric models (eg PCA, PLS) from external software packages such as PLS_Toolbox (Eigenvector) or SIMCA-Q (Sartorius).



ADVANTAGES



27
MEASUREMENT
POINTS

SAM-SPEC is the only multipoint measuring system capable of measuring up to **27 measurement points** simultaneously.



100
TIMES MORE
VOLUME

Exceptional in-line analysis capacity, handling up to **100 times more volume** than a classic approach.



SPEED
2MS

Extremely fast acquisition: 2 ms for 12 spectra. **10 ms** with processing and decision time included.



MULTI
PARAMETER
ANALYSIS

Simple, accurate acquisition of critical data for better control of your process.



SMART
ACQUISITION

Simultaneously measures several parameters such as: residual moisture, homogeneity, hardness, contaminant detection, coating thickness

TECHNICAL SPECIFICATIONS

Technology	High-throughput multi-point near-infrared spectroscopy system for in-line analysis of solid dosage forms and complex liquids
Illumination source	Tungsten halogen
Detector	InGaAs PIN-Photodiode
Spectral range	900 – 1650 nm
Spectral pixels	256 pixels
Spectral resolution (FWHM)	10 nm
Acquisition time	From 0.001 to 1000 ms in function of the application
Analyses	Real-time display of the acquired spectra by means of the SRS Ready firmware. Application of recipes integrating multivariate models from PLS_Toolbox (Eigenvector) or SIMCA-Q (Sartorius). Process communication via TCP-IP or OPC-UA
Temperature	5 – 40 °C
PC	Industrial PC integrated in the acquisition unit
Dimensions	H 300 x W 600 x D 600 mm
Casing material	Stainless steel
Certification	CE
Maximum number of measurement channels	27

BENCHTOP HYPERSENSPECTRAL IMAGING: HYPERREAL



Near-infrared chemical imaging (NIR-CI) is a versatile analytical technology capable of acquiring both spatial and spectral information on samples and improving understanding of processes. The combination of digital imaging and optical spectroscopy integrated in an NIR-CI instrument makes it possible to collect and process information by means of the electromagnetic spectrum for each pixel of the image acquired. By moving the hyperspectral camera underneath the samples and taking advantage of the combination of spectral and spatial data thus obtained, chemical components such as active pharmaceutical ingredients or residual moisture content can be identified and their spatial distribution can be used to characterize the homogeneity of these components within the samples.

HypeReal, a unique inspection system developed by Indatech, is the ideal tool for quick, non-destructive laboratory analyses of solid dosage forms.

NON-DESTRUCTIVE, NON-CONTACT MEASUREMENTS IN A ROBUST AND REPEATABLE MEASUREMENT CONFIGURATION

Unlike conventional wet chemistry analyses, the HypeReal can be used to indirectly assess the chemical composition of the samples, their residual moisture content and other critical quality attributes, without destroying or modifying the sample and without using toxic reagents. The unique measurement configuration, where the camera moves beneath the sample, allows you to inspect the samples from underneath, through their glass or plastic recipient. The constant, repeatable path length provided by this innovative measurement configuration eliminates any potential problems with the surface flatness of the samples (e.g. powders). In addition, this highly robust design means there is no need for optical adjustments, so non-specialist lab personnel can perform precise analyses on samples in a reproducible manner. This is further facilitated by the provision of customized trays dedicated to the specific samples studied, with integrated white and/or gray references.



FOUR POSSIBLE CONFIGURATIONS

- HPR-17-300: NIR-CI solution with spectral range 900-1700 nm in its standard version allowing to inspect sample trays with a width of 19 cm, characterized by a spatial resolution of about 300 μm per pixel
- HPR-17-070: NIR-CI solution with spectral range 900-1700 nm in its version with improved resolution, for applications requiring the detection of smaller particles, characterized by an effective pixel size of 70 μm , reducing the sampling area to a width of 4.5 cm.
- HPR-19-300: NIR-CI solution with spectral range 1150-1900 nm in its standard version allowing to inspect sample trays with a width of 19 cm, characterized by a spatial resolution of about 300 μm per pixel
- HPR-19-070: NIR-CI solution with spectral range 1150-1900 nm in its version with improved resolution, for applications requiring the detection of smaller particles, characterized by an effective pixel size of 70 μm , reducing the sampling area to a width of 4.5 cm.

EASY-TO-USE, DATA-RICH TECHNOLOGY

The Breeze® software guarantees an intuitive, easy-to-use interface for data acquisition, model creation, workflow application and report generation. By substantially reducing the time required for analysis, while preserving the samples and increasing understanding of the process through its combination of spectral and spatial data, HypeReal ensures a significant return on investment for the laboratory.



TECHNICAL SPECIFICATIONS

Technology	Benchtop near-infrared imaging system with built-in hyperspectral camera moving underneath the sample, backed by an external PC delivered with the system
Illumination source	Halogen light bulbs
Detector	InGaAs with TEC cooling
Spectral range (bands)	900 – 1700 nm (224) or 1150 – 1900 nm (224)
Spectral resolution (FWHM)	8 nm (average)
Spectral sampling / pixel	3.5 nm
Spatial resolution	640 pixels, 300 μm per pixel or 70 μm per pixel in function of the configuration
Samples	Solid samples with maximum dimensions of 30 x 19 x 8 cm are measured from below by means of customized trays
Acquisition time	Less than one minute to analyze an entire tray
Analyses	Real-time prediction via the user-friendly Breeze® interface or analysis using external software chosen by the user (e.g. MATLAB or Python)
Temperature	5 – 40 °C (without condensation)
PC	External PC with two hard drives and powerful graphics card
Dimensions	H 47.39 cm x W 81.98 cm x D 46.44 cm (without external PC dimensions)
Certification	CE



SOFTWARE & AUTOMATION: READY

Indatech's multipurpose software "Ready" offers a versatile GUI for collecting, visualizing and processing spectroscopic data transmitted by the measuring instrument, from the laboratory through to the production line.

Our 21 CFR part 11 compliant software is adapted to all of Indatech's instruments and allows to:

- **Modulate the acquisition parameters:** Users can configure acquisition parameters such as acquisition type, integration time, and number of scans while ensuring compliance with data integrity regulations.
- **Visualize the spectra and metadata in real-time:** The software offers a configurable interface for real-time display of spectra and metadata, enhancing data monitoring and decision-making while maintaining an audit trail.
- **Import and implement chemometric models:** Apply recipes and display the results in real time, adhering to regulatory requirements for decision-making traceability.
- **Export the data and predictions in various formats:** Ensuring integrity and traceability of electronic records.
- **Communicate via OPC-UA:** guaranteeing secure and standardized communication between systems, thus facilitating integration and data exchange.
- **Create different user access levels:** Configurable access levels ensure compliance with security and regulatory standards, protecting sensitive data and maintaining a complete audit history.
- **Perform performance qualification (PQ):** Routine system verification checks can be performed in line with applicable pharmacopoeia standards to maintain validated instrument performance.
- **Reporting with regulatory validation:** Generate automated reports tailored to regulatory requirements, ensuring full transparency, auditability, and traceability of data.

But there is more !

We offer turnkey solutions to maximize the added value of our equipment.

Our solutions are designed to be compatible with Industry 4.0, but their potential may remain underexploited by customers lacking in-house expertise in this domain. That is why we make every effort to facilitate the integration of our systems into customer environments and we offer turnkey solutions tailored to customer needs. Personalized solutions that adapt to the specific requirements of each client, allow them to get the most out of their automation systems.



Our automation services cater to a wide range of needs, including:

- **adapting our equipment to the SCADA infrastructures already in place:** allowing for a smooth and uninterrupted transition of operational processes, while maximizing the use of existing systems.
- **the development of custom interfaces:** allowing to efficiently connect our equipment via the OPC-UA/TCP protocol.
- **improving connectivity with management systems** (ERP integration).
- **optimization of laboratory management systems** (LIMS integration).
- **cybersecurity solutions:** implementing robust security measures to protect data storage, transmission, and processing in compliance with international regulations.
- **and many more:** our team is ready to develop bespoke solutions tailored to your unique automation needs, ensuring full regulatory compliance at every stage.

Do not hesitate to reach out to our software & automation service to discuss your needs.



FROM HUMANS TO MACHINES: SEAMLESS COMMUNICATION WITH OPC-UA

OPC-UA (Open Platform Communications Unified Architecture) is a communication standard for exchanging data between different devices and systems. Perfectly suited to modern manufacturing environments and Industry 4.0, this protocol offers a robust solution for exchanging large amounts of data, thus boosting the interoperability, security and upgradability of the systems involved.

Indatech's READY software products can exchange data in real time with PLCs (such as SIPAT (Siemens) or SynTQ (Optimal Industrial Technologies – Bruker)) via this communication protocol. The major advantage of OPC-UA over traditional supervision protocols (such as Modbus TCP, etc.) is that communication takes place through open sessions between clients and servers, secured by the popular SSL protocol. OPC-UA supports several communication models, including the PUB-SUB (Publisher-Subscriber) model, which is particularly suitable for environments requiring real-time data transmission and efficient event management.

In Indatech's software, such as Viserion, MxViserion, Asuryan and SRS Ready, the PUB-SUB model is used so that users can connect to this server to configure and perform measurements without the need for an operator using the supervision software. The server updates information such as data collection and then makes it available to clients for reading. This allows one machine with clients to connect to multiple servers and

eliminates the need to use multiple software products to collect a chain of measurements from interested parts of a process. It also allows synchronized data collection from various parts of the process.

One of the strengths of OPC-UA is the management of secure exchanges through the use of digital certificates. This functionality is essential to guarantee the confidentiality, integrity and authenticity of the data exchanged between OPC-UA servers and clients. Security certificates are used for server and client authentication to ensure that only authorized entities can access data or control equipment. The certificates are issued by a Certification Authority (CA) and are used to establish a secure connection based on protocols such as TLS/SSL (Transport Layer Security / Secure Sockets Layer). In Indatech's solutions, we use these certificates to secure OPC-UA connections, in order to guarantee that the data flows between the instruments and the supervision systems are protected against any risk of cyberattack.

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