



half a century of technological breakthroughs in spectroscopy and medicine

## UV-Visible SPECTROPHOTOMETERS



*Excellence in spectrophotometry .*



Excellence is never due to chance.

It requires passion, knowledge, commitment to quality and experience.  
It demands permanent innovation in keeping with tradition and reliability.

SAFAS, inventor of the world's first UV-Visible spectrophotometers with grating monochromators (1958), now makes excellence affordable for your laboratory.

Your analysis deserve our technologies.

# UV-VISIBLE SPECTROPHOTOMETERS



## high reliability technological jewels

Astute, accurate, evolutive and ultra-fast, UV mc<sup>1</sup> and UV mc<sup>2</sup> spectrophotometers are **introducing a lot of breakthrough technologies which you won't find anywhere else**. They will bring to your laboratory unparalleled performances, astute concepts and a unique range of accessories in a very small footprint.

Enter a new world of spectroscopy, with instruments where **everything has been carefully considered, where every usual problem has been efficiently tackled**. Fully autocalibrating, UVmc series also achieve an accurate **FULL AUTOMATIC LAMP CENTERING at every switch-on, for perfect optimization of the measurements, day after day, year after year**. **Rugged and reliable**, they are designed for a long term use with a **very low ownership cost**.

Introduced by SAFAS in 1978 for very special high level applications, then progressively applied to all our spectrophotometers, our compensator automatically subtracts the effects of external light and enables you to **work with cuvette-compartment opened, without undergoing the major drawbacks of a pulsed lamp**. Now, you can comfortably and safely **inject your reagents and check your samples during the measurements**.



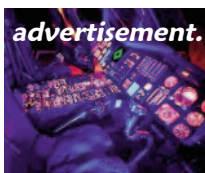
**Highly innovative**, the UVmc series advanced signal processing brings unparalleled speed and sensitivity. The **miniaturized beams enable to work with microvolumes without losses of energy**.

**But at SAFAS, with more than 1/2 century of experience in high level spectroscopy, we know that breakthrough solutions are useless if basic principles in optics and mechanics are not respected**. That's why UVmc series are respecting SAFAS tradition of quality at 100%, especially for many essential requirements on which other manufacturers are now using cheap solutions.

For these reasons, UVmc is a **genuine symmetrical and simultaneous double-beam, guaranteed without rotating mirrors, with coated large aperture high quality optics (f/3)**. It does not include lenses nor plastic optics-holders.

Whatever can be your application, whatever may be the problems which you met on other instruments, SAFAS UVmc will certainly be the best solution for your analysis... with the advantage of an **efficient team of engineers and a free hot-line, for a fast and efficient answer to all your questions and requests**.

## amazing and unrivalled sensitivity and speed



*Regarding performances and innovation, there is often a slight difference between the beautiful images and announcement effects of the advertisements and brochures, et the results really obtained on the instruments after delivery...*



**..reality!**

All the instruments, even the cheapest ones, pretend to be the best... Because our customers are -just like us!- scientific people, we prefer to give you figures, easy to compare to all the instruments which claim to be the best, the most sensitive and the fastest... provided they dare to give corresponding figures !

A fast scan is useless if measurements are distorted, or if there is only one measurement left every 5 or 10nm. On the contrary, UVmc spectrophotometers are able to draw spectra up to **7.000 nm/min nearly without deformation and with 1 graphic point every nanometer**, with a **repeatability of 0.01nm guaranteed by our exclusive sine bar + micrometric screw wavelength mechanics**.

With kinetics up to **50 points/second**, with an **automatic & linear ultra-fast cuvette holder enabling the measurement of 10 samples in only 5 seconds**, and the **possibility to process the Millionth of Absorbance**, UV mc spectrophotometers really set a new standard in productivity, speed and sensitivity.

These outstanding performances will enable you to enter in a new world of spectroscopy, profit by the latest technologies in electronics and discover **new techniques of data processing**, now getting quantitative results from data which were yesterday impossible to process, due to noise, interferences, too slow instruments, and overall cheap (or just mistaken) technologies.



Last but not least, UVmc series are fitted with **innovative optical technology: only 3 mirrors are met by each beam, the lowest number in the world**. Considering that optical ageing is correlated to the number of mirrors, and thanks to the association of auto-optimization, protected optics and high aperture, you will benefit from our reputed **long-lasting performance and compliance**.

## quality management, IQ/OQ, GLP, EPC, FDA 21CFRpart11 at your fingertips

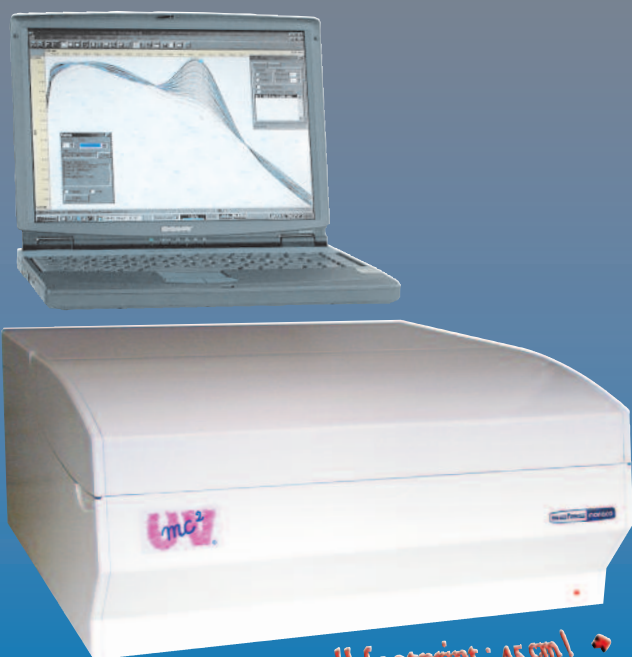
SAFAS UVmc spectrophotometers will **conform to all the requirements of the European Pharmacopeia... not only when they are new, but for many years**. And because Validation is time consuming and subject to mistakes on standards, on manipulations and on transcription, UVmc brings you a turnkey solution. Just forget the old fashioned boards to prepare, the hand written reports, the suspicion of auditors and the doubtful standards. Our "Validation" option includes **ready-for-use procedures** (user selectable depending on which standards are present and which trials have to be achieved), a **set of certified standards (solid for ISO 9000 requirements, or liquid for EPC requirements)** placed in a protective standard holder which can be inserted in the instrument in a few seconds, a software for **full automatic validation, and an automatic report generator**.

For our customers which require IQ/OQ/PQ, our engineers can assist them for the IQ/OQ procedures and supply corresponding forms (optional), as well as achievement of the IQ/OQ procedures when installing the unit. Obviously, like all SAFAS spectrophotometers, UVmc is fitted with autocalibration procedures with report generation upon request of the user.



Last but not least, for those who need to conform to FDA 21CFR part11, an optional software enables to keep 100% of functionalities of the standard software with the same ease of use, and compatibility with domain name. It doesn't require additional database or plug-on, no third-part software: the updates are easy and transparent, the software is fully validated and debugged, and it will handle audit trails, and electronic signature (biometry compatible).

## The award winning spectrophotometer !



← a very small footprint : 45 cm! →

✓ 100% PC driven by USB & BLUETOOTH, compatible with TOUCHSCREENS. The optional TouchSnake concept enables to hold a tablet ideally.

✓ low power and no heating: no drift, immediately stable without preheating, no openings on the top (user safety in labs which manipulate liquids)

✓ strong and flat upper surface without small screen or keyboard : increased reliability, and no side loss of room for the PC

✓ sample compartment on the front, easy access to all cuvettes, many options available like our linear ultra-fast 10/12-cuvette holders + 1µl microvolume

✓ innovative technology enabling measurement at open-sky (with lid opened). Full protection of detectors (guaranteed 10 years), smart cabinet removed in seconds.

## multivalence, scalability and ease of use



Regarding ease-of-use, there are also often surprising differences between advertisements, and the crucial reality. Everything seems simple when presented by a specialist during the demo, but the reality is different when you are faced to the instrument, alone in your lab'... sometimes, the software seems to have been developed by software developers



JUST FOR software developers!

That's why our software are the fruit of a permanent partnership with our customers since more than 25 years, with our unique **FREE UPDATE CONCEPT** (excepted shipment, CD & packaging costs). Available in several languages, it is **REALLY very easy to use**, and most of functions are available at one single "click". Its functional richness and graphic power are a **delight for all spectroscopists**.

Spectra software, for single or cycling spectra (spectra kinetics), allow multiple zoom, automatic peak and valley search, multiple data processing, inter-spectra and inter-wavelength calculations, and quality derivatives up to the 6th order.

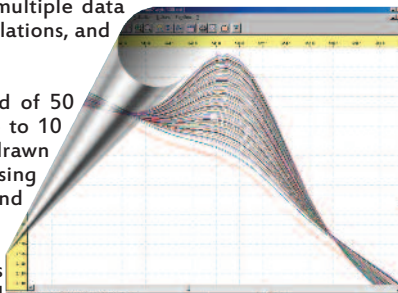
Fast kinetics\* can be achieved at the unique speed of 50 points/second, and multiple cuvette kinetics, on up to 10 cuvettes and at up to 10 different wavelengths, are drawn in real time in graphics and boards. Many processing formulas are available; for example for enzymology and hospital diagnosis.

For series of samples, our optional software enables to synchronize with our optional autosampler and with most of the automatic samplers of the market; hundreds of samples can be managed, identified, with calibration curves and replicates, and presented in a spreadsheet with reports.

As all our software is 100% developed by SAFAS, any special function can be developed "on-purpose" for our customers: don't hesitate to ask us.

### Many accessories are available:

- \*automatic linear holder for 10 cuvettes or microcuvettes
- \*thermostatable holders, PT100 temp. probe ( $\pm 0.1^{\circ}\text{C}$ )
- \*1nm or 0.5nm bandwidth
- \*efficient stirring on 1 to 10 cuvettes
- \*fiber optics probes and in-situ holder
- \*thermal melt for DNA, polymers and proteins (Tm, GC) on 10 samples, fully programmable from the computer, with hysteresis cycling and high speed of temperatures
- \*\*"BIO" applications with automatic calculations for DNA, RNA, oligonucleotids and 1µl sample volume
- \*external automatic sampler for up to 300 samples with complete software for managing samples and data
- \*comprehensive kinetic and enzymology software on 10 samples and at up to 10 wavelengths, hospital diagnosis software and dissolution testing for drugs and medicines
- \*reflectance and colorimetry softwares, integrating sphere
- \*peristaltic pump (external, to avoid spilling of samples in the instrument)
- \*device for turbid or scattering solutions
- \*measurements on electrophoresis strips/gels
- \*measurements at high or low temp./pressure
- \*measurements on polluted or non-flat optics
- \*holders for anaerobic tubes
- \*voice control with wireless microphone
- \*any kind of cuvettes, including ultra-micro cuvettes for measurements of very low volumes (down to 8µl)+flow-through cuvette
- \*AUTOMATIC VALIDATION for EPC
- \*AUTOMATIC VALIDATION for ISO9000
- \*IQ / OQ achievement by our engineers, or just supply of complete validation procedures



... your application is not listed ? Don't hesitate to contact us, many other options are available, and any kind of accessory or software can be developed on purpose.

\* optional





UVmc TouchSnake:  
all the advantages of a TouchScreen...  
without the drawbacks !



Because touchscreens have invaded our life, especially on smartphones, they are intuitively considered as attractive and easy-to-use. But when it comes to driving scientific and analytical instruments, many drawbacks have to be considered...

First, touchscreens are directly fixed on the cabinet and consequently not ideally placed, too small or too far from the eyes, and subject to damage by corrosive liquid projections or manipulations with gloves contaminated by chemicals. Unfortunately, they are usually custom made by the instrument manufacturer, which makes them expensive to replace when built-in. They also don't allow updates or evolution...

SAFAS brings you the solution : all the advantages of a touchscreen, without the drawbacks ! An ingenious flexible arm holds a tablet which becomes a very wide touchscreen in front of the face of the operator, exactly where he likes and out of reach of liquid sprays. Driving the instrument and following-up the measurements remain possible at any moment, even when the compartment lid is opened, so as the user can fully profit by the exclusive SAFAS technology enabling to measure at open sky, thus allowing easy injections of reagents during the experiments.

The touchscreen is built-in, but locked by a key ; so it cannot be stolen, and is full in conformity with the exclusive SAFAS concept of SUSTAINABLE SPECTROSCOPY : in case of damage, or just to profit by new technologies, it can easily be unlocked by the owner and replaced at low cost by any tablet from 8 to 12" (autoadaptive) with Windows 7, 8, or 10, fitted with Bluetooth or USB port. The software updates are free for instrument's life.



# SAFAS Quartz Guarantee: a commitment to transparency



The automotive market has highlighted recently the possibility for some manufacturers to modify by software the results when tests are achieved. This is a risk which we identified in 1988 when we introduced the world's first UV-Vis spectrophotometer 100% PC computer driven. We immediately introduced our Quartz Guarantee to certify that the excellent quality of our measurements is exclusively provided by the excellence of our optics, mechanics and signal-processing, and that our measurements undergo absolutely no alteration due to computer processings, like hidden systematic smoothings, "trick". You can use our powerful data processing tools how you want and when you want, but your precious original data will never be wrecked by an automatic hidden processing which you don't know and cannot suppress. **Your Pharmacopoeia compliance is a true compliance, not a trick; it proves that your measurement are good at any wavelength and under any condition.**

**This is our transparency commitment, for original data pure like a Crystal.**

## main features

|   |   |
|---|---|
| Optical principle .....                                     | <b>Genuine symmetrical and simultaneous double-beam</b><br>(in the UVmc1, the 2nd beam is internal and the instrument is used like a single-beam, but has the quality and the stability of a double-beam) |
| Spectral range & wavelength accuracy.....                   | 185 to 1100 nm, <b>accuracy ±0,1 nm on the whole range</b> , AUTO CALIBRATING   |
| Wavelength repeatability .....                              | typically <b>±0,01 nm</b>   |
| Minimum step between 2 measurement points (resolution)..... | 0.1nm   |
| Bandwidth .....   | 2 nm standard, 1.5nm or 1nm on request (variable at the order), or 0.5nm (option)   |
| Monochromator.....  | Concave blazed grating, aberration corrected, with <b>very high aperture (f:3)</b>  |
| Wavelength drive.....                                       | With <b>micrometric screw, sine bar</b> and stepping motor  |
| Mirrors.....  | High quality UV, protected, with exclusively metallic holders, NO lenses  |
| Straylight at 220 and 340nm.....                            | typically 0.02% (ASTM)  |
| Straylight at 200nm on Pharmacopoeia KCl .....              | Absorbance > 2A / conformity to <b>European Pharmacopoeia</b> requirements  |
| Measurement units .....                                     | Absorbance, T%, Concentration, Activity (with optional kinetics software)   |
| Photometric range in Abs .....                              | <b>Symmetrical (because true double-beam), +4A to -4A</b> (depending on conditions)   |
| Photometric range in T% .....                               | From 0% to 999 999%   |
| Photometric accuracy.....                                   | ±0.002 A at 0.5 A   |
| Photometric noise.....                                      | about ±0.000 005A RMS (depending on conditions)   |
| Absorbance display .....                                    | up to 0.000 001 A (millionth of Absorbance)   |
| Transmission display .....                                  | up to 0.000 001 A   |
| Spectra draw speed .....                                    | <b>up to 7000nm/minute (nearly without any deformation)</b>   |
| Kinetic speed (optional) on one cuvette.....                | up to 50 points/second on one cuvette   |
| Automatic holder (optional).....                            | <b>linear, high speed (10 samples analyzed in about 5 sec. only)</b>  |
| Derivatives .....   | high quality up to 6th order  |
| Sources .....   | tungsten and deuterium with <b>very long life, full automatic centering</b> & hour counters   |
| Cuvette stirring.....                                       | optional for <b>10 cuvettes</b> , without any electronic component below cuvettes   |
| Computer control.....                                       | external PC computer, via <b>USB, and Bluetooth</b> (RS232 is available upon request)   |
| Operating systems compatible with our softwares.....        | <b>Windows 7, 8 and 10</b>  |
| Software updates .....                                      | Free of charge for instrument's life (excepted participation to copy and shipment expenses)   |
| Dimensions and weight.....                                  | 450mm x depth 450mm x h.210mm, about 15 Kg (without options)  |
| Mains and power .....                                       | 220/240 V (110/120 V optional), 50/60Hz, 150 Watts  |



*Pictures and features are not contractual. They are subject to change without notice. The standard version of UVmc series is delivered with one holder for one measurement cuvette from 1 to 40mm pathlength, one holder for one measurement cuvette from 1 to 40mm pathlength (excepted UVmc1), the mains and RS232 cords, and software for spectra, calibration curves and maintenance. The automatic cuvette-holder for 10 cuvettes, the thermostatable cuvette holder, the kinetics software, the validation software with certified standards, the Voice Control, the external PC computer and printer ARE NOT INCLUDED AND ARE OPTIONAL.*



Our factory (right side of the harbour) during the Formula 1 Grand Prix of Monaco. Welcome to Monte-Carlo !



MANUFACTURER OF HIGH TECHNOLOGY SCIENTIFIC INSTRUMENTS SINCE 1952

**SAFAS S.A.**

10, quai Antoine 1<sup>er</sup> - 98000 MONACO

phone (RNIS): +377 99 99 52 52 - fax: +377 99 99 52 50

e-mail: safas@safas.com - web: <http://www.safas.com>

