eRPHiX$_2$

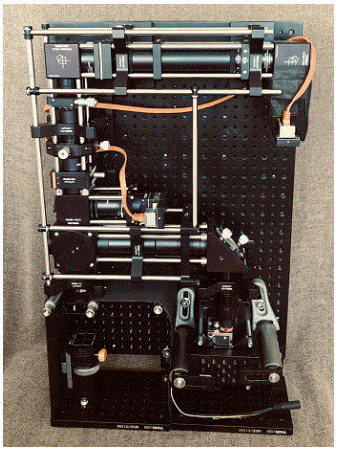
DATASHEET

(Version 2024)

Product Synopsis

eRPHiX$_2$ is the improved next generation of our experimental field lab instrumentation platform. It is capable of fast hyperspectral imaging of the plasmonic effect of Raman active organic composites in enhancing colloidal liquids or nano-substrates.

The platform is intended to facilitate the verification of sensitivity and reproducibility of SERS-substrates and the development of novel solutions.
It addresses a need of research labs and nanomaterials manufacturers.



Main Features

The present functional prototype enables the detection and dynamic hyperspectral imaging of Raman spectra in:

- solids, powders, and liquids at a min. 10% concentration of the analytes
  and
- surface enhanced plasmonic Raman spectra of low concentration of organic volatiles in droplets of colloidal solutions on glass slides or solid nano-substrates.

It comes in a robust transportation case, fast to build up and versatile in use, either in horizontal or vertical standing. SERS droplets are scanned in the present version on a microscopy slide in the vertical standing only.

An additional monochromatic camera provides a magnified image of the scanned microscopic scenery.

Customizations are easy to implement.

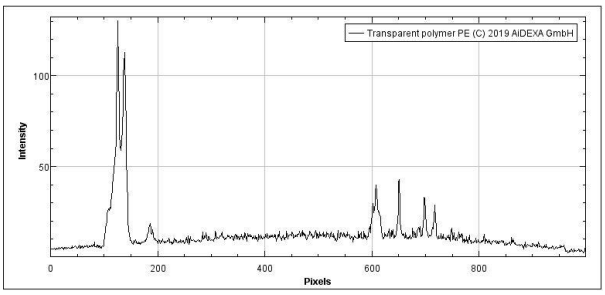
The unit is equipped with a GigE Vision interface and can be easily connected to state-of-the-art hyperspectral imaging software packages for further data evaluation and modelling.

Specifications

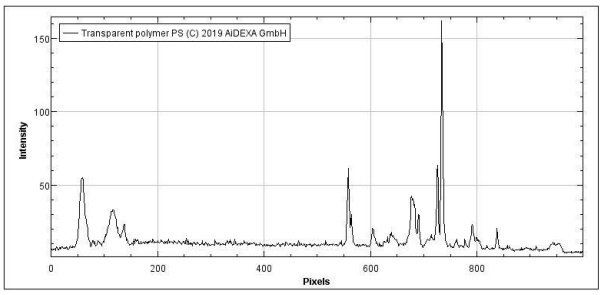
Weight:	20 kg with case / 12kg w/o
Dimensions:	60 x 44 x 26 cm w. case / 45 x 30 x 20 cm w/o case
Power supply:	100 - 230 Vac / 1 Amp
Operating temperature:	0 – 50 ° C
Laser :	532nm +/- 0.1nm | FWHM max. 1pm, TEM0O / max. 50mW, optical and electronic (USB interface) adjustment
Spectrograph:	Transmissive, 20u slit, prismatic
Spectral range:	Raman shift 150 – 3600 cm-1 @ up to 1600 spectral pixels
Spectral resolution:	8 – 10 cm-1 (0.25 – 0.5 nm) w/o binning
Line of Detection:	256 spatial pixels on 1.5mm scanning line; customizable optics possible
SpectralView Camera:	CMOS | 2.4um pixels | binning 8 x 8 | 384 spectral x 256 spatial pixels; nominal 10 fps @ ca. 0.1 s exp.
SideView Camera:	CMOS | 3.45um pixels | 50 FPS at full frame 1440 x 1080 pixels
Dual Cameras Interface:	GigE Vision 2 x Gigabit Ethernet
Production:	Austria
Recommended list price:	58.500,- EURO, net

Examples of recorded Raman spectra with eRPHiX

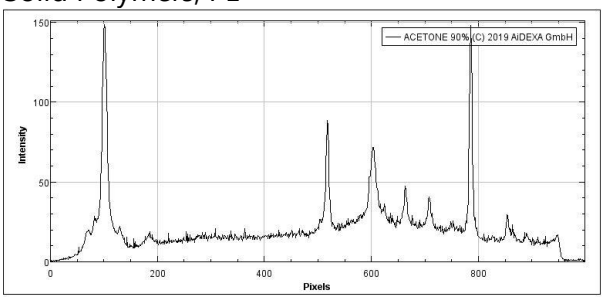
Raman spectral wavenumbers from right to left 0 - 3600 cm-1 and 1000 spectral pixels width



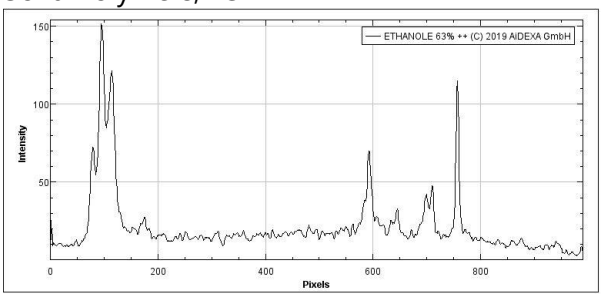
Solid Polymers, PE



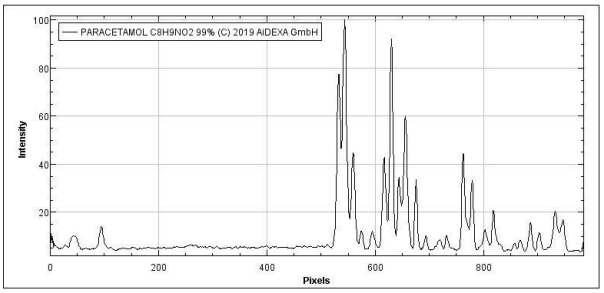
Solid Polymers, PS



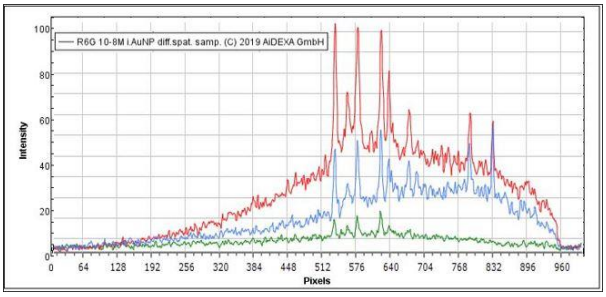
Acetone 90% liquid



Ethanol 63% liquid

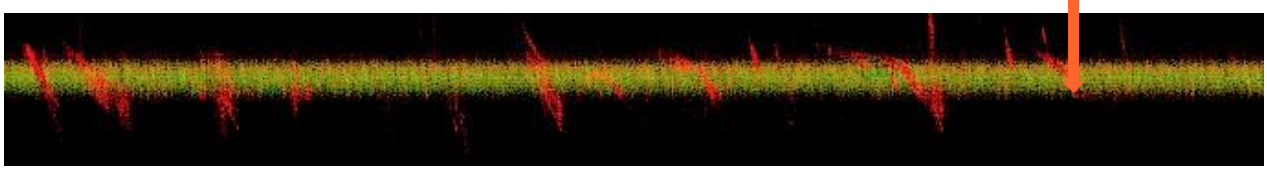


Paracetamol 99% powder



SERS spectra of 10-8M R6G in AuNP colloid

Visualization of plasmonic surface enhancement in colloidal droplet:



Vertical section line of 1.5mm through colloidal droplet of 10-8M R6G in AuNP placed on aluminum foil covered glass slide and scanned with 10 fps (time is on the horizontal axis). Green visualizes spot of increased fluorescence; orange are hyperspectral pixels with SERS spectra of R6G.