afs
Member of the TRUMPF Group

Dual-wavelength ps-sources

Developed for

Coherent anti-Stokes Raman spectroscopy (CARS)

&

Stimulated Raman spectroscopy (SRS)

Distributor in China for CARS/SRS systems:

WINWINTEC
INTERNATIONAL GROUP

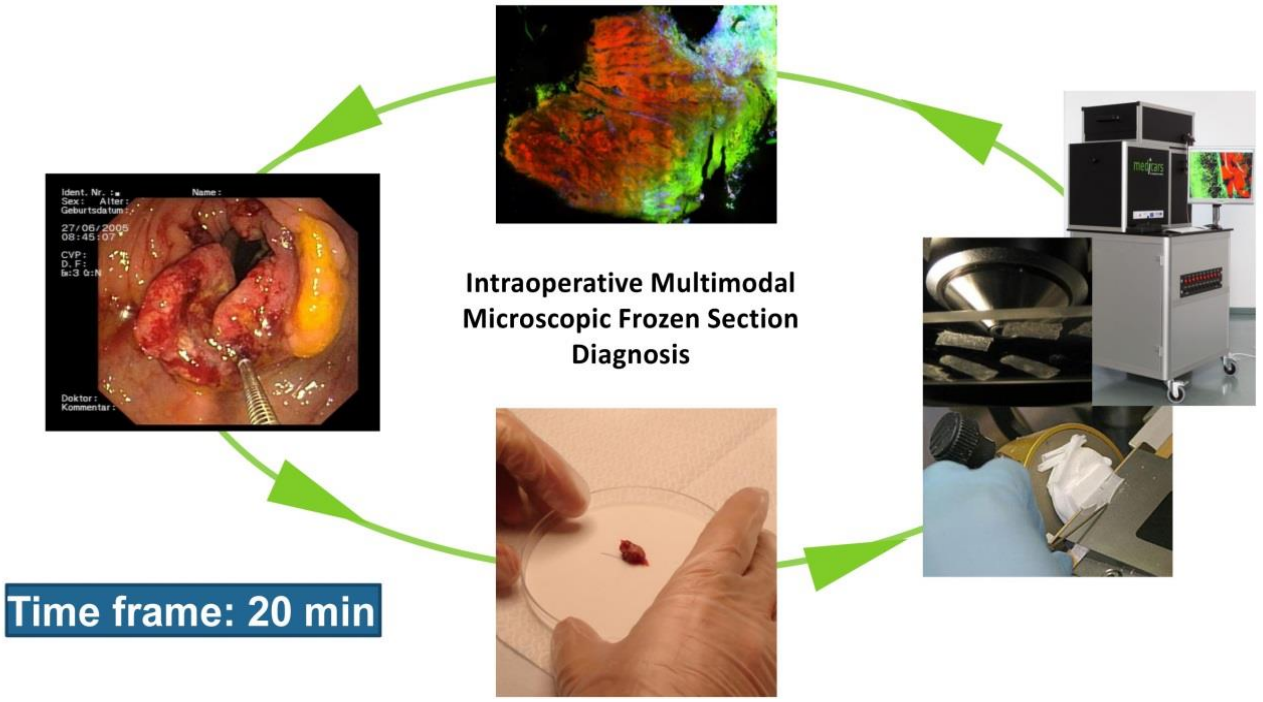
Dual-wavelength ps-fiber laser for coherent raman imaging

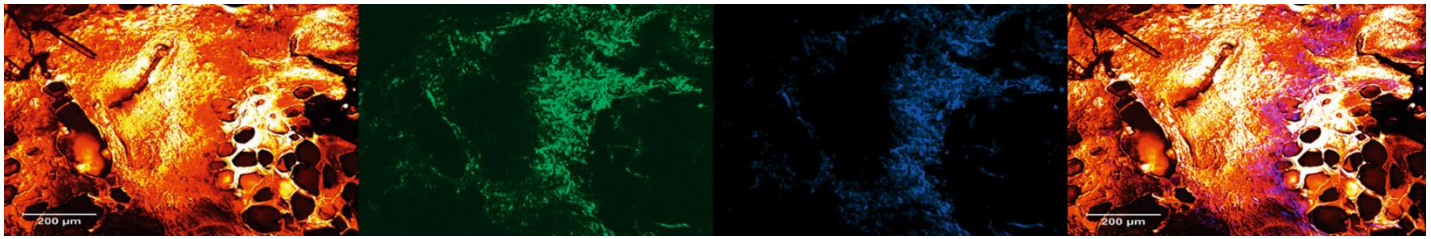
- **turn-key, compact, air-cooled, fully software-controlled**
- **fiber-coupled synchronized emission of picosecond pulses**
- **addressable resonances from 0cm^{-1} to 5000cm^{-1}**
- **Tuning speed of few seconds**

Specs range

Tuning range (wavenumbers)	0 cm^{-1} ... 5000 cm^{-1}
Output wavelength range	Typically between 600nm and 1100nm
Spectral width	As narrow as < 10 cm^{-1}
Tuning speed	As fast as < 1 s (full-range)
Repetition rate wavelength	Flexible, tunable configurations single shot ... 30MHz
Pulse duration	As short as <10ps
Average power	As high as 1000 mW
Peak power	As high as >500W for all outputs
Polarization	Linear
Beam quality	Fiber coupled or free space output M^2 < 1.2
Spatial overlap	Overlapped or independent outputs possible
Temporal overlap	Passively overlapped or actively adjustable to compensate dispersion effects in attached microscope
SRS extension	Available as options RIN < -145dBc/Hz on output 1/2
Power tunability	Outputs can be tuned independently from 0 to full power while maintaining pulse duration and bandwidth
Warm-up time after system start	<1min
Control interface	Software, RS232, USB, customizable
Dimensions (W × D × H)	As small as 200mm × 200mm × 200mm (customizable, depending on configuration)
Mass	As light as 10kg (customizable, depending on configuration)
Power consumption / Cooling	< 100W (24V power supply) / Air-cooled

Dual-wavelength ps-fiber laser for coherent raman imaging





Multimodal composite image of human connective tissue showing an overlay of CARS (red), SHG (blue) and TPEF (green) signals. Courtesy of ipht Jena

Biomedical applications and beyond

Investigation of biomechanical properties and microstructure of the human ventricular myocardium

CARS and SRS guided histopathology of biomolecules such as proteins, lipids, nucleic acids and carbohydrates, even under in-vivo conditions

CARS and SRS guided analysis of drug uptake and distribution in biological cells

CARS guided laser ablation precision surgery (complete resection of tumors, ophthalmology)

Carbamate-modified disiloxane in porous PVDF-HFP membranes → new electrolytes / separators for Lithium-Ion batteries

Two-photon luminescence from nano-porous gold capped with micro-printed salts

Chemical composition of thermo-responsive nano-gels and their interaction with the skin barrier

Dual-focus CARS microscopy of human perivascular tissue surrounding an artery

Elucidation of compression-induced surface crystallization in amorphous tablets by Sum Frequency Generation (SFG) microscopy

Installed laser systems

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