TECNOLOGIE D'AVANGUARDIA

PAN & TILT

Hyperspectral scanner

The earth tactive tripod allow you to scan a landscape or a static target since a synchronized tilting system will move the head. The target pointing is achieved with a software preview screen. Up to a couple of sensor can be lodged inside the same head (i.e. VNIR and SWIR) besides a standard camera used as pointing device. The power supply unit is a rack size external device (powered @28Vdc), and contains also the electronic controllers for the acquisition and control interface.

The P&T system is available for various wavelength ranges UV (200-400nm), VIS-S (400-700nm), VIS-NIR (400-1000nm), IR (900-1700nm), SWIR (1000-2500nm) and with different resolutions, depending on the chosen entrance slit dimension of the spectrograph, the chosen FOV and the target distance.

Remote sensing

Environment
Territory

Pollution

Restoration
Forensic

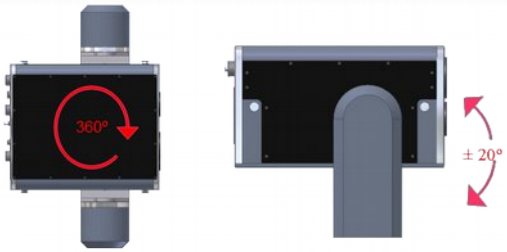
Agricolture
Precision farming

DV S.r.l. Tecnologie d' Avanguardia 35129 Padova/Italy Viale dell' Industria, 62
Ph. +39 049 8070024 Fax +39 049 772477 Email infospectroscopy@dvoptic.com

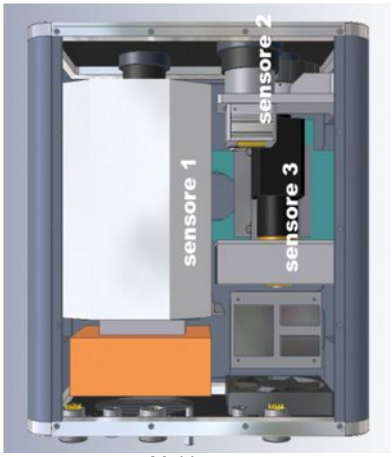
Mechanical characteristics

Tilt movement group

- Vertical scan angle: ± 20°
- Vertical scan angle: 0.014°
- Horizontal scan angle: 360°



Pan and Tilt movements



Multi sensors

Single sensor

Spectrophotometers containers box

- Single/Multi sensor support
- Connectors on back chassis
- Seal box (optional)
- Mechanical shutter controlled by software (optional)

Control and powr supply

- Micro-step driver built into the structure
- Programmed via seriale RS232/USB
- Stepper motor 5A
- Power supply input: 220VAC or 12V DC

Tripod for movement support

- Material: aluminium
- Dimensions: H min 1.00m, max 1.70m
- Load max: 35Kg
- Color: black


Acquisitions outside old church of Fasano (Italy)

DV S.r.l. Tecnologie d' Avanguardia 35129 Padova/Italy Viale dell' Industria, 62
Ph. +39 049 8070024 Fax +39 049 772477 Email infospectroscopy@dvoptic.com

TECNOLOGIE D'AVANGUARDIA

Optical characteristics

HIPERSPECTRAL IMAGING SYSTEM IR [1000-1700nm]

Imaging spectrometer

- Spectral Range 900-1700nm
- Spectral resolution 5nm
- Aberrations Insignificant astigmatism
- Smile o keystone < 5 µm
- Entrance slit dim.: 30µm x 9.6mm
- Image dim.: 9.6 mm x 7.2 mm
- Numerical aperture: F/2.0
- Total eficiency > 50%, independent of polarization
- Stray light < 0.5% (halogen lamp, 1400 nm notch filter)
- working temperature: +5 . +40 °C non-condensing

Sensor

- TE-cooled InGaAs photodiode array
- Pixels: Full frame 320(spatial) x 240(spectral) or 640(spatial) x 480(spectral)
- Data Interface GigEthernet: 14 bits
- Frame rate: Up to 30 fps
- Robust metal housing

HIPERSPECTRAL IMAGING SYSTEM VNIR [400-1000nm]

Imaging spectrometer

- Spectral Range: 400-1000nm
- Spectral resolution: 2.0nm
- Input slit: 18µm x 14.2mm
- Numerical aperture: F/2.4
- Dimension: max 60 x 60 x 175 mm
- Weight: 1100g
- Body: Anodized alluminium
- Mount type: "C" mount
- Environmental conditions: +5° / +40° not condensing

DV S.r.l. Tecnologie d' Avanguardia 35129 Padova/Italy Viale dell' Industria, 62
Ph. +39 049 8070024 Fax +39 049 772477 Email infospectroscopy@dvoptic.com

TECNOLOGIE D'AVANGUARDIA

Sensor

- Resolution: horizontal/vertical 2330 pixels x 1750 pixels
- Pixel Size: horizontal/vertical 5.5 µm x 5.5 µm
- Frame Rate: 26 fps
- Interface: Gigabit Ethernet
- Video Output Format: Mono 8, Mono 12, Mono 12 Packed
- Pixel Bit Depth: 12 bits
- Housing Size &Weight : 40.7 x 62 x 62mm, 300g
- Housing Temperature: 0 °C - 50 °C

HIPERSPECTRAL IMAGING SYSTEM SWIR [1000-2500nm]

Imaging spectrometer

- Spectral Range 1000-2500nm
- Spectral resolution 10nm (30µm slit)
- Aberrations Insignificant astigmatism
- Smile o keystone < 5 µm
- Entrance slit dim.: 30µm x 9.6mm
- Available slits: 50µm , 80µm
- Image dim.: 9.6 mm x 7.2 mm
- Numerical aperture: F/2.0
- Total eficiency > 50%, independent of polarization
- Stray light < 0.5% (halogen lamp, 1400 nm notch filter)
- working temperature: +5 . +40 °C non-condensing
- Size, cased (L x W x H) 558 x 191 x 205 mm con N24E

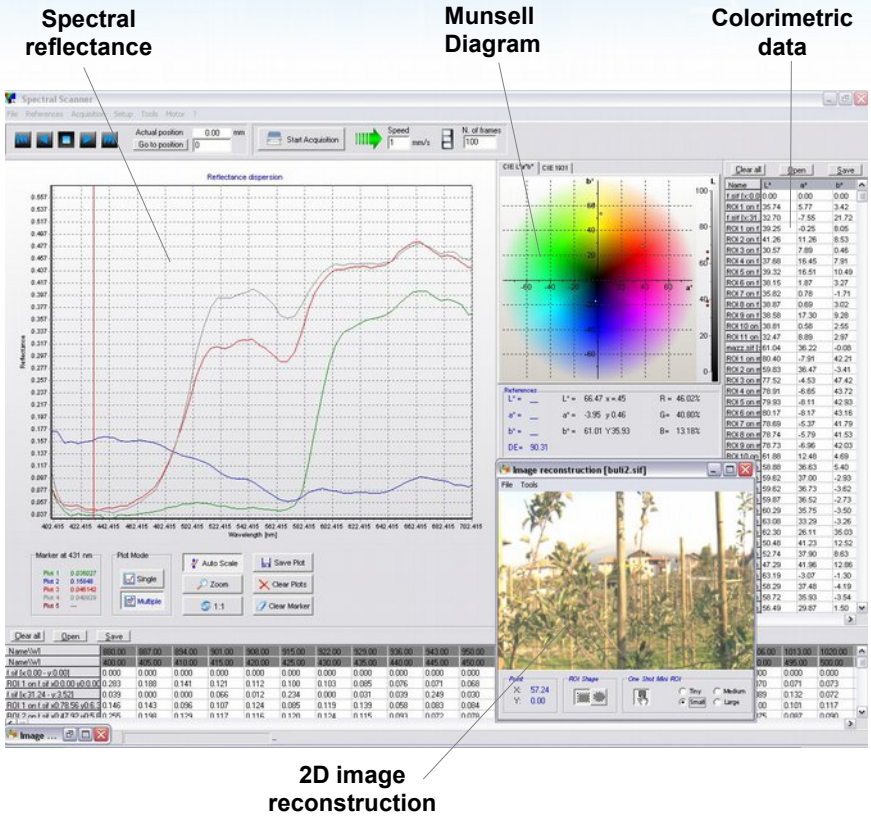
Sensor

- Sensor: MCT
- Pixels in full frame: 320(spatial) x 256(spectral)
- Interface: Camera Link, 12 bits
- Frame rate: Up to 100 fps
- Dynamic range 68 dB (2400:1)

DV S.r.l. Tecnologie d' Avanguardia 35129 Padova/Italy Viale dell' Industria, 62
Ph. +39 049 8070024 Fax +39 049 772477 Email infospectroscopy@dvoptic.com

TECNOLOGIE D'AVANGUARDIA

SPECTRAL SCANNER SOFTWARE



SpectralScanner© is a spectral imaging software that captures the spectral composition of each point of the sample using a line spectrometer. The Software controls a mechanical device which moves the optical system and captures a series of two-dimensional frames. By interpreting each of these as an array of spectra, point by point, the Software reconstructs an entire image on the screen line by line, making available all the spectral data which are displayed numerically and in graphical form on a chart, through L*a*b* coordinates and diagram and in the Munsell color space.

Reflectance, transmittance, absorbance

Many spectral imaging applications, like color measurement, require to determinate the absolute reflectance of the sample; Spectral Scanner calculates reflectance for every acquired pixel, evaluating the acquired signal ratio with a white reference sample. The mouse movement on the rendered image gives access to the spectral profiles of the selected pixels, instantly evaluates the colorimetric parameters and with one click lets you imediately save the data in various formats. Software filters allow narrow band analysis of the images. In the same way Spectral Scanner can render an image in transmittance mode for applications that require it.

DV S.r.l. Tecnologie d' Avanguardia 35129 Padova/Italy Viale dell' Industria, 62
Ph. +39 049 8070024 Fax +39 049 772477 Email infospectroscopy@dvoptic.com

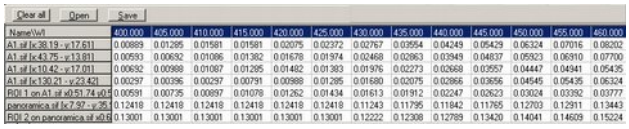
TECNOLOGIE D'AVANGUARDIA

Single wavelength selection

Spectral Scanner allows the selection of single bands with defined wavelengths and the visualization to screen of the rendered filtered images.

Data exportation

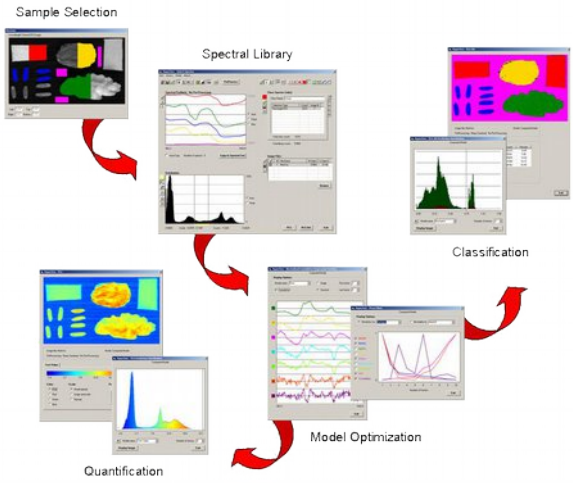
All the spectral reflectance data and colorimetric calculated values can be quickly exported for further elaborations with other mathematical applications and tools...



Name\Wl	400.000	405.000	410.000	415.000	420.000	425.000	430.000	435.000	440.000	445.000	450.000	455.000	460.000
A1.sif [x:38.19 - y:17.61]	0.00889	0.01285	0.01581	0.01581	0.02075	0.02372	0.02767	0.03554	0.04249	0.05429	0.06324	0.07016	0.08202
A1.sif [x:43.75 - y:13.81]	0.00593	0.00692	0.01086	0.01382	0.01678	0.01974	0.02468	0.02863	0.03949	0.04837	0.05923	0.06910	0.07700
A1.sif [x:10.42 - y:17.01]	0.00692	0.00988	0.01087	0.01285	0.01482	0.01383	0.01976	0.02273	0.02668	0.03557	0.04447	0.04941	0.05435
A1.sif [x:130.21 - y:23.42]	0.00297	0.00396	0.00297	0.00791	0.00988	0.01285	0.01680	0.02075	0.02866	0.03656	0.04545	0.05435	0.06324
ROI 1 on A1.sif x0:51.74 y0:5	0.00591	0.00735	0.00897	0.01078	0.01262	0.01434	0.01613	0.01912	0.02247	0.02623	0.03024	0.03392	0.03777
panoramica.sif [x:7.97 - y:35	0.12418	0.12418	0.12418	0.12418	0.12418	0.12418	0.11243	0.11795	0.11842	0.11765	0.12703	0.12911	0.13443
ROI 2 on panoramica.sif x0:6	0.13001	0.13001	0.13001	0.13001	0.13001	0.13001	0.12222	0.12308	0.12789	0.13420	0.14041	0.14609	0.15224

Advanced analysis tools

Spectral Scanner provides many tools that provides an intuitive user friendly path through the complexities of hyperspectral image exploration and the development of robust prediction models for either image feature classification or chemical component quantification. Moreover other application software are available by DV for advanced spectral analisys and color proof and simulation.



DV S.r.l. Tecnologie d' Avanguardia 35129 Padova/Italy Viale dell' Industria, 62
Ph. +39 049 8070024 Fax +39 049 772477 Email infospectroscopy@dvoptic.com