



MISTRAL-NIR-HS

Imaging Spectrometer

Technical Specifications

MISTRAL-NIR-HS is a Fourier transform imaging spectrometer for hyperspectral microscopy applications in the visible-NIR spectral range. MISTRAL-NIR-HS delivers cost efficiency, compact size and design simplicity with no compromise on performance and quality. The operating principle is based on the Arion Optics innovative birefringent interferometer technology.

FEATURES AND BENEFITS

- Three software selectable modes:
 - 2MP 30 fps monochrome imaging camera
 - Imaging spectrometer mode to analyze the spectrum of any region of the image
 - Imaging spectrometer mode to acquire the full hyperspectral hypercube
- C-mount compatible, can be attached to any microscope with a C-mount camera port.
- Very large optical throughput improves the SNR and makes it feasible for low light applications such as fluorescent and darkfield microscopy.
- 400 - 1000 nm spectral range
- 2 MP maximum spatial resolution
- 80 cm⁻¹ minimum spectral resolution (3 nm FWHM at 630 nm)
- Software adjustable spectral and spatial resolution
- NIST-traceable factory wavelength calibration
- Wavelength stability guaranteed by internal reference laser
- USB-powered
- Compact size 6" x 5" x 3.5"
- Free ArionScope software included. Output hypercube formats are compatible with ENVI, ImajeJ, HSpEQ, Predictera, ImageLab, Matlab software.
- Applications include fluorescent, brightfield and darkfield microscopy.



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| Parameter | Test Conditions | Value | Unit |
|---|--|----------------------------|--------------------|
| System parameters in imaging spectrometer mode | | | |
| Spectral range | PSD > 0.05*(max. PSD) with QHL light source illumination | 400 – 1000 | nm |
| Resolution, in wavenumbers | | 80 | cm ⁻¹ |
| Resolution, in wavelengths ⁽¹⁾ | At 630 nm | 0.9 | nm |
| Wavelength accuracy ⁽²⁾ | At T _A = +5C to +45C | ±3 | nm |
| | At T _A =20 ⁰ C | ±2 | |
| Wavelength repeatability ⁽³⁾ | | 0.1 | nm |
| Wavelength temperature drift | | 0.03 | nm/ ⁰ C |
| Single scan time | Depends on resolution | 10 sec min | sec |
| Spectral channel-to-channel leakage | For channel-to-channel spectral distance > 100 nm | 0.2 | % |
| System parameters in imaging camera mode | | | |
| Image Sensor | | Aptina Micron MT9P031 CMOS | |
| Color mode | | Monochrome | |
| Bit depth | | 12 | bit |
| Spatial resolution | | 2 | MP |
| Dynamic Range | | 70 | dB |
| Maximum Frame rate | | 30 | fps |
| Frame Exposure Time | | 0.05 - 750 | ms |
| Hardware Gains | | 1x – 16x | |
| Responsivity | | 1.4 | V/lux-sec |
| Electrical parameters | | | |
| Control interface | | USB 2.0 or USB 3.0 | |
| Power supply | | USB powered | |
| Power consumption | Idle state (not scanning) | 0.4 | W |
| | During spectral scan | 2.5 | W |
| Mechanical parameters | | | |
| Dimensions (W x D x H) | | 6" x 5" x 3.5" | inch |
| Weight | | 1.1 | kg |
| Maximum ratings | | | |
| Operating temperature | No dew condensation | +5 to +45 | ⁰ C |
| Storage temperature | No dew condensation | -20 to +60 | ⁰ C |

General conditions: T_A = +5C - +45C, 2.5 seconds single scan, unless otherwise specified.

⁽¹⁾ Resolution of Fourier-Transform spectrometers is constant in the wavenumbers domain and proportional to λ^2 in the wavelengths domain. Resolution numbers are given as FWHM for apodization degree = 0 (boxcar)

⁽²⁾ Wavelength accuracy is a maximum difference between measured and tabulated wavelength values of the NIST SRM-2035 standard absorption peaks.

⁽³⁾ Wavelength repeatability is an RMS variation between consecutive scans, constant illumination conditions

Information provided in the specifications is current as of April 2021. Product design, software, firmware or specifications are subject to change without prior notice. The product warranty is valid for two years from the date of title transmission and is limited to product repair or replacement for manufacturing defects discovered and reported to Arion Optics within the two years warranty period. Arion Optics accept no liability for any losses caused by product use or by inaccuracies or errors in the software, firmware, product specifications, manuals or any other supporting documentation. Arion Optics spectrometers are subject to pending patent application US 62/844,864.

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