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# Technical data specifications

For traditional design optical systems there is some type of trade-off when it came to resolution. Either the spatial resolution was high, but the spectral resolution was low or vice versa. Now our new generation optical system simultaneous provides high spatial and spectral resolution, to provide operators with a higher resolution and greater level of detail than ever before. The sharper images from HSI lead to improved analysis and interpretation, providing better discrimination of complex alteration systems.

Since the signal reflected from surface always is relatively weak, high signal-to-noise performance is a must. Our innovative light division system reaches light throughput performance of ~90% with compact and easy-to-use system. Light throughput directly determines signal-to-noise ratio. The image quality of field data in general is influenced by weather conditions. Our system has better sensitivity that increase overall capability and can operate at normal weather conditions, in opposite existing HSI ability to operate only at bright sunlight.

The spatial resolution, spectral resolution, and SNR are the main parameters of HSI, as they have dramatic effects on the ability to perform mapping using hyperspectral data.

Spatial resolution is the key to mapping of detailed, scale-dependent variation. Increasing the pixel size (decreasing the spatial resolution) results in the loss of image detail. There is a tendency to lose small, discrete occurrences of specific materials with larger pixels.

Spectral resolution is the key to separation of subtle material differences. Decreasing the spectral resolution results in losses in the ability to distinguish and map fine spectral detail. If there are not any extremely fine spectral differences, coarser spectral resolution can prohibit discrimination and identification of specific minerals.

SNR and as consequence light throughput performance is the key to overall quality of the spectral mapping process. There is decreased capability to define key spectra with decreasing SNR. If the SNR level is inadequate, neither spatial or spectral resolution matters.

Almost all hyperspectral cameras are operating only in a wavelength range of 400-1000 nm.
The longer wavelengths in the SWIR 1000 – 1700 nm range of the HSI are able to penetrate fire smoke and haze. Our multispectral and SWIR imagery provides vastly improved capabilities in support of surface mapping applications at a higher resolution than previously available.

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# Technical characteristics

| Wideband VIS-SWIR spectroscope for hyperspectral imaging | | |
|---|---|---|
| **Spectral range (nm)** | VISUAL (400 - 1000) | SWIR (900 – 1700)* |
| **Spectrograph design** | High throughput & resolution | |
| **FOV (deg)** | 4 | |
| **Scanning mode** | Whiskbroom | |
| **Spectral pixels** | 1100 | 1100 |
| **Spectral channels** | 410 | 400 |
| **Detector pixel pitch (µ)** | 5,3 | 15 |
| **Dispersion per Pixel (nm/pixel)** | 1 | 8 |
| **FWHM Slit Image (nm)** | 6 | 10 |
| **F/#** | f/3 | f/3 |
| **Aperture (mm)** | 66 | |
| **Slit width (µ)** | 10 | |
| **Slit length (mm)** | 12 | |
| **Optical throughput** | 90% | |
| **Optical resolution (lines/mm)** | 400 | |
| **Spatial resolution at 1500 m flight altitude above ground level (m)** | 0,5 | |
| **Size (mm)** | 110 x 110 x 65 | |
| **Weight (kg)** | 3,7 | |
| **Data storage** | Internal, 8TB per sensor | |
| **IO connectivity** | USB | |
| **Bit Depth** | 14 | |
| **GPS/IMU** | Integrated high performance model | |
| **Signal-to-Noise Ratio** | 500 | |
| **Power requirement Typical / Max(W)** | 26/30 | |
| **Applications** | aerial survey, airborne remote sensing, satellite imaging | |

**-Limited by SWIR sensor. Throughput of Optical system up to 2500 nm*