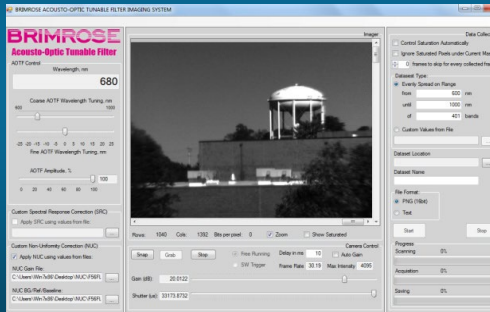# Acousto-Optic Tunable Filter SWIR
IS510 Hyperspectral Imagers

KEY FEATURES

- SWIR Range 900-1700 nm
- Low-Power Consumption
- High-Switching Speed: 16,000 λ/sec
- Solid State: No Moving Parts
- High-Spatial Resolution
- C-Mount Interface
- OEM Integration Design
- Wide Operational Temperature Range

APPLICATIONS

- Military – SWIR Concepts for the Shadow - UAV Platform
- Laboratory and Industrial Applications
- Environmental Science
  – Waste Material Sorting
- Remote Sensing
- Biological and Biomedical Research
  – Including Detection of Cancer Cells
- Online Quality and Process Monitoring
- Other OEM Applications

AOTF SWIR Hyperspectral Imagers (IS510 Series)

Brimrose has introduced a new series of AOTF Miniature SWIR Hyperspectral Imaging Spectrometers known as the IS510 Series. This custom module is designed for field portable applications where the SWIR camera is integrated with the AOTF module.

The AOTF SWIR imaging system with Brimrose Synthesizer Electronics provides a narrow-bandwidth and rapid-wavelength selection and intensity control. This imaging spectrometer system comprises an integral system that can produce hyperspectral imaging on any target area, including microscopic (with an adequate adapter) by use of a 2-D InGaAs camera and AOTF operating as a monochromator. This unit includes image acquisition and AOTF control electronics in a single package unit that can easily be interfaced with any laptop (running WinXP+).

Brimrose AOTF Imaging System (BAOTFIS) Software Equipped.

The Brimrose SWIR f22.5mm/F3.5 lens is custom designed for operation with the Brimrose VA210-0.9-1.7 Video Adapter, or the IS210-0.9-1.7 or IS510-0.9-1.7 Hyperspectral Imagers which can operate over an 800-1700 nm wavelength range using our custom cameras.

Brimrose Technology Corporation

AOTF SWIR Hyperspectral Imager
IS510-0.90-1.70 Specifications

Model #	IS510-0.90-1.70/640	IS510-0.90-1.70/320
Device Type	Image Quality AOTF (aperture size 10 x 10 mm)	
Wavelength Range	900-1700	
Spectral Resolution	6-20	
Camera Model	SU640HSX-1.7RT High Resolution InGaAs SWIR Camera	SU320KTSX-1.7RT High Sensitivity InGaAs SWIR Camera
Camera Resolution	640 x 512	320 x 256
Field of View for Camera System (Horizontal)	1.5-6.5º with Tamron Zoom Lens f70-300 mm and 5.7-13º with Tamron Zoom Lens f28-80 mm and 16º with Brimrose C-Mount SWIR Lens f22.5 mm	
Field of View for Microscope System	1.6mm with 4x objective lens 0.64mm with 10x objective lens 0.16mm with 40x objective lens	
Camera Mount	C-mount	
Lens Mount	C-Mount and F, PK Mount Adapter	
Driving Power	~2 watts	
RF Connector - type	SMA	
Weight	620 g	
Dimensions	W x H x D: 65 x 52 x 196 mm	

For more information, please check the Brimrose Technology website or contact us at office@brimrosetechnology.com.

SPF Model AO Controller Specifications

The SPF Model AO Controllers are high-performance, RF frequency synthesizers incorporated into an OEM aluminum case with AC power supply. A modular cable with a DB9 connector interface allows frequency control via the Personal Computer USB port (Serial RS232 optional). Using simple commands with any terminal (modem) program (such as ProComm) allows the user to set any frequency from the computer keyboard. In addition, included with the unit is a frequency control program that can be used with any IBM PC.

Driver Model #	VFI-XX-YY-SPF-A-C3
Frequency Range	Matching the AOTF requirements.
Frequency Step Size	10 Hz
Frequency Stability	0.015%; +15°C to +75°C
Frequency Switching Speed	8 ns
Minimum Duration of Each Step	32 ns for sweeping mode 1 ms for hopping mode (for <300 hops) 15 ms for hopping mode (>300 hops)
Power Output	5.0 w optimized for maximum performance of the AOTF device.
Power Control	12 bit attenuator with 25 dB range (min.)
Modulation	None (TTL or Analog Optional)
Enclosure	The unit will be packaged in a 190 mm (7.5 inch) wide by 100 mm (4 inch) high by 220 mm (8.75 inch) deep instrument case. The rear panel heat sink increases the depth to 240 mm (9.75 inches) maximum. The size is exclusive of connectors. A detachable AC line cord and RF cable are provided.
Environmental	Nominal Laboratory conditions: The maximum ambient temperature is +35°C. The unit is not sealed against moisture or condensing humidity.
Output Impedance	50 ohms
Output Connectors	SMA jack on front panel

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SWIR f22.5mm/F3.5 Lens Specifications

Brimrose has designed the first Brimrose SWIR f22.5mm/F3.5 lens for operation in the 800-1700nm wavelength range. The lens performs best with the Brimrose VA210-0.9-1.7 video adapter, or the IS210-0.9-1.7 or IS510-0.9-1.7 hyperspectral imagers.
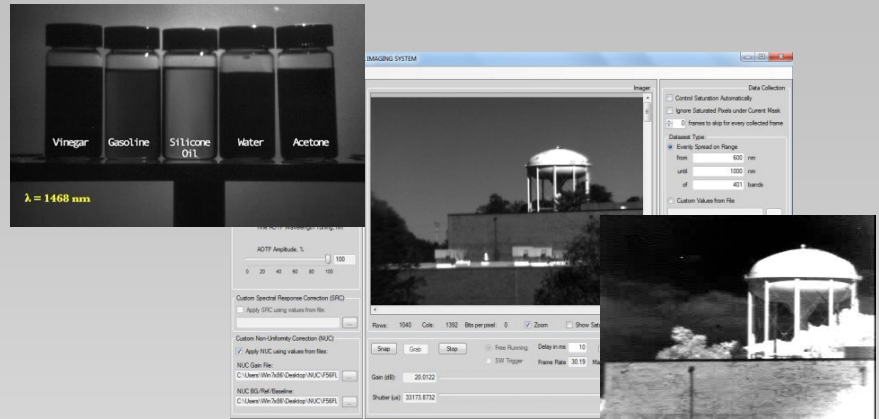
Specification	SWIR f22.5mm/F3.5 Lens
Operating Wavelength Range	800 - 1700 nm
Focal Length	22.5 mm
Aperture	F3.5 ~ F16
Mount Type	C-Mount
Focus Distance	0.5 m ~ ∞
Format Compatibility	All Brimrose SWIR AOTF Imaging System
Angle of View (H & V)	17º
Groups/Elements	4/6
Dimensions (D x L)	Approx. 55 x 122 mm
Weight	340 g

For more information, please check the Brimrose Technology website or contact us at office@brimrosetechnology.com.

Brimrose AOTF Imaging System (BAOTFIS) software

KEY FEATURES

- VIS-NIR-SWIR Range 400-1700 nm
- User-Friendly Interface
- SDK, Real-time SPFII AOTF Driver and Camera Control Software Available
- Intelligent Functions

APPLICATIONS

- Military & DoD Applications
  - Taggant Monitoring both Day and Night
  - HME Detection in Urban/Rural Environments i.e. Acetone
  - Latent Patrol Movement for Intelligence Gathering
  - Buried Ammunition/Supplies/Tunnels
- AOTF Vapor/Gas Imaging
- AOTF Biological Imaging
  - Biometric: Security Control
- Hidden Camouflaged Target Identification
- Remote Sensing
- Skin Identification
- Online Quality and Process Monitoring

The Brimrose AOTF Imaging System (BAOTFIS) software allows users to acquire hyperspectral data cubes and save data in either text or .png format. Direct and real-time control of the AOTF driver and camera are available via the application's graphical user interface.

BAOTFIS software provides optional non-uniformity correction (NUC) and spectral response correction (SRC). Either NUC or SRC, or both, can be applied. BAOTFIS software is provided with SPFII AOTF RF driver software to control the AOTF driver. An SPFII driver SDK is also available.

The AOTF SWIR Hyperspectal Imaging System uses an external source for various HME, WMD, and Hyperspectral Taggant signatures for many military, defense, robotics, security and other mission-critical imaging applications.

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