



# SWIR & VIS MMS

Shortwave Infrared and Visible Modular Microscopy Systems



is a world leader in the design, manufacture and integration of OEM and complete microscopy automation solutions for the biomedical, metrology, electronics, semiconductor, and flat panel display markets.

# NEXT GENERATION SWIR IMAGING

WDI's new LED-based SWIR Modular Microscope System (SWIR MMS) offers a compact, low-maintenance solution with exceptional image quality, stable performance, long-life, and various illumination choices providing reliable SWIR and visible light imaging.

- ✓ **SWIR Optimization:** WDI's MMS components are engineered for both SWIR and visible light imaging, including optics, sensors, and illumination, delivering unmatched image quality and superior performance.
- ✓ **Surface and Depth Autofocus:** Combining WDI's PFA-LN autofocus sensor and Optical Offset Adjuster (OOA) on the SWIR MMS, the system enables fast autofocus tracking of the surface while simultaneously imaging the internal features at depth.
- ✓ **Long-lasting Stability:** SWIR LED-based illuminators provide consistent, and spectrally stable output and long-lasting performance, ensuring reproducible imaging over time and eliminating the need for halogen bulb replacement.
- ✓ **Single or Dual-mode Illumination:** Single-wavelength SWIR or combined SWIR and visible illumination through a single optical package, eliminating the need for separate light sources, frequent reconfiguration, or bulky external solutions.



PFA-LN sensor and SWIR MMS solutions are designed for demanding microscopy imaging applications in semiconductor and machine vision metrology.

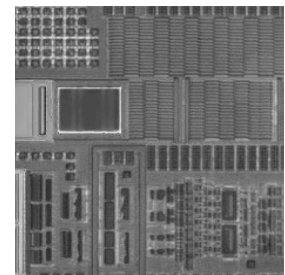
# SWIR APPLICATIONS

## Detecting Wide Range of Surface and Internal Features

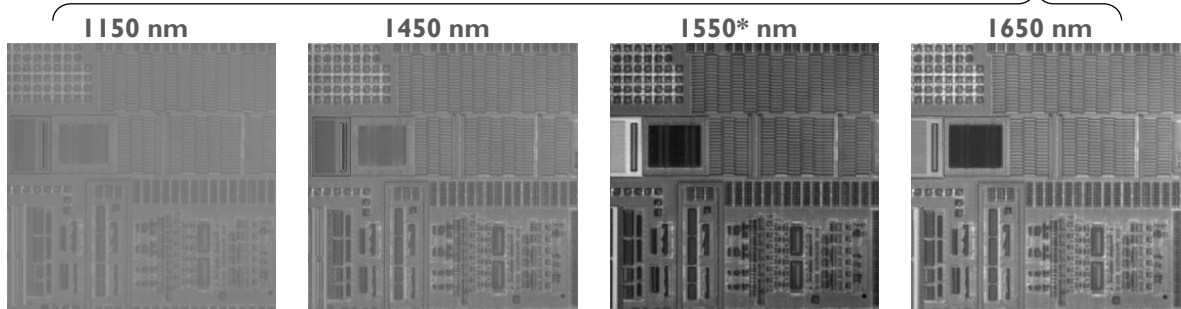
SWIR illumination penetrates many materials including Silicon, to expose internal and buried features not revealed by visible illumination. SWIR MMS combines the power of both illuminator types in one single compact solution.

## Broadband and Single SWIR Options

Broadband SWIR provides powerful and wide-range wavelength illumination enabling high contrast imaging, revealing buried structures and defects by leveraging the unique spectral properties of materials in the SWIR range. Six single SWIR wavelength options are also available for targeting specific material and feature types.



1150-1650 nm  
Broadband



More ← Resolving Power → Less

\*The best contrast wavelength depends on the specific material. This sample has the highest contrast at 1550 nm. Broadband illumination reveals structure that is not visible by a single SWIR wavelength.

# [ SWIR ILLUMINATOR OPTIONS ]



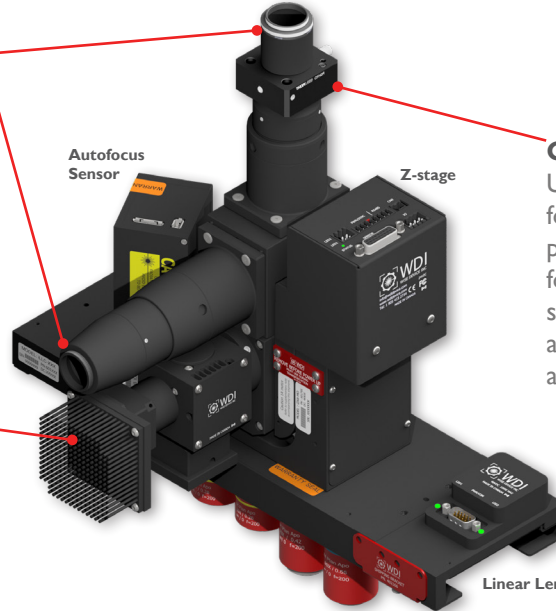
Single Wavelength SWIR

Broadband SWIR

## SWIR Illuminators

### Dual Camera MMS

With two camera ports (visible and SWIR cameras) and a dual channel illumination, WDI's SWIR MMS system provides fast imaging of surface and internal features without compromising performance or quality.



### Camera Bandpass Filter

Use of camera bandpass filter, especially for broadband SWIR illumination, provides selective wavelength filtering for different imaging needs. Manually swappable single filter holder as well as motorized filter wheel options are available to suit automated applications.

### SWIR and Visible Illumination

Delivering both visible light for conventional imaging and multi-wavelength SWIR illumination in one single solution.



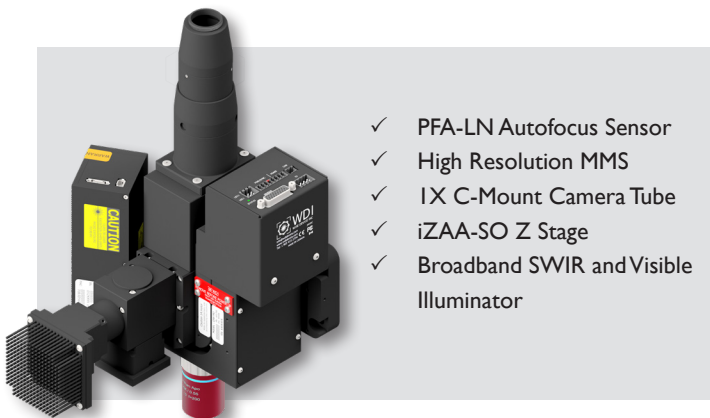
Visible and Broadband SWIR

## SWIR & Visible Illuminators

Visible and Single Wavelength SWIR



# [ SWIR MODULAR MICROSCOPE SYSTEM EXAMPLES ]



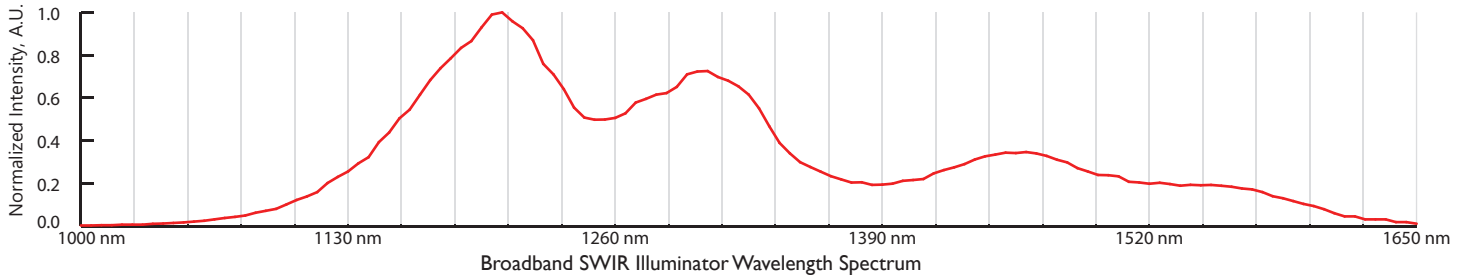
- ✓ PFA-LN Autofocus Sensor
- ✓ High Resolution MMS
- ✓ IX C-Mount Camera Tube
- ✓ iZAA-SO Z Stage
- ✓ Broadband SWIR and Visible Illuminator



- ✓ PFA-LN Autofocus Sensor
- ✓ High Resolution MMS
- ✓ IX C-Mount Camera Tube
- ✓ iZAA-MO Z Stage
- ✓ iLLC-SM Lens Changer
- ✓ Single SWIR Illuminator

# SWIR ILLUMINATOR SPECIFICATIONS

SWIR & Visible LED Illuminators	Single SWIR	Single SWIR & Visible	Broadband SWIR	Broadband SWIR & Visible
# of Channels	1	2	1	2
SWIR Wavelength Options	1150, 1200, 1300, 1370, 1450, 1550 nm		Approximately 1150 to 1650 nm (see plot below)	
Maximum Current	1.5 A per Channel			
Compatible Controllers	iZAA/iZPS Stages, CTR-AFML, and compatible standalone controllers			
Controller Operating Modes	Continuous, Pulse Width Modulation, Pulse Follow, Pulse Trigger			



# MMS COMPONENT SPECIFICATIONS

PFA-LN Autofocus Sensor	Value				Feature	Value
Structured Light Pattern	Line				IEC Certification	61326-1, 61010-1 and 60825-1
Laser Wavelengths Available	450 nm	660 nm	785 nm	850 nm	PC Communication	Gigabit Ethernet, RS485
Typical Output Power	1.1 mW	1.1 mW	0.9 mW	1.1 mW	Sampling Rate	Up to 3kHz (SWIFT 5 kHz)
Laser Classification	Class 3R				Static Autofocus Repeatability	± 0.25 Objective DOF or better
Standoff Distance	300 mm maximum				Tracking Autofocus Repeatability	± 0.33 Objective DOF or better

Integrated Z-Stages	iZAA-SO	iZAA-MO	iZPS
Objectives/Compatible Lens Changers	Single Objective (No Lens Changer)	Single Objective or LLC2, LLC3, iLLC-SM, sLLC-SM	iLLC-LG, sLLC-LG, Rotary
Motion Type	2 Phase Stepper with Integrated Controller		
Travel Range	10 mm (± 5mm)		
Maximum Resolution (1/64 microstep)	39 nm/step		47 nm/step
Maximum Load	1.0 kg	3.5 kg	6.5 kg
Illuminator Support <sup>1</sup>	Two 1.5 A or One 3 A LED Illuminator		

Linear Lens Changer	LLC2	LLC3	iLLC-SM	iLLC-LG
Maximum # of Objectives	2	3	3 to 5	3 to 6
Objectives Supported <sup>2</sup>	Typically Mitutoyo		Mitutoyo, Olympus, Zeiss, Nikon, Leica, mag.x, etc.	
Motion Type	Direct Drive Linear Motor			
Encoder	Linear Incremental Optical Encoder 78 nm Resolution			
Positioning Repeatability	± 0.25µm			
Bearings	High Precision Crossed-Roller with Anti-Creep			

<sup>1</sup> Broadband, single SWIR, or visible illuminator each is one 1.5 A channel. All illuminator options can be driven by the integrated Z-stage or separated controller.

<sup>2</sup> Other objective lens adapters are available upon request.



WDI is a world leader in the design, manufacture, and integration of OEM and complete microscopy automation solutions for the biomedical, metrology, electronics, semiconductor, and flat panel display markets. WDI's success lies in an innovative culture and ability to optimize and adapt our technology to customers' specific requirements by listening to their needs and gaining a deep understanding of their processes, applications and goals. WDI employs over 70 optical, electrical, mechanical and software engineers, as well as scientists, who are dedicated to servicing our customers. Contact WDI today to see how we can help solve your microscopy automation needs.

