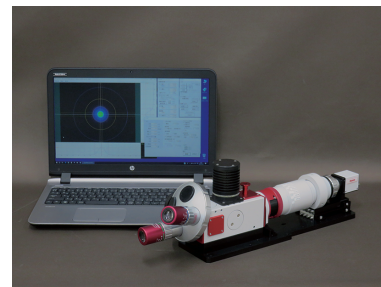


**SOPHISTICATED OPTICAL BEAM NFP MEASUREMENT SYSTEM FOR HIGH POWER LASER**

Optical beam profile and NFP measurement system especially targeting for high power laser.

**Sophisticated optical beam NFP measurement system for high power laser** is a high-performance optical beam profile measurement system targeting for ~10W class high power laser. Sophisticated NFP measurement optics for high power laser **M-Scope type HS** is used. The light flux emitted from high power laser sample is attenuated by beam sampler unit after passing through objective lens, and is further attenuated by ND filter at subsequent stage. The NFP image that has been attenuated to appropriate beam power is captured and image processing analysis is performed. In addition, the radiation angle distribution (FFP) can be measured in a narrow angle range by measuring without the objective lens.



**[Features]**

- **M-Scope type HS**, sophisticated NFP measurement optics for high power laser
  - Attenuation of incident beam with two-stage beam sampler and ND filters
  - Can be used with a variety of high power resistant objectives (M-Plan Apo NUV/NIR series)
- Optical beam analysis module **AP013**, specially designed high-functional image processing software for optical beam profile analysis
  - All-in-one package of PC, optical beam analysis software, detector driver, correction data.
  - High-performance image processing software for optical beam profile measurement **Optometrics BA Standard** is pre-installed.

**[Standard component]**

- High power laser NFP measurement optics laser selection
  - 850~940nm: **M-Scope type HS/NIR**
  - 400~650nm: **M-Scope type HS/BL**

\*Please specify the measurement wavelength because AR coating to some optical parts is required.
- Available detector
  - 400~1100nm : High resolution CMOS detector **ISA071/ISA071GL**
- Optical beam analysis module **AP013**
  - PC for image processing, optical beam analysis software **Optometrics BA Standard**, detector driver, calibration data, USB key
- Accessories
  - Cables, instruction manuals, etc.

**[Option]**

- Objective lens selection
  - Select the objective lens according to the optical magnification (field of view), pixel resolution, N.A., wavelength, etc.
- Option for optics (for **M-Scope type HS**)
  - 2× intermediate lens port **MS-OP011-RL2**  
Intermediate lens unit that doubles the overall magnification
  - 1/2× intermediate lens port **MS-OP011-RLH**  
Intermediate lens unit that halves the overall magnification
  - Coaxial epi-illumination port **MS-OP011-CEP**  
Coaxial epi-illumination port with removable half mirror
  - Dummy filters **MS-OP016-DF**  
wedge type dummy filters for pulse/low power measurement
- ND filter (for M-Scope type HS, dedicated 30φ)
  - Visible (400~700nm): **NDF 30-5** (5 types per set)
  - NIR (700~1100nm): **NDF NIR 30-5** (5 types per set)
- Coaxial epi-illumination light source
  - Visible~NIR: LED epi-illumination system
- Optics bench
  - Optics bench for fiber measurement with manual stages
  - Vertical setting optics bench

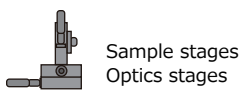
**[Detector selection, angle coverage, field of view, pixel resolution (approx. value)]**

Detector	High resolution CMOS detector <b>ISA071/ISA071GL</b>	
Spectral range	400~1100nm	
Sensor size	1/1.8 inch	
Total pixels	2048×1536	
Pixels pitch	3.45μm	
Magnification	Field of view (unit:mm)	Resolution (unit:μm)
5×	1.41×1.05	0.69
10×	0.70×0.52	0.345
20×	0.35×0.26	0.173
50×	0.14×0.1	0.069
100×	0.07×0.05	0.035
FFP meas. (unit:degree)	Meas. angle	Resolution
	±1.01x±0.75	0.001

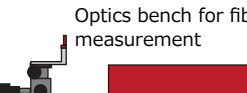
\*Pixel resolution: The measurement length equivalent to 1 pixel of the detector calculated from field of view and sensor pitch of the detector.  
 \*The optical magnification when using **MS-OP011-RL2** is 2 times the magnification in the table on the left, and the actual field of view and pixel resolution are 1/2. The maximum optical magnification is 200x when using a 100x objective lens.  
 \*The optical magnification when using the **MS-OP011-RLH** is 1/2 of each magnification in the table on the left, and the actual field of view and pixel resolution are 2 times.

**[Component selection of high power laser NFP measurement system]**

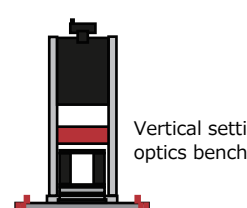
○ Stages · optics bench



Sample stages  
Optics stages



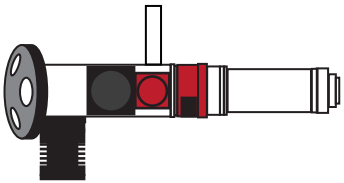
Optics bench for fiber measurement



Vertical setting optics bench

\* Can be combined with various motorized/manual stages

○ Optics selection

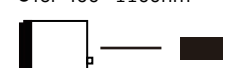


NFP measurement optics for high power laser **M-Scope type HS**

- Option
  - 2× intermediate lens port **MS-OP011-RL2**
  - 1/2× intermediate lens port **MS-OP011-RLH**


○ Detector selection

- for 400~1100nm




Hi-resolution CMOS detector **ISA071/ISA071GL**

○ Optical beam analysis module **AP013**




- Personal computer
  - Main unit
  - Accessories
- Optical beam analysis software **Optometrics BA Standard**
- Detector driver
- Calibration data
- USB licence key


○ Accessories




ND filter



Objective lens (M-Plan apo NIR/NUV)



Coaxial epi-illumination system



Dummy filters **MS-OP016-DF** (for low power, pulse emission sample)