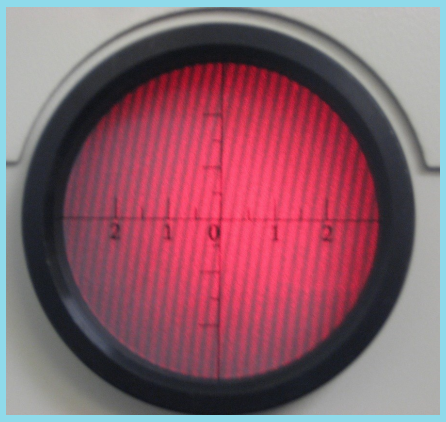
Construct, Conduct & Comprehend Physics Experiments

LEOK-21 Optical Fiber Information and Communication Experiment Kit - Complete Model

- *10 fundamental experiments*
- *Flexible solution for different levels of students*
- *Hands-on skill training*
- *Innovative design with quality components*



Interference pattern on ground glass screen

This kit provides an overview of fiber optic technology and basic skills needed to work with fiber optics. It is made up of a number of laboratory experiments. The most commonly used fiber optical components and their parameter measurements are introduced in this kit. Upon completing the experiments, one can gain a better understanding of fiber optic fundamentals with hands-on experience in real fiber optic components and techniques. With this carefully designed kit, students will gain a powerful tool to explore the exciting world of fiber communication. This kit is really a must for those wishing to learn fiber optics with related techniques.

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Note: product information is subject to change without notice.

Experimental Contents

1. Fundamentals of fiber optics
2. Optical fiber coupling
3. Numerical aperture (NA) of a multimode fiber
4. Optical fiber transmission loss
5. M-Z optical fiber interference
6. Optical fiber temperature sensing principle
7. Optical fiber pressure sensing principle
8. Optical fiber beam splitting
9. Variable optical attenuator (VOA)
10. Optical fiber isolator

Part List

Description	Part No./Specs	Qty
He-Ne laser	LLL-2 (2.5 mW@632.8 nm)	1
Handheld light source	1310/1550 nm	1
Light power meter	LLM-2	1
Handheld light power meter	1310/1550 nm	1
Fiber interference demonstrator	Includes following parts:	1
Fiber splitter	*633 nm*	*1*
Temperature controller		*1*
Stress controller		*1*
5-axis adjustable stage		*1*
Beam expander	*f = 4.5 mm*	*1*
Fiber clip		*2*
Fiber support		*1*
White screen	*With crosshairs*	*1*
Laser holder	*SZ-42*	*1*
Alignment aperture		*1*
Power cord		3
Single-mode beam splitter	1310 nm or 1550 nm	1
Optical isolator	1310 nm or 1550 nm	1
Variable optical attenuator		1
Single-mode fiber	633 nm	2 m
Single-mode fiber	633 nm (FC/PC connector on one end)	1 m
Multi-mode fiber	633 nm	2 m
Fiber spool	1 km (9/125 μm bare fiber)	1
Fiber patch cord	1 m/3m	4/1
Fiber stripper		1
Fiber scribe		1
Mating sleeve		5

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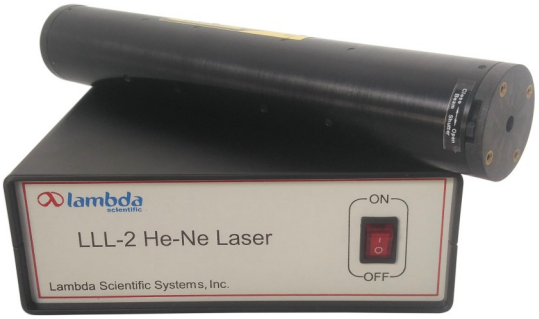
He-Ne Laser with Power Supply

Model: Lambda Scientific LLL-2

Wavelength: 632.8 nm
Mode & output power: $TEM_{00} \geq 2.5$ mW
Polarization: Linear polarization 500:1
Beam divergence: 1.3 mrad full angle
Beam diameter: 0.63 mm at $1/e^2$ point
Tube: length 270 mm and diameter 42 mm
High voltage: 1900 VDC/6.5mA, Alden HV connector
Power supply: 100—240 VAC, 50/60 Hz
Dimensions: 190mm x 80mm x 160mm.



Dual-wavelength Handheld Light Source

Wavelengths: 1310 nm/1550 nm
Output power: ≥ -7 dBm
Spectral width: < 10 nm
Optical connector: 2.5mm FC connector
Stability: ±0.05 dB/15 minutes or ±0.1 dB/8 hours
Modulation frequencies: 0/270/1k/2k Hz
Power supply: 2x AA 1.5V battery
Operating temperature: -10 to 50 °C
Dimensions: 180mm x 89mm x 42mm

Light Power Meter

Model: Lambda Scientific LLM-2
Measurement range: 2 μW ~ 200 mW, 6 scales
Display: 4-digi LED display
Sensor type: silicon detector (300 ~ 1100 nm)
Sensor area:10mm x 10mm
Power supply: 100—240 VAC, 50/60 Hz
Dimensions: 250mm x 200mm x 90mm

Handheld Light Power Meter

Calibrated wavelengths: 1310 nm/1550 nm
Response range: 850 ~ 1650 nm
Detector type: InGaAs
Measurement range : -50 ~ +26 dBm
Optical connector: 2.5mm FC Connector
Accuracy: ±0.2 dB
Power supply: 2x AA 1.5V battery
Dimensions: 180mm x 90mm x 42mm

Fiber Interference Demonstrator

Dimensions 350 x 300 x 210 mm. Includes following parts:

(1) 633 nm fiber beam splitter with FC input connector
(2) 20W heater with temperature senor
(3) mounted collimating reflective mirror f175mm
(4) 15 mm travel at 0.01 mm resolution micrometer
(5) diameter 60mm ground glass viewing screen
(6) 80mm x 80mm with cross scales white screen
(7) alignment aperture
(8) fiber holders
(9) fiber coupling objective lens 5x
(10) PID temperature controller
(11) x-y translation stage
(12) x-y-z translation stage
(13) Power supply: 100—240 VAC, 50/60 Hz

Single-mode Fiber (633 nm)

Operating wavelength: 633 nm
Length: 2m
Connector type: FC/PC, both ends
Core diameter: 4.3 um
Cladding diameter: 125 um
Coating diameter: 250 um
Numerical aperture: 0.10-0.14,
Cutoff wavelength: 500-600 nm.

Multi-mode Fiber (633 nm)

Operating wavelength: 633 nm
Length: 2m
Connector type: FC/PC, both ends
Core diameter: 9 um
Cladding diameter: 125 um
Insertion loss: <0.3 dB
Return loss: >50 dB

Single-mode Fiber (633 nm)

Operating wavelength: 633 nm
Length: 1m
Connector type: FC/PC, one end only
Core diameter: 4.3 um
Cladding diameter: 125 um
Coating diameter: 250 um
Numerical aperture: 0.10-0.14,
Cutoff wavelength: 500-600 nm.

Fiber Patch Cord (1310/1550 nm)

Operating wavelength: 1310/1550 nm
Length: 1m (4 pcs), 3m (1 pc)
Connector type: FC/PC
Core diameter: 9 um
Cladding diameter: 125 um
Cable diameter: 2.0 mm
Insertion loss: <0.3 dB
Return loss: >50 dB

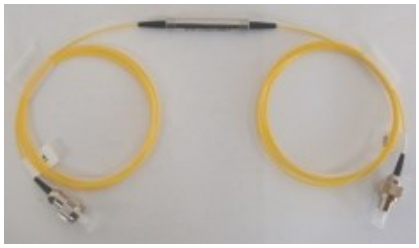
Fiber Spool

Operating wavelength: 1310/1550 nm
Length: 1000 m
Connector type: bare fiber, no connector
Core diameter: 9 um
Cladding diameter: 125 um

Single Mode Fiber Splitter

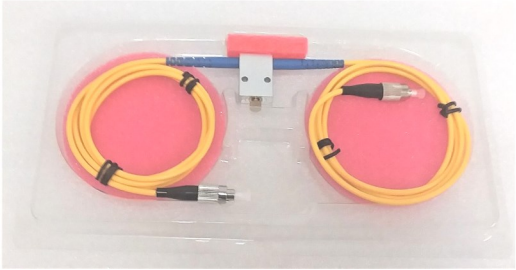
Operating wavelength: 1310 or 1550 nm
Dimensions: 2.0 mm diameter or 80 x 20 mm
Connector type: FC/PC
Insertion loss: < 0.35 dB
Polarization-dependent loss: 0.02~0.03 dB

Optical Isolator



Operating wavelength: 1550 nm (1 pc) and 1310 nm (1 pc)
Polarization sensitivity: insensitive
Stage number: single stage
Connector type: FC/PC
Bandwidth: +/-30 nm
Max insertion loss: 0.7 dB
Minimum isolation: 30 dB （typical 40 dB)
Minimum return loss: 55/50 dB

Variable Optical Attenuator



Range: 1~60 dB, FC/PC connector
Single mode fiber/length 1 m
Wavelength range 1290 nm ~ 1625 nm
Insert loss <1.5 dB, return loss > 55dB without connectors
Max power 300 mW,
Attenuation precision <0.2 dB @ 10 dB & <0.3 dB @10-45 dB.

Fiber Scribe

Tip material: carbide
Tip angle: 45°

Fiber Stripper

For strapping 125um fiber with 250um buffer coating

Mating Sleeves

Connector type: FC/PC
Insertion loss: <0.2 dB

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