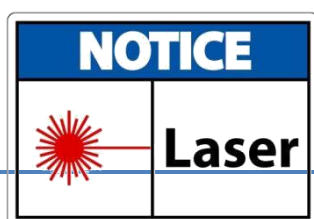


Operation Manual



Bench-top Fiber-coupled Light Source

Keep this manual properly.

Read and follow the safety procedures before operation.

- 0 -

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■ Optical Radiation Safety Markers

Marker	Marker Meaning
	Laser radiation warning symbol Warning of laser or intense optical radiation hazard
	Do not expose eyes to direct/scattered laser radiation
	Do not expose skin to direct/scattered laser radiation
	Operate strictly in accordance with this manual

■ Safety Warnings & Notices

1. Both laser and incoherent light can cause severe permanent damage to the retina and conjunctiva. Never aim light directly at human eyes.
2. Laser and incoherent radiation may burn skin; avoid direct exposure of skin to output light.
3. Optical radiation may damage sensitive electronic components and optical devices. Take precautions against light-induced component failure.
4. Operators shall conduct regular equipment inspections and ensure all on-site personnel comply with safety protocols.
5. Do not touch fiber end faces or optical surfaces with bare hands or foreign objects to prevent permanent component damage.
6. Retain original factory packaging boxes and materials. Use original packaging for all returns for repair to avoid secondary damage during transit.
7. All equipment operators must fully comply with relevant industrial laser safety regulations and protective measures.

■ Scope of This Operation Manual

- This manual applies to benchtop single-channel light sources with B1 and B2 enclosures.
- Manual Version: V2025.2
- Release Date: Dec 01, 2025

■ Product Description

This light source is built upon semiconductor or fiber laser chips, with optical output delivered via fiber coupling (single-mode, multi-mode, or polarization-maintaining fiber). High-precision constant-current pump drive and temperature control circuits deliver long-term stability of core optical metrics including central wavelength and output power. It is widely deployed for R&D and production testing in fiber sensing, optical communication, optical component characterization, advanced medical photonics, quantum optics, and related fields. Full product specifications and performance parameters are referenced in the factory test report shipped with each unit.

Features

- Benchtop or modular design
- Stable spectrum and power
- Single-mode or polarization-maintaining output

Applications

- Fiber-optic communication
- Fiber-optic sensing
- Optical device testing

■ Standard Accessories

	Name	Description
1	Laser (Benchtop)	1 unit
2	USB-RS232 DB9 Data Cable	1 unit
3	AC Power Cord	1 unit
4	Product Test Sheet	1 unit
5	Operation Manual	1 unit
6	Output fiber	1 (Pre-installed)

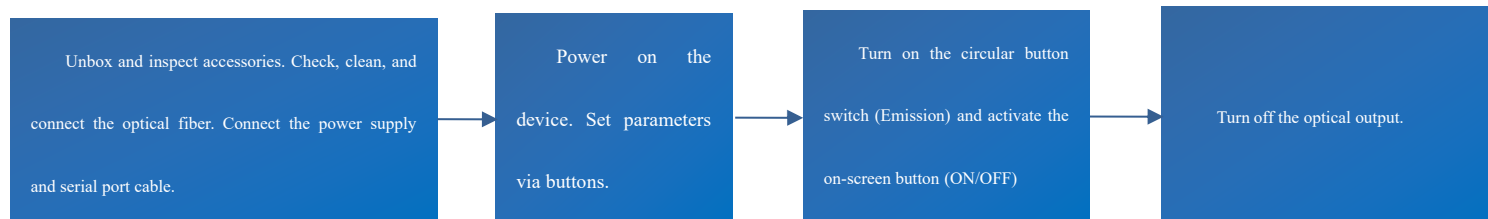
Verify all accessories upon delivery.

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Basic Operating Procedures



Required Tools & Test Equipment

Fiber connector cleaning cassette, fiber end-face inspector, optical power meter, optical spectrum analyzer

Step 1: Unpack & Hardware Setup

- 1) After unpacking, cross-check all supplied accessories including power cord/adaptor, fiber pigtail, operation manual, and factory test report.
- 2) Inspect all fiber connector end faces with a fiber end-face inspector, then thoroughly clean all connectors using a dedicated fiber cleaning cassette.
- 3) Connect power supply: Benchtop units accept direct AC mains input; modular variants require a matched DC regulated power supply.
- 4) Interface fiber connections via fiber mating sleeves (flanges). Ensure all mated fiber connectors feature identical ferrule/interface types to minimize insertion loss.

Note: The output fiber pigtail is permanently fixed to the front panel and non-detachable for this model.

Step 2: Power On the Unit

- 1) Toggle the power switch on the rear panel to boot the light source.
- 2) On power-up, the laser will load power/current parameters from the last operating session. Adjust settings via touchscreen or host software as needed.
- 3) Factory default state: Minimum pump current, minimum output optical power.

Step 3: After setting the appropriate output power, press the round pushbutton or key switch (Enable) on the panel and then press the Activate button on the screen; the

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light source will begin emitting light. During the experiment, you can adjust the output power as needed. Measure the light source's output power (using a power meter) and check its spectrum and wavelength (using a spectrometer); adjust the light power and observe whether the actual output power measured by the power meter changes accordingly;

Step 4: After testing is complete, turn off the round switch or key switch (Enable) to shut down the light source output, and finally turn off the power switch on the back of the light source;

Note: While the light source is emitting light, it is strictly prohibited to perform any operations—such as inserting, removing, connecting, or cleaning—on the fiber patch cord connectors or fiber end faces. Failure to comply may easily cause damage to the connector end faces and the light source itself, resulting in malfunction;

■ Operating Instructions

1. Design

Front Panel: Output fiber port | Touchscreen | Circular Enable switch (with indicator)

The label in the upper-right corner includes the product model (PN), serial number (SN), date of manufacture (Date), and key parameters such as operating wavelength and output power. This model features an LCD touchscreen for controlling and displaying operating parameters;



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Fiber Interface: The fiber optic cable is permanently mounted on the front panel by default and cannot be removed. It extends approximately 1 meter outside the chassis and is terminated with a fiber optic connector, typically an FC/APC connector. Extending the output fiber outside the enclosure allows customers to easily inspect (using a fiber end-face inspector) and clean the ceramic end-face of the fiber connector (using a dedicated fiber cleaning kit). This also prevents loss at the fiber connector and significantly reduces failures and damage caused by contamination and dust on the connector's ceramic end-face.

Rear Panel: Cooling fan | RS232 DB9 port | AC power socket (100-240V) & main switch



2. Display Content

The upper-left corner of the screen displays the current real-time output power (Output Power), laser pump current (Pump Current), and laser temperature (LD Temp). The lower-right corner displays the output wavelength or spectral range of the current light source under “Wavelength,” and the output power adjustment range under “Setting Range”; for fixed-power models, “Fixed xx mW” is displayed. The remaining areas are reserved for controls and parameter input. The “Active” area in the lower-left corner serves as the activation button for laser output;

OutputPower	5.0	mW	PowerSet	△
PumpCurrent	8.3	A	10.0 mW	▽
LDTemp	25.2	°C	Setting Range	Wavelength
Active	Fixed	10.0 mW	1780-2000nm	
Laser is	OFF			

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3. Fiber Connection

Open the dust cap of the optical fiber connector and carefully check the optical fiber end face with an optical fiber end face inspector. After confirming that there is no pollution or damage, connect the optical fiber to other optical fiber devices or test equipment. If there is pollution or damage, the connector of the output optical fiber must be cleaned or replaced first. For high-power light source models, it is recommended to use fusion fiber connection;

4. Power adjustment

For broadband light source products with adjustable power, you can directly click  and  area to increase or decrease the power value. Long press for quick adjustment, short press for slow and fine adjustment. You can also click the Power Set area, enter the required optical power value in the pop-up keyboard, and click Enter to take effect after setting, as shown below.



5. Output Activation

The output activation of the light source is dual controlled by the circular switch (**Enable**) on the right side of the panel and the **Active** button on the screen. The **Active** area in the lower left corner is used to control and display the current light source output activation status. **OFF** means no amplified light output, and **ON** means the amplified laser is outputting. Each time you click on this screen area, the light source output status switches between output and no output (it can only be

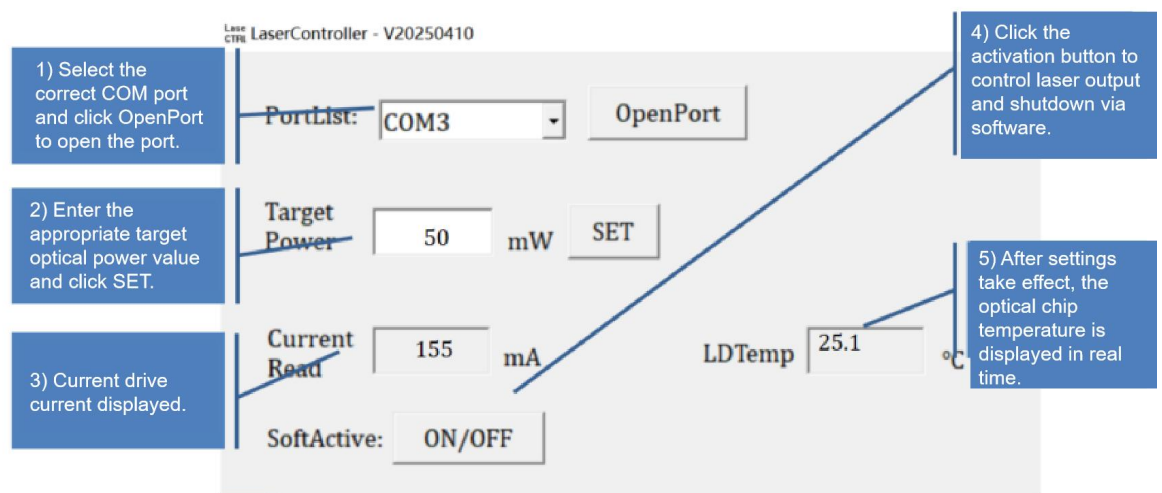
switched to the **ON** state after the **Enable** switch is pressed. If the **Enable** switch of a light source in the output state is pressed, the light output will stop immediately).

6. PC Software Control

This product supports PC software control. The default communication port is RS232 DB9, located on the rear panel. The dedicated PC software and communication protocol code are included with the product.

Connection Procedure: Use the original USB-RS232 serial data cable (provided with the laser module) to connect the module to a computer. Note: The computer must first install the dedicated serial port driver to recognize the USB-RS232 cable.

Without this driver, the software cannot establish proper communication with the laser module. Request the driver from our company. Software Features: For adjustable power models: The output optical power can be adjusted via the PC software. Use the SoftActive button in the software to enable/disable the laser output. For fixed power models: The SoftActive button can only enable/disable the laser output (power adjustment is unavailable).



After launching the host computer software, first select the correct serial port number from the PortList, then click the OpenPort button to open the serial port. At this point, the Current Read and LDTemp windows will display the module's

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operating current and pump temperature. Enter the target optical power value in the TargetPower window, then click the SET button. The settings take effect when both the laser module's pushbutton switch and the "SoftActive" button in the software are activated simultaneously, and the laser will begin outputting optical power. The computer must first have the USB-to-232 serial port driver installed; otherwise, the host software will be unable to connect and communicate properly with the laser module. The software version number must match the version listed on the product test sheet; refer to each product's test report for the software version. The parameters and status settings configured in the control software are automatically saved within the laser module. If you do not need to modify the laser parameters, there is no need to connect to the host computer;

■ Precautions and Maintenance

For single-mode fibers (e.g., Hi-1060, PM980, SMF-28e, PM1550), the theoretical continuous light power tolerance of their end-faces (when structurally intact and clean) is approximately 200mW. Therefore, for light source models with output power below 200mW, you can connect other fibers of the same type (right image below) via a movable adapter (fiber optic flange, left image below).



Before connecting fiber optic connectors:

- 1) First, confirm the light source output is turned off.
- 2) Use a special fiber optic cleaning tool (left image below) to thoroughly clean the connector's end-face: press the end-face against the cleaning cloth surface, then slide it flatly 2–3 times.
- 3) Use a fiber optic end-face inspector (right image below) to carefully check the end-face.



Only after confirming the end-face is completely free of dust and contamination (left image in the following set) should you connect via the fiber optic flange, then turn on the light source.

The reason for this standardized operation: When a contaminated fiber connector end-face (middle image in the following set) is exposed to laser (even at low power),

the connector's end-face is highly likely to be burnt and damaged (right image in the following set).

The three images below were captured by a fiber optic end-face inspector at 400x magnification.



Clean & Undamaged Connector



Contaminated Connector



Damaged Connector

- 4) When cleaning, inspecting, or connecting fiber optic connector end-faces, ensure the light source is in the output-off state — do not operate with the light active. After use, once disconnected from other fiber connectors, cover the fiber connector with its dust cap immediately; do not leave it exposed to air for extended periods.
- 5) Standard light source models come with an FC/APC fiber connector by default. For light source products with an output power of 200mW or higher:
 - We recommend using this fiber connector only for output power detection (connected to an optical power meter).
 - You can also connect it directly to an FC-port fiber collimator (left image below) to output a collimated beam for free-space use (right image below).
 - Do not use a flange to directly connect it to other fibers or device pigtail connectors (this risks damaging the fiber connector and the laser itself).
 - If connection to other fibers is required, fiber fusion splicing (thermal fusion with a fusion splicer) is recommended. Ensure the connected fiber types are compatible; otherwise, significant optical power loss will occur.



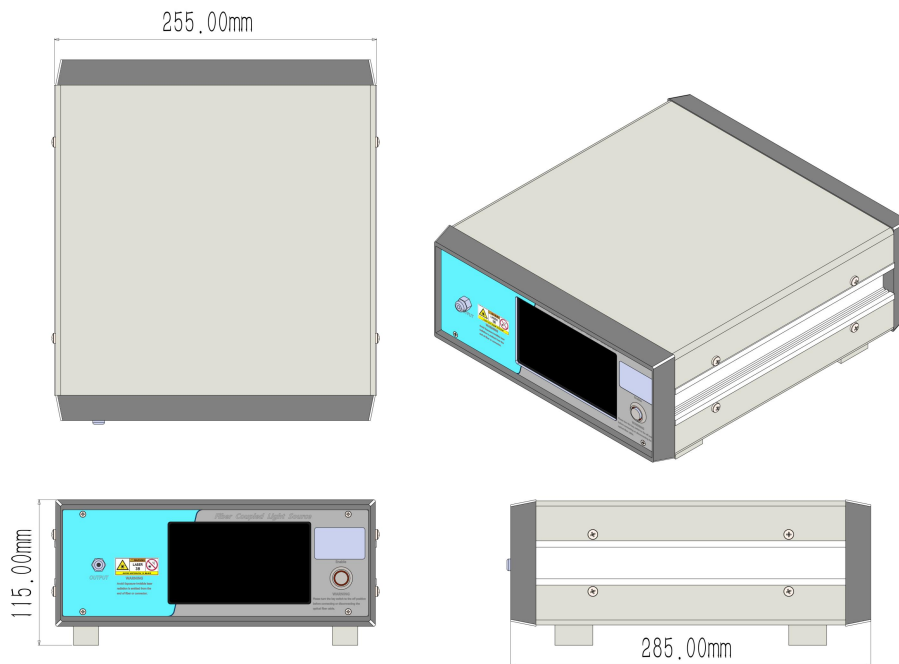
- 6) Frequent plugging/unplugging of the output-end fiber connector is not recommended. This avoids dust contamination, which can increase insertion loss or cause burning of the connector end-face.
- 7) When starting up, first ensure the power switch and activation key switch are off before connecting the power supply to prevent damage from sudden light emission after energization. When shutting down, first turn off the key switch or push-button switch, and disconnect the power supply only after the output indicator light has extinguished. Never directly cut off the power supply while the laser is operating.
- 8) Take precautions against moisture, dust, and corrosion. Keep light source equipment away from high-temperature and high-humidity environments.

■ Common Troubleshooting for Benchtop Light Sources

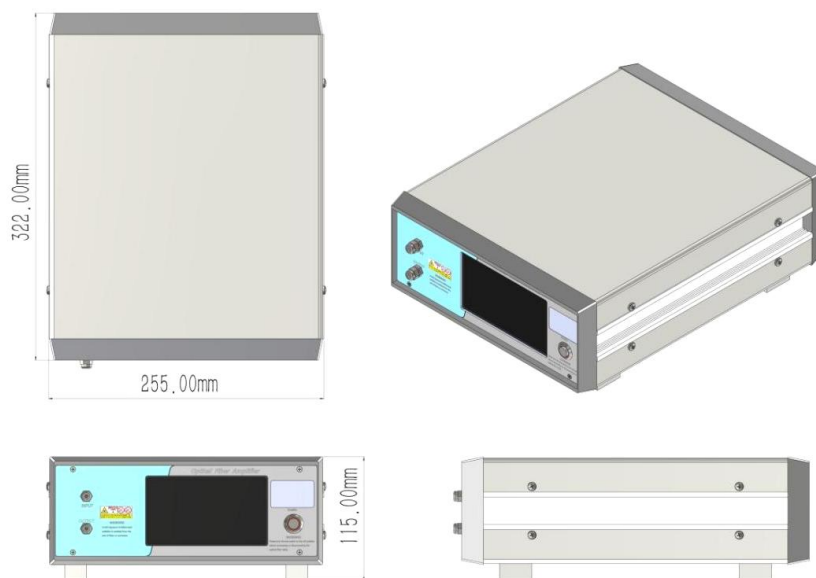
Fault	Possible Causes	Troubleshooting & Resolution
Output beam is not circular	Output fiber connector end-face is contaminated or damaged	Inspect the output fiber connector end-face; return to factory for repair
Output power is slightly low	Measurement error of the optical power meter	No action needed ($\pm 10\%$ range is normal)
Output power is significantly low	Exceeded the optical power meter's range	Replace with an appropriate optical power meter model
	Incorrect wavelength selection on the optical power meter	Select the correct wavelength for the optical power meter
	Output fiber is bent or damaged	Inspect the integrity of the output fiber
	Output fiber connector end-face is contaminated or damaged	Inspect and clean the output fiber connector end-face
No output power	Enable physical key & screen Active button are not turned on	Inspect and activate the corresponding buttons
	Output fiber is bent or damaged	Inspect the integrity of the output fiber
	Fiber connector end-face is severely contaminated or damaged	Inspect the output fiber connector end-face; return to factory for repair
	Light source detected high temperature and activated self-protection shutdown	Restart after the temperature returns to normal
	Laser chip is damaged	Return to factory for repair
Output power stability is significantly degraded	Output fiber connector end-face is contaminated or damaged	Inspect the output fiber connector end-face; return to factory for repair
	Internal circuit fault	Return to factory for repair

	Heat dissipation channel is blocked	Avoid blocking the cooling/heat dissipation channel
Bright spot appears at the end of the output fiber and moves toward the light source	Irregular operation caused fiber core melting	Shut down immediately (do not restart); return to factory for repair
Touch screen is unresponsive	Host computer software is controlling the light source	Normal phenomenon (no action needed); disconnect the host computer then operate the touch screen
	Touch screen malfunction	Return to factory for repair
Host computer software cannot control light source parameters	Incorrect serial port COM port selected	Confirm and select the correct COM port
	Serial data cable driver not installed properly	Install the correct serial data cable driver
	Poor connection of the serial data cable connector	Inspect or replace the serial data cable
	Incorrect version of the host computer software used	Replace with the correct version of the host computer software
Air-cooling noise is significantly loud	Fan malfunction or foreign object intrusion	Return to factory for repair
Temperature display shows "ALARM"	Abnormal internal temperature	Return to factory for repair
Cannot power on	External power supply failure	Inspect the rear panel power switch and external power supply
	Internal power supply fault	Return to factory for repair

■ Product Dimensions



B1 Package Desktop Light Source Dimensions: 255(W)×285(D)×115(H)mm



B2 Package Desktop Light Source Dimensions: 255(W)×322(D)×115(H)mm

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■ Warranty and After-Sales Service

1. Product Quality Assurance Period

From the date of delivery, if there are quality problems (non-human-induced) with the product within one year, the customer can request the manufacturer to replace parts or the entire unit free of charge. After one year, the manufacturer will provide paid repair services.

2. Product Warranty Scope

During the free warranty period, free repair or replacement services will be provided for malfunctions caused by product quality issues.

During the warranty period, our company reserves the right not to provide free repair services in the following situations:

- 1) The product is damaged or impaired due to natural factors or environmental influences (such as electric shock, dust).
- 2) The product is damaged due to non - standard operation by the user.
- 3) The product has obvious signs of human - induced damage.
- 4) The product has been disassembled, modified, or repaired without the authorization of our company.
- 5) The quality - assurance label on the light source housing has been tampered with or is incomplete.
- 6) The product is damaged or lost during transportation.

Product Warranty Card	
Product Name	
Product Number(PN)	
Product Serial Number(SN)	
Purchase Date	
Description of Product Defects	
User Name	
Contact Address	
Contact Phone	
E-mail	

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■ Appendix 1: Product Optical Radiation Risk Classification

Laser Wavelength	Optical Power	Laser Hazard Rating
400~700nm	$\leq 0.39 \text{ mW}$	1; 1M
	$\leq 1 \text{ mW}$ (Collimated beam); $\leq 67 \text{ mW}$ (Non-collimated beam)	2; 2M
	$\leq 5 \text{ mW}$	3R
	$\leq 500 \text{ mW}$	3B
	$> 500 \text{ mW}$	4
700~1050nm	$\leq 0.39 \times C_4 C_7 \text{ mW}$	1; 1M
	$\leq 2.0 \times C_4 C_7 \text{ mW}$	3R
	$\leq 500 \text{ mW}$	3B
	$> 500 \text{ mW}$	4
	$\leq 0.39 \times C_4 C_7 \text{ mW}$	1; 1M
1050~1400nm	$\leq 2.0 \times C_4 C_7 \text{ mW}$	3R
	$\leq 500 \text{ mW}$	3B
	$> 500 \text{ mW}$	4
	$\leq 10 \text{ mW}$	1; 1M
	$\leq 50 \text{ mW}$	3R
1400~4000nm	$\leq 500 \text{ mW}$	3B
	$> 500 \text{ mW}$	4

Correction Factors C_4 and C_7 in the Table Above

Laser Wavelength λ	Correction Factor C_4	Laser Wavelength λ	Correction Factor C_7
700~1050nm	$10^{0.002 (\lambda-700)}$	700~1150nm	1
1050~1400nm	5	1150~1200nm	$10^{0.018 (\lambda-1150)}$
		1200~1400nm	$8+10^{0.04 (\lambda-1250)}$

*Reference Standards:

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-
- Chinese National Standard GB44703-2024 *Technical Specifications for Optical Radiation Safety*
 - International Standard IEC 60825-1 *Safety of laser product*

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