

Multi-Channel Laser Software User Manual

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1. Software Information

- Software Version: V1.0.0.260211
- Last Compiled: 2026-02-11
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2. System Overview

This system is a high-performance four-in-one laser software control system that integrates four wavelengths: 405nm, 488nm, 532nm, and 640nm. The equipment is highly integrated with laser diodes, fiber-coupled optical systems, and high-precision current control units.

1) Key Features

- Multi-wavelength Synchronous Output: Supports simultaneous observation of multiple markers to improve experimental efficiency.
- Narrow Linewidth Spectrum: High-quality spectrum reduces stray light interference for clearer imaging.
- High Power Stability: Ensures long-term output reliability and consistent experimental results.
- Fine Power Adjustment: Supports continuous adjustment from 0-100% with a step accuracy of 1% to prevent photodamage to biological samples.
- Safety Interlock Mechanism: Integrated hardware safety feedback including Key, Interlock, and EStop for real-time monitoring.

2) System Requirements

- Operating System: Windows 10/11 Pro (64-bit)

- Memory: 8GB DDR4 or above
- Runtime Environment: .NET 6.0 Runtime (Windows Desktop)

3. Software Introduction

The software interface is divided into three main sections:

- State Panel: Displays hardware feedback information.
- Control Panel: Provides equipment operation controls.
- Top Title Menu: Contains "System" and "Help" menus.



Pic1 Software Interface

1) State Panel

This panel displays the device status, including current (mA), temperature (° C), ON-OFF state, and hardware feedback.

- Current (mA): Updates each channel's information in real-time only when the device is in "Internal" trigger mode and the channel is ON; the default value is -1.
- Temperature (° C): Feedback for each specific channel.
- ON-OFF State: Reflects the actual real-time status of the channel.
- Hardware Feedback: Key switch status (ON/OFF). Interlock: Safety interlock status (OK/Error). EStop: Emergency stop status (OK/Error). Preheat: Preheating status (Preheating / Finished / SystemError). Channels can only be controlled when this state is "Finished".
- Note: Due to hardware protocol limitations, the 532nm channel does not provide temperature or current feedback (displayed as N.A.).

Laser State				
	405nm	488nm	532nm	640nm
Current (mA)	-1	-1	N.A.	-1
Temp (°C)	-1	-1	N.A.	-1
ON-OFF State	N.A.	N.A.	N.A.	N.A.
Key: N.A.	Interlock: N.A.	Estop: N.A.	Preheat: N.A.	

Pic2 State Panel

2) Control Panel

This panel is used to control the device.

Channel	Value Adjustment	Power Data
405nm	Slider, Input Box, Up/Down Buttons	0
488nm	Slider, Input Box, Up/Down Buttons	0
532nm	Slider, Input Box, Up/Down Buttons	0
640nm	Slider, Input Box, Up/Down Buttons	0

Pic3 Control Panel

1. Channel Value Adjustment: Achieved via sliders, input boxes, or \uparrow/\downarrow buttons.
 - Slider: Adjust the slider to change the input box value for control. There is a 100ms trigger delay.
 - Input Box: Enter a value and press Enter or click nearby to apply. The range is [0, 100]. If an out-of-range or invalid value (such as letters or symbols) is entered, it will automatically revert to the previous value.
 - \uparrow/\downarrow Buttons: Adjust the laser power by 1 unit per click within the range of [0, 100].
 - Power Data: Located on the far right of each channel. If reading fails, the default value -1 will be displayed.
2. Channel ON/OFF: Controls the state of the current channel.
 - If a channel fails to open, the system will display a prompt and roll back to the previous state.
 - When the "Hardware Status Feedback" indicates an error, all channels will automatically switch to the OFF state.
3. Mode Switching: Use the dropdown box in the lower-left corner to toggle between "External" and "Internal" control modes.
4. After switching to "Internal" mode, the current values in the State Panel will update in real-time.

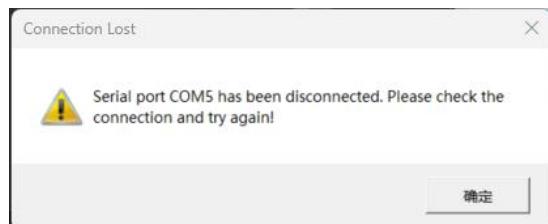
5. Manual/Auto Connection

- The device automatically detects all available COM ports and adds them to the dropdown list.
- Select a COM port manually and click 'Manual Connect' to establish a connection.
- Click 'Auto Connect' to automatically verify and match the correct serial port.
- Once connected, the dropdown list will automatically switch to display the active COM port.
- Upon a successful connection, clicking "OK" on the pop-up will start the data refresh on the State Panel.



Pic4 Connected Successfully

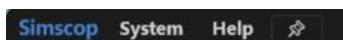
- If the connection is lost during operation, a disconnection prompt will appear. Check the hardware connection and use Manual or Auto Connect to restore it without closing the software.



Pic5 Connection Lost

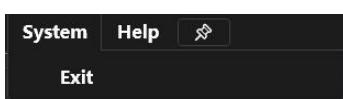
3) Top Title Menu

The Top Title Menu consists of two sections: "System" and "Help".



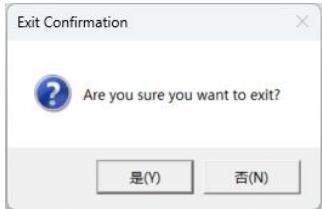
Pic6 Top Title Menu

1. System: Exit the software.



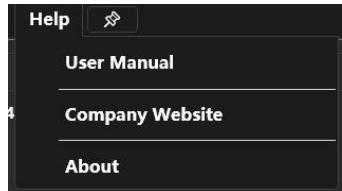
Pic7 System (Expanded)

- A pop-up reminder will appear when exiting to prevent accidental closure.



Pic8 Confirmation Prompt

2. Help: Includes "User Manual", "Company Website", and "About".



Pic9 Help (Expanded)

➤ User Manual:

Provides the product manual for reference in PDF format.

➤ Company Website

Visit the company website: <https://www.simskop.com/WebShop/index.aspx>

➤ About

Provides information regarding the software.



Pic10 Software Information

3. The title bar features a thumbtack icon button; click it to toggle the "Always on Top" status of the window.

4. FAQ

Q1: Why do the current and temperature for the 532nm channel display as N.A.?

A: Due to the hardware protocol limitations of the 532nm laser module, this channel does not support digital current and temperature feedback. This is normal and does not affect power adjustment.

Q2: What should I do if there is no laser output after clicking the switch?

A: Please check the "Preheat" status at the bottom of the State Panel. Laser channels can only be turned on when this status shows "Finished".

Q3: How do I restore a connection interrupted by unplugging/plugging the communication cable?

A: There is no need to close the software. After reconnecting the cable securely, click "Auto Connect" on the Control Panel to search for the serial port and resume communication.

Q4: Why is there no response after entering a power value?

A: Please enter a number between 0 and 100 and press Enter, or click anywhere outside the input box to confirm and apply the value.