

Supercontinuum Laser

# SL-Pico

*Operation Manual*

Ver 24-05



**SLI**  
SPECTROLIGHT Inc.

# TABLE OF CONTENTS

## **1. Introduction**

### 1.1 SL-Pico

## **2. System Overview**

### 2.1 System Main components

### 2.2 Front Panel Functions

### 2.3 Back Panel Functions

### 2.4 Specifications

## **3. Installation**

### 3.1 Software Installation

## **4. Operation**

### 4.1 Laser Connection

### 4.2 Laser Operation

## **5. Trouble Shooting**

### 5.1 Device Connection Error

### 5.2 Laser Connection Error

## **6. Safety Guidelines**

### 6.1 Laser Safety

### 6.2 Electrical Safety

## **7. Technical Support**

### 7.1 Contact Information

### 7.2 Warranty Information

# 1. Introduction

Spectrolight's pico-second supercontinuum lasers are designed to meet the diverse and dynamic needs of cutting-edge research and industrial applications. These supercontinuum white light lasers are highly regarded for their wide wavelength range and cost-effectiveness.

SL-Pico offers a spectral range from 410 nm to 2400 nm, has high power, is very stable, and is capable of delivering power up to 20 W. The SL-Pico's SL series shows relatively high power in the SWIR region. The SL-Pico's SLM series is a mode-locked fiber laser with a fixed repetition rate and stable and uniform power spectrum in visible range, and the SL-Pico's SLMV series has a tunable repetition rate in MHz, ensuring compatibility with a wide range of devices. Integrating a tunable bandpass filter improves the laser's versatility, enabling tunable broadband laser output. This capability is important for a variety of applications, including fluorescence microscopy, TCSPC, hyperspectral imaging, machine vision, semiconductor inspection, sensor development, and more.



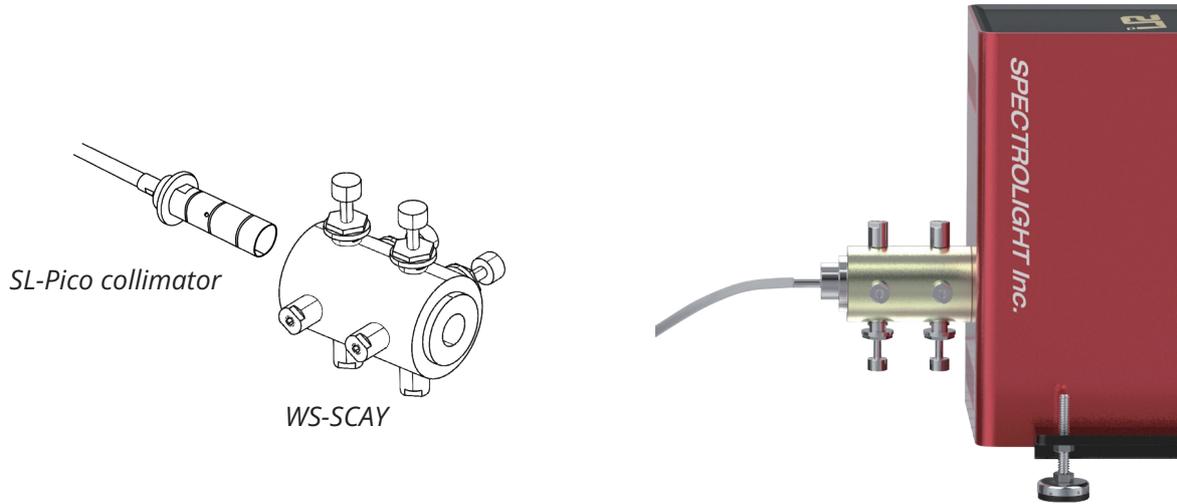
Wide broadband spectral range

## General Specifications

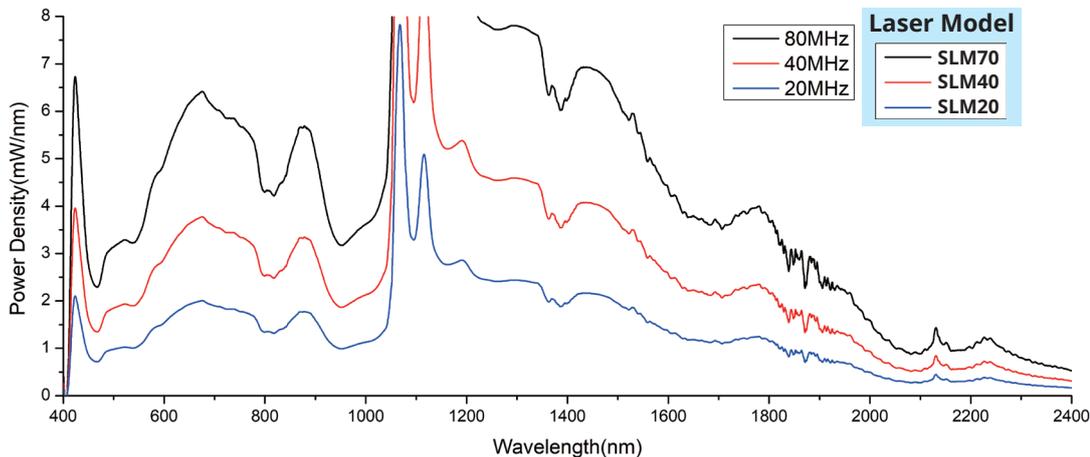
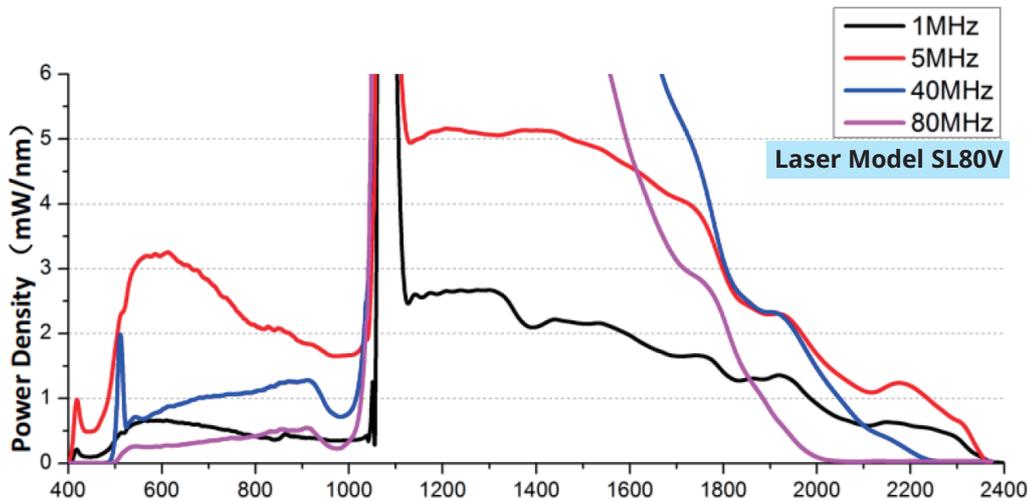
Model	Supercontinuum output power		Repetition Rate	Output pulse width (ps)	Spectral Range (nm)
	Visible	Total			
SL10	100 mW	1 W	5 MHz	< 50 ps	450 - 2400 nm
SLM10	250 mW	1 W	10 MHz	< 50 ps	410 - 2400 nm
SLM20	500 mW	2 W	20 MHz	< 50 ps	410 - 2400 nm
SLM40	1 W	4 W	40 MHz	< 50 ps	410 - 2400 nm
SLM35V	1 W	3.5 W	0.01 to 40 MHz	< 50 ps	410 - 2400 nm
SL80V	1 W	8 W	0.01 to 200 MHz	< 300 ps	430 - 2400 nm
SLM70	2 W	7 W	80 MHz	< 50 ps	410 - 2400 nm

# 1. Introduction

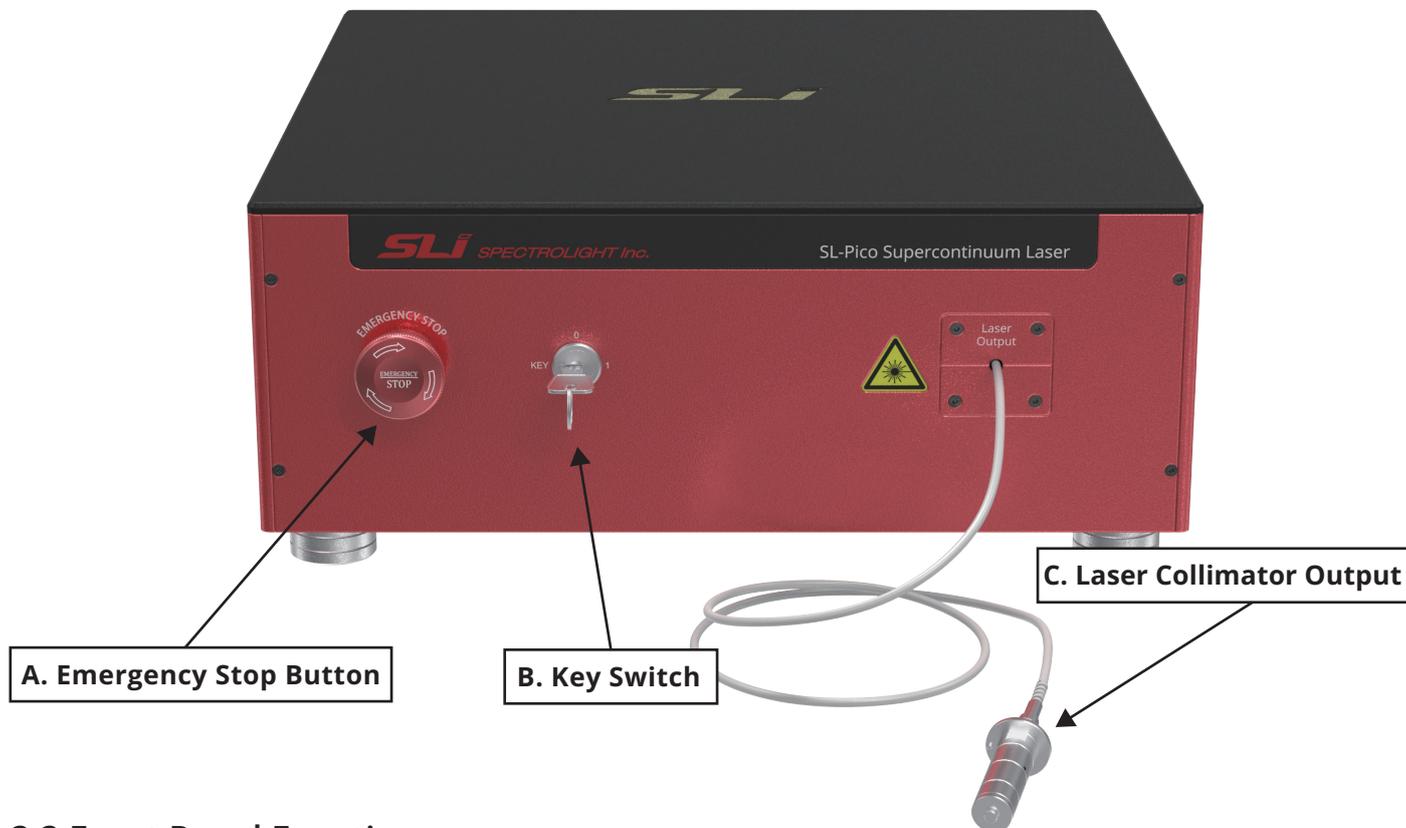
The SL-Pico can be applied to various applications requiring high power and repetition rates, such as low-noise OCT, fluorescence microscopy, nanophotonics, semiconductor inspection, ultra-high-resolution imaging capabilities, and other applications.



- Powerful Supercontinuum Laser Source
- Easy connection and alignment using the WS-SCAY accessory.
- Fully compatible and tunable with the Flexible Wavelength Selector.



### 2.1 System Main Components



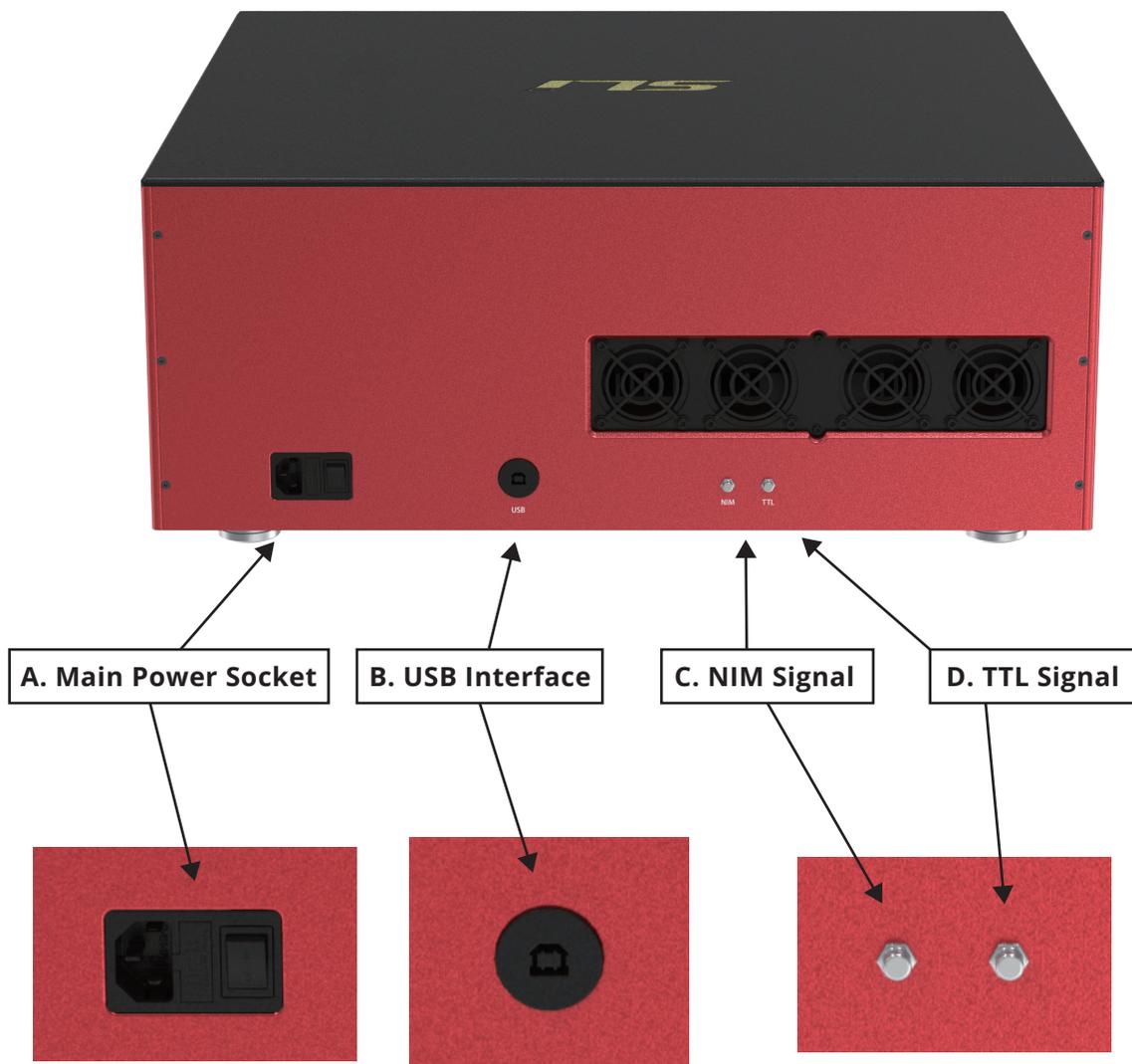
### 2.2 Front Panel Functions

**A. Emergency Stop Button** : Press it in an emergency situation, and you can restore it by rotating it clockwise.

**B. Key Switch** : Rotate precisely 90 degrees clockwise to power on, and rotate 90 degrees counterclockwise to power off the laser.

**C. Laser Collimator Output** : Collimator output for the laser. It can be connected to the FWS's input linker (WS-CAY) accessory.

### 2.3 Back Panel Functions



**A. Main Power Socket :** Plug the power cord into the main socket.

**B. USB Interface :** Connect a USB cable to the computer to control the laser.

**C. NIM Signal :** 0 to -1, square wave with same frequency. 50  $\Omega$ .

**D. TTL Signal :** The SMA interface will output a pulse square wave signal loaded 50  $\Omega$  with the same pulse and the same frequency; LLT Voltage: 0-3.3 V

### 2.4 Specifications

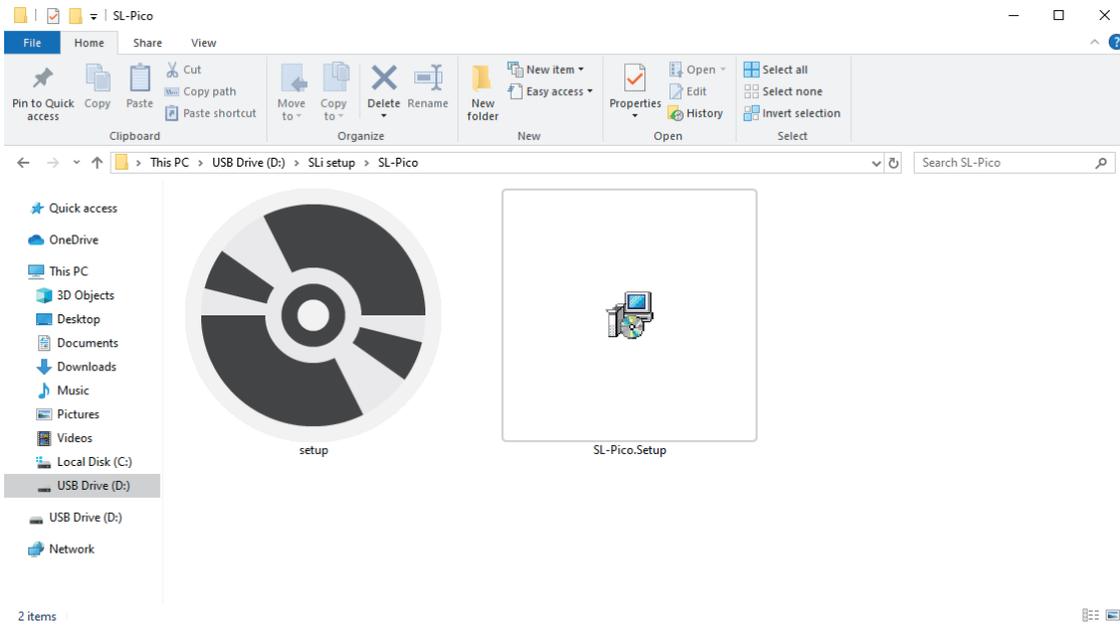
		SL10	SLM10	SLM20	SLM40	SLM35V	SL80V	SLM70
Output Power	Visible	100 mW	250 mW	500 mW	1 W	1 W	1 W	2 W
	Total	1 W	1 W	2 W	4 W	3.5 W	8 W	7 W
Repetition Rate		5 MHz	10 MHz	20 MHz	40 MHz	0.01 to 40 MHz adjustable	0.01 to 200 MHz adjustable	80 MHz
Output pulse width		< 50 ps	< 50 ps	< 50 ps	< 50 ps	< 50 ps	< 300 ps	< 50 ps
Spectral range		450 - 2400 nm	410 - 2400 nm	410 - 2400 nm	410 - 2400 nm	410 - 2400 nm	430 - 2400 nm	410 - 2400 nm
Power stability		< 1 %						
Sync(trigger) Output		(Optional) NIM Output 0 - (-1) V or TTL Output 0 - 3.3 V						
Beam diameter and quality		~ 2 mm@633 nm; M2<1.1						
Beam divergence (half angle)		< 1 mrad						
State of polarization		Unpolarized						
Length of output fiber		1.5 m						
Software		SL-Pico ver.1						
Dimension (L x W x H, mm)		340 x 370 x 150	440 x 470 x 150					
Input power		AC 100 - 240 V, 50/60 Hz						
Data interface		USB 2.0						

# 3. Installation

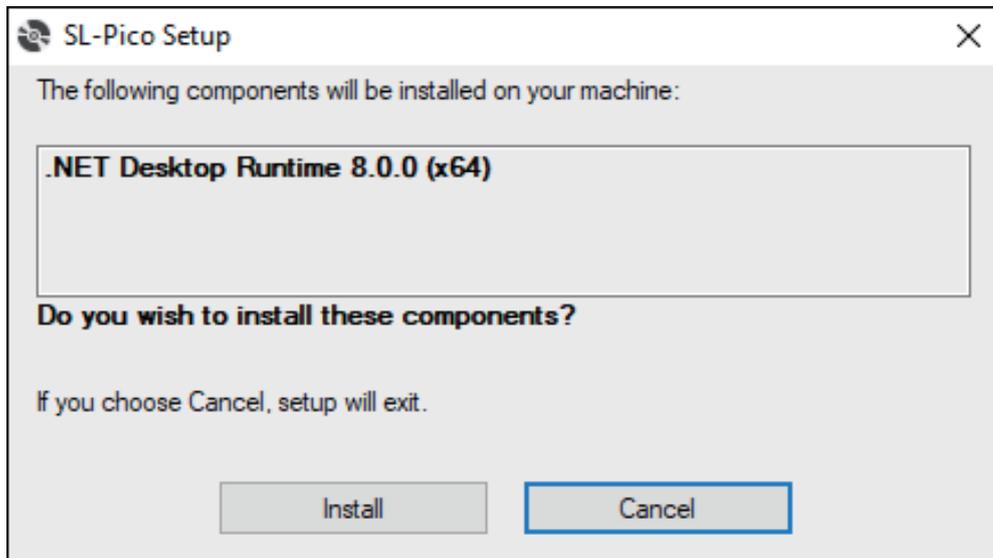
## 3.1 Software Installation

Download the software from the USB we have provided, or download it from our website - <https://www.spectrolightinc.com/shop/product/127>

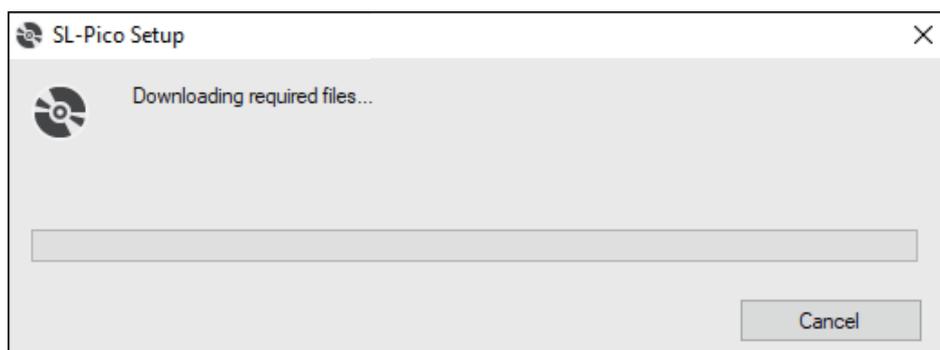
### 1. Run the "setup" program



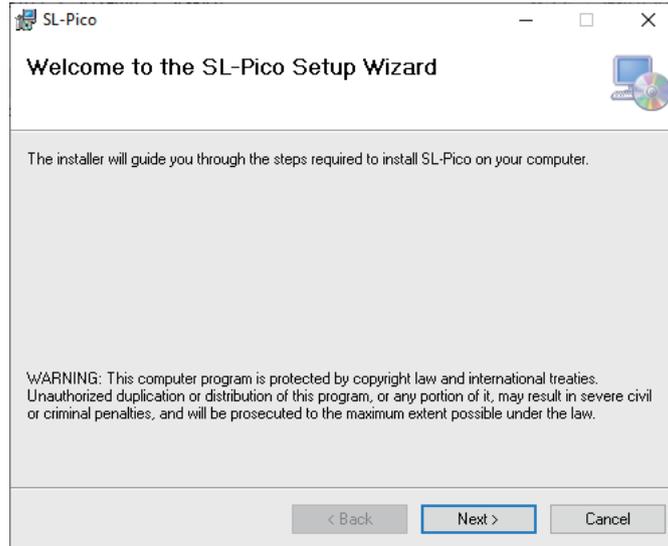
### 2. Click "Install"



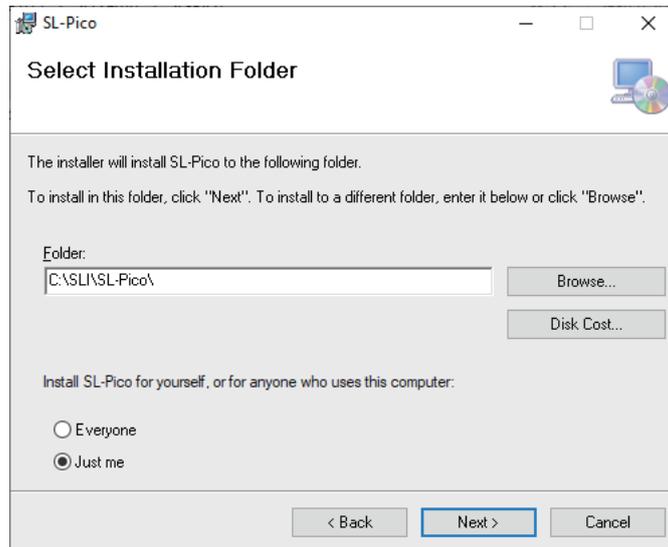
### 3. During installation if a windows pops up, click "Yes"



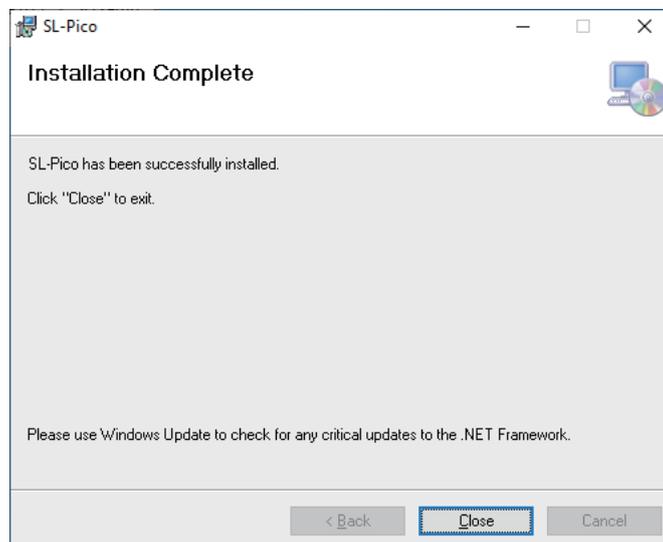
## 4. Click "Next"



## 5. Click "Next"



## 5. Installation complete

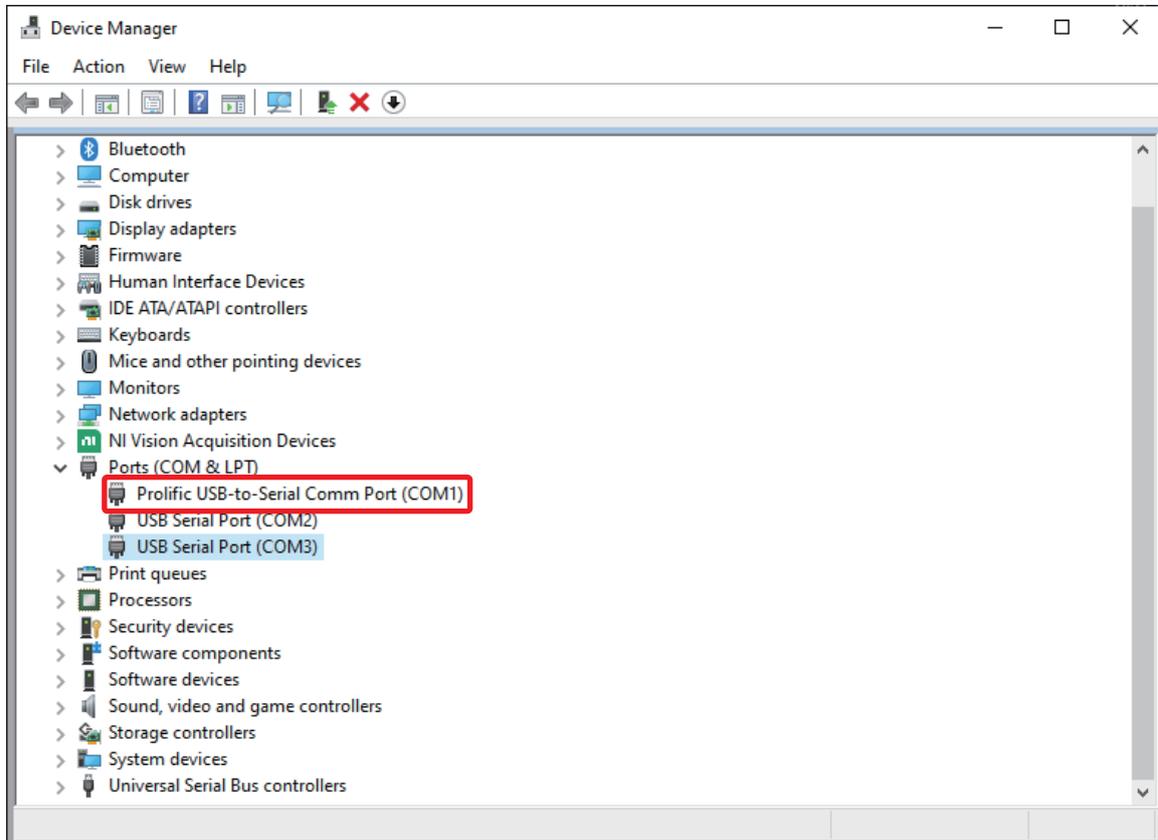


## 4. Operation

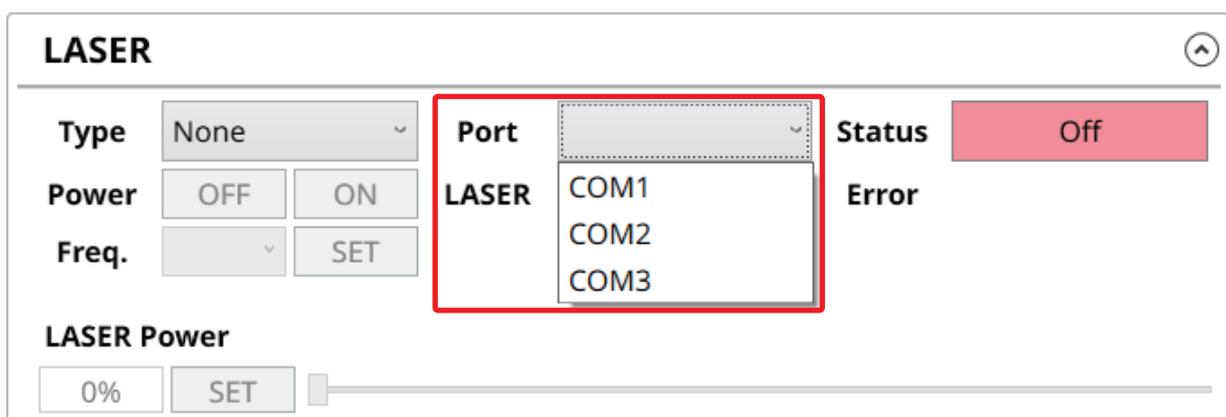
### 4.1 Laser Connection

1. Once the SL-Pico is connected to the PC, open the "Device Manager"

Look under the Ports tab to find the "Prolific USB-to-Serial Comm Port" and check the COM number (If you cannot find the "Prolific USB-to-Serial Comm Port", please go to 5. Trouble Shooting in this manual) Once you have checked the COM number, open the SL-Pico software.



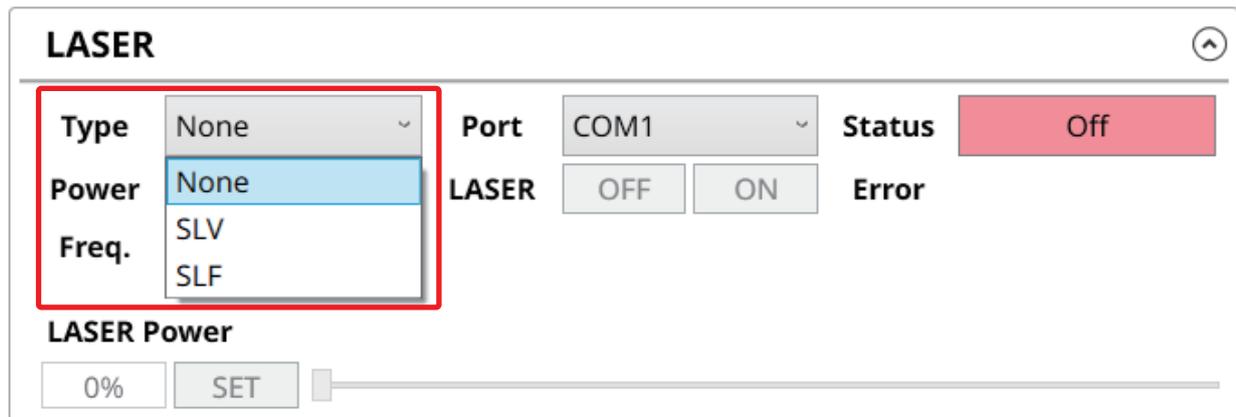
2. Set the Port number same as the COM number.



## 4. Operation

3. Select the type of laser by clicking the [Type] tab.

(If you are not sure of the laser type, please contact us at [support@spectrolightinc.com](mailto:support@spectrolightinc.com))

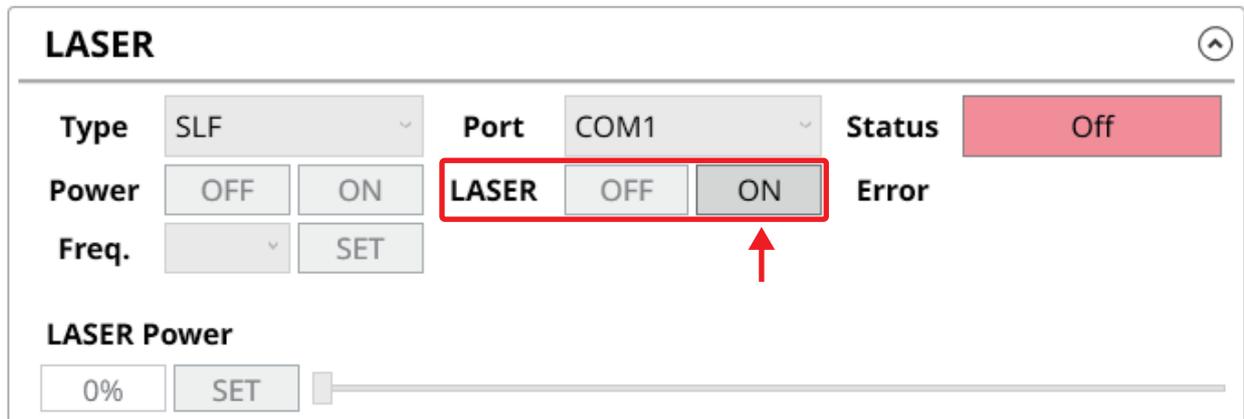


The screenshot shows the 'LASER' control panel. The 'Type' dropdown menu is open, showing options: 'None', 'SLV', and 'SLF'. The 'None' option is currently selected. Other controls include 'Port' set to 'COM1', 'Status' set to 'Off', and 'LASER' power buttons 'OFF' and 'ON'. A 'LASER Power' slider is at 0%.

### 4. SLF models -

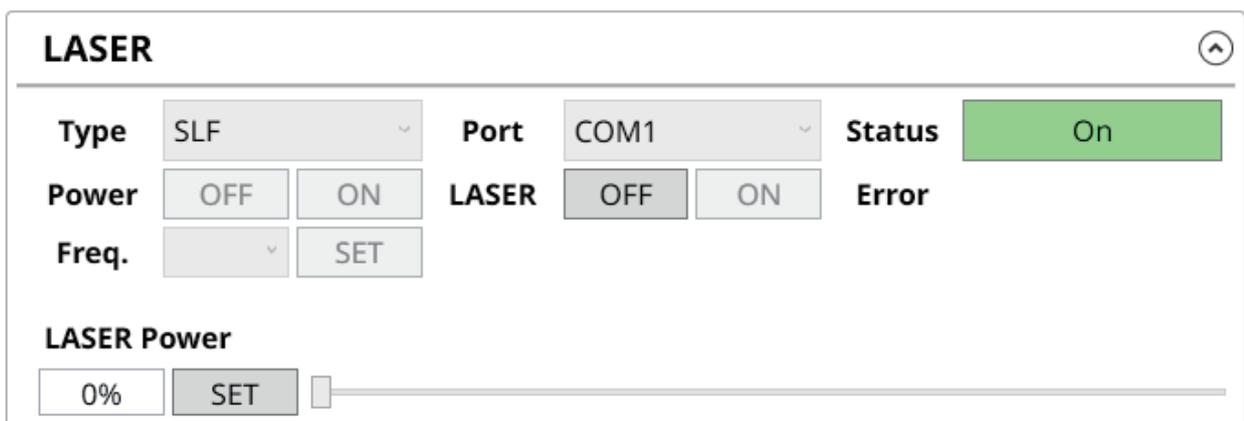
Once the laser is connected, the [LASER] tab should be activated.

Click the "ON" button of the [LASER] tab to turn on the laser.



The screenshot shows the 'LASER' control panel. The 'Type' dropdown is now set to 'SLF'. The 'LASER' tab is active, and the 'ON' button is highlighted with a red box and an arrow pointing to it. The 'Status' remains 'Off'.

The laser is now ready for use.

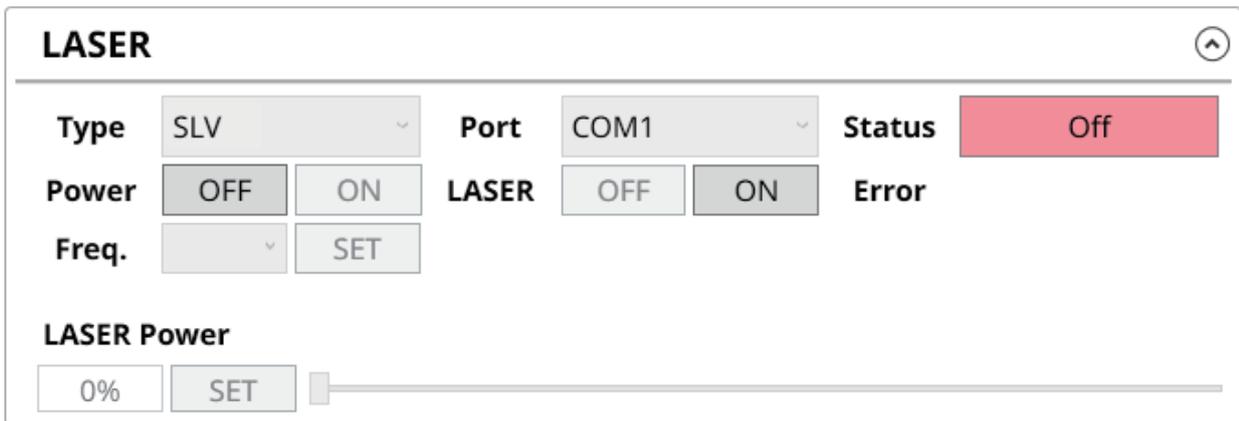
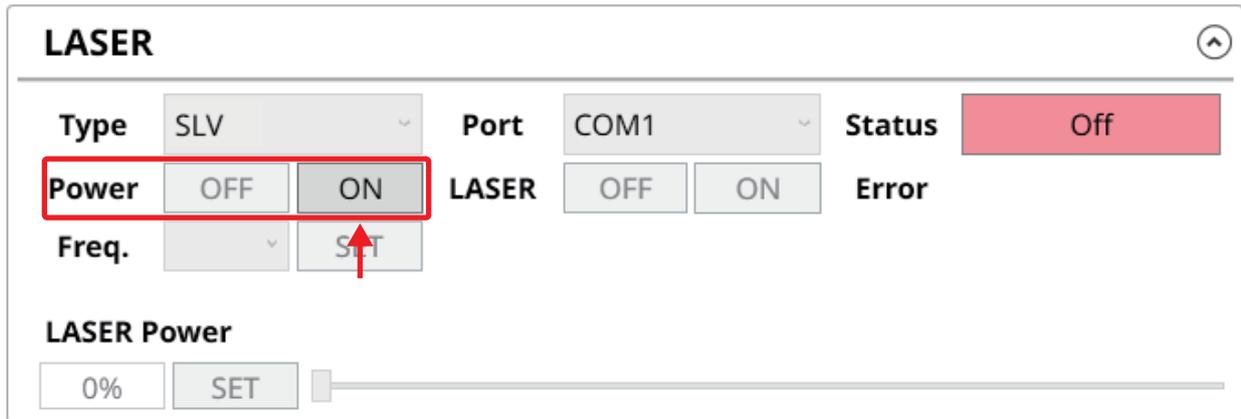


The screenshot shows the 'LASER' control panel. The 'Status' is now 'On', indicated by a green background. The 'LASER' tab remains active, and the 'ON' button is still highlighted.

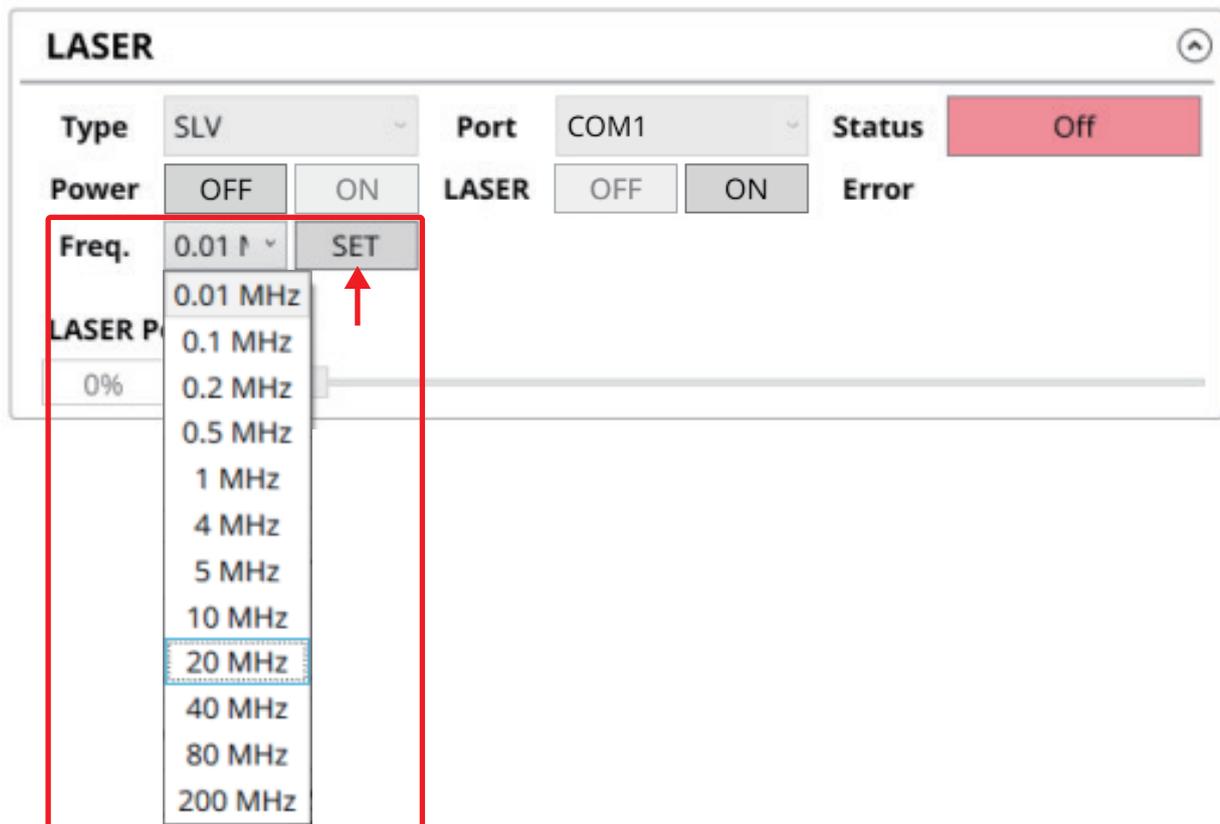
## 4. Operation

### SLV models -

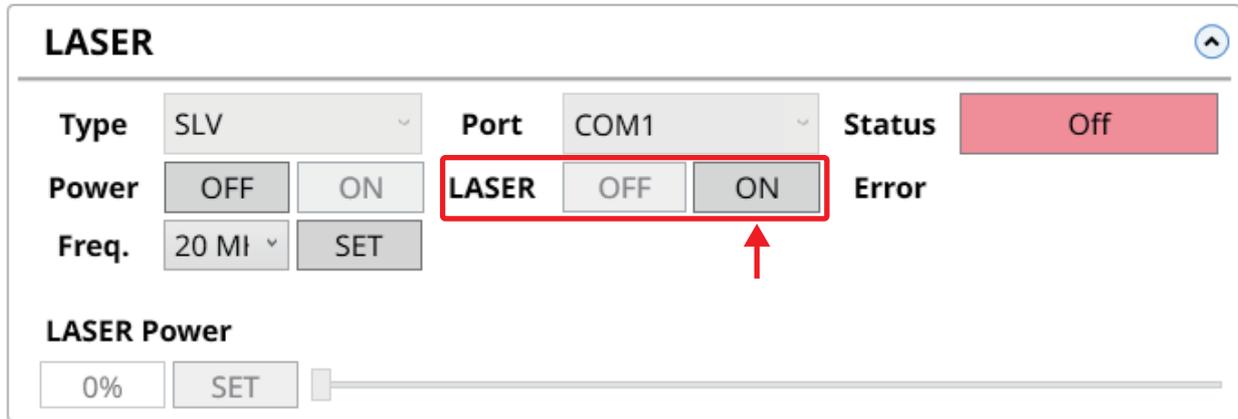
Once the laser is connected, the [Power] tab should be activated. Click the "ON" button of the [Power] tab to activate the [LASER] tab.



Once the [LASER] tab is activated, select the desired frequency on the [Freq.] tab, then click "SET".



After setting the desired frequency, click the "ON" button of the [LASER] tab to turn the laser on.

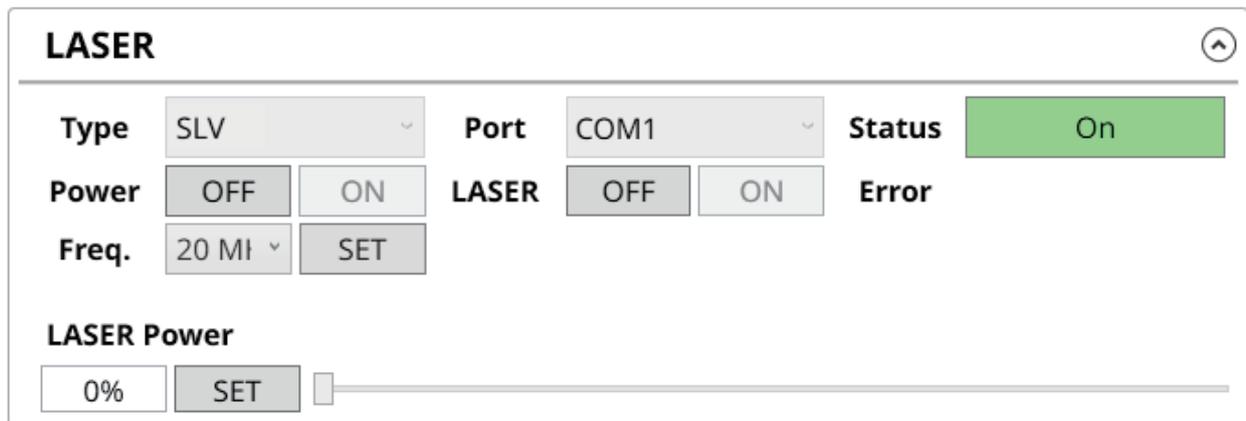


The screenshot shows the LASER control panel. The 'Status' indicator is a red box labeled 'Off'. The 'LASER' tab is selected, and its 'ON' button is highlighted with a red rectangle and a red arrow pointing to it. Other controls include 'Type' (SLV), 'Port' (COM1), 'Power' (OFF/ON), 'Freq.' (20 MI), and a 'LASER Power' slider set to 0%.

Type	SLV	Port	COM1	Status	Off	
Power	OFF	ON	LASER	OFF	ON	Error
Freq.	20 MI	SET				

LASER Power: 0% SET

The laser is now ready for use.



The screenshot shows the LASER control panel after the laser has been turned on. The 'Status' indicator is now a green box labeled 'On'. The 'LASER' tab is still selected, and its 'ON' button is highlighted with a red rectangle and a red arrow pointing to it. Other controls remain the same as in the previous screenshot.

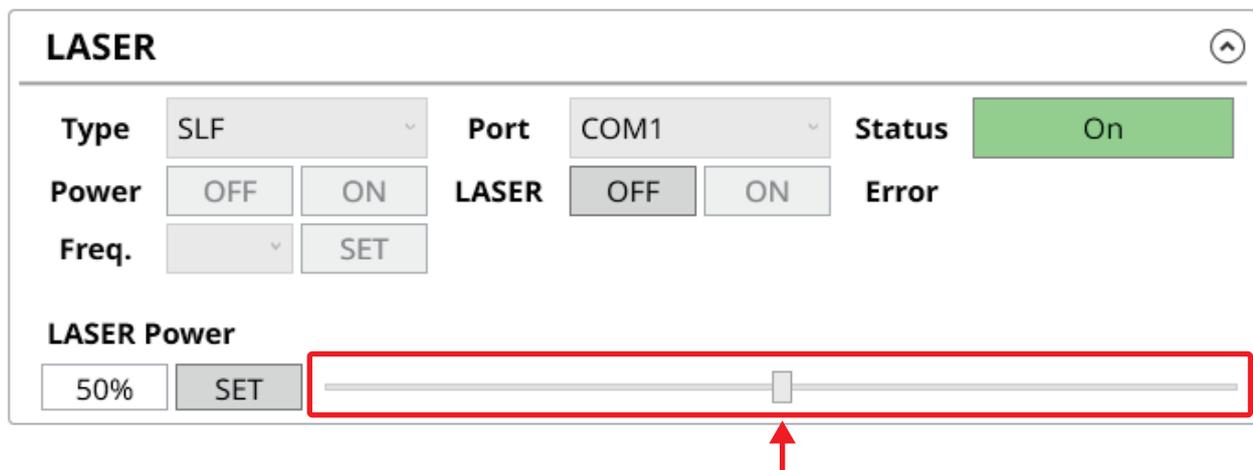
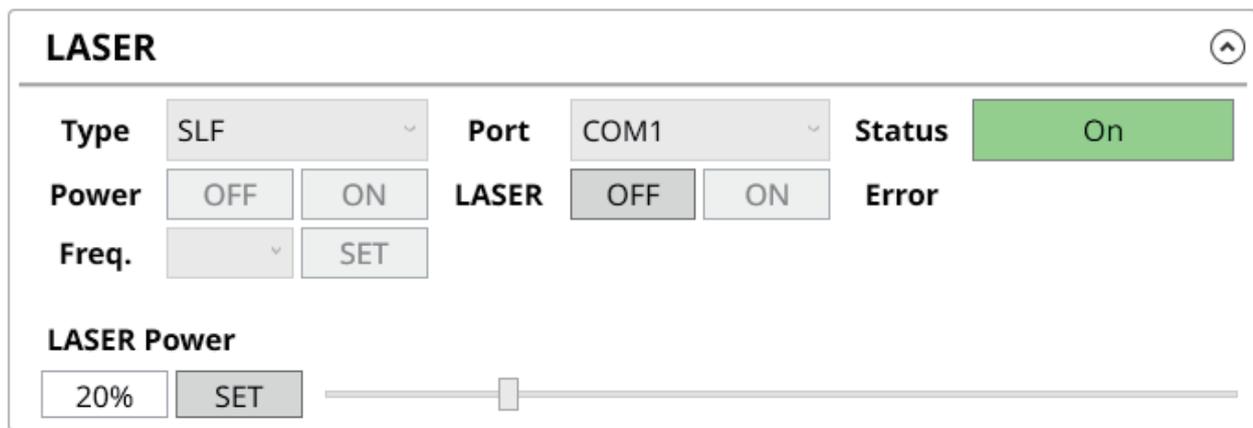
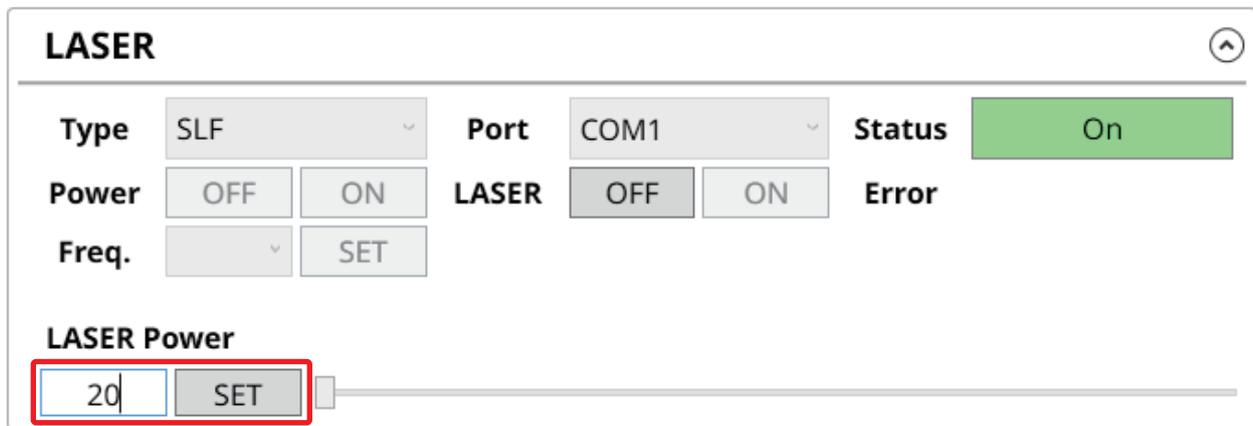
Type	SLV	Port	COM1	Status	On	
Power	OFF	ON	LASER	OFF	ON	Error
Freq.	20 MI	SET				

LASER Power: 0% SET

## 4.2 Laser Operation

Once the laser is ready for use, use the [LASER Power] tab to set its desired power.

Users can manually input the power directly and click "SET" button or use the scroll bar on the right.

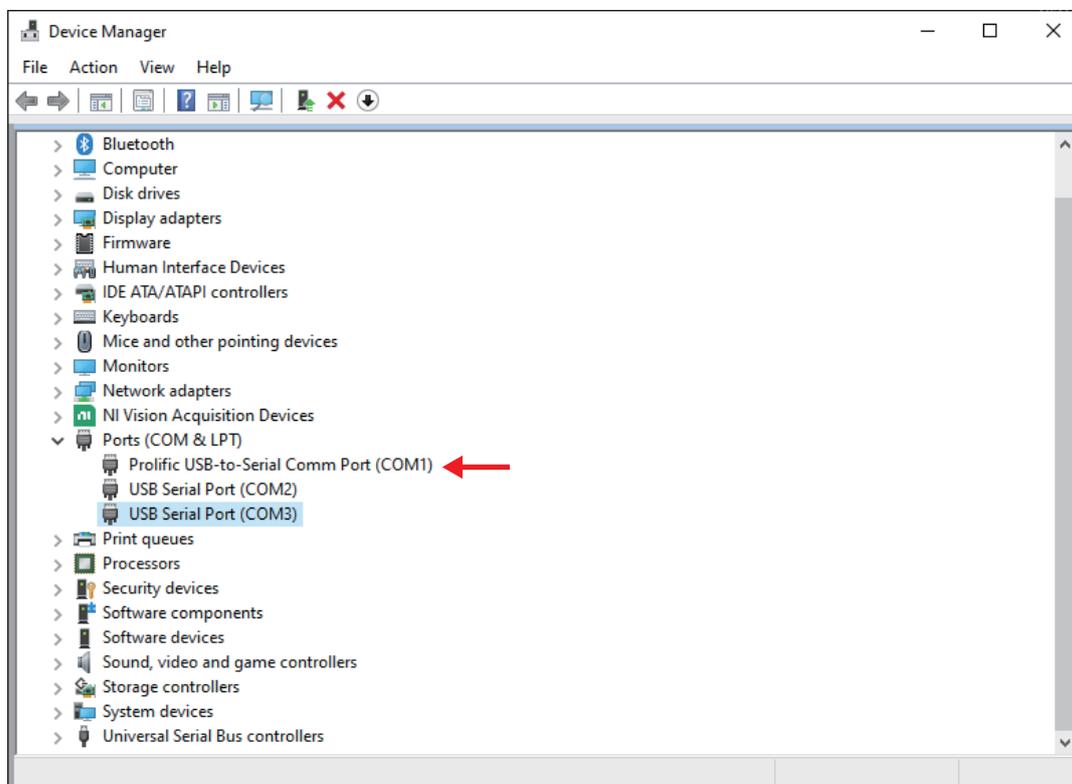


**\*NOTE :** When increasing the power of the laser, be sure to increase power steadily from 0 to 100%.  
For example : 0% → 30% → 50% → 80% → 100%

**\*NOTE :** When turning the power off of the laser, be sure to decrease power steadily from 100 to 0%.  
For example : 100% → 80% → 50% → 30% → 0%  
Then click "OFF" of the [LASER] tab.

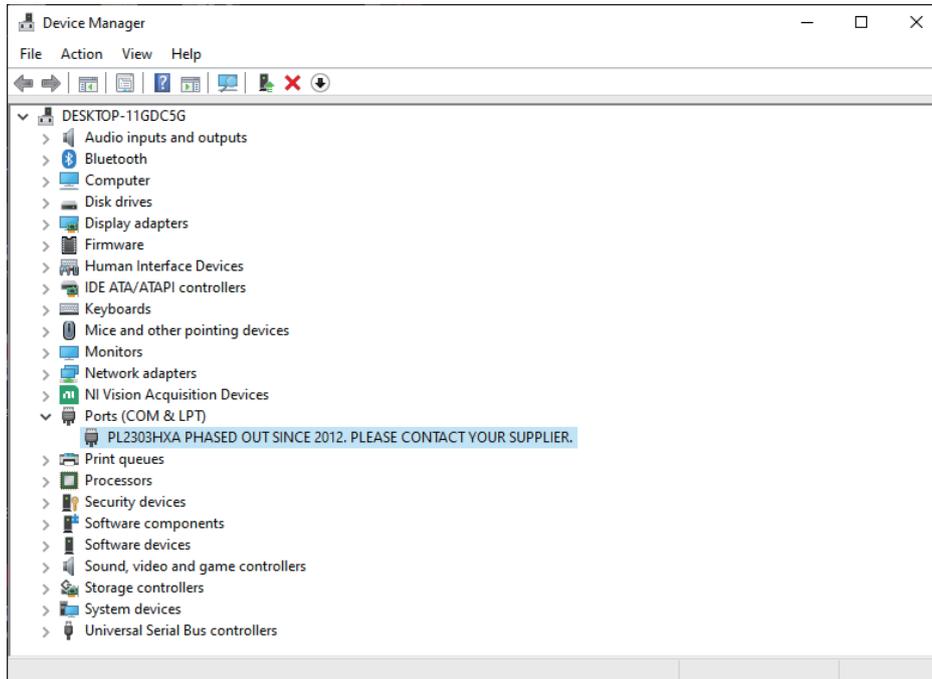
### 5.1 Device connection error

- If you're experiencing issues with the connection between the device and software, ensure the communication driver is correctly installed and displayed in the Device Manager.
- If there is a problem with the communication driver, install the latest FTDI USB driver suitable for your OS from the following website - <https://ftdichip.com/drivers/>

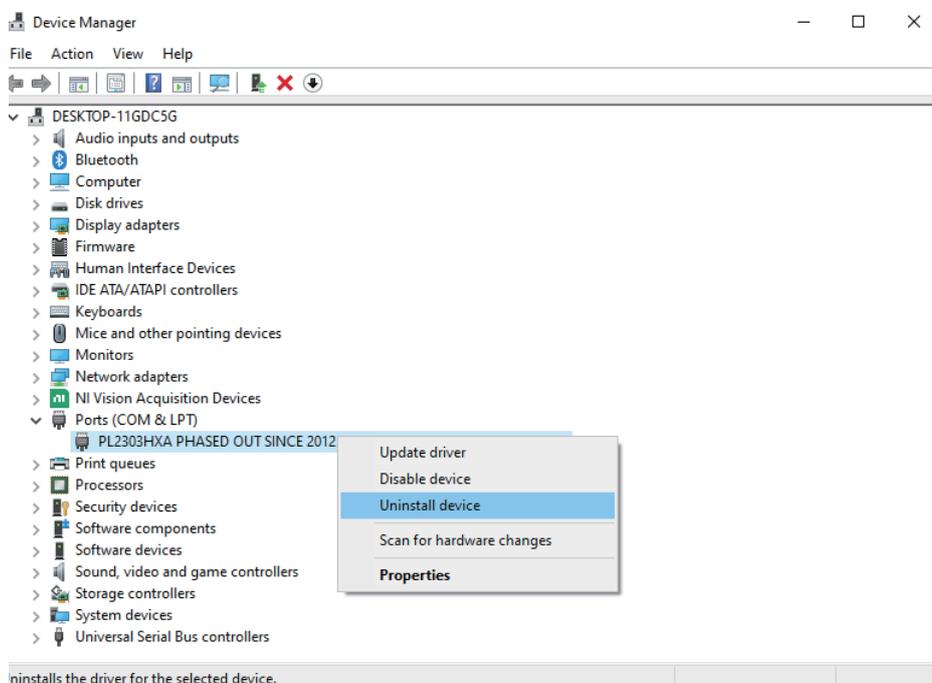


## 5.2 Laser connection error

- If you are having difficulty setting up a laser connection, check the "Ports (COM & LPT)" section of Device Manager for the presence and proper configuration of the laser.

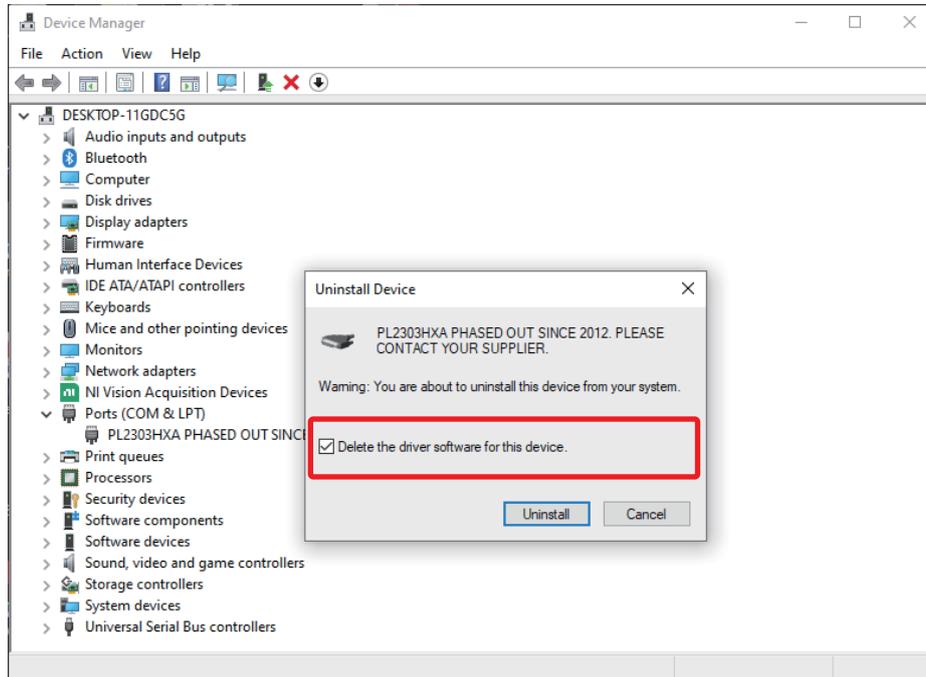


- If the name of the port is as follows, right click on the respective port and click "Uninstall device".

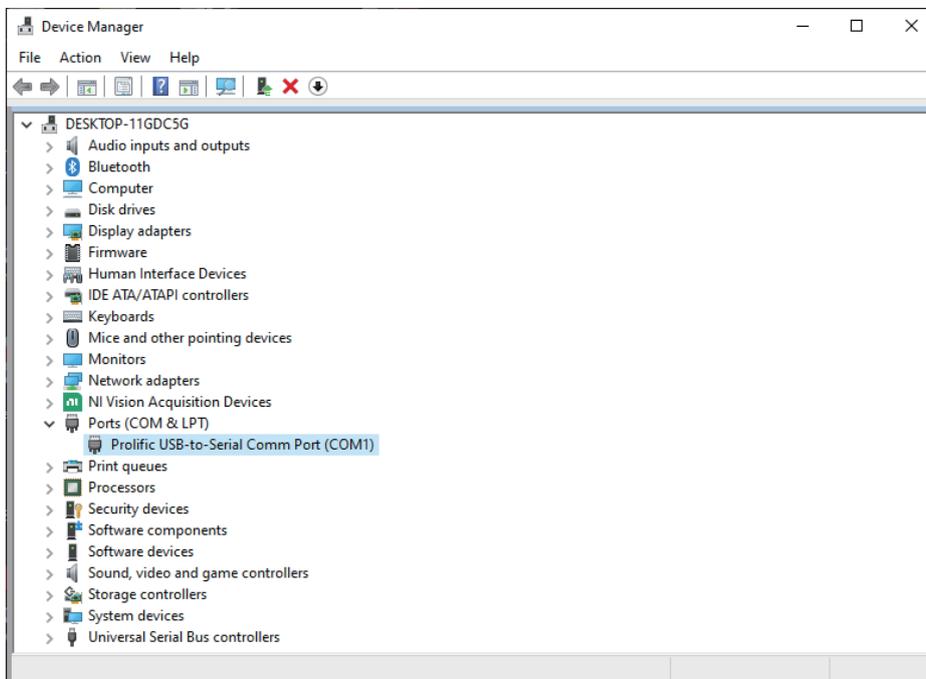


## 5. Trouble shooting

- When the following screen pops up, be sure to check the box and click “Uninstall”.



- Once the uninstall is complete, disconnect the USB cable of the SL-Pico and reconnect.
- Reopen the Device Manager and check under “Ports (COM & LPT)”.

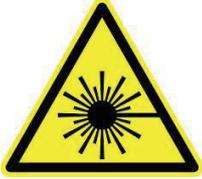


- If the laser port name is “Prolific USB-to-Serial Comm Port”, check the COM port number and choose the respective number in the SL-Pico software.

### 6.1 Laser Safety

The following general safety precautions must be observed during all phases of the operation of this instrument. Failure to comply with these precautions or specific warnings elsewhere in this manual violates safety standards for the instrument's intended use.

#### Safety Symbols



Laser radiation emitted from this unit may be harmful. Avoid direct exposure to the beam.



Always read and understand the manual before working on or with this device.

**Spectrolight has no liability for the customer's failure to comply with these requirements.**

1. Before the operation, review the instrument and manual for safety markings and instructions. You must follow these to ensure safe operation and to maintain the instrument in safe condition.
2. Avoid direct exposure to the beam.
3. Always wear protective goggles or eyeglasses appropriate for working with laser light.
4. Avoid looking at the beam directly.

**Warning : A strong reflected laser beam back into the SL-Pico output may damage the laser.  
If you need high visible light power, 5 MHz and more than 70 % power would be suggested.  
If you need high pulse energy, 1 MHz and more than 80 % power would be suggested.  
The higher the power, the more stable the spectrum.**

### [Safety considerations]

1. Strong reflected laser beam back into the SC output may damage the SC ;
2. Don't direct looking at the output of the SC at any time in any case ;
3. Don't put things in the air passage in case it's clogged;
4. Don't place heavy objects on the laser body;
5. Don't put the output collimator toward people or any other reflective surface in case causing any personal injury;
6. Don't check the laser directly with your eyes unless you sure the device is in power-down state while the laser may lunch infrared and ultraviolet light invisible but harmful to your eyes;
7. Be sure that the laser is out of power before checking the device;
8. Don't stare at the emission port directly even you wear the laser protective glasses;
9. Don't put any low ignition substance on the laser such as the flammable, explosive materials etc;
10. Be sure that the laser is placed in non-professionals can't touch;
11. Don't shoot the laser light to the glass since the normal glass with about 4% reflectivity and reflect light back to your eyes to cause harm;
12. Please take off your watch when you use the laser in case the watch surface reflecting light into your eyes;
13. Please use a detector or conversion film to locate the laser light since the light beyond 800nm is totally invisible;
14. We strongly recommend that you should wear a pair of laser goggles corresponding to laser in specific wavelength to protect your eyes when you using the laser for working;
15. We recommend that you wear a long suit of white clothes. For it will not burn your clothes then cause a fire even the laser irradiate to your body.

### 6.2 Electrical Safety



1. The respective modules, boards, or RF inputs and outputs are susceptible to damage by electrostatic discharge (ESD) and require proper protection procedures for storage and handling.
2. To completely shut off electrical power to the unit, disconnect the power cord

### 6.3 Environmental Considerations

Highlight any environmental conditions that may impact the system's performance or safety.

#### **Environmental Concerns**

To maximize the long-term performance and overall testing accuracy of this instrument, the following environmental safeguards should be considered.

1. Avoid dust and direct sunlight. The optical performance of the unit may be compromised by long-term exposure to direct sunlight and dust.
2. Avoid excess vibration that might compromise the mechanical integrity of the unit.
3. Avoid exposing the unit to situations or environments that may result in contact with corrosive gasses.
4. Do not block fan vents. If the unit is racked, make sure it has proper ventilation.
5. The recommended operating temperature is 10-35° C.
6. Keep original packing material for transport or shipment. If original packing is not available, call Spectrolight to have a factory-approved shipping case delivered to you.

### 7.1 Contact Information

Technical support:

Spectrolight, Inc.

19800 MacArthur Blvd. #300

Irvine, CA 92612

Tel: 949-800-7780

Email: [support@spectrolightinc.com](mailto:support@spectrolightinc.com)

### 7.2 Warranty Information

2 years from ship date.

#### **DISCLAIMER**

This device is designed for use in laboratory and industrial environments. This is not a medical device, so it should not be used or applied to humans in any way.

#### **WARNINGS AND PRECAUTIONS**

- Operate the device using 100-240 V AC, 50/60 Hz, 1.5 A / Output 12 V DC, 5.0 A.
- Always use the grounded power supply cord set provided to connect the system to a grounded outlet.
- Do not expose the device to rain or moisture.
- Never look into the optical pathway of the light sources used.
- Do not connect or disconnect the cables while the device's power is turned ON.
- Always allow free flow of fresh air on all sides.
- Operating / Storage conditions Indoor Use Only

Temperature: 10 - 40 °C, 50 - 104 °F

Humidity: 20 - 85 %

Pressure: 700 - 1060 hPa

#### **CLEANING AND MAINTENANCE**

Please cover the output head with the dust-cap to avoid dust pollution while it's in idle state. Keep the laser body clean, don't let the body and power adapter touch water.

#### **STORAGE CONDITIONS**

Temperature: 25 °C(± 20 °C), humidity : 60% or less.

#### **OPERATION CONDITIONS**

Temperature: 25 °C(±5 °C), humidity: 60% or less.

#### **ELECTRICAL CHARACTERISTICS**

INPUT : 100 ~ 240VAC 50/60Hz 2A

Power dissipation : 100 ~ 130W

## ***SPECTROLIGHT Inc.***

<b>Headquarters</b>	19800 MacArthur Blvd. Suite 300, Irvine, CA 92612 U.S.A.
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	<a href="mailto:sales@spectrolightinc.com">E-mail</a> : sales@spectrolightinc.com
<b>Technical Support</b>	<a href="tel:(949)800-5117">Phone</a> : (949) 800-5117
	<a href="mailto:support@spectrolightinc.com">E-mail</a> : support@spectrolightinc.com
<b>OEM Sales</b>	<a href="tel:(949)800-7780">Phone</a> : (949) 800-7780
	<a href="mailto:sales@spectrolightinc.com">E-mail</a> : sales@spectrolightinc.com