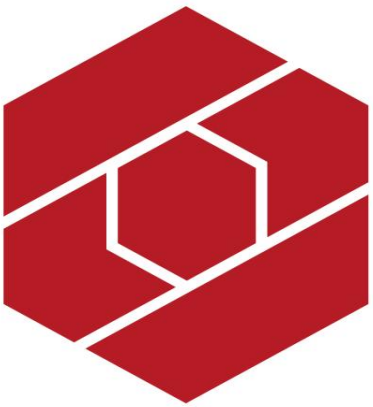
S-40-355-N1

Pulsed Solid-state Laser User Manual



GZTECH

Company Introduction

Wuhan Guangzhi Technology Co., Ltd. was established in May 2018 in Optics Valley of Wuhan. The Chairman, Dr. Huang Zhihua, is a graduate of Tsinghua University, and the founding team boasts profound expertise in theoretical design, technology development, and product engineering. The company specializes in the research and development, production, and sales of pulsed lasers, as well as offering laser process development and customized laser solutions. The products are primarily applied in fields such as new energy, hard and brittle material processing, surface marking, and cleaning. Based on fiber laser technology and solid-state laser technology, and integrating high-speed electronic control software and thermal control structure technology, the company has successively launched a series of industrial laser products including fiber MOPA, QCW, fiber infrared picosecond and green lasers, as well as solid-state nanosecond ultraviolet lasers. Additionally, it possesses OEM/ODM development capabilities for other special wavelength research and customization-type lasers.

GZTECH is named after a passage in *Mozi's Explanations of the Classics,* which reads, “Jing (shadow), when guang (light) arrives, jing vanishes; if guang exists, jing will never arise.” The 21st century is the Photonics Century, and GZTECH is dedicated to illuminating traditional manufacturing fields by utilizing advanced laser technology, thereby creating incremental value for society.

GZTECH is headquartered in Wuhan, with sales and service centers established in Shenzhen, Suzhou, and Jinan, as well as a Foreign Trade Department responsible for overseas business. Guided by the mission of “Promoting lasers to be a fundamental productivity tool in intelligent manufacturing”, GZTECH is committed to relentless technological innovation and continuous improvement of laser performance, aiming to make lasers a fundamental productivity tool in the field of future intelligent manufacturing.

GZTECH will proceed with utmost sincerity on the path to long-term success, growing and developing together with customers.

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Chapter 1 Safety Information

1. Safety warning signs and classifications

The following safety warning sign requirements must be strictly observed during the operation of lasers:

Sign type	Descriptions and requirements
	**Warning:** There is potential harm to the human body, and operations must be carried out following established procedures. Violation may result in personal injury. During operation: It is mandatory to wear qualified protective glasses at all times; direct viewing of or exposing skin to the laser beam is strictly prohibited.
	**Attention:** There is potential harm to the equipment, and operations must be carried out following established procedures. Violation may result in equipment damage. During operation: Avoid touching optical lenses or high-precision components; ensure that grounding and power supply meet specifications.
	**Caution laser:** This sign is posted at the laser output port. It indicates the presence of Class IV visible light, invisible light, and ultraviolet radiation from the laser. Direct exposure can cause permanent retinal damage.

2. Laser safety protection requirements

Laser Class: Pulsed solid-state lasers all belong to Class IV lasers (with power greater than 500mw). In China, they are also classified as Class 4 according to GB 7247.1-2012.

Protective equipment: Specialized protective glasses must be selected and worn throughout the entire operation process.

Operation prohibitions: Direct contact with the laser output head or mirror-reflected areas is prohibited; installing cameras or optical instruments while the laser is in operation is prohibited; disassembling the enclosure or adjusting internal components without powering off is prohibited.

3. General safety regulations

Mirror reflection risk: Secondary radiation may be generated after the main laser beam is reflected by a flat surface. Although the energy is relatively low, it may still cause damage to the eyes or material surfaces. It is necessary to avoid the reflection path during operation.

Key points for optical operation: Before the laser device emits laser, be sure to remove the dust-free tape or other obstructions at the laser outlet. When the laser is working normally, please avoid contact between your eyes or skin with the laser directly emitted or scattered from the laser output end. Do not look directly at the laser output head. Make sure to wear laser safety glasses correctly when operating the laser.

Electrical safety: Before using the laser, please make sure that the power supply is 24 VDC (Nanosecond UV power supplies rated at 30W and above operate on 48VDC), check the power supply voltage and positive and negative poles, and power on only after ensuring that the connection is correct. Incorrect connection may cause damage to the laser.

4. Operating environment and maintenance

Environmental requirements: Temperature: 10°C - 35°C; Humidity: 20% - 70% (no condensation). The equipment must be placed inside a ventilated and dust-proof cabinet, away from high-temperature or humid environments. The cooling fan should be kept at a distance of 5 cm or more from obstacles to ensure unobstructed airflow.

Daily maintenance: Do not collide with the scanning table or optical components. In case of a malfunction, shut down the equipment immediately and contact professional personnel. Regularly clean the dust from the equipment surface and keep the work area clean and tidy.

5. Protection commitments and government-required safety assurances

Please read this manual thoroughly and sign the safety confirmation form before operation. Improper operation may lead to irreversible consequences! Although the laser itself is safe, necessary protective measures still need to be taken during use. Both equipment manufacturers and end-users should strictly adhere to laser safety standards, which is a fundamental prerequisite for ensuring safe production. In usage situations, it is imperative to commit to installing laser protection devices with isolation and blocking functions, even when the laser is in an activated state. Relevant safety requirements can be referred to in the national standard GB 7274.1-2012.

Chapter 2 Product Introduction

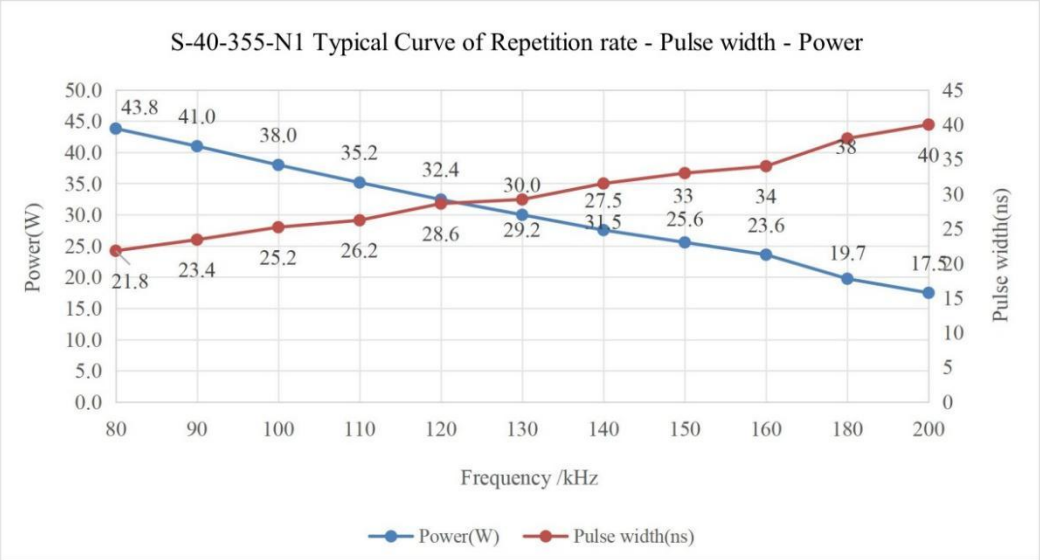
Pulsed solid-state laser utilizes Nd:YVO_4 as the gain medium. It has excellent spot roundness, high beam quality, a compact structure, high electro-optical efficiency, as well as stable and reliable performance, making it a dependable laser source for applications such as industrial marking and precision laser cutting. The product features standard industrial control interfaces, enabling adaptation to various user operating environments.

1. Configuration list

No.	Name	Quantity	Unit
1	Solid-state Nanosecond UV laser	1	set
2	Beam expander	1	/
3	Galvanometer connection tube	1	/
4	Galvanometer adapter	1	/
5	Switching power supply	1	/
6	Laser power supply cable	1	cable
7	AC power cord	1	cable
8	RS232 serial port cable	1	cable
9	Laser test report	1	sheet
10	Auxiliary materials	1	pack

2. Optical characteristics

No.	Characteristics	Parameter value	Unit
1	Central wavelength	355	nm
2	Maximum pulse energy	> 500@80kHz	μJ
3	Output power	> 40@80kHz	W
4	Frequency adjustment range	80 - 200	kHz
5	Pulse width	< 33@80kHz	ns
6	Output power instability	< 3%	RMS
7	Beam quality M^2	< 1.3	/
8	Spot roundness	> 90%	/
9	Polarization direction	horizontal	/
10	$1/e^2$ beam diameter (Bare beam)	0.7 ± 0.1	mm
11	$1/e^2$ beam diameter (8X)	5.6 ± 1	mm
12	Visual beam diameter (8X)	8.4 ± 1.5	mm
13	Bare beam divergence angle	< 2	mrad
14	Warm-up time	< 10	min



3. Electrical characteristics

No.	Characteristics	Parameter value	Unit
1	Power supply voltage	48	VDC
2	Working current	< 12	A
3	Power consumption	< 576	W
4	Recommended power supply	≥ 800	W

4. Environmental requirements

No.	Characteristics	Parameter value	Unit
1	Ambient temperature	15 - 35	℃
2	Storage temperature	-10 - 50	℃
3	Ambient relative humidity	< 90 % (no condensation)	/

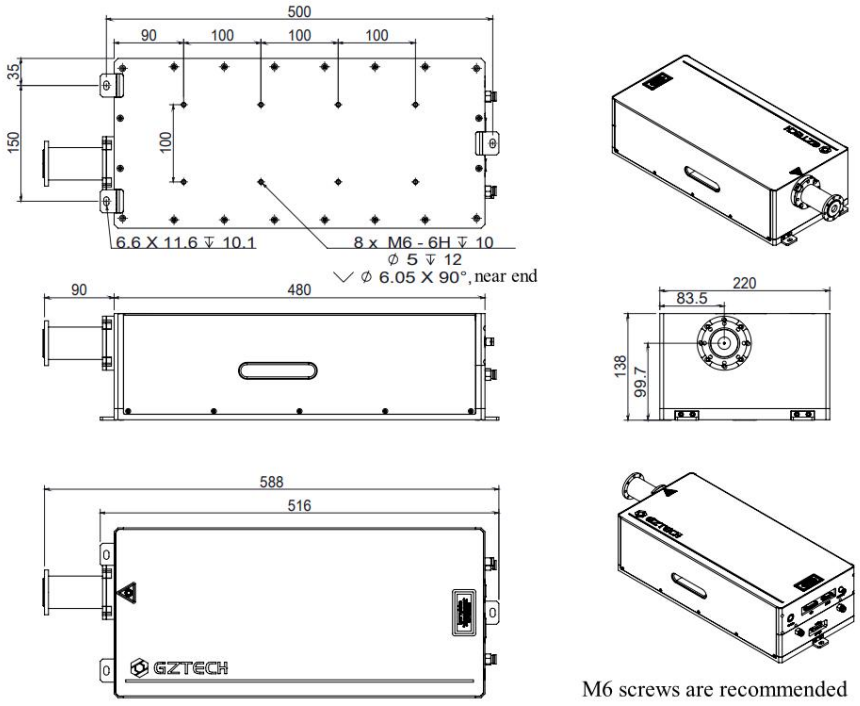
5. Requirements for chillers

No.	Characteristics	Parameter value	Unit
1	Cooling capacity	> 1000	W
2	Water flow rate	> 6	L/min
3	Water tank temperature control	25 ± 0.3	℃
4	Water pipe diameter	10	mm

6. Structural characteristics

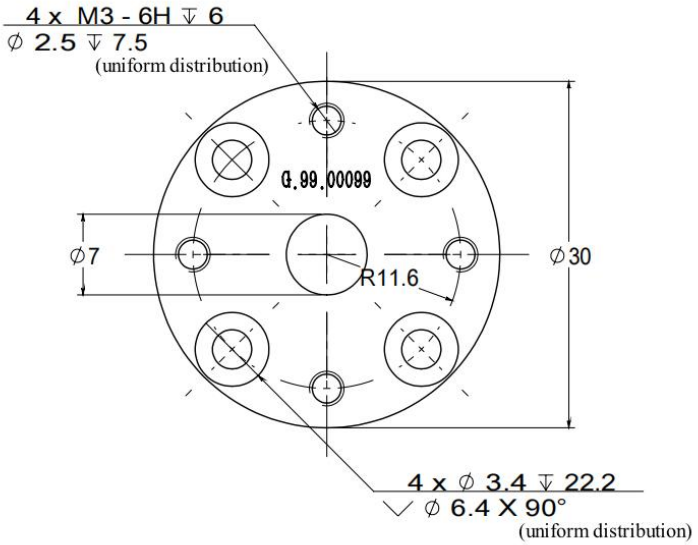
No.	Characteristics	Parameter value	Unit
1	Laser dimension (without feet and galvanometer adapter)	480*220*138	mm^3
2	Net weight	23 ± 0.3	kg

7. Dimension

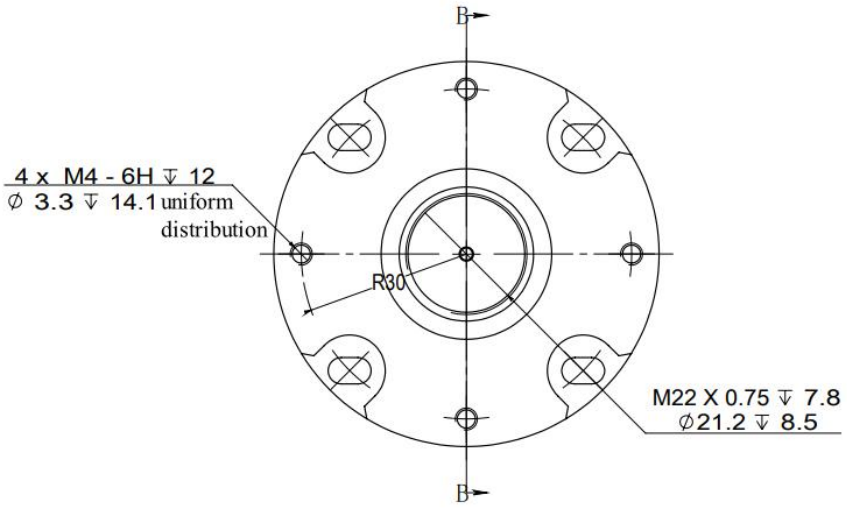


M6 screws are recommended

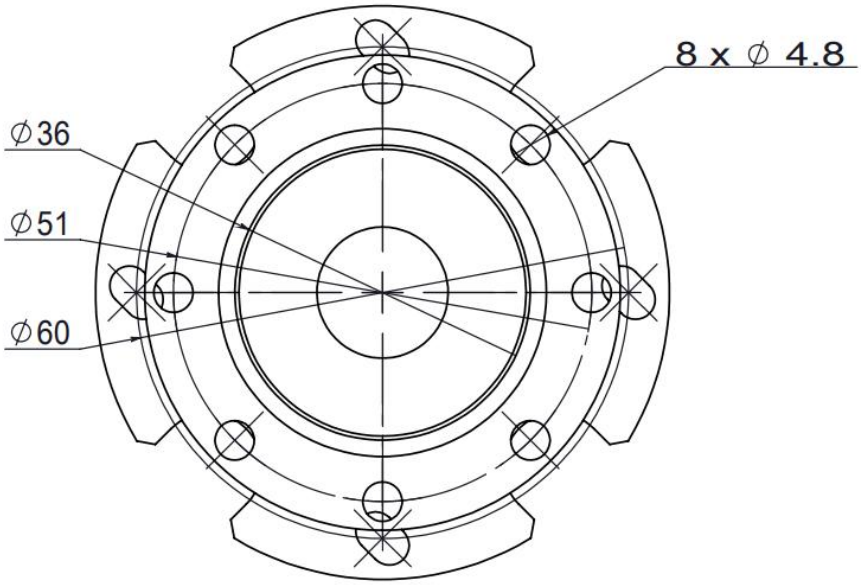
8. Flange beam expander mounting hole size reference, standard configuration for this model



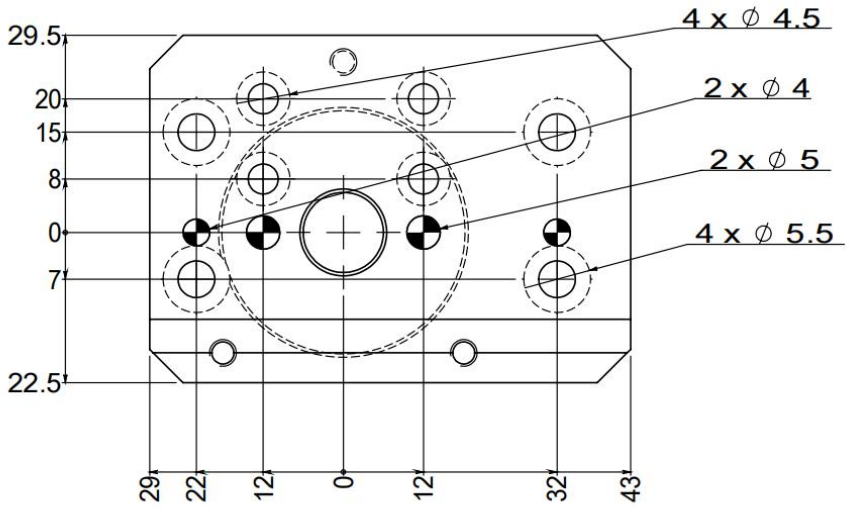
9. Threaded beam expander mounting hole size reference (M22 threaded hole)



10. Galvanometer connection tube

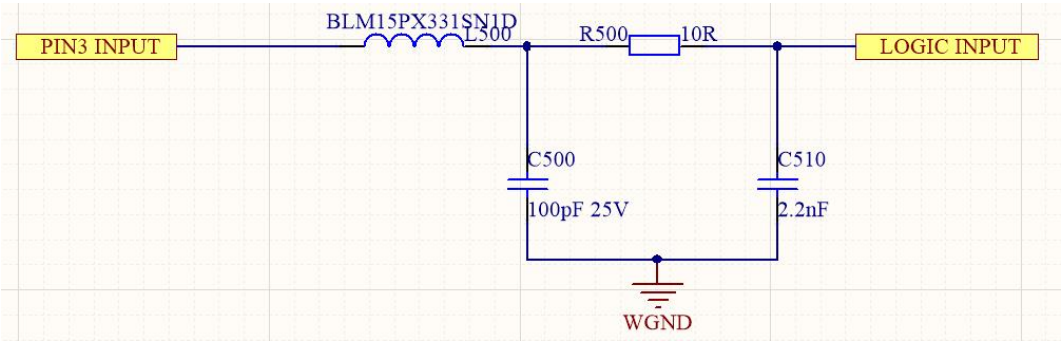


11. Galvanometer adapter



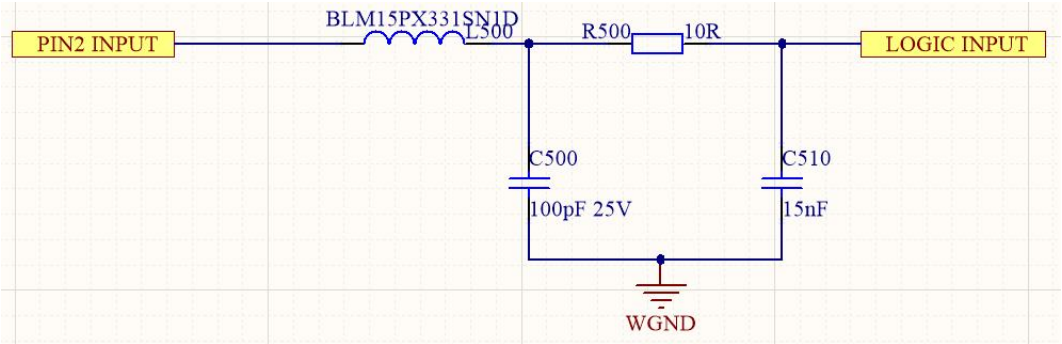
Chapter 3 Laser Interface Description

1. Digital input



Pin 3 Input

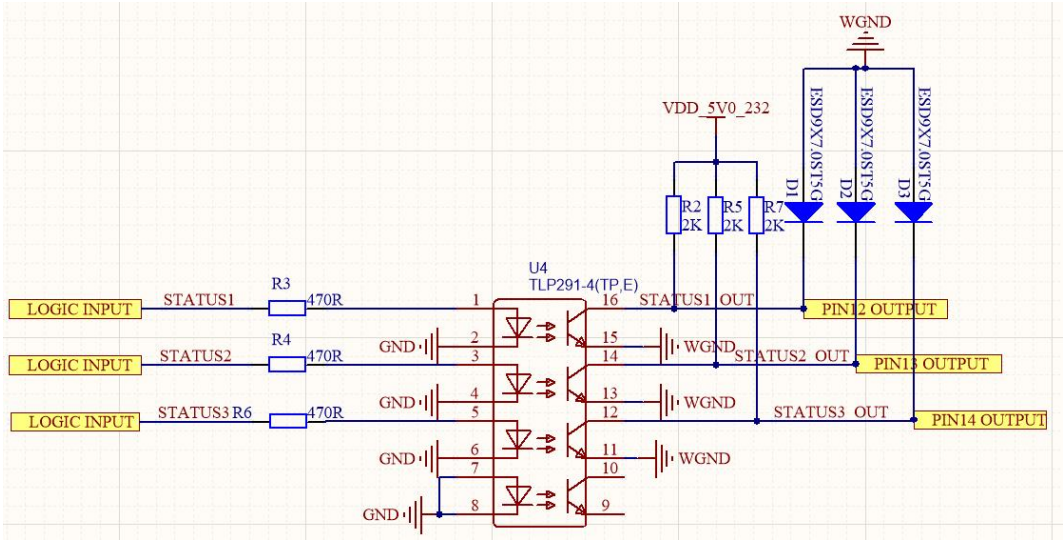
Maximum input voltage is 5.5V, and the minimum operating input current is 1mA.



Pin 18, Pin 19, and Pin 22 Input

Maximum input voltage is 5.5V, and the minimum operating input current is 1mA.

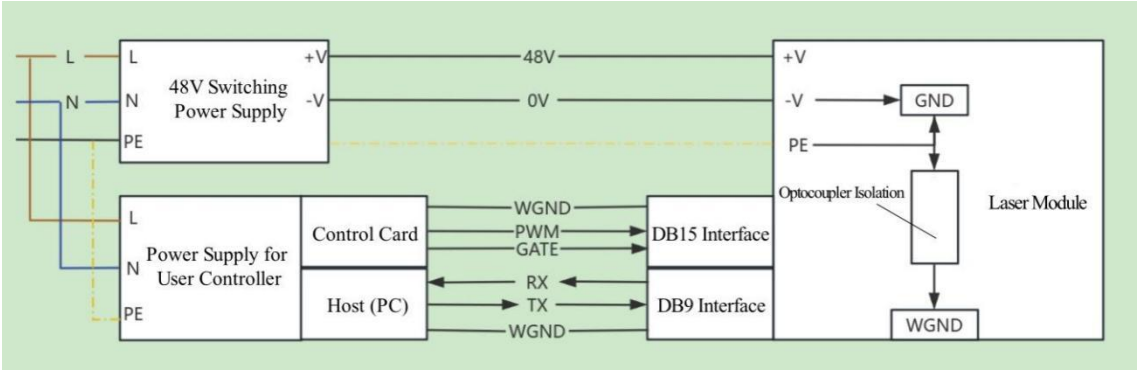
2. Digital signal output



Pin 12, Pin 13, and Pin 14 Output

The output voltage is 5V, and the maximum driving output current is 1mA.

3. Electrical connection diagram



4. Power cable connection definitions

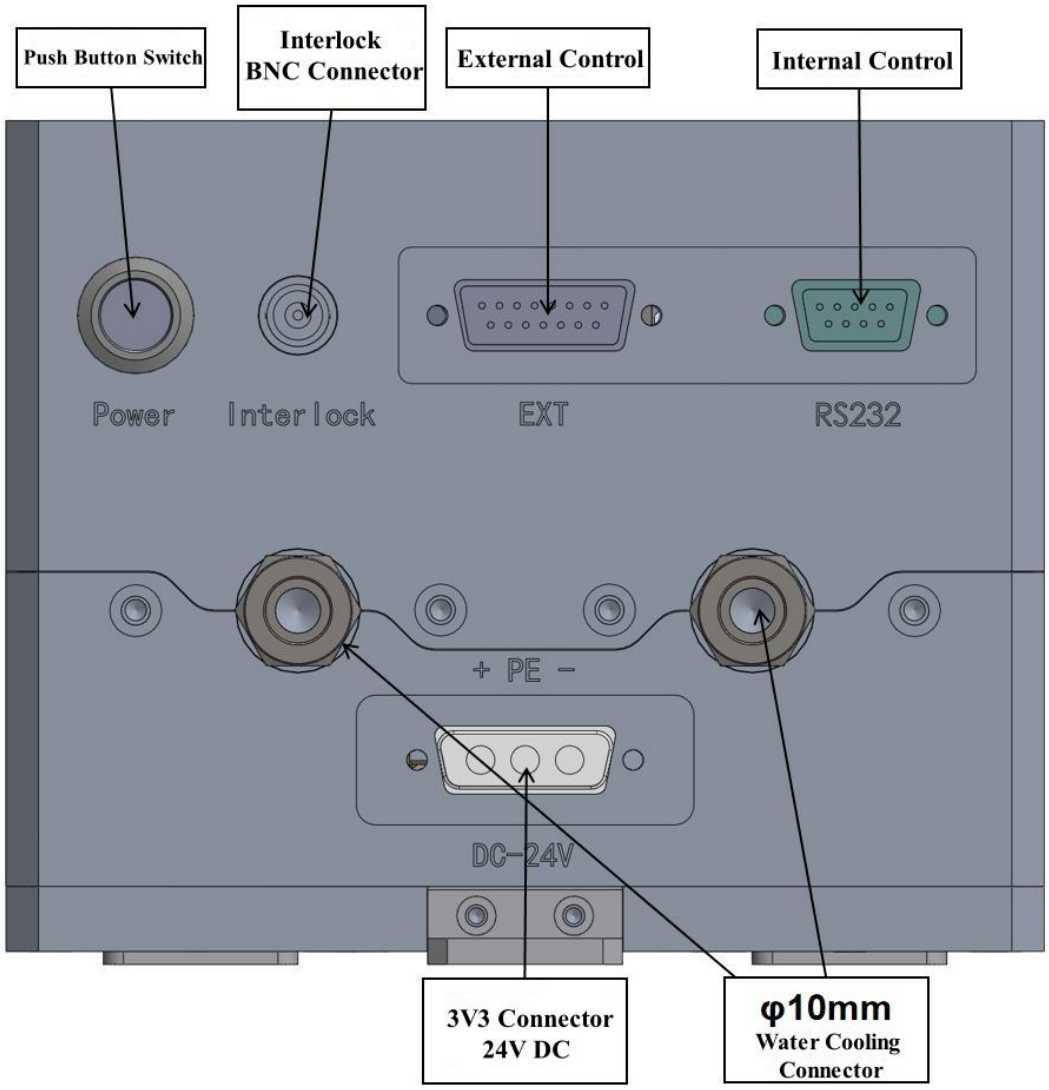


Figure 1 Panel wiring diagram

Name	Color	Definition	Wiring Description	Notes
PE	Yellow-green	GND	This port should be connected to the grounding port of the equipment integrator.	Cable specification: The total cable length is approximately 3±0.1m (with a cross-sectional area of 3*2.5mm^2). The default reserved length of stripped wire at the end of the cable is 10cm.
0 V	Blue	Power negative pole	This port should be directly connected to the negative pole of the switching power supply.	
+24 V	Brown	Main power supply +24V	For conventional low to medium power products of 30W and below, this port should be directly connected to the +24V port of the switching power supply.	
+48 V	Brown	Main power supply +48V	For high-power nanosecond ultraviolet lasers of 30W and above, this port should be directly connected to the +48V port of the switching power supply.	

5. Definition of DB header interface for signal cables

DB connector types	Pin	Definition	Wiring descriptions	Note
DB9 female connector (RS232)	2	RXD	RS232 interface. No soldering of wires is required. It can generally be directly connected to the computer's USB port using the serial port cable provided by our company.	
	3	TXD		
	5	GND		
	1,4,6-9	No connection		
DB15 female connector (Ext control)	2	Gate (active high)	Connected to the high-level laser emission signal of the marking card	The high-level signal range for DB15 signals is greater than 3.5V and less than 5.4V. The low-level signal is less than 0.8V. Pins 12 and 14 can be used at the user's discretion.
	3	PWM	Connected to the frequency signal of the marking card	
	5	GND	Connected to the GND of the marking card	
	6	inter lock	Water flow rate alarm signal	
	7	inter lock	Water flow rate alarm signal	
	12	READY	Readiness status indication, active high	
	13	ERR	Fault alarm	
	14	EMISSION	Laser emission status indication, active high	
	15	GND	Connected to the GND of the marking card	
	Others	No connection	Disconnected	

6. Common control board definitions

(For control boards of other brands, please contact our company in advance to confirm the corresponding pin definitions.)

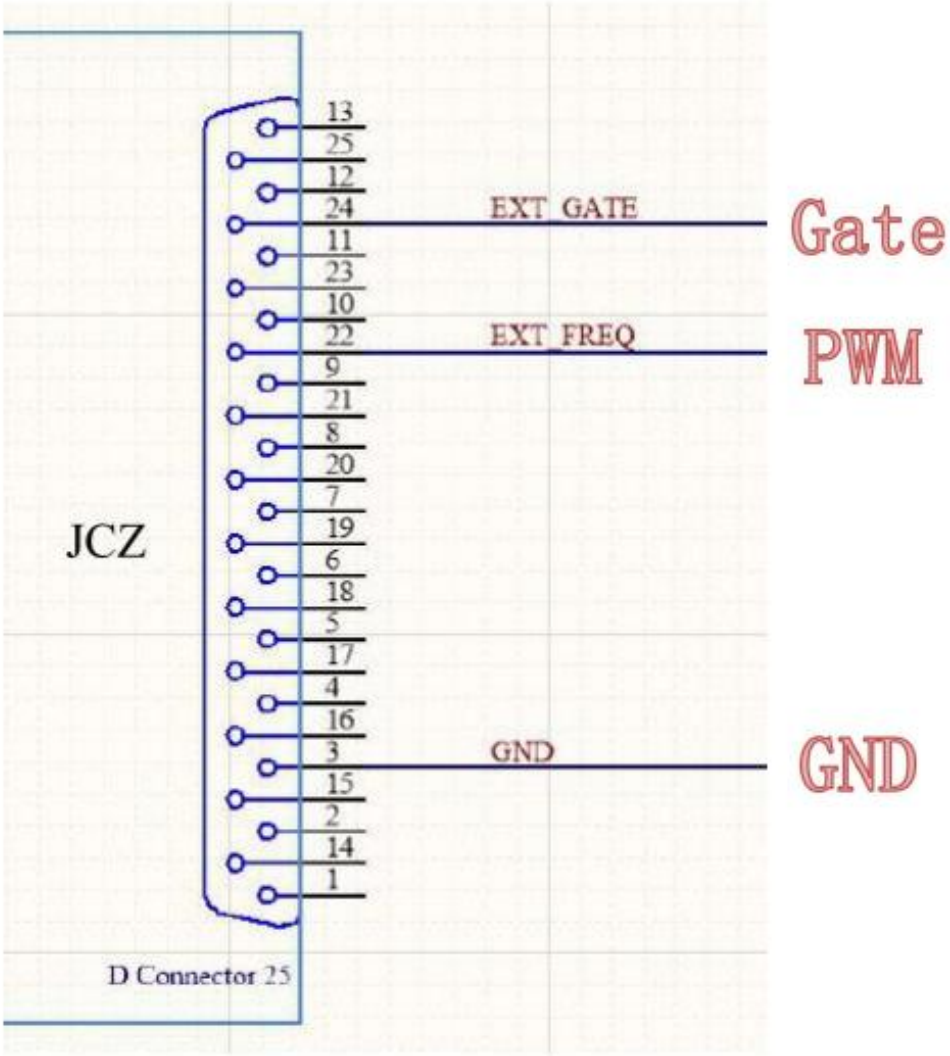


Figure 2 Wiring diagram of JCZ control board

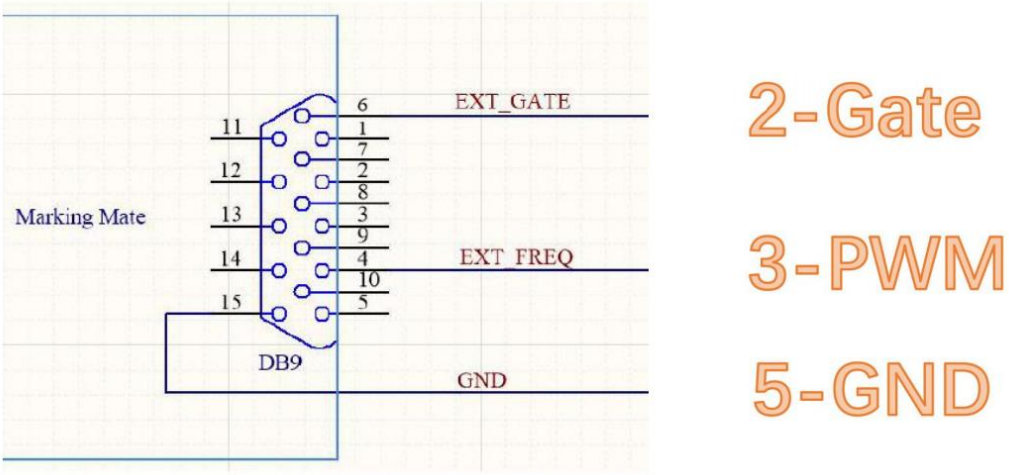


Figure 3 Wiring diagram of Eastern Logic control board

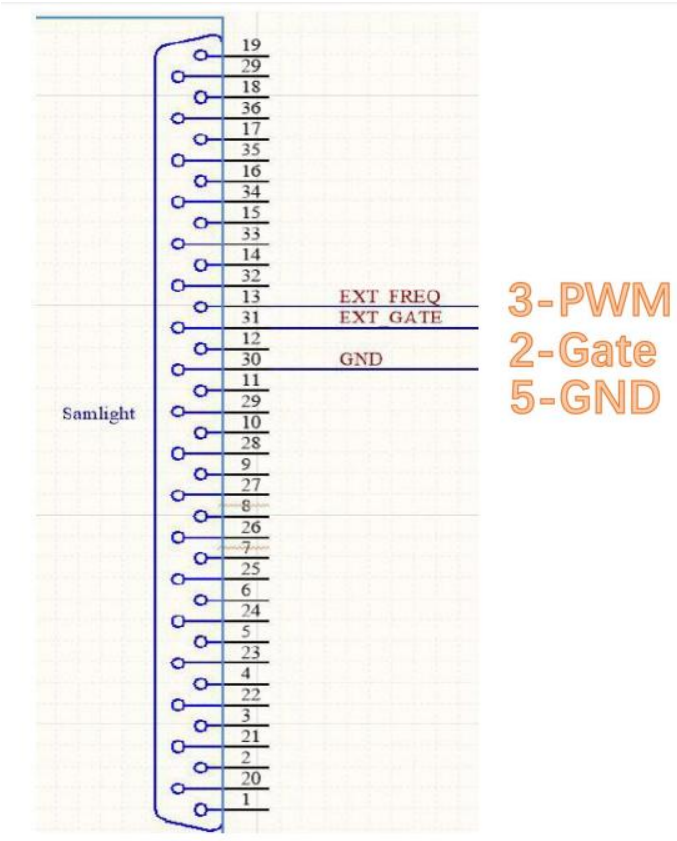


Figure 4 Wiring diagram of SamLight control board

Chapter 4 Software Instructions

1. Software installation

1) Decompress the RS232 serial port program package **(Win8 and above systems are directly connected to the cable, no need to install the driver)**;

2) Run \Driver\PL2303_Prolific_DriverInstaller_v1.12.0.exe;

3) Install by default.

As shown below:

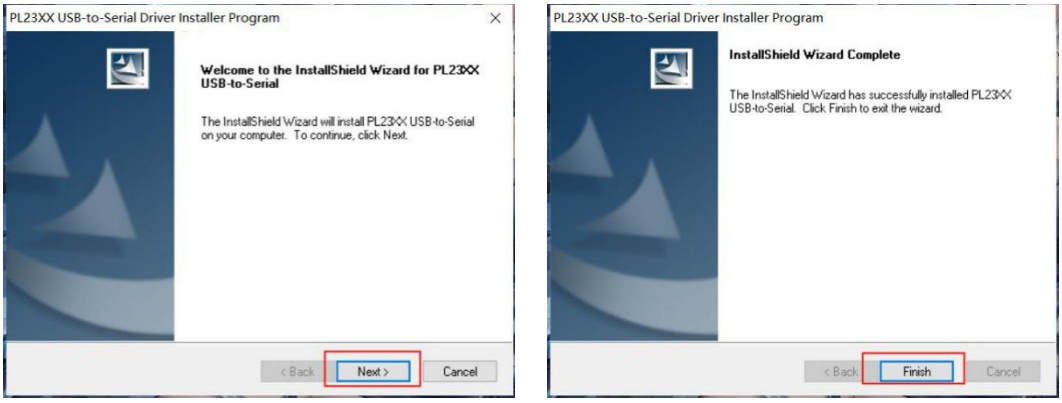


Figure 5 USB to RS232 driver installation

After the installation is complete, use a serial port cable to connect the computer and the laser, and check the serial number. Open the Device Manager, as shown below:

You can see that the port will have a serial port connection, and the figure shows the COM3 port.



Figure 6 Port interface diagram

2. Upper computer interface description

1) Introduction of functional interfaces

This upper computer software consists of two interfaces: the initial interface and the solid-state ultraviolet operation interface. When the software is opened, the initial interface is displayed first. After successfully connecting to the laser, it will automatically switch to the operation page.



Figure 7 GUI initial interface diagram

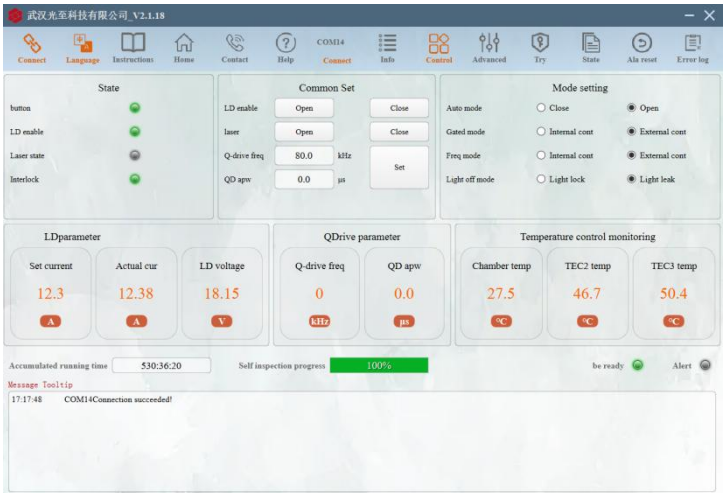


Figure 8 GUI operational interface diagram

Table 1 Navigation functions

Category	Description
Connect	It is a fast connection, the USB to RS232 serial port cable is connected to the computer, click “Connect” and the port connected to the computer can be identified at this time.
Language	The interface displays Chinese by default. Press to switch to English.
Instructions	Click to open the software user manual.
Home	Click to open the link to our company’s official website.
Contact	Click to open the link to our company’s contact information interface.
Help	Click to open the link to our company’s relevant file download interface.
Manual Connection	Manually select the serial port corresponding to the laser. Press to start connecting to the laser.
Information	Press to switch the main interface to the information interface.
Control	The default main interface.
Advanced	Press to switch the main interface to the advanced control interface.
Try	Press to switch the main interface to the trial interface.
State	Press to switch the main interface to the status interface.
Alarm Reset	When the laser encounters an abnormality, click this button to send a reset command.
Error Log	Click this button to view error information.

Table 2 Commonly-used functions

Functions	Description
Laser-on	Set the laser emission control to internal control. Click the laser-on control software. When the laser status in the status bar turns green, it indicates the laser-on; when the laser status in the status bar is gray, it indicates the laser-off.
Frequency Setting	Set the frequency control to internal control. Enter the set value in the input box and click “Set” to send the command.
Pulse Width Setting	Enter the set value in the input box and click “Set” to send the command.
LD Enable	When the automatic mode is turned on, the current set in the previous session will be automatically loaded upon startup. While the automatic mode is on, the status light turns green; when it’s off, the status light turns gray. The data is refreshed in real-time.
Automatic Mode	Turn Off: When the automatic mode is turned off, click the “Turn Off” button. After turning it off, it has the function of LD disabling. Turn On: When the automatic mode is turned on, click the “Turn On” button. After turning it on, it automatically loads the LD current and also has the function of LD enabling.
Laser Emission Mode	Internal Control: When the laser emission mode is set to internal control, click the “Internal Control” button. At this time, the laser can be turned on or off by using the laser on/off buttons. External Control: When the laser emission mode is set to external control, click the “External Control” button. At this time, the laser on/off buttons cannot control the turning on or off of the laser; it is controlled by external input.

Frequency Mode	Internal Control: When the frequency mode is set to internal control, click the “Internal Control” button. In this mode, the frequency can be manually set via the upper computer. External Control: When the frequency mode is set to external control, click the “External Control” button. In this mode, the frequency is controlled externally and remains consistent.
Laser-off Mode	Laser Leakage: When the laser-off mode is set to laser leakage, click the “Laser Leakage” button. In this mode, the Gata signal is at a low level, and the laser emits a continuous leakage of laser. Laser Locking: When the laser-off mode is set to laser locking, click the “Laser Locking” button. When the pre-release compression mode’s Gata is at a low level, the laser locks laser.
LD Parameters	Actual Current: Displays the actual driving current of the laser. Supply Voltage: Displays the supply voltage for the laser’s LD. Set Current: Sets the current for the LD.
Frequency	Displays the laser emission frequency when in internal control mode.
Pulse Width	Displays the laser release time when in internal control mode.
Cavity Temperature	Monitors the temperature of the laser cavity.
TEC2 Temperature	Real-time monitoring of TEC2 temperature
TEC3 Temperature	Real-time monitoring of TEC3 temperature
Message Prompt Box	Records and prompts operational actions.
Accumulated Running Time	The cumulative time the laser has been turned on, starting from the moment the laser is powered on.
Accumulated Laser Emission Time	The cumulative time the pump has emitted laser.

Ready	When the “Ready” indicator is green, it means the system has no errors, and the temperature control has reached within ±0.2℃ of the setpoint.
Alert	When an alarm occurs, the indicator light turns red.

2) Introduction of the status bar interface

When an abnormality occurs in the laser, you can check the detailed abnormal information on the status interface. When the laser is not connected, the corresponding status indicator on the interface defaults to gray. A green status light indicates normal operation, while a red status light signifies an abnormal condition.

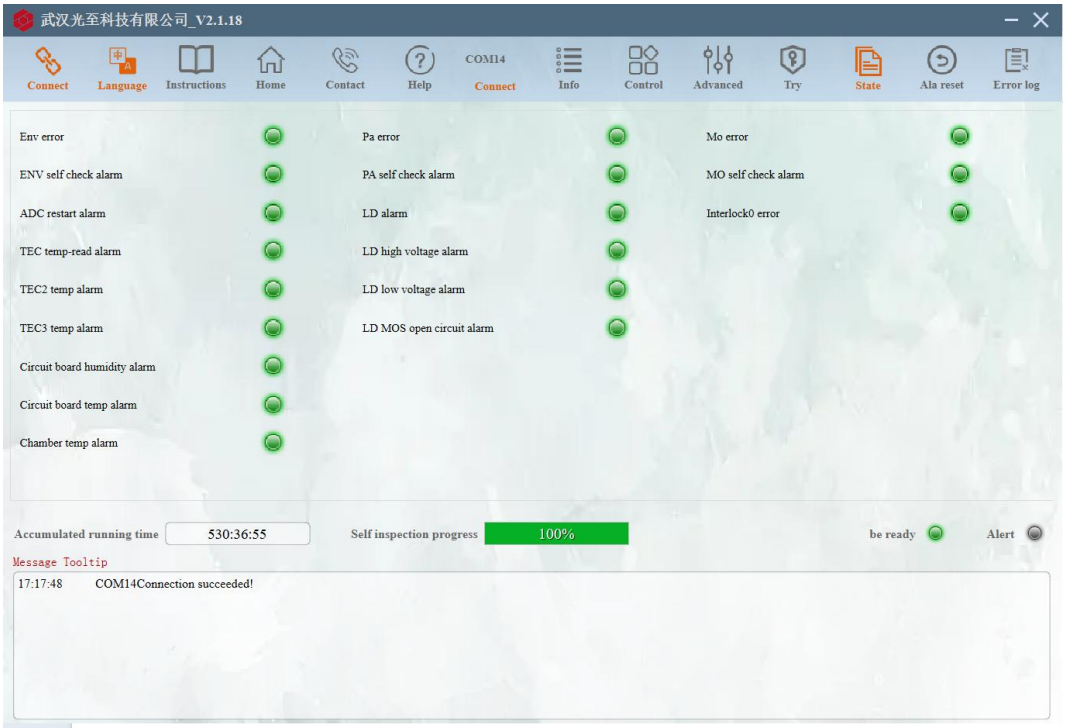


Figure 9 Status display interface diagram

3. Upper computer software connection

1) Automatic connection

Upon clicking the “Automatic Connection” button, the software will automatically traverse all available serial ports on the current system. During the connection process, it will send commands to the laser. The connection is deemed successful only when it is confirmed that the serial port cable is connected to the laser. If not, it will proceed to test the next serial port. This process continues until either all serial ports have been traversed or a successful connection is established on one of them. Meanwhile, connection information will be displayed in a message box. If the serial port number corresponding to the laser is already known, it is recommended to use the manual connection method.

2) Manual connection

Select the corresponding serial port of the laser from the drop-down box above the button. Press the “Manual Connection” button to initiate the connection process. A pop-up window will appear to indicate whether the connection is successful or not, and connection information will be displayed in a message box. If the current computer is connected to a large number of serial ports, it is recommended to use the manual connection method, as it will take less time.

3) Reasons for connection failure

① The serial port driver is not installed successfully;

② The laser is not powered on;

③ The serial port cable is not connected to the laser;

④ The serial port cable is occupied by other software;

⑤ After the laser is powered on, connecting it immediately will cause the laser connection to fail. Please try to reconnect;

⑥ The serial port is stuck. Re-plug the serial port or restart the computer.

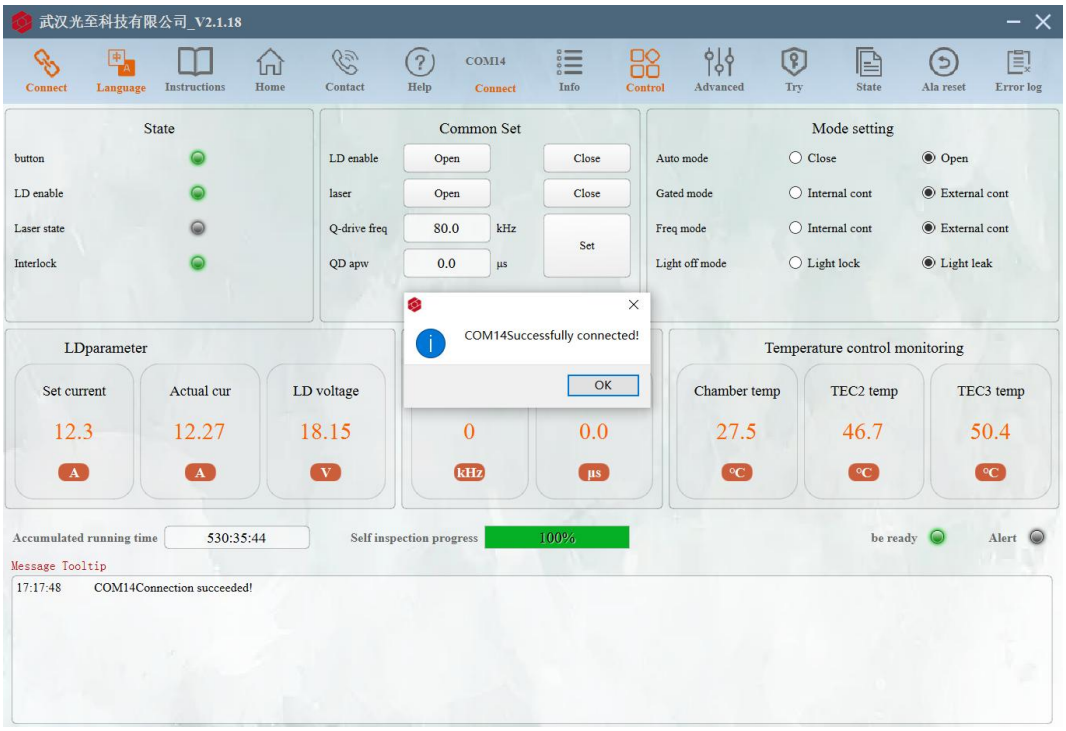


Figure 10 Successful connection diagram of the upper computer

Chapter 5 Product Usage

1. Operating conditions and requirements

1) It is recommended to install horizontally.

2) For air-cooled laser models, the distance between obstacles and both the air outlet and air inlet on either side must be no less than 50mm. It is strictly prohibited to place obstacles at the air outlet to block the air duct, so as to avoid hot air backflow.

3) The laser shall not be installed in harsh environments such as those with corrosive or flammable gases, dust, oil mist, conductive dust, high humidity, strong magnetic fields, or near heat sources.

2. Laser startup procedure

1) Ensure that the water tank is connected to the laser and set to operate at the correct cooling temperature;

2) Securely fasten the laser and ensure that there are no obstructions in the optical path or at the laser exit port;

3) Connect the power cable to a +24V DC constant-voltage switching power supply (For nanosecond UV lasers with 30W or higher power, use a +48V DC constant-voltage switching power supply). Ensure that the DC constant-voltage power supply can provide sufficient output power. Refer to the power interface definitions or the product specifications of our corresponding product series. Incorrect power connections may cause damage to the laser;

4) Connect the signal cable between the device and the laser, and check that it is securely locked;

5) Ensure that the serial port assistant software and the laser host computer software are properly installed;

6) **Power-on in automatic mode:** Simply press the power button on the laser cavity to complete the power-on and readiness process. This is the default factory mode.
Power-on in manual mode: Open the laser control software, and sequentially click the LD on, QS on, Beam on, etc., buttons in the software's startup control area to complete the power-on and laser emission process.

3. Laser shutdown steps

1) Open the laser control software;
2) Click LD OFF on the software interface or directly press the switch button of the laser cavity to complete the power off;
3) Make sure that the laser is powered off before closing the cooling water tank.

4. Beam expander replacement method

Note: Replacing a beam expander must be carried out in an ultra-clean environment to avoid contamination of the beam expander or window, which could increase the risk of component damage and reduce the service life of the laser.

Our company currently offers three main types of beam expanders: non-detachable, flange-mounted, and threaded.

1) Non-detachable beam expander: This is a proprietary product developed by our company. The beam expander tube is marked with “Do Not Disassemble”. It is not available for external sale. When replacement is necessary, the unit must be returned to our company for replacement by professional personnel in an ultra-clean environment.
2) Flange-mounted beam expander: This is also a proprietary product of our company. You may contact our after-sales service personnel to purchase it and replace it yourself.
3) Threaded beam expander: This type is similar to standard beam expanders available on the market. After confirming the thread specifications, expansion ratio, and length with our after-sales service personnel, you may purchase it yourself or contact our company for procurement and replacement.

Installation steps for flange-mounted beam expander:

1) Remove the galvanometer connection tube and then remove the flange-mounted beam expander. The mounting surface of the flange-mounted beam expander is a flange, which is secured by four M3*12 screws.

2) Replace the beam expander with one of the same specifications according to the type of beam expander installed on the laser. Ensure that the laser beam passes through the exact center of the beam expander during fixation (this operation requires turning on the indicator light for guidance), and tighten the screws to secure it.

Installation steps for threaded beam expander:

1) The thread specifications for threaded beam expanders vary, such as M22*0.75, M30*0.75, etc. Please consult our after-sales personnel for the specific specifications. The threaded beam expander needs to be installed on a beam expander adapter. Simply tighten the threaded beam expander with a sealing ring onto the adapter.

2) Adjust the adapter to ensure that the beam passes through the exact center of the beam expander (The indicator light needs to be turned on for operation.), and then tighten the screws to secure it in place.

Steps to adjust the divergence angle of the beam expander:

1) Turn on the indicator light to project the laser spot onto a white sheet of paper. Move the white paper while observing the size of the laser spot. If the spot size remains unchanged as you move from a farther position to a closer one (approximately 3 meters from the beam expander exit port), it indicates that the laser beam is collimated.

2) If the spot size becomes smaller as you move from a closer position to a farther one, it indicates that the laser beam is converging. In this case, you need to rotate the lens tube inward and observe the change in spot size again until it remains unchanged.

3) If the spot size becomes larger as you move from a closer position to a farther one, it indicates that the laser beam is diverging. In this case, you need to rotate the lens tube outward and observe the change in spot size again until it remains unchanged. When fixing the lens tube, simply rotate it inward and the retaining ring outward to press them firmly together.

4) Once the laser beam passes through the exact center of the beam expander and is collimated, and all screws and retaining rings are tightened, the replacement of the beam expander is complete.

5. Window mirror replacement method

Note: The replacement of the window mirror should be performed in an ultra-clean environment. Replacing it in other environments may cause contamination to the beam expander, window mirror, and optical cavity, increasing the risk of component damage and reducing the service life of the laser.

Special instructions: Our company shall not be held responsible for any damage caused by optical cavity contamination resulting from the replacement of the window mirror at the customer's site.

Steps to replace the window mirror:

1) Remove the galvanometer connection tube, beam expander, and window mirror.

2) Turn on the indicator light and install the window mirror at the light exit port. For UV products, position the beveled edge of the window mirror to the left or right (based on whether the indicator light passes through the exact center of the window mirror's light exit port). For green laser products, position the beveled edge of the window mirror downward.

3) After securing the window mirror, install the beam expander and galvanometer connection tube in sequence. Refer to section 4 for installation steps.

6. Precautions

1) Wear laser safety glasses during operation.

2) Before shutting down, stop the laser operation first, then cut off the power, and finally turn off the cooling water tank.

3) In case of any uncontrollable dangerous situation, you can directly unplug the power plug to forcibly cut off the power.

Chapter 6 Product FAQ Troubleshooting Instructions

1. Laser alarm prompts and solutions

No.	Alarm status	Alarm description	Solution
1	Overcurrent protection	The current exceeds the preset protection current value.	
2	Overvoltage protection	The voltage exceeds the preset protection voltage value.	
3	Open-circuit protection	LD is not connected or the connecting wire is disconnected.	
4	Short-circuit protection	LDP and LDN are short-circuited or the LD voltage is below 2V.	
5	Interlock	Interlock alarm	The Interlock signal is not short-circuited. Please short-circuit the ports again.
6	TempSwitch	Reserved interlock	Not enabled
7	QD LP Error	Q drive low power alarm	Not enabled
8	QD HP Error	Q drive high power alarm	Not enabled
9	TEC1 temperature protection	Channel 1 temperature alarm	Exceeds set temperature value or NTC not connected

10	TEC2 temperature protection	Channel 2 temperature alarm	Exceeds set temperature value or NTC not connected
11	TEC3 temperature protection	Channel 3 temperature alarm	Exceeds set temperature value or NTC not connected
12	Monitor protection	Cavity temperature alarm. Cavity temperature exceeds set temperature value (Default 35℃)	Cavity temperature exceeds set safety range. Check if water tank is on, water temperature is normal, or water pipes are bent or blocked.
13	Board protection	Over-temperature alarm for circuit board	Not enabled

After resolving the alarm, you need to click the **alarm reset** button on the interface and then power on the laser again. For Interlock alarms, the system can automatically reset after the alarm is cleared, and no manual reset is required. In automatic mode, when the Interlock alarm is reset, the laser will automatically restart and enter the ready state.

2. Common product problems and solutions

No.	Problem description	Solutions
1	No laser emitting	1) Check the water flow through the laser and make sure the laser path is not blocked; 2) Check the hardware connection, DB9 and DB15 connection; 3) Check the input signal voltage; 4) Check that the software settings are normal: the marking is controlled externally; 5) Connect our upper-computer software to control the laser device to emit laser. If the laser device fails to emit laser, an alarm message will be displayed.
2	Weak laser energy	1) Please measure the laser output power under the guidance of our technical staff.
3	Abnormal laser spot	1) When the laser is power-off, check whether the laser output lens is clean and undamaged; 2) Check whether the mirror of galvanometer and field lens is normal.
4	Reduced marking capability	1) Check whether the laser parameters are appropriate; 2) Check the status of the marking machine, adjust the lifting rod, check whether the laser spot is stuck, whether the output laser spot is a circular spot, and check whether the external optical path components are contaminated, such as the galvanometer and field lens; 3) Check whether the focus of the laser spot falls on the processing material; 4) Check whether the laser output power is normal.
5	Laser parameters not adjustable	1) Check whether the DB15 cable is normal and replace it . 2) If the solutions cannot be resolved using the above methods, please contact our technical staff.

If the above solutions still cannot solve the problem, please contact our after-sales personnel.

Chapter 7 Warranty Statement

Damage to personnel or equipment caused by failure to operate in accordance with this manual is not covered by the warranty;

Users are prohibited from disassembling or assembling the equipment by themselves, and repairs must be carried out by authorized technicians from GZTECH.

Do not open the laser. If you encounter any malfunctions or have questions, please contact Wuhan Guangzhi Technology Co., Ltd. If the label is torn off or damaged, the company will not provide a warranty.

Warranty Terms for Fiber Laser Products: The free warranty period for fiber lasers starts from the date of the sales contract and varies from 24 months to 36 months depending on the model, with the specific period subject to the contract agreement;

Warranty Terms for Solid-State Laser Products: The free warranty period for solid-state lasers starts from the date of the sales contract and is 18 months, with the specific period subject to the contract agreement. For wear-and-tear components exposed to the user's operating environment, including beam expanders and window mirrors, the warranty period is 6 months.

Extended Warranty Service: After the laser warranty expires, to ensure post-sales service quality, customers can purchase extended warranty services. For specific pricing, please consult the business department.

Remote Service: For laser malfunction issues, please call our after-sales service hotline tel: 400-863-9698. We promise to respond within 24 hours.

Certificates

RoHS Certification



UDEM

RoHS COMPLIANCE
DIRECTIVE 2011/65/EU
ATTESTATION OF CONFORMITY

Technical file of the company mentioned below has been inspected and assessment has been completed successfully

2011/65/EU RoHS Compliance of Directive have been taken as references for these processes

Company Name	: **Wuhan Guangshi Technology Co., Ltd.**
Company Address	: Room 201, Building 8, Optics Valley Electronics Industrial Park, No. 28,Guoxin 4th Road, East Lake High-tech Development District, Wuhan City, Hubei Province, China
Related Directives and Annex	: **Directive 2011/65/EU Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment**
Related Standards	: **EN 62321-4:2013+A1:2017; IN 62321-5:2013 IN 62321-6:2015; IN 62321-7-1:2015 IN 62321-7-2:2017; EN 62321-8:2017**
Product Name	: **Laser**
Report No and Date	: HTT102311055CH
Product Brand/Model/Type	: GZ IR/SH / S-5-355, YFPS-20-CGO, YFPS-20-CGO, YFPS-08-CG, YFPS-60-CG, YFPS-60-CGL, YFPS-60-CGH, YFPS-60-CGHL, YFPS-60-CGHH, YFPS-60-CGHHL, YFPS-100-CG, YFPS-100-CGL, YFPS-100-CGH, YFPS-150-CG, YFPS-150-CGL, YFPS-150-CGH, YFPS-150-CGHL, YFPS-150-CGHH, YFPS-150-CGHHL, YFPS-200-CG, YFPS-200-CGL, YFPS-200-CGH, YFPS-200-CGHL, YFPS-200-CGHH, YFPS-200-CGHHL, YFPS-300-CG, YFPS-300-CGL, YFPS-300-CGH, YFPS-300-CGHL, YFPS-300-CGHH, YFPS-300-CGHHL, YFPS-400-CG, YFPS-400-CGL, YFPS-400-CGH, YFPS-400-CGHL, YFPS-400-CGHH, YFPS-400-CGHHL, YFPS-500-CG, YFPS-500-CGL, YFPS-500-CGH, YFPS-500-CGHL, YFPS-500-CGHH, YFPS-500-CGHHL, YFPS-600-CG, YFPS-600-CGL, YFPS-600-CGH, YFPS-600-CGHL, YFPS-600-CGHH, YFPS-600-CGHHL, YFPS-800-CG, YFPS-800-CGL, YFPS-800-CGH, YFPS-800-CGHL, YFPS-800-CGHH, YFPS-800-CGHHL, YFPS-1000-CG, YFPS-1000-CGL, YFPS-1000-CGH, YFPS-1000-CGHL, YFPS-1000-CGHH, YFPS-1000-CGHHL, YFPS-1500-CG, YFPS-1500-CGL, YFPS-1500-CGH, YFPS-1500-CGHL, YFPS-1500-CGHH, YFPS-1500-CGHHL, YFPS-2000-CG, YFPS-2000-CGL, YFPS-2000-CGH, YFPS-2000-CGHL, YFPS-2000-CGHH, YFPS-2000-CGHHL, S-5-355, S-10-355, S-15-355, S-20-355, S-25-355, S-30-355, S-40-355, S-50-355, YFPS-80-CG, YFPS-80-CGL, YFPS-80-CGH, YFPS-80-CGHL, YFPS-80-CGHH, YFPS-80-CGHHL, YFPS-100-CG, YFPS-100-CGL, YFPS-100-CGH, YFPS-100-CGHL, YFPS-100-CGHH, YFPS-100-CGHHL, YFPS-200-CG, YFPS-200-CGL, YFPS-200-CGH, YFPS-200-CGHL, YFPS-200-CGHH, YFPS-200-CGHHL, YFPS-300-CG, YFPS-300-CGL, YFPS-300-CGH, YFPS-300-CGHL, YFPS-300-CGHH, YFPS-300-CGHHL, YFPS-400-CG, YFPS-400-CGL, YFPS-400-CGH, YFPS-400-CGHL, YFPS-400-CGHH, YFPS-400-CGHHL, YFPS-500-CG, YFPS-500-CGL, YFPS-500-CGH, YFPS-500-CGHL, YFPS-500-CGHH, YFPS-500-CGHHL, YFPS-600-CG, YFPS-600-CGL, YFPS-600-CGH, YFPS-600-CGHL, YFPS-600-CGHH, YFPS-600-CGHHL, YFPS-800-CG, YFPS-800-CGL, YFPS-800-CGH, YFPS-800-CGHL, YFPS-800-CGHH, YFPS-800-CGHHL, YFPS-1000-CG, YFPS-1000-CGL, YFPS-1000-CGH, YFPS-1000-CGHL, YFPS-1000-CGHH, YFPS-1000-CGHHL, YFPS-1500-CG, YFPS-1500-CGL, YFPS-1500-CGH, YFPS-1500-CGHL, YFPS-1500-CGHH, YFPS-1500-CGHHL, YFPS-2000-CG, YFPS-2000-CGL, YFPS-2000-CGH, YFPS-2000-CGHL, YFPS-2000-CGHH, YFPS-2000-CGHHL, S-5-355, S-10-355, S-15-355, S-20-355, S-25-355, S-30-355, S-40-355, S-50-355, YFPS-80-CB, YFPS-80-CBL, YFPS-80-CBH, YFPS-80-CBHL, YFPS-80-CBHH, YFPS-80-CBHHL, YFPS-100-CB, YFPS-100-CBL, YFPS-100-CBH, YFPS-100-CBHL, YFPS-100-CBHH, YFPS-100-CBHHL, YFPS-200-CB, YFPS-200-CBL, YFPS-200-CBH, YFPS-200-CBHL, YFPS-200-CBHH, YFPS-200-CBHHL, YFPS-300-CB, YFPS-300-CBL, YFPS-300-CBH, YFPS-300-CBHL, YFPS-300-CBHH, YFPS-300-CBHHL, YFPS-400-CB, YFPS-400-CBL, YFPS-400-CBH, YFPS-400-CBHL, YFPS-400-CBHH, YFPS-400-CBHHL, YFPS-500-CB, YFPS-500-CBL, YFPS-500-CBH, YFPS-500-CBHL, YFPS-500-CBHH, YFPS-500-CBHHL, YFPS-600-CB, YFPS-600-CBL, YFPS-600-CBH, YFPS-600-CBHL, YFPS-600-CBHH, YFPS-600-CBHHL, YFPS-800-CB, YFPS-800-CBL, YFPS-800-CBH, YFPS-800-CBHL, YFPS-800-CBHH, YFPS-800-CBHHL, YFPS-1000-CB, YFPS-1000-CBL, YFPS-1000-CBH, YFPS-1000-CBHL, YFPS-1000-CBHH, YFPS-1000-CBHHL, YFPS-1500-CB, YFPS-1500-CBL, YFPS-1500-CBH, YFPS-1500-CBHL, YFPS-1500-CBHH, YFPS-1500-CBHHL, YFPS-2000-CB, YFPS-2000-CBL, YFPS-2000-CBH, YFPS-2000-CBHL, YFPS-2000-CBHH, YFPS-2000-CBHHL, YFPS-300-CCL, YFPS-600-CCL, YFPS-1000-CCL
Certificate Number	: **M.2023.206.C/92704**
Initial Assessment Date	: 10.11.2023
Registration Date	: 13.11.2023
Reissue Date/No	: -
Expiry Date	: **12.11.2028**

UDEM International Certification Auditing Training Centre Industry and Trade Inc.Co

The validity of the certificate can be checked through www.udem.com.tr. Upon completion of EC declaration of conformity,it is solely at the manufacturer's responsibility. This certificate remains the property of UDEM International Certification Auditing Training Centre Industry and Trade Inc. Co. to whom it must be returned upon request. The above named firm must keep a copy of this certificate (3) year from the registration of certificate. This certificate only covers the product(s) stated above and UDEM must be notified in case of any changes on the product(s).

Address: Mahkemeyi Mahallesi 3093 Sokak (Eski 91 Sokak) No:10 Çankaya – Ankara – TÜRKİYE
Phone: +90 0312 443 03 90 Fax: +90 0312 443 03 79
E-mail: info@udem.com.tr www.udem.com.tr

FCC Certification



CERTIFICATE
of Conformity

Registration No.:	AK 50604027 0001
Report No.:	CN23J03K 001
Holder:	Wuhan Guangshi Technology Co., Ltd. Room 102, Building 6, Optics Valley Electronics Industrial Park, No. 28, Gaoxin 4th Road, East Lake High-tech Development District, Wuhan City, Hubei P.R. China
Product:	Laser Equipment *(MOPA Pulsed Fiber Laser)*

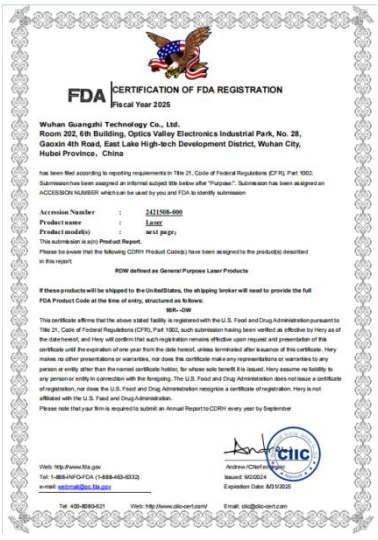
Type designation listed on the next page

The certificate of conformity refers to the above-mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned on the next page. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Certification Body
Date: 2023-10-16
Xinhua Lu

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg
www.tuv.com
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Page 1 of 2

FDA Certification



FDA CERTIFICATION OF FDA REGISTRATION
Fiscal Year 2025

Wuhan Guangshi Technology Co., Ltd.
Room 202, 6th Building, Optics Valley Electronics Industrial Park, No. 28, Gaoxin 4th Road, East Lake High-tech Development District, Wuhan City, Hubei Province, China

has been filed according to reporting requirements in Title 21, Code of Federal Regulations (CFR), Part 1002. Submission has been assigned an informal subject title below after "Purpose:". Submission has been assigned an ACCESSION NUMBER which can be used by you and FDA to identify submission

Accession Number	:	2421508-000
Product name	:	Laser
Product model(s)	:	next page;

This submission is a(n) **Product Report.**

Please be aware that the following CDRH Product Code(s) have been assigned to the product(s) described in this report:

ROW defined as General Purpose Laser Products

If these products will be shipped to the United States, the shipping broker will need to provide the full FDA Product Code at the time of entry, structured as follows:

95K - OW

This certificate affirms that the above stated facility is registered with the U. S. Food and Drug Administration pursuant to Title 21, Code of Federal Regulations (CFR), Part 1002, such submission having been verified as effective by Hery as of the date hereof, and Hery will confirm that such registration remains effective upon request and presentation of this certificate until the expiration of one year from the date hereof, unless terminated after issuance of this certificate. Hery makes no other presentations or warranties, nor does this certificate make any representations or warranties to any person or entity other than the named certificate holder, for whose sole benefit it is issued. Hery assume no liability to any person or entity in connection with the foregoing. The U.S. Food and Drug Administration does not issue a certificate of registration, nor does the U.S. Food and Drug Administration recognize a certificate of registration. Hery is not affiliated with the U.S. Food and Drug Administration.

Please note that your firm is required to submit an Annual Report to CDRH every year by September

CIIC
Andrew /Chief of Service
Issued: 9/2/2024
Expiration Date: 8/31/2025

Web: http://www.fda.gov
Tel: 1-888-INFO-FDA (1-888-463-6332)
e-mail: [redacted]

Tel: 405-8080-621 Web: http://www.ciic-cert.com/ Email: ciic@ciic-cert.com

CE Certification



CERTIFICATE
of Conformity
EC Council Directive (EU) 2014/30
Electromagnetic Compatibility

Registration No.:	AE 50604012 0001
Report No.:	CN23H9O 001
Holder:	Wuhan Guangshi Technology Co., Ltd. Room 102, Building 6, Optics Valley Electronics Industrial Park, No. 28, Gaoxin 4th Road, East Lake High-tech Development District, Wuhan City, Hubei P.R. China
Product:	Laser Equipment *(MOPA Pulsed Fiber Laser)*

Type designation listed on the next page

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the License Holder's disposal. This is to certify that the tested sample is in conformity with all provisions of Annex I of Council Directive (EU) 2014/30. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to the a.m. Directive.

Certification Body
Date: 2023-10-16
Xinhua Lu

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg
CE The CE marking may be used if all relevant and effective EC Directives/Regulations are complied with. CE
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For more detailed certification source documents,

please visit GZTECH official website: https://en.gzlasertech.com/