Laser instruction manual

PSU-SR

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I. Product components and accessories list

1. Laser head 	2. Power supply 
3. BNC signal modulation cable 	4. Power supply cable 

II. Use of symbols

	**Warning: This symbol is used to warn operators of hazards easily caused by visible and invisible laser radiation!**
	**Note: Remind operators to prevent danger, pay attention to whether the operation is correct, the wrong operation and connection may lead to personnel injury or damage of goods.**

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	**Danger: Beware of electric shock, high voltage danger!**

III. Safety precautions and instructions

	**Warning: Laser radiation can cause damage to eyes and skin. The safety precautions and instructions mentioned in this manual must be followed in the process of installing or operating this laser system.** **All laser safety rules and standards are applicable. The safety precautions and instructions mentioned in this manual cannot replace the safety standards applicable with other countries.**

Optical safety

	**Please pay extra attention to laser products which wavelength range is greater than 700nm (invisible infrared light) or less than 400nm (invisible ultraviolet light). Because this invisible laser is very dangerous.**

1.1. Do not observe laser or scattered laser radiation directly or indirectly.

1.2. Monitor should also be used even when the Laser level below Class I, it cannot observe directly with naked eyes.

1.3. Wear appropriate laser goggles. Even though laser goggles can protect a person's vision, make sure that never look into the laser beam or highly reflective surface.

1.4. Laser beam on highly reflective surfaces can cause serious injury, such as mirrors, glass, metal, etc. Reflected scattered lasers are also dangerous.

1.5. Do not aim at targets with a laser randomly.

1.6. Do not use the laser at the places marked "No Smoking" or "Flammable and Explosive", which may cause danger.

1.7. For invisible lasers, use an infrared detector or infrared display card to verify if the laser is working before operating the laser.

1.8. Always use clean finger cots, latex gloves and other insulation equipment when handling optic problems.

1.9. Post warning signs in notable location of laser operation area. Set up reminder signs when the laser is operating and impose restrictions on non-operating personnel to the laser working area.

1.10. If the laser is not in use or unattended, the laser should be turned off completely.

1.11. Make sure the beam height is not near eye level to avoid inadvertent eye encounter with beam.

Electrical safety

	**Unauthorized repair is not recommended and the risks arising there from shall be borne by the user. The non-tear tag fails will lose the warranty any unauthorized repair may invalidate the warranty .**

2.1. Unplug the main power cord immediately when the equipment is not in use. And keep the laser head connected with the power supply tightly to prevent static damage.

2.2. Any operations to disconnect and connect the laser head to the power supply need to ensure that the power is turned off.

2.3. If conditions permit, please keep enough distance from the device to reduce the risk of electric shock

2.4. Do not touch exposed wiring and components when power is on.

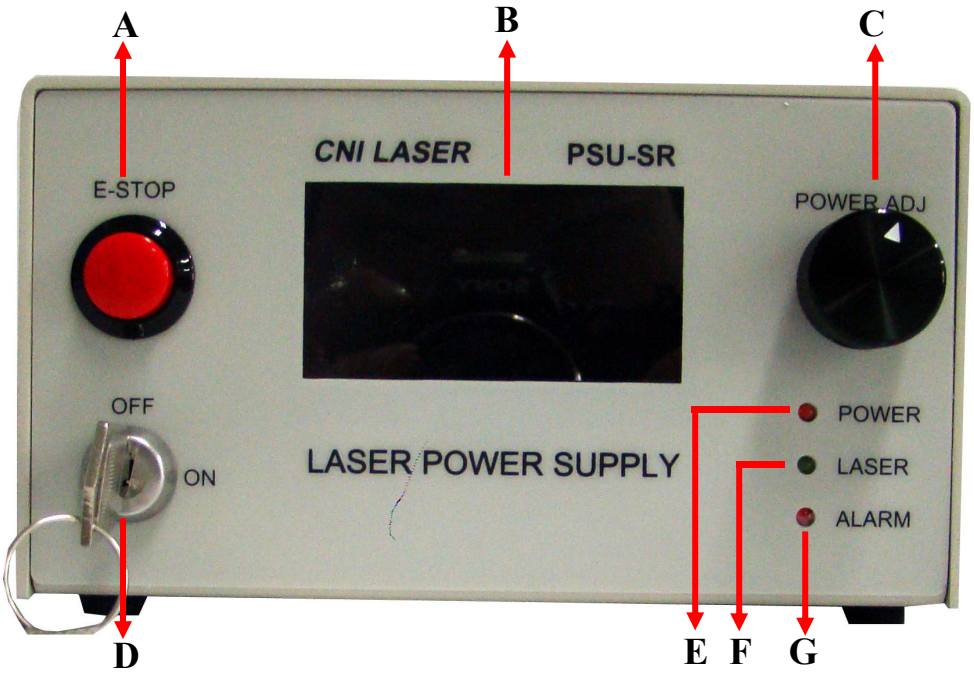
2.5. Ensure that insulated tools are used when maintaining or repairing electrical equipment.

2.6. In order to avoid damage to the laser system caused by lightning strike, static electricity, electrical interference, etc., it is necessary to ensure that the laser system is properly connected to the ground.

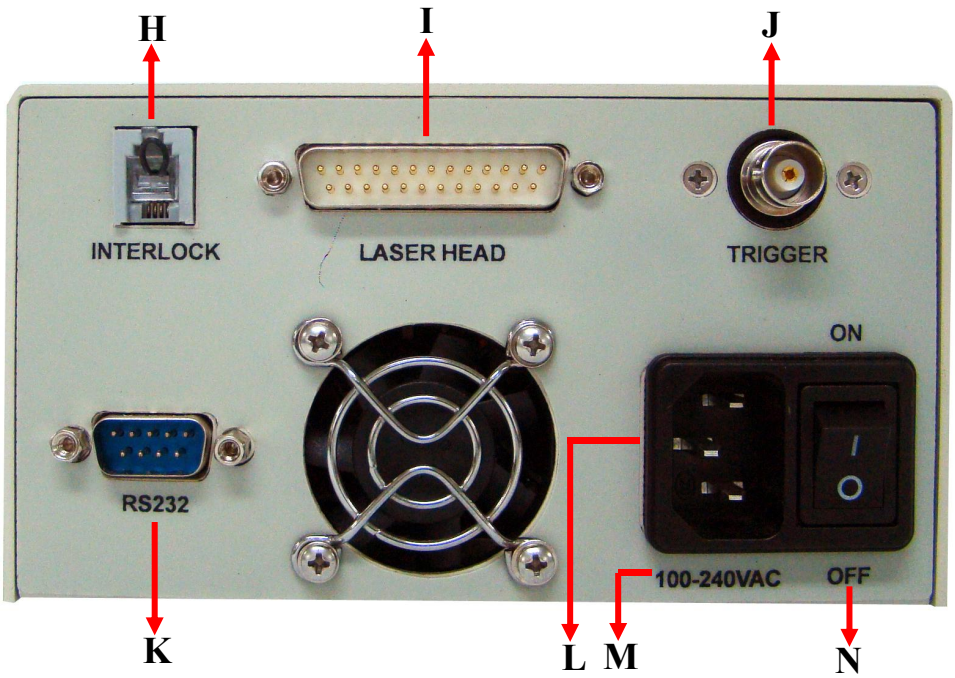
2.7. Follow all ratings on the product instructions to avoid fire disaster or electric shock. Please refer to the product instruction for detailed information about the rating before connecting the product.

IV. Power supply description and function introduction

Power supply front panel function description



Power supply back panel function description



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Function description of power supply

	Items	Function introduction
A	Emergency stop button	Press this button to stop the laser when emergency occurs. To restart the laser, you need to restart the power switch and key switch after that the laser will resume working.
B	Display	Display the working state of the laser.
C	Adjusting knob	a) Adjust current value in ACC Mode, turn the knob clockwise, the current is increased. Otherwise, the current is decreased; b） Adjust power value in APC Mode, turn the knob clockwise, the power is increased. Otherwise, the power is decreased; c） Switch the step length in Step menu; d） Switch Trigger mode in Trig menu; e） Switch lock mode in Option menu.
D	Key switch	Use this key switch to turn on and off the laser after the system is powered on.
E	Power on indicator	Connect the power supply to 100-240VAC, the power on indicator will light.
F	Laser on indicator	The “laser on indicator” will light when the laser starts to work.
G	Alarm indicator	The “Alarm indicator” will light in the following situations. ➢ Press the emergence stop button or unplug the interlock. ➢ Power supply faults. (Please turn off the laser system and contact us when this happens)
H	Security lock "interlock"	Unplug the RJ11 plug, or cut off the shorting stub on the plug (you must cut off both of the shorting stubs unless there is only one shorting stub). The laser system will stop working. The laser system can restore to normal working status by plug in the RJ11 plug or resuming shorting stub at this stage.
I	Laser head connection and control interface	It connects the laser head and power supply.
J	Trigger	Trigger is used for TTL or analog modulation. The red cable connects to positive electrode; the black cable connects to negative electrode. Connect the black cable then the red cable. The order is reversed when closing.
K	RS232 interface	Connect it to your computer via a RS232-USB cable(This machine is useless).
L	Power supply socket	Supply voltage to the power supply.
M	Voltage range	Supply voltage to the power supply as indicated.
N	Power switch	Power switch is the main power unit of the power supply. It is switched between “on” and “off”. The power supply will turn of when the power switch is set to "off".

V. Operating environment

	**Harmful laser radiation may occur if the control, adjustment and operation methods specified by CNI are not followed.**

	**It's not allowed to turn on the laser until the temperature of the laser shell close to the operating temperature, to avoid the device damage caused by excessive temperature differentials.**

	**In order to extend the lifetime of the laser, it is recommended that: do not use it over the given temperature range by CNI. If it exceeds its limit temperature, the entire system will turn to protective state and cannot output laser. Failure to operate follow this specification may cause fatal damage to the laser. All CNI lasers have electrostatic discharge protection.**

The operating environment conditions of the laser system are as follows:

1. Temperature: 10-35 ° C (ambient temperature)
   25 ± 3 ℃ (suggest base plate temperature)
2. Maximum relative humidity: <90%
3. Main power voltage: less than ± 10% of the nominal voltage.

VI. Preparing for operation

1. Check out if the power switch is set to "off".
2. Provide voltage to power supply as indicated on its back panel.
3. You need to connect a BNC signal modulation cable to the trigger on the front panel of power supply for the modulation function. The red cable connects to positive electrode; the black cable connects to negative electrode. First connect the black cable then the red cable. The order is reversed when closing.
4. RS232 interface: Need to connect with a USB to RS232 cable to use.

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VII. Installation and operating instructions

	**Make sure read all the safety instructions mentioned in the previous parts carefully and well understand.**

	**Note: The laser system must be installed and operated by a professional who is well knowledged in all laser safety terms and equipment safety. The customer should take all necessary measures to ensure the safety of the laser system. CNI is not responsible for any damage to the laser or personal injury caused by improper installation and operation. Please contact us if there is any question.**

	➢ **We strongly recommend that place the machine on a well cooling platform to maintain the laser temperature within limits. Otherwise it will cause fatal damage to the laser.** ➢ **The temperature is required to change slowly within 10 ℃ -35 ℃, otherwise the laser will not keep working well.** ➢ **Do not paste anything under the laser.** ➢ **Make sure there are no obstructions at 0.05m-0.1m from the ventilation opening to ensure a good heat dissipation environment.** ➢ **If the laser system needs to be installed inside other equipment, please ensure well ventilation is good. Additional fans could be used for heat dissipation if necessary. The direction of the cooling air flow should be the same as the laser fan.**

Note: It is normal if the power protection light "Alarm" is on, when the power switch is "on" and disconnect to the laser head.

1. Connect the laser plug with the power supply. Fix the screw by side of the connection interface.
2. Connect the power supply cable to the power supply socket.
3. Remove the block label in front of the laser head. Open the shutter of laser head if there have one.
4. Turn on the power switch. The red indicator "Power" light up.
5. Turn on the key switch. The green indicator "Laser" lights up after about 5 seconds and the laser starts to work. The laser will operate stably after about 10 minutes at room temperature.

6. If the alarm indicator "Alarm" is on, please turn off the power switch. After a few minutes, turn on the power switch and the key switch the laser will back in operating mode.

7. Refer to “Laser TTL modulation instruction” or “Laser analog modulation instruction” according to different modulation mode.

   7.1. Laser TTL modulation instruction

   a） Without signal input, the laser is in CW operation;
   b） The laser is off when the signal input at low level (<0.7V);
   c） The laser is on when the signal input at high level(> 2.3V);
   d） The input voltage cannot exceed 5.2V.

   7.2. Laser analog modulation instruction

   a) Without signal input, the laser is off;
   b) The laser is off when the signal input at low level (<0.7V);
   c) The laser outputs maximum when the signal input at 5V;
   d) The laser will have different output power when the signal input voltage between 0-5V, such as 1.5V, 2.6V ...3.8V...
   e） The input voltage cannot exceed 5.2V.

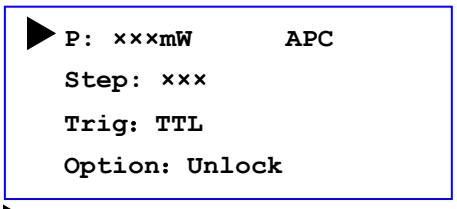
8. Turn off the laser system: Turn off the key switch, then turn off the power switch, after that unplug the power supply plug.

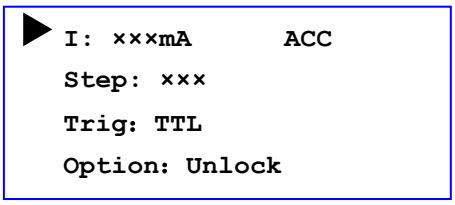
9. Close the shutter of laser head if there have one. Attach the block label.

Operation procedure instruction of the power supply

NOTE：Factory default: constant power mode, TTL Modulation, display under Unlock condition.
The laser works under the last condition when it opens again.

After connect the power cable. Turn the power switch at the back panel to “ON”, the red indicator light “POWER” at the front panel will up indicates that the power supplied. Then turn the key switch at the front panel to “ON”. The LCD screen light up and will display the boot screen as follows:





▶ Indicates the current project is changeable (when the screen is unlocked). Press Knob to switch over between function menus.

The first line displays the output power of the laser. Turn the knob clockwise, the output power is increased. Turn the knob counter-clockwise, the output power is decreased. Press and hold the knob, this line will display the current value. Turn the knob clockwise, the output current is increased. Turn the knob counter-clockwise, the output current is decreased.

The second line displays the step length. Turn the knob to adjust the step length.

The third line displays modulation mode. Turn the knob to adjust the modulation mode.

The forth line displays screen lock status. Unlock means the display is under unlock state, and you can

change the laser operating current, operating power and step length; turn the knob to switch to Lock state, all values cannot change in unlock mode

VIII. Warranty and maintenance

	**Warning: Do not open or remove the cover of the laser and the shell of the laser power supply without authorization please, otherwise there will be risk of personnel injury by the laser and invalidating the warranty at the same time. It is recommended to return the laser to CNI for repair if necessary.**

1. The warranty period of this product is one year from the shipping date.

2. Any of the following cases will not count as warranty object.

2.1 Misused, improper operation, improper storage or unauthorized operation, and some processing operations supplemented by agency;

2.2 Remove or damage or change the initial identification number or label;

2.3 Any other claims not arising directly from defects in materials or workmanship.

3. The laser should be used in a clean, dry, dust-free and static-free environment.

4. If there are any questions during operation, please contact CNI representative.

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IX. Appendix

	Accessories name	Included	Obiter dicta
A	Optical fiber	/	/
B	Optical fiber bracket	/	/
C	End collimator	/	/
D	Linear prism	/	/
E	Optical fiber coupler	/	/
F	Polarization attenuator	/	/
G	Beam expander	/	/
H	Optical fiber oscillator	/	/
I	RS232 Driver USB Flash Disk	/	/
J	RS232-USB cable	/	/
K	Round adjustable attenuator	/	/
L	Optical filter	/	/
M	1/2 wave plate	/	/
N	Planoconvex lens	/	/
O	Cooling equipment	/	/
P	Heat sink	/	/
Q	Fan	/	/
R	Infrared card	/	/
S	Laser goggle	/	/
T	Connection plate	/	/
U	Extension cable	/	/

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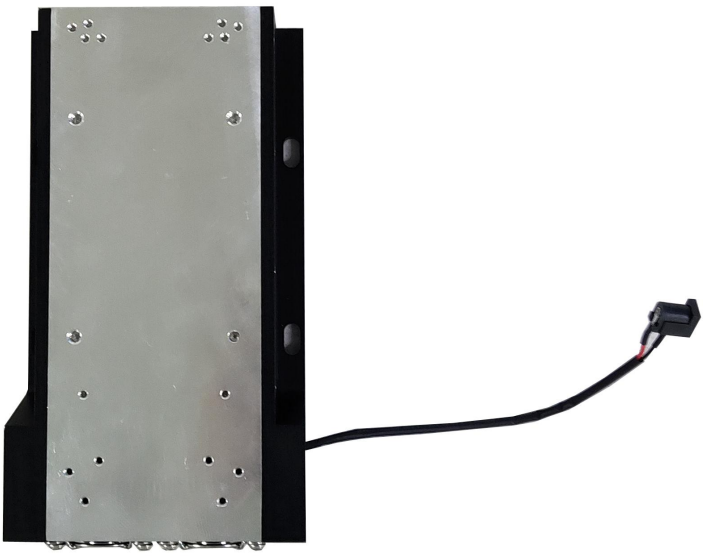
TC-02-FS Heat sink Installation Instructions



The specific steps for fixing the TC-02-FS to the laser are as follows:

Step 1: first confirm the fixing holes on the TC-02-FS. Take the FN model as an example. The FN model uses the fixing holes as shown in the figure below. The holes are circled in red circles.

Step 2: after placing the laser on the TC-02-FS, align the holes and fix them with the screws provided with the goods.

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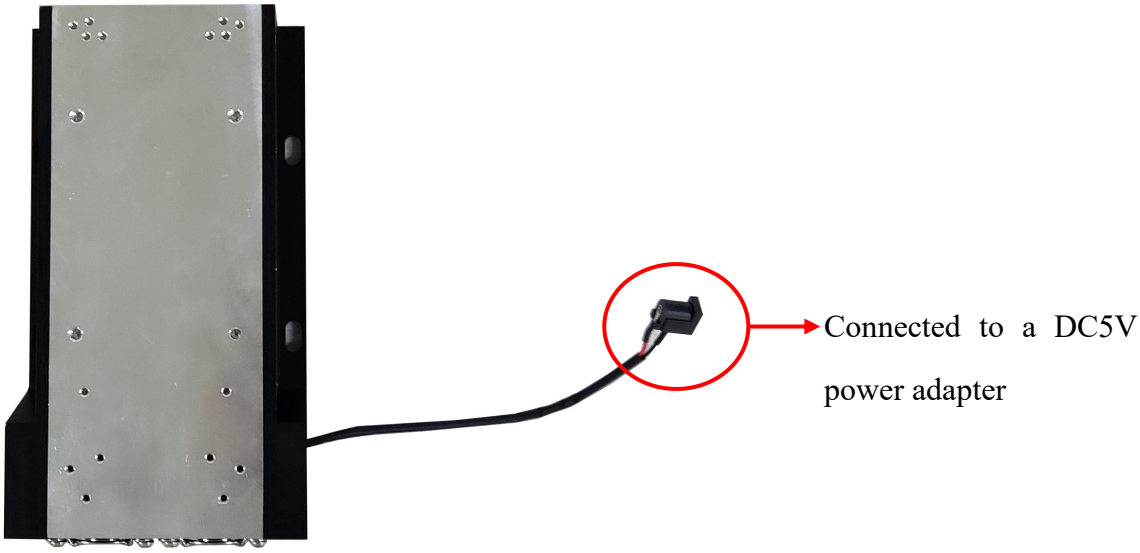
Step 3: after the laser is connected to TC-02-FS, TC-02-FS needs to be connected to a DC5Vpower adapter for use.



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