







# Laser instruction manual

PGL-VI-405/450


## I. Use of symbols

	<b>Warning: This symbol is used to warn operators of hazards easily caused by visible and invisible laser radiation!</b>
	<b>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.</b>
	<b>Danger: Beware of electric shock, high voltage danger!</b>

## II. Safety precautions and instructions

	<b>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.</b> <b>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.</b>
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### **Optical safety**

	<b>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.</b>
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- 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 therefrom 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.

### III. Operating environment

	<p><b>Harmful laser radiation may occur if the control, adjustment and operation methods specified are not followed.</b></p>
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	<p><b>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.</b></p>
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	<p><b>In order to extend the lifetime of the laser, it is recommended that: do not use it over the given temperature range. 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 lasers have electrostatic discharge protection.</b></p>
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**The operating environment conditions of the laser system are as follows:**

1. Temperature: 10-35 ° C (ambient temperature)  
25 ± 2 ° C (suggest base plate temperature)
2. Maximum relative humidity: <90%

### IV. Installation and operating instructions

	<p><b>Make sure read all the safety instructions mentioned in the previous parts carefully and well understand</b></p>
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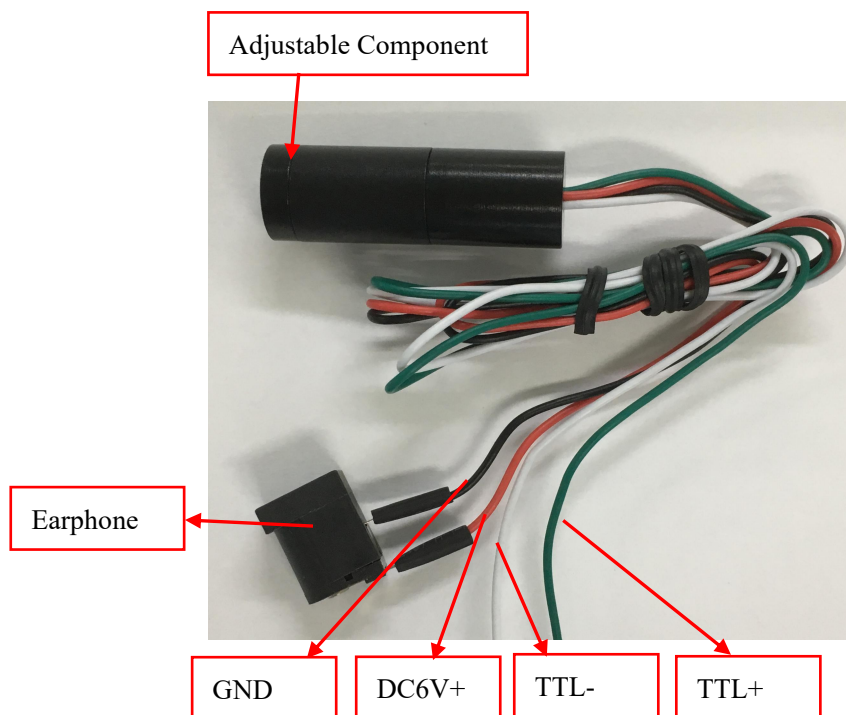
	<p><b>Note: The laser system must be installed and operated by a professional who is well knowledged in all laser safety terms and equipment safety. The customer should take all necessary measures to ensure the safety of the laser system. We are not responsible for any damage to the laser or personal injury caused by improper installation and operation. Please contact us if there is any question.</b></p>
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- 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°C-35°C, 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 and ensure a good heat dissipation environment.
- If the laser system needs to be installed inside other equipment, please ensure well ventilation. 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 recommended to place a not flammable and reflective black metal object in front of aperture of the laser to receive the laser light to avoid burning skin or catch a fire.
- Temperature should be adjust between 23°C-27°C with heat dissipation set. Otherwise, the laser will not work well. The best laser operating temperature is 25°C . Do not touch any element of the PC board. Or else, the laser will not work well. It is strongly advise to mount the laser system on a thermally dissipating surface. Failure to comply with this procedure may cause permanent damage to the laser.
- If the laser system needs to be installed into equipment, please make sure the airflow clear. If necessary, turn on the extra fans for heat dissipation.



1. Please take off the label pasted at the aperture of the laser module.
2. Connect the adapter with the earphone socket on the laser, then connect the adapter to external power supply, the laser emits; If not use the earphone socket, please cut it off. The red line is “+”, please connect it with 6VDC. The black line is “-”, please connect it with 0V. The green line is “TTL+”, The white line is “TTL-”. After doing so, the laser emit.

Notes for TTL Modulation:

- a. Without signal input (or the leads open), the laser is in CW operation.
  - b. With signal low level ( $<0.7V$ ) input, the laser is in the on state.
  - c. With signal high level ( $>2.3V$ ) input, the laser is in the off state.
  - d. Signal input does not exceed 5.2V.
3. The beam size turns bigger when clockwise adjust the alignment component and reverse direction turns smaller.
  4. Closing the laser system: Turn off the mains power of the power supply.
  5. To prevent optic path from dust, you should replace aperture label or close the shutter.

## V. 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 for repair if necessary.**

1. Any of the following cases will not count as warranty object.
  - 1.1. Misused, improper operation, improper storage or unauthorized operation, and some processing operations supplemented by agency;
  - 1.2. Remove or damage or change the initial identification number or label;
  - 1.3. Any other claims not arising directly from defects in materials or workmanship.
2. The laser should be used in a clean, dry, dust-free and static-free environment.
3. If there are any questions during operation, please contact representative.
4. Please do not turn on the laser before reading the instructions to avoid danger. Must wear laser goggle and take special protective measures when removing the laser cover.
5. Please follow the instruction manual to operate the laser.