Operation Instruction for CNI Model with PSU-III-LCD

Caution-Use of controls or adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

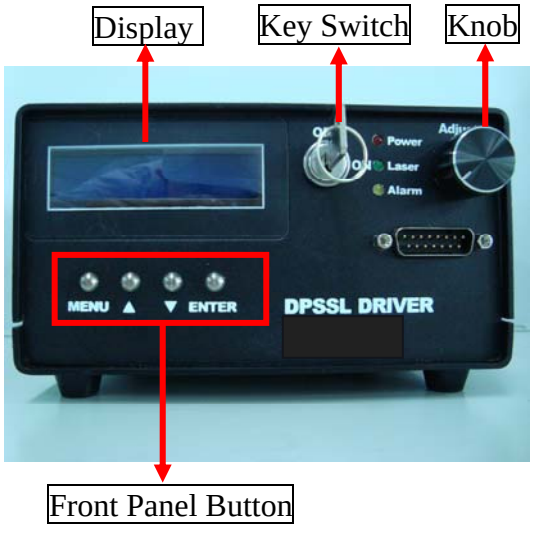
Note: The laser only can be operated after the case temperature of the laser system return to the room temperature to avoid the damage of the big temperature range.

A. CNI suggests that the laser be mounted on a flat, thermally dissipating surface to maintain a high-level of heat dissipation, and reliability.

B. Slowly change between 10℃-35℃. Or else, the laser will not work well. Do not touch any element of the PC board. Or else, the laser will not work well. If the laser is not already mounted on a thermally dissipating surface, it is strongly advised to do so. Failure to comply with this procedure may cause permanent damage to the laser.

C. The air duct should not be blocked, and make sure there is nothing placed within 0.05m-0.1m.

D. If the laser system needs to be installed into equipment, please make sure the airflow clear. If necessary, the extra fans can be used for heat dissipation.



I、 Instruction on the front panel

1. Key Switch: "OFF" state

2. Display Screen

3. MENU BUTTON

3.1. Switch over between main interface and main menu

3.2. Turn back to submenu from the main menu

4. "▲" BUTTON

Switch over different main menu

5. "▼" BUTTON

Switch over different main menu

6. "ENTER" BUTTON

6.1. Enter into submenu from main menu

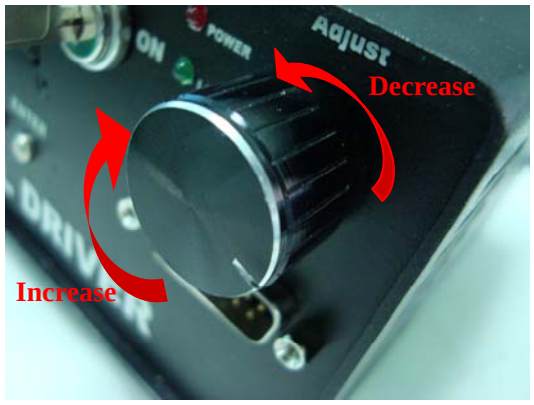
6.2. Confirm the modified parameter in the submenu

7. Knob

7.1. Turn the knob counter-clockwise, the output power is decreased.

7.2. Turn the knob clockwise, the output power is increased.

7.3. Push the knob, the step length of setting value increases.



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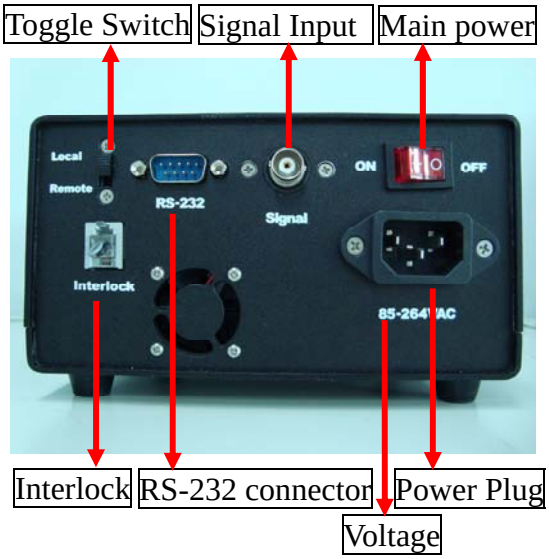
II、 Instruction on the back panel



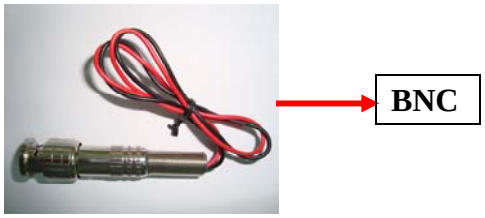
1. **Main Power:** "OFF" state
2. **Interlock**: Pull off the crystal plug or disconnect the short wire on the plug(if there are two short wires ,disconnect both of them)，laser system will stop working. At this point you must connect the plug or restore short wires, the laser system return to normal working station.
3. **Voltage range:** Make sure your local voltage is in the range showed at the back panel.
4. **Signal input:** TTL or Analog modulation.
   Note: You should connect BNC when use it.
5. **BNC：** There are two leads (red+, black-).
6. **RS-232 connector:** You need a communication RS-232 cable for connecting laser system to computer.
7. **Toggle switch**

7.1. Push it to "Local" position, the laser works as CW, external signal is not available.

7.2. Push it to "Remote" position External trigger input is valid.

a) If the power supply can work in TTL function. The laser works as CW, now external TTL trigger is workable.

b) If the power supply can work in Analogue function. The laser doesn't emit, 0-5V external Analog voltage is necessary to make it work.



Note: the laser should be set in constant current mode (See below the interface of constant current mode)

```
I: ××××mA          C
P: ×××.×mW
```

7.2.1. Notes for TTL Modulation

a) Without signal input (or the leads open), the laser is in CW operation.

b) With signal low level input, the laser outputs Min. value/No output.

c) With signal high level input, the laser outputs Max value.

7.2.2. Notes for Analog Modulation.

a) Without signal input (or the leads open), the laser is OFF.

b) With signal low level input, the laser outputs Min value/No output.

c) With signal 5VDC input, the laser outputs Max value.

d) With other voltage between 0-5VDC, such as 1V, 2V, 3V, 4V, 4.5V, the laser outputs different powers.

7.2.3. Notes for Pulse modulation.

Please refer to the "Matters need attention for controllable pulse laser MPL".

Note: Make sure the key switch is on "off" state before changing the toggle switch.

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III、 Operation Instruction

1. Attach the laser head to the connector of power supply firmly. Please make sure to fasten the locking ring on the connector.
2. Connect the power cord of the power supply to AC Power Jack.
3. Remove the label at aperture.

IV、 Operation procedure instruction of the power supply

1. Starting interface

Turn the main power to 'ON' position. The red LED - "Power" is on; it shows that power was connected. Then turn on the key switch at "ON" state. The laser starts to work after about 3 seconds delay. The green LED -"Laser" is on. The starting interface is as followed:

```
        DPSSL
   DRIVING SYSTEM
```

The Starting interface comes into Default (Constant Current Mode) Menu after 3 seconds .The display screen shows the Monitor Main Interface:

```
I: ××××mA          C
P: ×××.×mW
```

The up line shows the actual working current value.
The below line shows the actual output power value
C stands for the laser works in constant current mode.

If there is no button operation, the laser will automatically work as constant output power mode as set value. At this time, the display screen shows monitor interface:

```
P: ×××.×mW          P
I: ××××mA
```

The up line shows the actual output power value.
The below line shows the actual working current.
P stands for the laser works in constant output power mode.

2. Main menu interface

Press MENU button to switch to Laser Power Mode main menu interface:

```
Menu       3-1
LASER PWR. MODE
```

（Under this interface, the laser works in the LASER POWER MODE.）
Switch to Laser Current Mode via pressing button ▲ and button ▼ to Laser Current Mode main menu interface:

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```
Menu        3-2
LASER CUR. MODE
```

（Under this interface, the laser works in the LASER CURRENT MODE.）

Switch to Laser Current Mode via pressing button ▲ and button ▼ to RS-232 Mode main menu interface:

```
Menu        3-3
RS-232
```

（Under this interface, the laser works in the RS232　MODE.）

3. LASER PWR. MODE Operation Process

When the display shows the LASER POWER MODE main menu interface:

```
Menu        3-1
LASER PWR. MODE
```

Press ENTER button to come into the LASER POWER submenu interface:

```
×××.×mW          1mW/P
×××.×mW         ××××mA
```

（Turn the knob clockwise or counter-clockwise will make the power 1mW increase or decrease. ）

Push the knob will come into submenu interface:

```
×××.×mW          10mW/P
×××.×mW         ××××mA
```

（Turn the knob clockwise or counter-clockwise will make the power 10mW increase or decrease.）

Push the knob will come into submenu interface:

```
×××.×mW          100mW/P
×××.×mW         ××××mA
```

（Turn the knob clockwise or counter-clockwise will make the power 100mW increase or decrease.）

Push the knob will come into 1mW submenu interface again.

The up line shows the laser power value that you want to set up and the step length.

The below line shows actual output power value and actual working current.

After setting up, please press ENTER button to confirm and the laser will output as the setting parameter and maintain constant. At this time, the display screen shows the Monitor Main Interface:

```
P :×××.×mW          P
I :××××mA
```

The up line shows the actual output power value.

The below line shows the actual working current.

In the main interface, PLS press MENU button to back to the main menu interface:

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```
Menu        3-1
LASER PWR. MODE
```

Modify the parameter and press ENTER button，and then the laser will output as the settled parameter and maintain constant.

4. LASER CUR. MODE Operation Process

When the system display screen is as follows:

```
Menu        3-1
LASER PWR. MODE
```

Press button ▲ and button ▼ to come into the LASER CUR.MODE

```
Menu        3-2
LASER CUR. MODE
```

Press ENTER button to come into the LASER CURRENT submenu interface.

```
××××mA        1mA/P
××××mA      ×××.×mW
```

（Turn the knob clockwise or counter-clockwise will make the current 1mA increase or decrease. ）

Push the knob will come into submenu interface:

```
××××mA       10mA/P
××××mA      ×××.×mW
```

（Turn the knob clockwise or counter-clockwise will make the current 10mA increase or decrease. ）

Push the knob will come into submenu interface:

```
××××mA      100mA/P
××××mA      ×××.×mW
```

（Turn the knob clockwise or counter-clockwise will make the current 100mA increase or decrease. ）

Push the knob will come into submenu interface:

```
××××mA     1000mA/P
××××mA      ×××.×mW
```

（Turn the knob clockwise or counter-clockwise will make the current 1000mA increase or decrease.）

Push the knob will come into 1mA submenu interface again.

The up line shows the laser current value that you want to set up and the step length. (After setting up the step length and confirm it , the laser system will save it automatically and will show the parameter when starts the system next time.)

The below line shows actual output working current and actual power value.

After setting up and press ENTER button to confirm and the laser will output as the setting parameter and maintain constant. At this time, the display screen shows the Monitor Main Interface:

```
I :××××mA          C
P :×××.×mW
```

The up line shows the actual working current value.
The below line shows the actual output power value.

If you want to set the current again, PLS press MENU button from main interface back to the main menu interface:

```
Menu        3-1
LASER PER. MODE
```

Pressing button ▲ and button ▼ to Laser Current Mode main menu interface:

```
Menu        3-2
LASER CUR. MODE
```

Modify the parameter and press ENTER button，and then the laser will output as the settled parameter and maintain constant

5. **RS-232 Working Mode**

   You should install the “RS-232 set up file” before use it.
   Only when the laser is off, users can communicate with the upper computer.
   Please refer to the “RS-232 System interface operation instructions”
   Turn on the laser, then choose RS-232 working mode in the main menu. Press ENTER BUTTON to enter into the interface as follows:

```
Menu        3-3
RS-232
```

   Press ENTER button to enter into submenu interface of RS-232 working mode as follows:

```
RS-232
LINKING...
```

   At this time, the laser works under the RS-232 working mode, the laser can be controlled by software.
   Press MENU button to stop communication to the main menu interface as follows:

```
Menu        3-3
RS-232
```

   The connection is cut.

6. Only when unexpected accident occurs, the yellow LED-“Alarm” will be on. That means the laser system works in abnormal state. Please switch off the main power. Please reset the main power and key switch after a few minutes, then to restart the laser system again.
7. Closing the laser system: Turn off the key switch first, and then switch off the mains power of the power supply.
8. To prevent optic path from dust, you should replace aperture label.

V、Operating Environment

1. Temperature: 10-35℃（environment temperature）

25±3℃（bottom plate temperature /recommended temperature）

NOTE：It is not recommended to operate the laser outside of this temperature range for prolonged periods. The unit is designed to shut down if the laser exceeds operating temperature limits. Failure to comply with the environment temperature may cause permanent damage to the laser. All CNI lasers are designed with ESD protection.

2. It should also be noted that the CNI laser must be operated in an environment with low vibration to meet the power stability specifications.

3. Humidity: 50±10% (RH)

If the air humidity overruns the figure, the working capability of the laser system will be affected indirectly (e.g. intracavity crystal deliquescence, circuit board short etc.). And operate the laser in an environment in which there is normal aeration.

4. Threshold voltage: （According to the testing report）

Failure to comply with this procedure may cause permanent damage to the laser.

Following is the possibility if the service voltage is unstable:

4.1. Integrated circuit will be damaged; crystal cooling exceeds the rated value (crystal cooling circuit invalid), output power decreased, and fan not run, caused by unstable service voltage.

4.2. Unstable power supply makes LD damaged by instantaneous peak current passing.

4.3. Unstable voltage/static electronic makes potentiometer/electric capacity/resistor/integrated circuit/TEC circuit/PC board damaged.

5. Threshold current: （According to the testing report）

Failure to comply with this procedure may cause permanent damage to the laser. The potentiometer/capacitance/resistance/integrated circuit/chiller circuit/ PC board may be damaged by momentary current or unstable current.

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VI、 Laser safety

1. Optical Safety

1.1. Wearing a set of proper laser safety goggles is a good idea. Though laser safety goggles can protect a person's vision, it's always best to remember NEVER to look into a laser beam or bright reflection even when wearing laser safety goggles.

1.2. Viewing optics or display screens should be used during operation to make the accessible emission less than Class I, reflected beams can cause serious accident by aiming beam at reflective surfaces, e.g. mirror, glass and bright metal.

1.3. Never use your laser in the vicinity of highways and airports. DO NOT target moving vehicles and airplanes.

1.4. Never randomly aim a laser out the window

1.5. DO NOT use a laser at the place marked “No smoking” “inflammable and explosive” and easily caused the danger.

1.6. Use an infrared detector to verify that the laser beam is on or off before working on the laser.

1.7. Set up controlled access areas with for laser only in well marked areas with controlled access. Be sure to post appropriate warning signs visible to all.

1.8. The operation of lasers should be under the supervision of qualified personnel only. When not in use, lasers should be shut down completely and made off-limit to unauthorized personnel.

1.9. Limit access to the laser system to persons required to be present.

1.10. Laser should be operated in the ambient of clean and dry and no electric.

1.11. Maintain experimental setups at low level to prevent inadvertent eye encounter with beams.

2. Electrical Safety Precautions

2.1. Disconnect main power lines before working on any electrical equipment when it is not necessary for the equipment to be operating.

2.2. Never work on electrical equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment, and who is competent to administer first aid.

2.3. When possible, keep one hand away from the equipment to reduce the danger of current flowing through the body if a live circuit is accidentally touched.

2.4. Always use approved, insulated tool when working on equipment.

2.5. Special measurement techniques are required for this system. Ground references must be selected by a technician who has a complete understanding of the system operation and associated electronics.

Invisible or visible radiation is dangerous to humans and should not be viewed directly or indirectly with or without optical instruments. Please refer to IEC 825-1 “Safety of Laser Products” and 21 CFR 1040.10-1040.11 “Performance Standards for Light Emitting Products” for additional information.

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VII、 Warranty and maintenance

1. The warranty is one year from the shipping date.

2. This warranty will not apply to those products which have been **r**epaired or altered other than in accordance with the terms of this agreement**.**

2.1. Abused, misused, improper handling in use, or storage, or used in an unauthorized or improper manner or without following written procedures supplied by manufacturer.

2.2. Original identification markings or labels have been removed, defaced or altered.

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

3. Laser should be operated in the ambient of clean and dry and no electric

4. Always use finger cots, latex gloves, or the equivalent when handling optics, and use a clean, cushioned wok surface.

5. In case you have any question during operation, contact CNI representative.

6. Please do not open the laser head without instructions from manufacturer, which may lead to the danger of exposure of hazardous visible and invisible laser radiation. Exceptional care must be taken when operating the laser with the covers removed. Laser protective eye ware must be worn.

7. Please operate the laser according to the operation instructions.

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