



# **Pro-3500RGB**



## **User Manual**

**Please read this manual carefully before use!**

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## Checking parts

Please check if all listed parts are included, and are not damaged.

Included:

- 1 x Pro-3500RGB Laser
- 1 x Power cable
- 1 x 9-pin plug
- 2 x key
- 1 x safety cord
- 1 x manual

## SAFETY INSTRUCTIONS

If the device has been exposed to great temperature changes, do not switch it on immediately. Condensation water may damage your device. Leave the device switched off until it has reached room temperature.

The laser must only be used for shows. Any operation has to be attended and supervised by a skilled and well-trained operator.

Never leave this device running unattended and keep it away from children and unauthorized persons.

Keep away from heaters and other heat sources. In order to safeguard sufficient ventilation, leave 50 cm of free space around the device.

Never direct the laser beam to people or animals.

CAUTION LASER DIODE: If you open the device for cleaning, always disconnect from mains!

**-HEALTH HAZARD! Never look directly into the light source, as sensitive persons may suffer an epileptic shock!**

These lasers are considered a definite eye hazard, particularly at the higher power levels, which WILL cause eye damage. So these laser series models supplied with a key switch to prevent unauthorized use, warning labels and aperture labels affixed to the laser.



### Installation safety

Prior to installation and operation of the laser, the paths of the beams and effects should be considered, particularly with respect to how they will reach the audience. If direct audience scanning is desired, then the laser energy in the effects needs to be considered to decide if the effects are safe for direct viewing. Always ensure, that the maximum permissible exposure (MPE) is not exceeded in the area accessible to the public. So install the laser in such a way, that minimum distances and heights ensure the MPE is never exceeded in the public area.

### Warning labels on the device

Laser radiation

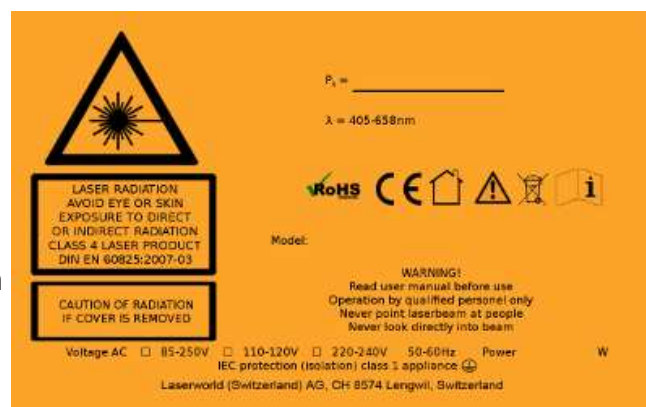
Avoid exposure  
To the beam

Laser class 4

Caution of radiation  
If cover is removed

Indoor use only

At front opening: Avoid exposure – laser radiation is emitted.



Read manual  
before use

Operation by qualified  
personal only

Never direct laser  
Beam at people

Never look directly  
into beam

## OPERATING THE LASER

The operator has to make sure that laser radiation – also reflected laser radiation – higher than the maximum permissible level is avoided by technical or organisational measures. (Especially with respect to the MPE, see above.)

Make sure to use the correct voltage

If the device is used in a flying installation, the mounting brackets and an appropriate safety-rope must be fixed.

In some countries, the operator must notify the accident insurance and the authority for industrial safety, before operating a laser. For more information, contact the relevant authorities.

Please consider that unauthorized modifications on the device are strictly forbidden due to safety reasons!

If this device will be operated in any way differently than described in this manual, the product may suffer damages and the guarantee becomes void. Furthermore, any other operation may lead to dangers like short-circuit, burns, electric shock, etc.

Keep surrounding dry and clean. This unit should be kept dry, do not use in the rain or damp and dusty environment. Projector should be put in a water-proof housing when operated outside.

Regularly open the device (see "cleaning" further down) to check for dust inside, or if fog fluid condenses in the housing (if so rearrange hazer and/or laser position).

Operating temperature is 10~35°C. In a new installation, check after some 15-30 minutes whether the outlet air gets too warm. Regularly check the inside for dust deposits, especially around the fans. Let laser cool off 10 minutes after 2 hours of operation, to ensure maximum lifetime for the diode.

Distance between laser aperture and projection screen should be not less than 1 meter.

Do not turn device on and immediately off again frequently.

Do not look into the laser beam directly, especially not with optical instruments.

Do not touch the device with wet hands.

When the laser diode becomes dim or broken, please contact your dealer timely.

When returning laser to dealer/manufacturer always use original packaging.

Maintenance should be performed every 15-day period. See "cleaning" further down.

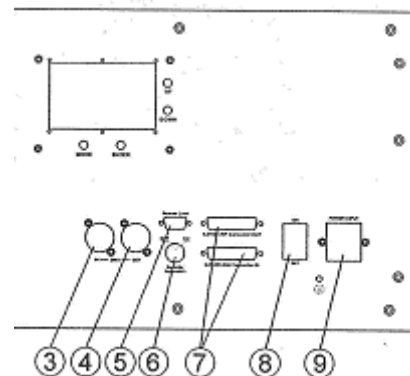
## Using the laser

**Caution – use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.**

Make sure the correct voltage is used. Connect mains. Connect an emergency switch to the 9-pin connector on the backside (pins 1, 2). If you do not wish to connect an emergency switch, connect the 9-pin plug. Depending on the mode selected (see below), laser light should come out of the opening on the front panel – be careful.

## Control panel

|            |                                                                                                               |
|------------|---------------------------------------------------------------------------------------------------------------|
| <b>3/4</b> | <b>DMX In/Out</b>                                                                                             |
| <b>5</b>   | <b>Remotelock:</b> connect emergency switch. If no emergency switch is connected use the 9 pin plug supplied. |
| <b>6</b>   | <b>Security switch:</b> Laser on/off                                                                          |
| <b>7</b>   | <b>ILDA connector</b> in/out                                                                                  |
| <b>8</b>   | <b>Power switch:</b> power on/off                                                                             |
| <b>9</b>   | <b>Power:</b> connect to mains.                                                                               |



## Control panel

- **MODE:** select mode, or go up in menu
- **ENTER:** confirm changes, or go down in menu
- **UP/ DOWN:** change DMX address

## Operating modes:

Automatic mode: built-in patterns are displayed

Music active: laser is controlled from built-in microphone

"DMXAddr": DMX512 mode-. Here you can change the DMX address:

"Open": change address

"Up" & "down": increase/decrease address

"Save": save new address

"LCD display memory function": save settings automatically.

Laser: On/Off, when set to Off, laser is off in Auto/DMX mode (ILDA mode only)

X/Y-Axis: mirrors projection horizontally/vertically

Upside down: Display turned upside down

## ILDA mode

When an IDLA compatible interface is connected to the laser, the laser is automatically switched to ILDA mode. Output is then controlled from a PC running software.

The laser uses pins 4 and 17 of the IDLA signal to detect the presence of an ILDA interface.

Further information can be found in the software manual.

## DMX mode

| Channel |                       | DMX512 value | Function                  |
|---------|-----------------------|--------------|---------------------------|
| 1       | Red                   | 0~255        | 0~100% Dimmer             |
| 2       | Green                 | 0~255        | 0~100% Dimmer             |
| 3       | Blue                  | 0~255        | 0~100% Dimmer             |
| 4       | Colour                | 0~25         | Original colour           |
|         |                       | 26~51        | White                     |
|         |                       | 52~77        | Yellow                    |
|         |                       | 78~103       | Red                       |
|         |                       | 104~129      | Green                     |
|         |                       | 130~155      | Cyan                      |
|         |                       | 156~181      | Blue                      |
|         |                       | 182~207      | Purple                    |
|         |                       | 208~233      | Change colour             |
|         |                       | 234~255      | Colour flux, slow to fast |
| 5       | Pattern group         | 0~51         | Pattern group 1           |
|         |                       | 52~103       | Pattern group 2           |
|         |                       | 104~154      | Pattern group 3           |
|         |                       | 155~205      | Pattern group 4           |
|         |                       | 206~255      | Pattern group 5           |
| 6       | Pattern               | 0~255        | 160/5=32pcs               |
| 7       | Horizontal rotation   | 0~255        | slow to fast              |
| 8       | Vertical rotation     | 0~255        | slow to fast              |
| 9       | Rotation about Z-axis | 0~255        | slow to fast              |
| 10      | Horizontal movement   | 0~255        | slow to fast              |
| 11      | Vertical movement     | 0~255        | slow to fast              |
| 12      | Horizontal size       | 0~255        | slow to fast              |
| 13      | Vertical size         | 0~255        | slow to fast              |
| 14      | Hor. and vert. size   | 0~255        | slow to fast              |
| 15      | Drawing speed         | 0~255        | slow to fast              |
| 16      | Point draw            | 0~255        | slow to fast              |
| 17      | Scanspeed             | 0~255        | slow to fast              |
| 18      | Pattern size          | 0~1          | Original size             |
|         |                       | 2~255        | Size (120=original)       |

## **Maintenance / cleaning**

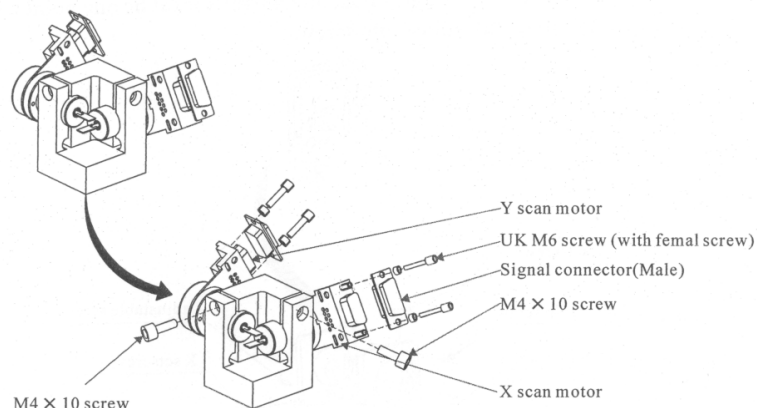
Always disconnect from mains before cleaning/opening the laser. Regularly clean the interior from dust, especially ensure operation of the fans. Use a sponge with alcohol, rather than wet cloth or other chemical liquid, to clean the mirrors. Be careful, even light scratches reduce the output power of the laser. Mirrors need cleaning, when a "halo" is noticeable around the beam, or an unusual high amount of diffuse light can be seen inside the device.

## Technical specifications

- **Output power:** typical: 3500mW, guaranteed: 2650mW, 800mW 532nm green, 350mW 473 blue, 1500mW 650nm red
- **Lasersources:** aircooled DPSS laser
- **Laser class:** 4
- **Modes:** ILDA, DMX 512, auto, music active
- **ILDA:** 25pin ILDA standard Sub-D shaped 25pin connector
- **Galvos:** 50k scanspeed
- **DMX 512:** 14 channels
- **Patterns:** 160
- **Scanangle:** set to ca. 40° optical (60° max)
- **Beam:** ca. 3mm/1mrad
- **Accessories:** power cable, key switch, interlock plug, manual, safety cord
- The laser comes in a flightcase.
- **Input voltage:** AC 100~240V 50/60Hz
- **Power consumption:** 450W
- **Size:** 670 x 370 x 440 mm (W x D x H)
- **Weight:** 30kg Laser, **total:** 50kg **(with flightcase)**
- **Operating temperature:** 10°-35°C (below 20°C the power may be reduced)

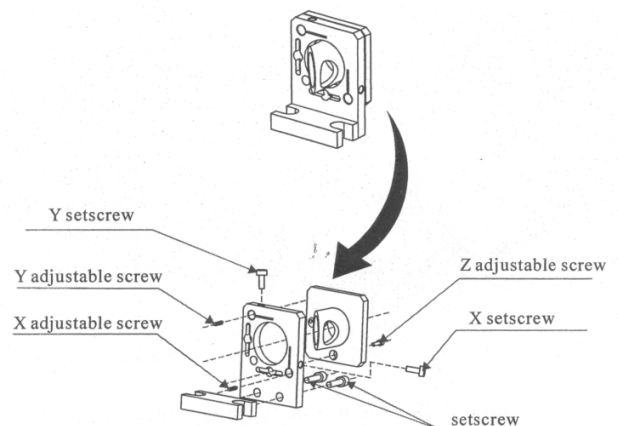
## Change scanner

1. Unscrew UK M6 screws and disconnect signal cable.
2. Loosen M4 x 10 screw and remove galvo.
3. Insert galvo, reconnect and fix signal cable.
4. Rotate galvo to centre projection. Fix galvo.



## Adjustable mirror mounts

1. Loosen setscrews, then adjust with X/Y adjustable screws. Make sure beam is centred on scanner mirrors.
2. Adjust Z-screw simultaneously.
3. Tighten setscrews.
4. When combining beams (RGY/RGB laser), first make sure the beams are (roughly) on the same spot on the mirrors/dichros. Then use a test pattern (e.g. rectangle) to do fine adjustment. For adjustments, always turn output power down (if possible).



## Troubleshooting

| Problem                       | Possible reason                                | Damaged part                                      | Replacement       |
|-------------------------------|------------------------------------------------|---------------------------------------------------|-------------------|
| No power                      | Fuse blown                                     | Fuse                                              | 09-00-3001-01     |
|                               | Power supply defective                         | + -24V                                            | 16-03-0039-00     |
|                               |                                                | 12V                                               | 19-03-0019-00     |
| Music mode not working        | Microphone defective                           | Microphone                                        | 16-03-0001-00     |
|                               | Control board defective                        | Control board                                     | 26-2A-2009LD-00   |
|                               | Potentiometer defective                        | Potentiometer                                     | 04-03-0104-01     |
|                               | CPU defective                                  | IC                                                | 00-89C516ED-00    |
| X and/or Y axis no deflection | Scanner defective                              | Galvo                                             | 15-01-2215-00     |
|                               | CPU defective                                  | IC                                                | 00-89C516ED-00    |
|                               | Control board defective                        | Control PCB                                       | 26-2A-2009LD-00   |
|                               | Power supply defective                         | + -24V                                            | 16-03-0039-00     |
|                               | Scanner driver board defective                 | Scanner driver board                              | 26-2A-6800A-00    |
| Laser dark or dim             | Lenses / mirrors dirty                         | Clean with alcohol                                |                   |
|                               | Laser diode defective                          | Laser diode                                       | Inquire           |
|                               | Control board defective                        | Control board                                     | 26-2A-2009LD-00   |
|                               | Configuration / wrong mode                     | Check configuration (see paragraph control panel) |                   |
| No output                     | Configuration / wrong mode                     | Check configuration (see paragraph control panel) |                   |
|                               | Control board defective                        | Control PCB                                       | 26-2A-2009LD-00   |
|                               | Power supply defective                         | + -24V                                            | 16-03-0039-00     |
|                               | Display board defective                        | Display                                           | 26-2A-YX2012DI-00 |
|                               | Pins 4 and 17 of the ILDA signal not connected | See below                                         |                   |

Laser does not switch to ILDA mode:

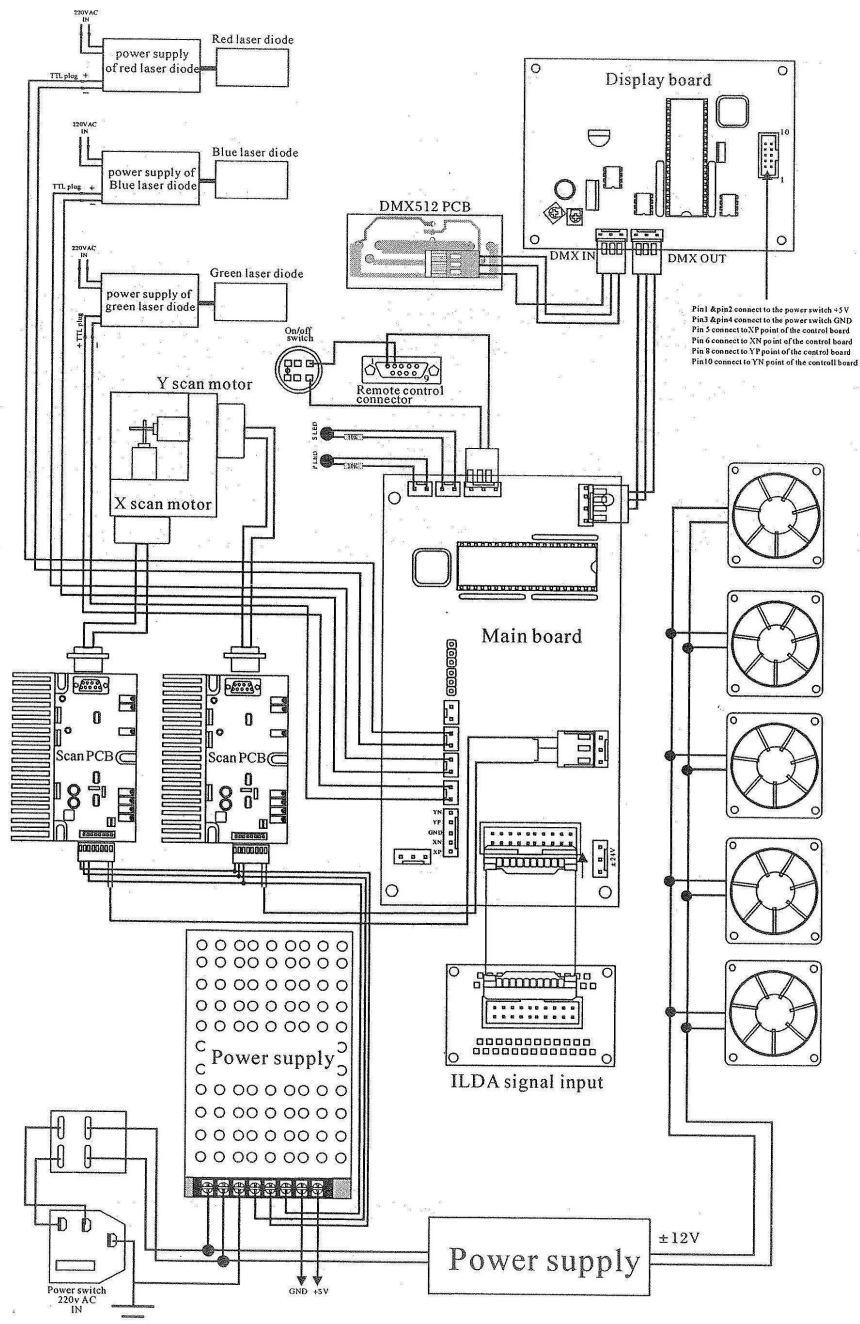
- The interface does not connect pins 4 and 17 (Interlock) of the IDLA signal. See interface manual
- The cable does not connect pins 4 and 17. Use a cable that connects pins 4 and 17.
- Use an adapter that connects pins 4 and 17.

## ILDA signal

Pin out of the standard ILDA signal:

|                            |            |                        |            |
|----------------------------|------------|------------------------|------------|
| 1 Scanner X+               | -10V..+10V | 14 X-                  | +10V..-10V |
| 2 Scanner Y+               | -10V..+10V | 15 Y-                  | +10V..-10V |
| 3 Intensity/Blanking+      | 0V..+2.5V  | 16 Intensity/Blanking- | 0..-2.5V   |
| 4 Interlock A              |            | 17 Interlock B         |            |
| 5 Red+                     | 0..2.5V    | 18 Red-                | 0..-2.5V   |
| 6 Green+                   | 0..2.5V    | 19 Green-              | 0..-2.5V   |
| 7 Blue+                    | 0..2.5V    | 20 Blue-               | 0..-2.5V   |
| 8 – 12 Not used            |            | 23-24 Not used         |            |
| 13 Shutter +5V, max. 20 mA |            | 25 GND Signal ground   |            |

## Technical diagram



## Please note

This device has left our premises in absolutely perfect condition. In order to maintain this condition and to ensure a safe operation, it is absolutely necessary for the user to follow the safety instructions and warning notes written in this user manual.

Laserworld cannot be made liable for damages caused by incorrect installations and unskilled operation!

## EU-declaration of conformity



We hereby confirm that the following device

### **Laserworld Pro-3500RGB**

complies with the essential safety requirements, laid down in the regulations of the committee to assimilate the provisions of law of all participating EU states on the electromagnetic compatibility (89/336/EWG) and with the requirements relating to the Low Voltage Directive (LVD 2006/95/EG) was based on the following standards:

DIN EN 61000-3-2:2000 + A2: 2005

DIN EN 61000-3-3:1995 + A1: 2001

Furthermore, the device is verified in correspondence to the laser class regulations DIN EN 60825-1, if properly set up according to the upper mentioned laser safety regulation. After installing the device, an inspection and official approval is indispensable for the overall setup. The inspection must follow the European guidelines EN 60825-1/-3 and corresponding regulations for the prevention of accidents BGV-B2.

This declaration is executed on behalf of the manufacturer.

### **Laserworld (Switzerland) AG**

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