



PL-4000RGB

USER MANUAL



Please read this manual carefully before use!

ENGLISH INDEX

1)Open the box for checking-----	Page 1
2)Installation -----	Page 1
3)Attention-----	Page 2
4)Warning-----	Page 2
5)Dimensions -----	Page 3
6)Structure of the fixture -----	Page 4
7)Scan motor Replacement-----	Page 5
8)Adjustable mirror socket-----	Page 6
9)Laser diode replacement -----	Page 7
10)Control board instruction-----	Page 8
11)Control board operation-----	Page 10
12)DMX512 Operate -----	Page 12
13)Specification-----	Page 13
14)Maintain -----	Page 13
15)Electrical diagram -----	Page 14
16)Trouble shooting -----	Page 15

1. Open the box for checking

In order to use this product safely and reasonably for the users, please read over this manual carefully before use and the operation must strictly according to this manual to avoid any damage to the product and personal safety.

Once after received this products please take and put carefully. And check carefully that whether the product was damaged or not during the transportation and please check the following things were enclosed:

Power cable 1PC

Pin 25 ILDA Signal cable 1PC

3 pin signal line 1PC

Hanging bracket 2PCS

Safety string 1PC

User manual 1PC

2. Installation

1. Please check the voltage whether is the same with the one showed on the equipment or not.
2. It must ask for the technical person and set the light safety when installation. And let the light beam at the suitable angle.
3. When install this equipment please make sure there's no flammable surfaces (decorated things, etc) within at least 1.5M and maintain minimum distance of 0.5M from the equipment to the walls.
4. Please make sure that there's no other equipment or decorating materials obstructed the exhaust fan and the vent-pipe.
5. Products should be install immobility.
6. In case of safety, it's very important that to connect the earth with line.

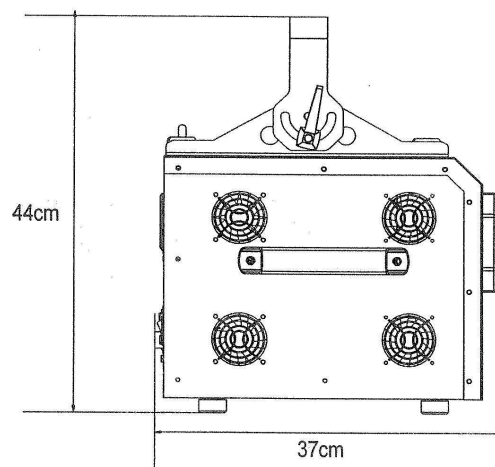
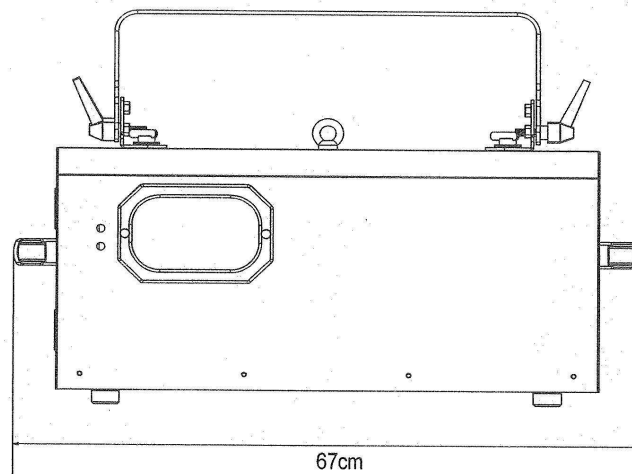
3. Attention

1. Must operate according to the user manual. Don't separate the light personally. Call the technician when the machine breaks down.
2. Please do not see the laser beam directly to avoid any damage.
3. Before connect or disconnect the power, please adjust the luminance of the laser diode to the least to avoid any damage to the laser diode.
4. This unit should be keep dry, do not use in the rain or dank and dusty environment. It can be use in the outdoor with the water-proof cover protector.
5. Set the light immobility and try to avoid strong shake or hit.
6. Prevent dust into the equipment to avoid problems.
7. Please keep that there's no other equipment or decorating materials obstructed the exhaust fan and the vent-pipe when the equipment was working.
8. Before connect power, check the plug is immobility or not, power line should be connect well.
9. Please do not open or close the equipment frequently that's to avoid any affect to the life span of the laser diode, and try the best to avoid the long time working.
10. Due to the characteristic of the laser diode, after three hours working, it should be close at least 25 minutes until the laser diode cooling then work again.
11. Don't touch the light or draw the power line when your hand was wet. And do not pull the electronic power line.
12. Maintain the distance at least 10M above from the equipment to the object.
13. This equipment does not have any parts can repair for the users, please do not open the equipment.
14. When the laser diode became dim or damaged please contact the dealer timely.
15. To use the original package when transport again and to avoid shake.

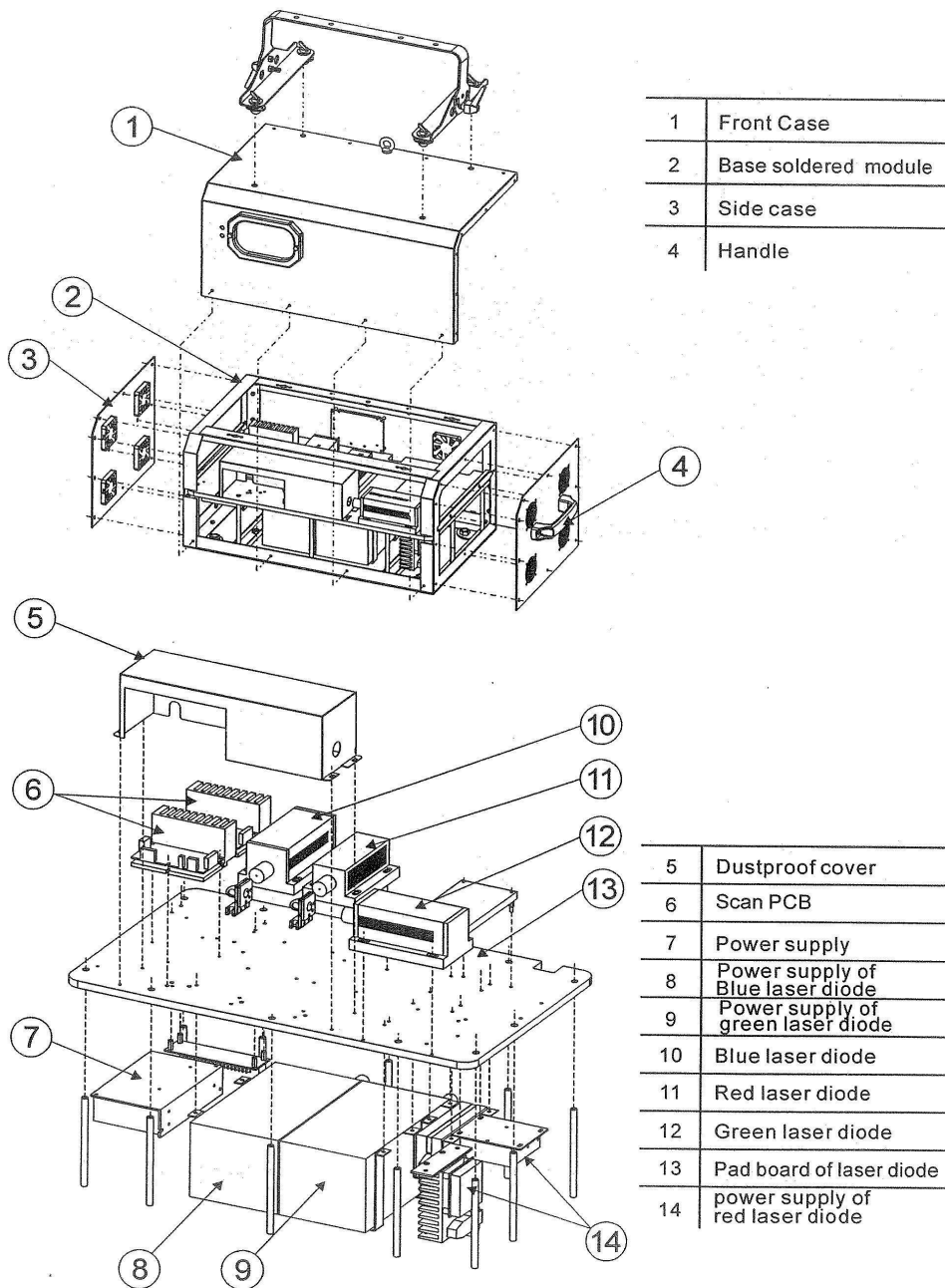
4. Warning

1. Don't look the light directly to prevent make some destroy with eyes..
2. Keep the space between light equipments and the lighted things more than 10 M.

5. Dimensions



6. Structure of the fixture



7. Scan motor Replacement

(1) Steps:

1. Unscrew UK M6 screw and plug out male signal connector.
2. Disassemble all M4 × 10 screw for X,Y scanner socket so that scan motors can be took out,put in or rotate to adjust the scan angle.
3. After adjust ,fix M4 × 10 screws,plug in male signal connector and then screw UK M6 screw.

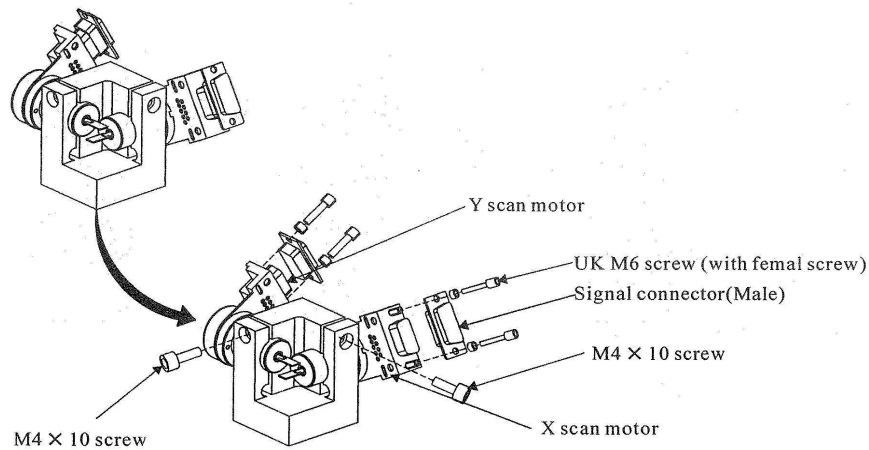


Fig7-1 Scan motor install diagram

(2) Optical system:

RGB mix beam be reflected out by X,Y scan mirrors.

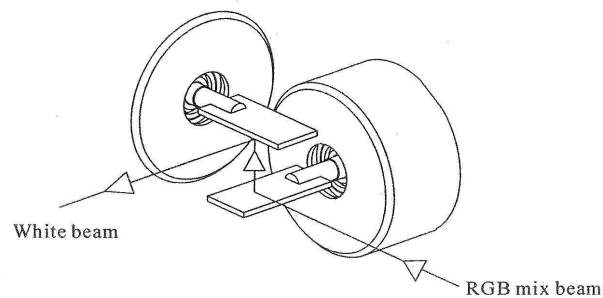


Fig7-2 Optical System diagram

8. Adjustable mirror socket

(1) Steps

1. Loose setscrew of X,Y and then adjust mirror socket to suitable position by X,Y adjustable screws.
2. Adjust Z adjustable screw at same time.
3. Fix X,Y setscrew.

NOTE: Made sure all beams through adjustable mirror socket be one point when you adjust X,Y,Z line with adjustable screw.

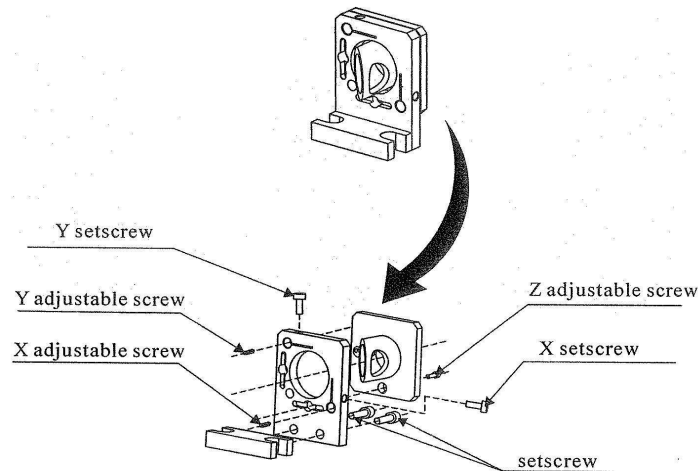


Fig8-1 Adjustable mirror socket structure

(2) RGB Laser beams mix system:

Mirror socket 1: Transmit green beam, reflect red beam, and then mix out yellow beam through mirror socket 1.

Mirror socket 2: Transmit yellow beam, reflect blue beam, and then mix out white beam through mirror socket 2.

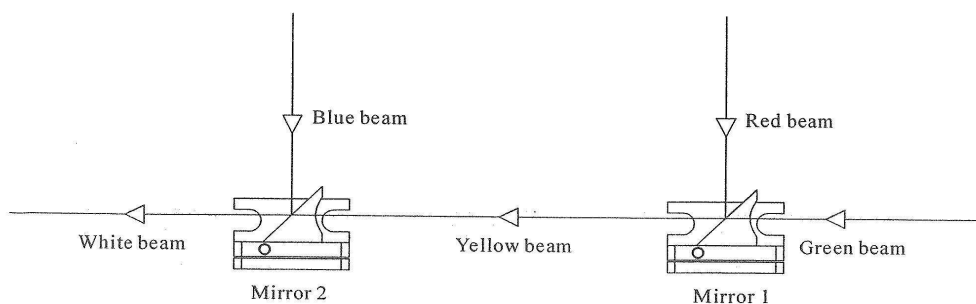


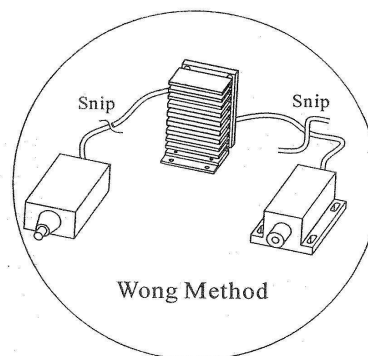
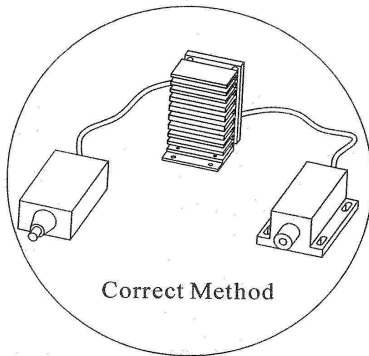
Fig8-2 RGB laser beams mix system

9. Laser diode replacement

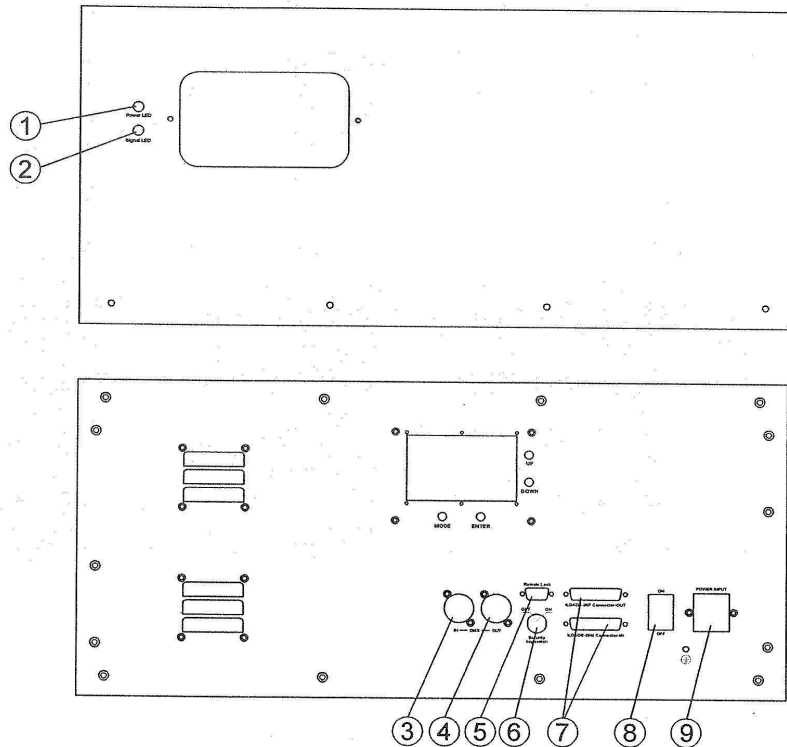
Methods:

Disassemble whole laser system (include power supply 1, power supply 2, laser diode) and then replace new one at original position.

Note: keep laser diode, power supply and cables be completely and don't try to damage, destroy or cut them so that it can be repaired (refer fig9-1).



10. Control board instruction



①	Power LED	Power LED
②	Signal LED	Signal LED
③	DMX IN	DMX signal input
④	DMX OUT	DMX signal output
⑤	Remote Lock	In the event of removal, laser will not emit any beam.(E.U. IEC regulation)
⑥	Securitykey switch	Laser diode ON/OFF
⑦	ILDADB-25F Connector-IN/OUT	Signal input connection port of the laser perform software that in accordance with the ILDA standard.
⑧	ON — OFF	Power switch
⑨	POWER INPUT	Input power, with inner fuse.

Computer software control mode

Fixture, there has a switch to select control mode - by computer or inside program: The fixture has ILDA DB 25 connector so that it can be controlled by computer software. In the When ILDA DB25F IN connects with QM2000 interfacial card or USB interfacial card, the lamp will be control by software which installed in the computer. When ILDA DB25F IN connector's connection port are free, the laser will driver by the inside program, temporality it can control by music or DMX512 signal.

The control mode switch will check the 4th Pin (InterLock A) and the 17th Pin (InterLock B) to adjust whether there has computer (with interfacial card) be connected to fixture. If Pin 4 not be connected to Pin 17, it means there no interfacial card otherwise there has and the connection port can receive all the signal of laser perform software that accord with the ILDA standard, such as LD-2000 of Pangolin company.

In the theory, all the signal of laser perform software that accord with the ILDA Db25 standard can control the fixture. But Pin 4 and Pin 17 not be connected in some laser perform interfacial card. You will need to sold this two pins together at Pin25 signal output connector or connect Pin4 and Pin 17 of the standard Pin 25 signal cable before use.

12. DMX512 Operate

The product has 18 operate channels(international standard DMX512 signal),The details as follow:

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	Colour change
		234~255	Colour fluent from 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 roll	0~255	roll from slow to fast
8	Vertical roll	0~255	roll from slow to fast
9	Z roll	0~255	roll from slow to fast
10	Horizontal move	0~255	from slow to fast
11	Vertical move	0~255	from slow to fast
12	Horizontal stretch	0~255	from slow to fast
13	Vertical stretch	0~255	from slow to fast
14	Horizontal & Vertical stretch	0~255	from slow to fast
15	Slow-draw speed	0~255	from slow to fast
16	Point-Draw	0~255	from slow to fast
17	Scan speed	0~255	from slow to fast
18	Pattern size	0~1	Original size
		2~255	100 grades

13. Specification

- Voltage: AC 100V~240V, 50/60Hz
- Total power: 350W
- Cooling mode: Air cooling
- X/Y axes beam scanning optical angle: $\pm 30^\circ$
- Input signal bandwidth: 0~1000Hz
- Condition temperature: $-10^\circ\text{C}\sim+35^\circ\text{C}$
- Laser light power: Red Laser Class 4 635nm
 Green Laser Class 4 532nm
 Blue Laser Class 4 473nm
- Working Mode: Laserword, Pangolin(ILDA connector), DMX512
- Net weight: 30 kg
- Dimension: 67 x 37 x 44 cm

14. Maintain

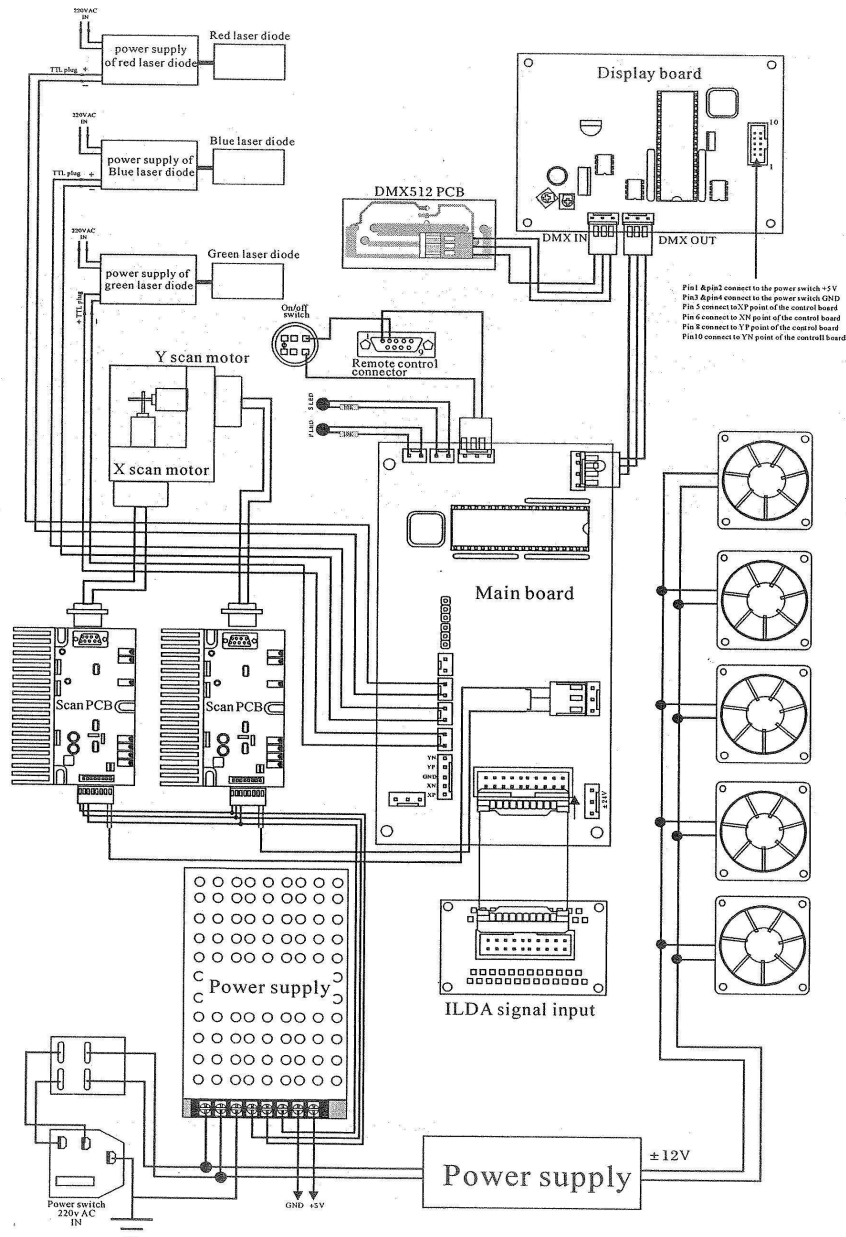
- Maintenance should be performed every 15-day period, by using a sponge which is dipped with alcohol, rather than wet cloth or other chemical liquid, to clean the mirror.
- Warning: Power must be disconnected before maintenance or repair. Do not look at the light source directly.

ATTENTION: DISCONNECT INPUT POWER BEFORE MAINTAIN.

DON'T LOOK STRAIGHTLY AT THE LIGHT SOURCES.

NOTE: Don't separate laser machine from laser power and repair them by yourself otherwise no good repair service will be supplied.

15. Electrical diagram



16. Trouble shooting

Problem	Caustion	Solution way	Series number
No power	Damaged fuse	Fuse	09-00-3001-01
	Damaged power switch	Power switch	08-05-0400-03
	Damaged power supply	$\pm 24V$	16-03-0039-00
	Damaged power supply	12V	16-03-0019-00
X&Y axis motors no power	Damaged scanner	Super scan motor	15-01-6800-00
	Damaged CPU	STC89C516	00-89C516RD-00
	Damaged control PCB	Control PCB	26-2A-2009LD-00
	Damaged power supply	$\pm 24V$	16-03-0039-00
	Damaged scan board	Scan board	26-2A-6800A-00
No light output / light output low	Dirty lens	Please refer to the user manual for further instruction	
	Damaged laser diode	Red laser diode	07-01-1000-01
		Green laser diode	07-03-0800-01
		blue laser diode	07-02-0400-01
	Damaged control PCB	Control PCB	26-2A-2009LD-00
No control	Operate	Please refer to the user manual for further instruction	
	Operate	Please refer to the user manual for further instruction	
	Damaged control PCB	Control PCB	26-2A-2009LD-00
	Damaged power supply	$\pm 24V$	16-03-0039-00
	Damaged display board	Display board	26-2A-YX2012DI-00
	Internal wires are disconnected	25 pins signal cable/ DMX512 signal cable)	

Appendix:

ILDA DB 25F PINOUTS DB 25 definens

1	X+	-5 to +5V
2	Y+	-5 to +5V
3	Intensity/Blanking+	0V to +2.5V
4	Interlock A	Connected to pin 17 inside the Qm2000
5	Red+	0V to +2.5V
6	Green+	0V to +2.5V
7	Blue+	0V to +2.5V
8	Deep blue+	0V to +2.5V
9	Yellow+	0V to +2.5V
10	Cyan+	0V to +2.5V
11	Z+	Depth Z(not intensity), -5 to +5V
12	Not connected	
13	Shutter	0V to +5V
14	X-	-5V to +5V
15	Y-	-5V to +5V
16	Intensity/Blanking-	-2.5V to 0V
17	Interlock B	Connected to pin 4 inside the Qm2000
18	Red-	-2.5V to 0V
19	Green-	-2.5V to 0V
20	Blue-	-2.5V to 0V
21	Deep blue-	-2.5V to 0V
22	Yellow-	-2.5V to 0V
23	Cyan-	-2.5V to 0V
24	Z-	-5V to +5V
25	Ground	Cable shield

EU- Declaration of Conformity



We hereby confirm that the following device

Laserworld PL-4000RGB Laser Projector

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 (98/336/EWG).

The device has been classified considering the following EU-norms on electromagnetic compatibility:

DIN EN 55103-1: 1996

DIN EN 55103-2: 1996

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

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

Assessment of compliance of the product with the requirements relating to the Low Voltage Directive (LVD) was based on the following standards:

DIN EN 60065 : 2002

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 and corresponding regulations for the prevention of accidents BGV-B2.

This declaration is executed on behalf of the Laserworld PL-4000RGB Laser manufacturer.

Laserworld (Switzerland) AG

Oberstrasse 1
8274 Tägerwilen
SWITZERLAND

Authorized person:
Supervisory board Ms Rhea Gössel

place of business: 8274 Tägerwilen / SWITZERLAND
company number: CH-440.3.020.548-6
Commercial Registry Kanton Thurgau

www.laserworld.com
info@laserworld.com

representative according to EMVG:
Cleantech Europe GmbH
Managing Director: Thomas Schulze
Fürkhofstr. 5
81927 München / DE