

**LASER TECHNIQUE**

User Instructions for

# **Laser Animator Laser Heads**

**50 to 600mW Green, Red and  
Blue Laser Systems**

**CE**

**LASER TECHNIQUE**  
by  
**NU LIGHT SYSTEMS LIMITED**

Unit 1, Atherton's Quay, Warrington, Cheshire, WA5 1AH, England.

Tel: +44 (0)1925 243075 Fax: +44 (0)1925 243077

Email: [sales@nu-light.co.uk](mailto:sales@nu-light.co.uk)

Web site: [www.nu-light.co.uk](http://www.nu-light.co.uk)

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## **SAFETY, OPERATING ENVIRONMENT AND USER MAINTENANCE:**

- 1. Before attempting to use the laser it is important that you read the operating instructions and become familiar with all functions and special considerations when using the laser. Failure to do so may cause a hazard or accident to the operators and the audience. Damage may also occur which will not be covered by the warranty.**
2. These instructions supplied with this product supersede any other versions.
3. When unpacking the laser system please check that all items are present (see inventory list in Contents section) and check the laser head by gently shaking for any loose objects.
4. The laser energy that is used in this system is powerful. Care must be exercised to avoid direct exposure to the laser beam or its reflections, it is important that the following safety precautions are observed at all times:
  - Do not look directly into a stationary laser beam. Your eye sight may be permanently damaged or lost.
  - Do not operate the laser system when fatigued or under the influence of alcohol.
  - Avoid wearing rings, metallic watchbands, or other metallic and or reflective objects, when near the output of the laser beam.
  - Never leave the laser system unattended while in operation and limit access to the laser system when in operation.
  - Do not allow persons near the laser system who are not trained in the operation and safety aspects of the laser system when there is no supervision.
  - Any alignment of the optical systems must be carried out with suitable eye protection. Insure that the eye protection is for the proper laser wavelength and optical density.
5. To comply with the HS(G)95 health and safety guidelines the following must be observed:

To meet with the maximum permissible exposure levels the laser beam projections if being used in audience scanning must have a minimum distance between the laser source and audience listed in the table below.

If the laser projections are being used in conditions where there is smoke in the atmosphere the laser power is reduced significantly, and the audience scanning distances can be reduced. Please see the Safety and Conformity section under LASER ANIMATOR HEAD SPECIFICATIONS of the user manual for full details of MPE levels and distances.

If the laser is not being used for audience scanning the projections should be 3m above the floor level.

When the laser is being used in situations where the distance between the audience and projections is less than the specified safety distance, it is important for a mask to be positioned so that the laser projections will be masked off (blocked) should the laser malfunction or the user attempt to scan the audience.

Laser Power	Minimum Recommended Viewing Distance
50mW	9.4m
100mW	13.6m
150mW	16.9m
200mW	19.7m
400mW	28.2m
600mW	34.8m

6. If a Risk Assessment has been provided for the installation of the laser system, it is the users responsibility to insure that the details in that assessment are adhered to.

7. Before operation the laser must be connected to a suitable mains plug. **THE UNIT MUST BE EARTHED, AND PROTECTED BY A 3 AMP FUSE.** The fuse inside the IEC connector is rated at 1.6A Delay Action 20mm for laser up to 200mW in power and 2A for lasers above 200mW – if it blows it must be replaced with a fuse of the same rating.
8. The laser must only be repaired by qualified personal, **any unauthorised modifications or attempts at repair will invalidate the warranty.** If there are any problems with the laser contact Nu Light Systems Ltd for advice.
9. The laser cannot be connected to a dimmer system, damage may occur if it is.
10. The laser is designed for inside use. Outside use is permitted providing it is not used in extreme weather conditions and that it is provided with adequate cover from rain and similar precipitation's Failure to do so may cause an electrocution hazard or damage and will invalidate the warranty.
11. The laser must not be operated for more than 6 hours in any one time.
12. The front laser output window and pan and tilt mirror should be cleaned with lens tissues frequently (at least once a week if it is used frequently) to remove dust and smoke particles. Use camera lens tissues and cleaning buds with pure methanol for cleaning purposes. These are available from all good camera shops.
13. Care must be exercised when handling the laser. It contains fragile components which may be damaged by knocks or excessive force.
14. The laser must always be secured to a stable mounting fixture.
15. The fan intake and output ducts must not be obstructed or placed near any object closer than 150mm.
16. Do not place the laser near the direct output from a smoke machine. Make sure there is a distance of at least 15m from a smoke machine.
17. Every time the laser is to be used all of its functions should be tested before the show.
18. Failure to observe the above may cause damage to the laser and will invalidate the warranty.
19. Do not throw away the original packaging. If you need to return the laser to the retailer then for maximum protection the original packaging must be used.
20. If you have any suggestions on the operation of this laser or require technical information or support please email: [lasupport@nu-light.co.uk](mailto:lasupport@nu-light.co.uk)

THE MANUFACTURER NU LIGHT SYSTEMS LTD REPRESENTED BY THE BRAND NAME OF "LASER TECHNIQUE" HOLDS NO LIABILITY FOR THE USE OF THIS PRODUCT OR FOR ANY DAMAGE WHICH MAY RESULT FROM ITS USE, IT IS THE USERS RESPONSIBILITY TO OPERATE THE LASER IN A SAFE MANNER. SPECIFICATIONS MAY CHANGE WITHOUT NOTICE.

## **WARRANTY INFORMATION:**

This laser system uses the highest quality components for the price / performance ratio. The laser comes with a full 12 month return to base warranty from the original date of purchase which covers all electronics, electromechanical components, enclosures. If the system is in the power range of 50 to 200mW then the warranty period is 10 months for the laser source, if the system is either 400 or 600mW then the warranty period is 12 months.

Laser Technique reserves the right to repair or replace the faulty product and to substitute any materials which may no longer be available with alternative parts. Charges for shipping the laser to and from Laser Technique must be covered by the customer.

The warranty does not cover defects which may be the result of misuse outside the specified operating conditions. **Any non authorised attempts at repairs or service of the product will void the warranty.**

## GENERAL DESCRIPTION AND OPERATION OF LASER SYSTEM:

### CONTENTS:

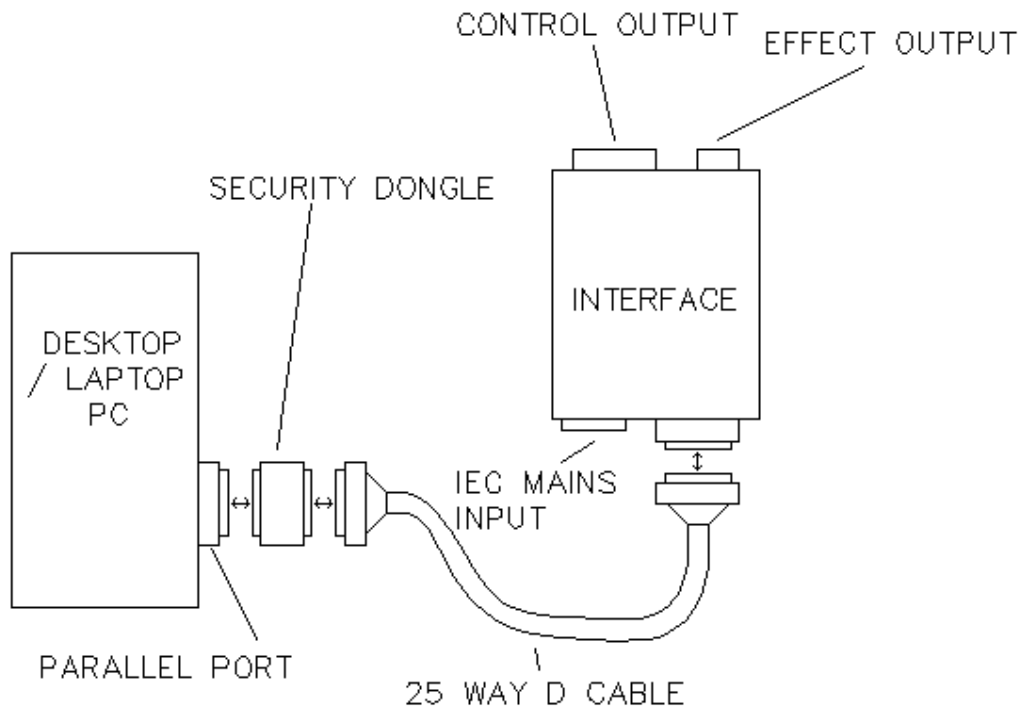
1. The complete Laser Animator System contains the following parts (separate Laser Animator Head's only contain the Laser Head):
  - Laser Head,
  - Interface,
  - Security Dongle,
  - Software CDROM,
  - 2m 25 WAY D parallel port cable,
  - 20m 25 WAY D control cable.

### LASER PHYSICAL FEATURES:

2. The laser head has the following features:
  - Projection Window where the laser animations project out from,
  - IEC input plug, and IEC socket lead which must be connected to the respective live, neutral, and earth lines,
  - 25 Way D Control Signal Input,
  - Mounting Bracket
  - Serial Label.

### SETTING UP AND TURNING THE LASER SYSTEM ON:

3. Position the laser head in a suitable position.
4. The laser interface, security dongle and 25 WAY D parallel port cable, need to be connected to your personal computer (PC).



5. The laser interface is connected to the PC's parallel port via the security dongle and a short 25 WAY D male to female cable. See the above diagram. The parallel port on the computer can be identified by locating the socket on the back which is a 25 WAY D female.

Connect the dongle to the computers parallel port first and then connect the 25 WAY D cable to that, then connect the female end of the 25 WAY D cable to the interface.

The interface has a 25 way D female output which carries all the Laser Control signals. The 9 way D female output carries all the Effect signal lines. The control outputs the X, Y, Blanking (Z), and 4 bit colour signals and the effect outputs 8 active high control lines which can be used to operate external devices via a suitable interface.

Note that we cannot supply spare security dongles, and so the software package and dongle should be insured against damage and loss to cover the full cost of a new software package.

For full details on the output signals of the interface please refer to the User Manual for the Laser Animator Software.

6. Connect the 25 WAY D female connector of the control cable to the 25 WAY D male input socket on the laser head. Connect the other end to the control output of the interface.
7. The power source for the laser should be from a clean mains source. The connections for the PC, interface and laser head should be taken from the same power point to avoid crossing phases and creating earth loops which may affect image stability.

If the laser is being powered from a generator, you should provide a power conditioning module, to clean the generators power output, or even run the laser through an appropriately rated computer un-interruptible power supply.

The signal cables between the interface and laser head should be routed away from mains carrying power cables to avoid interference, as image wobble at 50/60Hz mains may appear on the laser projections.

8. Connect the IEC mains input leads to the interface and laser head. Both the interface and laser head must be earthed and protected by a 3A fuse. **DO NOT APPLY POWER TO THE IEC LEADS YET.**
9. The laser output power may take up to 30 minutes to stabilise depending on the ambient temperature. If the laser head is operated from a very cold start the laser output may also be dim.
10. Start the Laser Animator Editor or Player software and then power the interface and laser head up, ie, connecting power to the IEC leads.

#### **TURNING THE LASER SYSTEM OFF:**

11. Stop output to the laser in Laser Animator Editor or Player.
12. Switch off the mains supply to interface and laser head and disconnect the mains IEC leads from both units.

#### **USER SUPPORT:**

13. If you have problems with the laser head, interface or software please contact your dealer for assistance. Alternatively you can email Nu Light Systems Ltd directly on [lasupport@nu-light.co.uk](mailto:lasupport@nu-light.co.uk)

## LASER HEAD SPECIFICATIONS:

### OPTICAL:

Laser Source : DPSS YAG  
Maximum Optical Power: 50=80mW, 100=120mW, 150=170mW, 200=220mW, 250mW=300mW  
400=500mW, 600=700mW,  
Classification : Class 3B for 50 to 400mW, Class 4 for 600mW  
Wavelength : 671nm Red, 523nm green, 473nm Blue.  
Beam Divergence : 2mrad,  
Beam Diameter : 2mm,  
Estimated Laser Life : 5000 Hrs for 50 to 200mW, 10000 Hrs for 250 to 600mW,  
Optics : Front surface enhanced aluminium mirrors with Anti Reflective coated output window,  
Shutter : Solid State Switching,  
Scan Time : 0.5mS Exposure at 30K,  
Galvanometers : XY set, maximum speed of 40K at small angles.

### POWER SUPPLY:

- Linear power supply for electronics and laser,
- 210 - 250 VAC Operation,
- 150 Watt power consumption for 50 to 200mW (Fuse at 1.6A DELAY 250VAC 20mm),
- 250 Watt power consumption for 250 to 600mW (Fuse at 2A DELAY 250VAC 20mm).

### CONFORMITY:

- CE Conformity to : EN 55011:1991 CLASS B (conducted and radiated),  
EN 61000-4-2:1995,  
EN 61000-4-3:1995,  
EN 61000-4-8:1994,  
LOW VOLTAGE DIRECTIVE,
- Recommended viewing distances for audience scanning. Note that these energy densities are approximate calculations based on the information provided in the HS(G)95 guide book.

Laser Power (mW)	MPE Energy Level (J/m <sup>2</sup> )	Safe Viewing Distance (m) in no Smoke and Energy Level (J/m <sup>2</sup> )	Safe Viewing Distance (m) in Low Density Smoke and Energy Level (J/m <sup>2</sup> )	Safe Viewing Distance (m) in Medium Density Smoke and Energy Level (J/m <sup>2</sup> )
50	0.060	9.4, 0.059	5.4, 0.058	3.4, 0.060
100	0.060	13.6, 0.060	6.6, 0.059	4.1, 0.054
150	0.060	16.0, 0.060	7.3, 0.057	4.4, 0.053
200	0.060	19.7, 0.060	7.7, 0.056	4.5, 0.059
400	0.060	28.2, 0.060	8.5, 0.054	4.9, 0.044
600	0.060	34.8, 0.060	8.8, 0.054	5.0, 0.043

- X or Y Scanner failure protection. If X or Y scanners fail, laser source will be shut down. Typical response time 2-5mS.

### PHYSICAL:

System Dimensions : 470(l) x 310(w) x 120(h)mm,  
Weight : 11.0Kg  
Operating Temperature : 5-35°C  
Packaging Size : 810(l) x 290(w) x 500(h)mm,  
Packaged Weight : 18.0Kg (including software and interface).

## LA HEAD SIGNAL INPUT DETAILS:

### CONTROL INPUT (25 Way D Female):

PIN 1	: +Y Differential Signal 10Vpp
PIN 2	: -Y Differential Signal 10Vpp
PIN 3	: Reserved for future use
PIN 4	: Reserved for future use
PIN 5	: +X Differential Signal 10Vpp
PIN 6	: Reserved for future use
PIN 7	: Reserved for future use
PIN 8	: -X Differential Signal 10Vpp
PIN 9	: Reserved for future use
PIN 10	: Reserved for future use
PIN 11	: Reserved for future use
PIN 12	: Reserved for future use
PIN 13	: Reserved for future use
PIN 14-19	: 0V
PIN 20	: Blanking Signal TTL (0V Low, +5V High)
PIN 21	: Colour Bit 4 TTL (0V Low, +5V High)
PIN 22	: Colour Bit 3 TTL (0V Low, +5V High)
PIN 23	: Colour Bit 2 TTL (0V Low, +5V High)
PIN 24	: Colour Bit 1 TTL (0V Low, +5V High)
PIN 25	: Reserved for future use

**NOTE: If this system is being used with a different control system than Laser Animator USE the following connections:**

PIN 1	: +Y Differential Signal 10Vpp
PIN 2	: -Y Differential Signal 10Vpp (use as 0V if used with single ended output)
PIN 5	: +X Differential Signal 10Vpp
PIN 8	: -X Differential Signal 10Vpp (use as 0V if used with single ended output)
PIN 14-19	: 0V
PIN 20	: Blanking Signal TTL (0V Low, +5V High)