

# KAM

INSTRUCTION MANUAL

## Laserscan Hyper 3D

Exceptional 3D ILDA laser with 8 different effects in a single unit

M A N U A L   V E R S I O N   2 . 0  
2 9 - 0 5 - 1 4

For the latest instruction manual updates and information on the entire Kam range visit:

[www.kam.co.uk](http://www.kam.co.uk)

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If this product is ever no longer functional please take it to a recycling plant for environmentally friendly disposal.

Due to continuous product development, specifications and appearance are subject to change.

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**Thank you for purchasing this Kam product, we are sure that it will serve you for many years to come.**

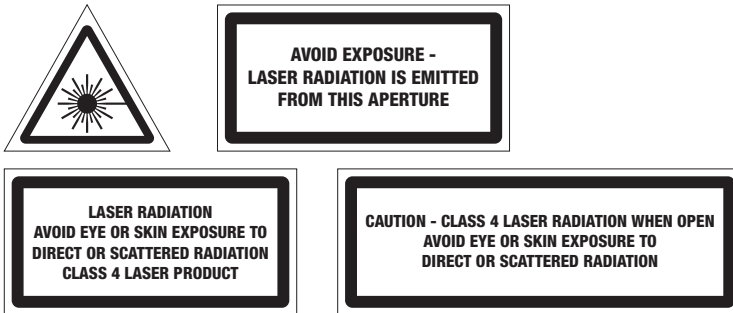
To optimise its performance, please read these instructions carefully to familiarise yourself with the basic operations of the unit. Please retain them for future reference. This unit has been tested at the factory before being shipped to you. To prevent or reduce the risk of electrical shock or fire, do not expose the unit to rain or moisture. To prevent a fire hazard, do not expose the unit to any naked flame sources. Unplug this apparatus during lightning storms or if it is unlikely to be used for long periods of time.

When installing the unit, please ensure you leave enough space around the unit for ventilation. Slots and openings in the unit are provided for ventilation to ensure reliable operation of the product and to protect it from overheating. To prevent fire hazard, the openings should never be blocked or covered.

The unit is powered by the mains, always handle the power cable by the plug. Never pull out the plug by pulling on the cable. Never touch the power cable when your hands are wet as this could cause an electric shock. Do not tie a knot in the cable. The power cable should be placed such that it is not likely to be stepped on. A damaged power cable can cause a fire or give you an electrical shock. Check the power cord periodically, if you ever find that it is damaged, replace it before using the unit again. Contact your retailer for a replacement.

The voltage of the available power supply differs according to country or region. Be sure that the power supply voltage of the area where this unit is to be used meets the requirements of the unit.

**The lightning flash symbol inside a triangle is to alert the user to the presence high voltage within the unit's enclosure that may be of sufficient power to constitute a risk of electrical shock to persons. Caution: to prevent the risk of electric shock, do not attempt to open the unit. No user-serviceable parts inside. Refer all servicing to qualified service personnel. The exclamation mark inside a triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the appliance. Please read and pay attention to all laser safety warning sticker labels on the unit.**



Select the installation location of your unit carefully. Avoid placing it in direct sunlight or locations subject to vibration and excessive dust. Do not use the unit where there are extremes in temperature (below 41°F / 5°C or exceeding 95°F / 35°C).

**Unpacking and safety** Please unpack your new product carefully. Your new product should reach you in perfect condition. Please check that no damage has occurred during transit. If any damage is found, do not operate your unit. Please contact the retailer you purchased it from immediately. If there is any damage to the mains cable do not use the device. Always disconnect the unit from the mains supply when carrying out any cleaning of the unit.

#### Manufacturer declarations



In compliance with the following requirements: **RoHS Directive (2002/95/EU)** and **WEEE Directive (2002/96/EU)**. If this product is ever no longer functional please take it to a recycling plant for environmentally friendly disposal.

#### CE declaration of conformity

R&TTE Directive (1999/5/EU), EMC Directive (2004/108/EU), Low Voltage Directive (2006/95/EU).

The declarations are available on application from [certification@lambapl.com](mailto:certification@lambapl.com)

Before putting the devices into operation, please observe the respective country-specific regulations.

This manual contains important laser system safety and operation information. Read and understand all instructions prior to powering on the laser unit the first time to avoid eye injury and to avoid breaking the law. Keep this manual in a safe place for future reference. Lasers can be hazardous and have unique safety considerations. Permanent eye injury and blindness is possible if lasers are used incorrectly. Pay close attention to each safety WARNING statement in this manual.

Please refer to the **Kam Class 4 Laser Product Safety Guide** for more information on laser safety issues.

**Laser safety warnings...**

Potential laser injury hazard exists with this product! Please read these instructions carefully, which include important information about installation, safe use and service!

**Caution** Avoid direct eye contact with laser light. Never intentionally expose your eyes or others to direct laser radiation.

**Caution** This laser product can potentially cause instant eye injury or blindness if laser light directly strikes the eyes.

**Caution** It is illegal and dangerous to shine this laser into audience areas.

**Caution** It is illegal and dangerous to shine any laser at aircraft.

**Caution** Operating procedures other than those specified herein may result in hazardous radiation exposure.

**Overhead rigging**

**Important** - the installation must be carried out by qualified service personal only. Improper installation can result in serious injuries and /or damage to property. Overhead rigging required extensive experience. Working load limits should be respected, certified installation materials should be used, the installed unit should be inspected regularly for safety.

- Make sure the area below the installation place is free from unwanted persons during rigging, de-rigging and servicing.
  - Locate the unit in a well ventilated spot, far away from any flammable materials and/or liquids. The fixture must be fixed **at least 50cm** from surrounding walls
  - The device should be installed out of reach of people and outside of areas where persons may walk by or be seated.
  - Before rigging make sure that the installation area can hold minimum point load of 10 times the device`s weight.
  - The device should be well fixed; a free swinging mounting is dangerous.
  - Do not cover any ventilation opening as this may result in overheating
- Before first time use, the unit should be inspected for safety. Inspection the unit regularly every year.

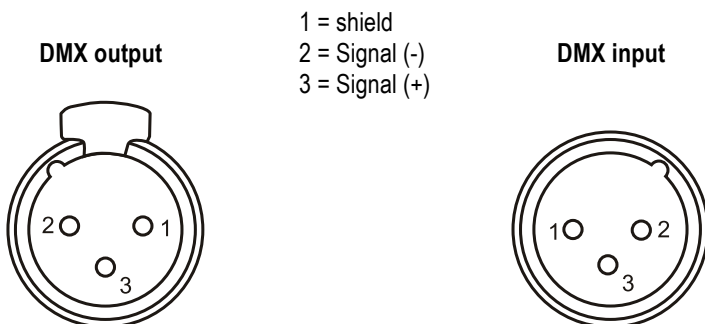
**AC power**

The unit is supplied with a power plug appropriate to its voltage. Should any other connections be required they must be carried out with the following configuration:

Cable (EU)	Cable (US)	Pin	International
Brown	Black	Live	L
Light blue	White	Neutral	N
Yellow/green	Green	Earth	⊕

**DMX-512 connection**

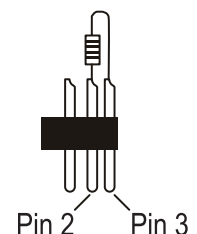
If you are using a standard DMX controller, you can connect the DMX output of the controller directly to the DMX input of the first unit in a DMX chain. If you wish to connect a DMX controller with other XLR outputs you will need to use adapter cables.



Connect the DMX output of the first unit in a DMX chain with the DMX input of the next unit in the chain. Always connect the the output of one unit with the input of the next unit until all units are connected.

If you use a controller with 5 pin DMX connection you will need to use a 5 pin to 3 pin adapter.

**Caution** at the unit, the DMX cable has to be terminated with a terminator. Solder a 120 Ohm resistor between Signal (-) and Signal (+) into a 3-pin XLR connector and plug this into the DMX output of the last unit in the chain.



The LaserScan Hyper 3D laser projector is a unique device offering 8 different effects in one package. The unit has been classified as a Class 4 laser product (please refer to the **Kam Class 4 Laser Product Safety Guide** for details of what this means) because it is capable of emitting high power laser beams that can cause eye damage. However, each of the 8 effects has a different hazard associated with it. It is the purpose of this guide to outline what these hazards are. The table below outlines all the effects and usage mode with an indication of the hazard potential for each.

Mode	Effect No.	Effect name	Menu	Potential hazard	Safe distance of usage
<b>Auto</b>	1	Hyper 3D	A3d	<b>3B</b>	15m
	2	Wide beam grating	AwY	<b>3B</b>	75m
	3	Northern lights	AuL	<b>3R</b>	0.5m
	4	Multi-grating	AuN	<b>3B</b>	25m
	5	Spirostar	Au9	<b>3B</b>	150m
	6	Kaleidoscope	Auo	<b>3B</b>	140m
	7	Wide-angle star cluster	AuC	<b>3R</b>	1m
	8	Flat beam & in-air tunnel	Aub	<b>4</b>	270m
<b>Sound-to-Light</b>	1	Hyper 3D	S3d	<b>3B</b>	15m
	2	Wide beam grating	S0Y	<b>3B</b>	75m
	3	Northern lights	S0L	<b>3R</b>	0.5m
	4	Multi-grating	S0N	<b>3B</b>	25m
	5	Spirostar	S09	<b>3B</b>	150m
	6	Kaleidoscope	S0o	<b>3B</b>	140m
	7	Wide-angle star cluster	S0C	<b>3R</b>	1m
	8	Flat beam & in-air tunnel	S0C	<b>4</b>	270m

**Mode:** This is either AUTO where each selected effect varies randomly or Sound-to-Light where the selected effect changes in time to the beat of the music.

**Effect No.:** This is the allocated number for the specific effect.

**Effect name:** This is the name of the specific effect.

**Menu:** This is the symbol that appears on the LED display on the back of the unit.

**Potential hazard:** This the hazard presented by the effect. It is based on the product classification system and uses the following classes:  
**3R** - can be considered safe.

**3B** - is hazardous and must be used with caution.

**4** - is **extremely** hazardous and must be used with the utmost of caution.

Note: A single beam can cause tissue burns a distances up to several metres!

**Safe distance of usage:** This is the distance below which the effect can become hazardous when shone directly into the audience eyes. Use this effect beyond the distance shown.

These figures have been arrived at by measuring the smallest beam shape that the unit can project for each effect – these represent its most concentrated beam power and thus its greatest hazard.

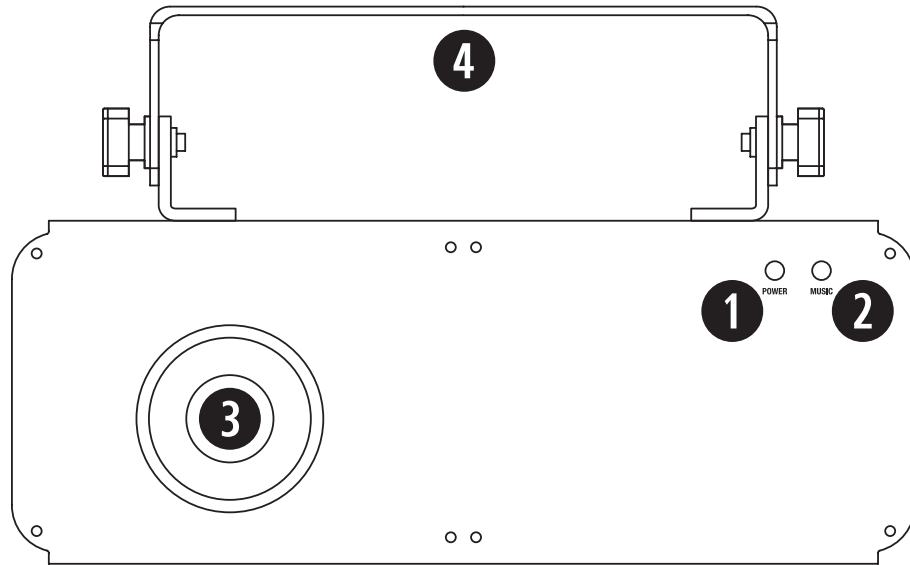
These figures are to be used as a guide to help determine what kind of show one can carry out. Effects like the Wide Angle Starcluster (effect 7) can be safely directed into an audience and can look very spectacular. The Northern Lights (effect 3), even though it is safe, is more effective when projected onto a wall. Please also note that the settings **Aut** and **Sou** (Automatic Random and Sound-to-Light) must **never** be used for audience scanning as you have no control over which effect will be used! If unsure about a show, always project at least 3m above audience head height. This is particularly true for the effects 1 and 8 as the 3m rule applies to the lowest part of the scanned image that can fall onto an audience. For the effects 2, 4, 5 and 6 the 3m rule applies for the central part of the projection – the very edges of the display are reduced in power and can fall onto audience. Scan an audience, at the edges, with these effects at your discretion.

When using this unit in **DMX mode** it is important to understand that this will override all internal effects and all the moving effects can be stopped to produce single beams. For this reason it is vital to ensure that **no** beams can go into audience at distances less than those specified in the table above.

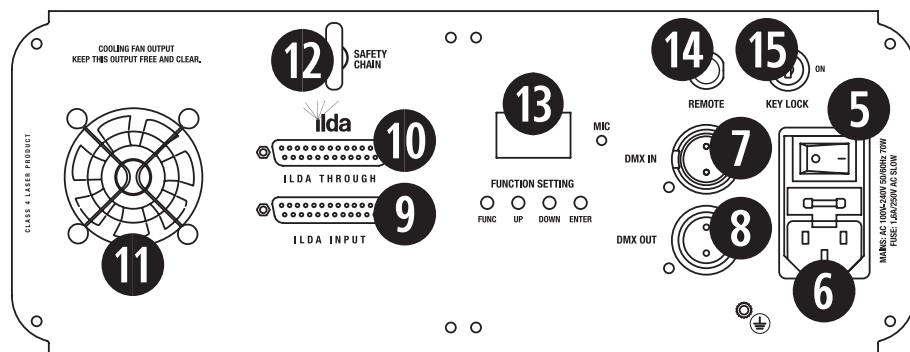
The same applies for the unit being used in ILDA mode – all the internally programmed images are overridden. Any audience scanning must be with the fastest possible scan rate and largest possible images at distances determined by careful calculation. **If in any doubt – don't audience scan.**

Please refer to the **Kam Class 4 Laser Product Safety Guide** for more detailed information.

## Front and rear panel controls and function



Number	Feature	Function
1	Power indicator LED	Illuminates red when the unit is turned on to show the unit is powered up.
2	Sound indicator LED	Flashes when an audio signal is received by the built-in microphone for reference.
3	Laser output aperture	The laser light is emitted from here. Never look directly into the hole when the unit is on.
4	Handle bracket	Adjustable handle for carrying the unit and for mounting.



Number	Feature	Function
5	Power switch	Turns the unit on or off when connected to the mains power supply
6	Power supply input	Attach the mains cable here. Built-in fuse and spare fuse
7	DMX input	3 pin XLR connector for DMX communication
8	DMX output	3 pin XLR connector for DMX communication
9	ILDA input	Standard ILDA interface. Automatically switches between the internal program and ILDA
10	ILDA through	Standard ILDA interface. Used to connect to other ILDA lasers
11	Cooling fan	Cooling fan output. Do not cover
12	Safety chain eyelet	Attach safety chain to this eyelet when mounting the unit
13	Control panel	LED panel featuring menu display and four button control
14	Remote connect	Safety connector used to turn the unit off immediately
15	Key lock switch	Even when powered up, the unit will not operate without the key inserted and turned to on

**Operating Mode**

When the laser is powered on, the LED Control Panel (13) on the rear panel shows the current operating standalone mode or the DMX address. With help of the LED Control Panel, it is very easy to set and change the operating mode of the laser. The next time the laser is powered on, it will show the last setting used before the unit was powered off.

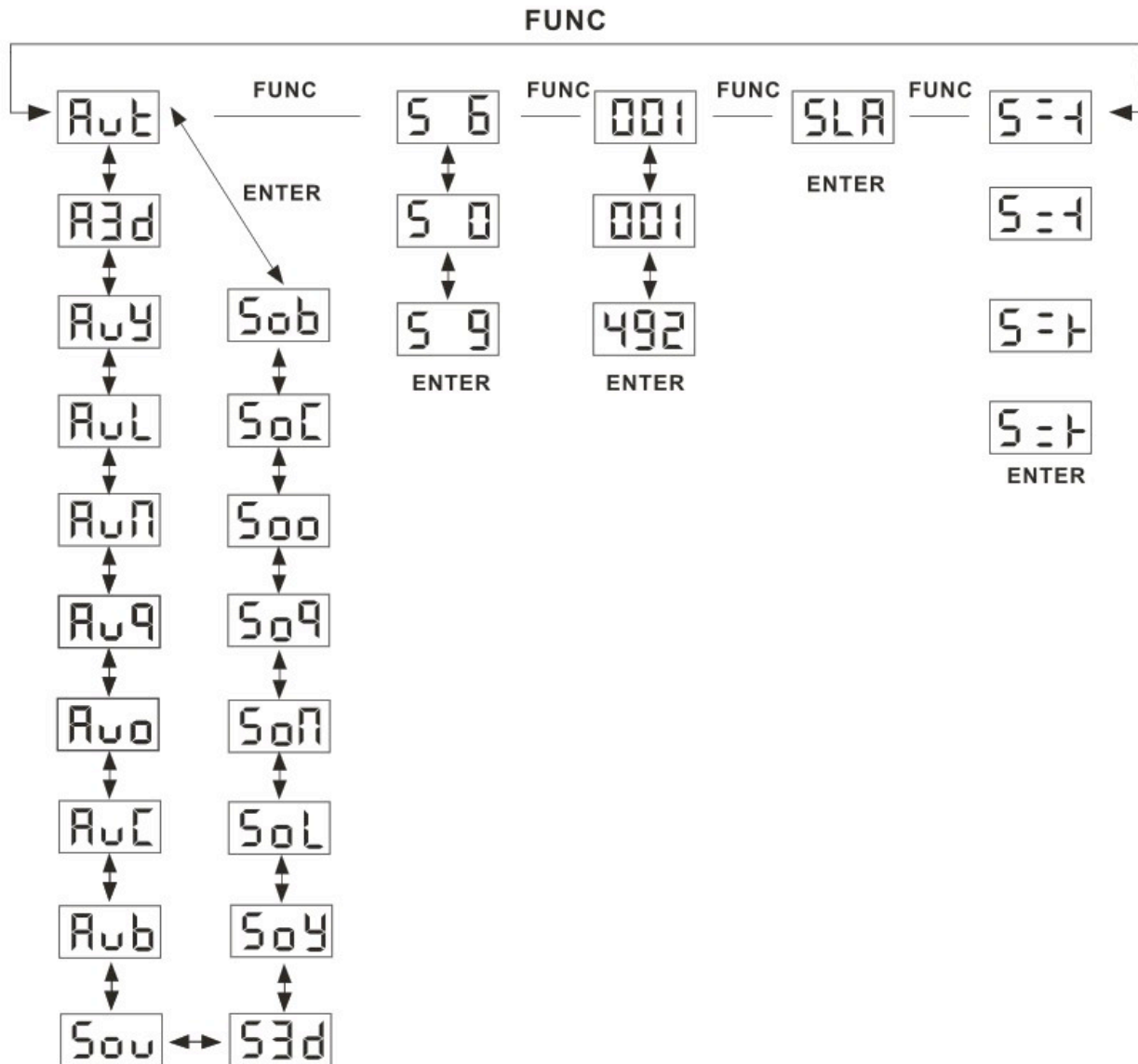
**LED Control Panel buttons**

**Funtion button (FUNC)** > mode option, press button to choose the operating mode of laser.

**UP and DOWN buttons** > press either button to change operating mode, parameter or DMX address.

**ENTER button** > press button to confirm a setting.

**Operation**



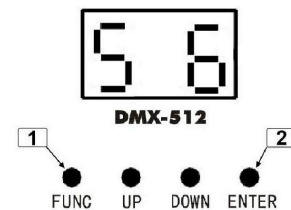
Display	Standalone mode – pre-programmed effect
AuT	Automatically cycle through its eight built in programs.
A3d	Automatically cycle through the built-in hyper 3D effects
AuY	Automatically cycle through the built-in wide beam grating effects
AuL	Automatically cycle through the built-in northern lights effects
Aun	Automatically cycle through the built-in multi-grating effects
Auq	Automatically cycle through the built-in spirostar effects
Auo	Automatically cycle through the built-in kaleidoscope effects

AuC	Automatically cycle through the built-in star cluster effects
AUb	Automatically cycle through the built-in flat beam & in-air tunnel effects
SOU	Sound Activated Show in corresponding effect
S3d	Cycle through the built-in hyper 3D effects by sound activation
SoY	Cycle through the built-in wide beam grating effects by sound activation
SOL	Cycle through the built-in northern lights effects by sound activation
Son	Cycle through the built-in multi-grating effects by sound activation
Soq	Cycle through the built-in spirostar effects by sound activation
Soo	Cycle through the built-in kaleidoscope effects by sound activation
SoC	Cycle through the built-in star-cluster effects by sound activation
Sob	Cycle through the built-in flat beam & in-air tunnel effects by sound activation

### Sound Activated Mode Sensitivity setting

The laser has a built in microphone and to reduce and increase the sensitivity of the pick up, which will alter the reaction of the programs, use the Sound activation mode settings.

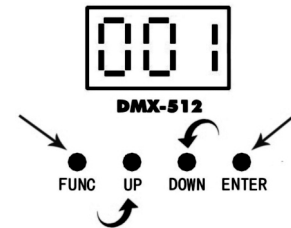
- Press FUNC till you see S6
- Press UP/DOWN to set the microphone sensitivity. S 0 is no sound activation, from S 1 to S 9; the sensitivity level will increase and be more sensitive.
- Press ENTER to confirm.



**ATTENTION!** In pre-programmed standalone MUSIC SHOW mode, the laser beams will blackout in 3 seconds without AUDIO/MIC activated signal.

### DMX Mode

- Press FUNC to enter the MODE selection
- The LED panel will show 001 for DMX mode
- Press ENTER to confirm the setting. Now the laser is working in DMX mode. Use the up/down buttons to select the DMX address.



Note: In DMX MODE, once the DMX cable is connected to the laser and DMX controller, the DMX LED in front panel of laser will be ON.

When DMX signal is present, the LED display will stop flashing.

**Controlling units via DMX** - each unit uses 19 DMX channels

### To set the DMX address

1. Press the function button until \*\*\* is displayed (range 001-512)
2. Using the up / down buttons select the desired DMX starting address
3. Press the enter button to confirm
4. Continue this formula to address any additional units

Note on setting the DMX address of units - If one or several units are to be controlled at the same time with the same features, set all units DMX address to the same value

Example all units to 001

If individual control of several units is required, each unit must have its on unique address and no channels must cross

Example unit 1 set to 001 – unit 2 to 020 etc adding 19 clear channels each time

### Slave Mode

- Press FUNC to enter the MODE selection
- The LED panel will show SLA for slave mode
- Press ENTER to confirm the setting Now the laser is working in SLAVE mode.

### Master slaving units with no DMX controller

Set the master unit to the desired setting

Example: auto or sound

Set all other units to slave mode

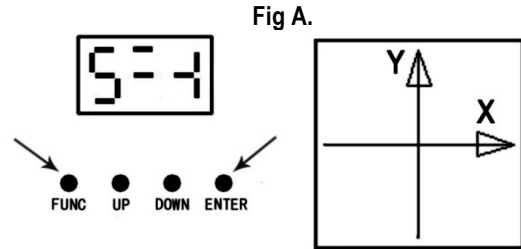
To set slave mode press the function button until SLA is displayed then press the enter button to confirm

Only one unit must be set as a master and all other units must be set as slave

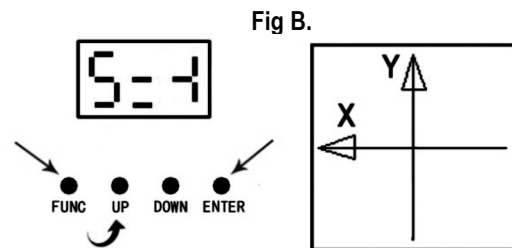
Connect each unit together via a 3pin DMX lead

### Pattern Mirror Reverse Setting

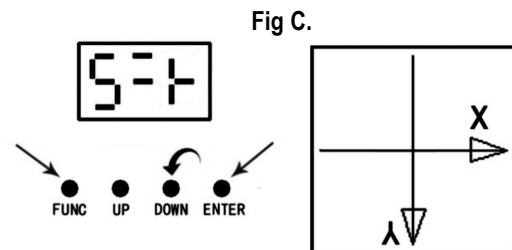
- Press FUNC to enter the MODE selection
- Use the up/down buttons to set the LED display to match Fig A.
- Press ENTER to confirm the setting.



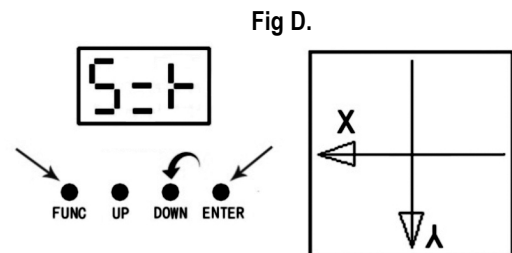
- Using the up/down buttons set the display to match Fig. B. This will rotate the graphic in the X direction.



- Using the up/down buttons set the LED display to match Fig. C. This will flip the graphic in the Y direction.



- Using the up/down buttons set the LED display to match Fig. D. This will flip the graphic in the X and Y directions.



### ILDA Control Mode

This unit has the ILDA DB25 port, which allows control of the laser via a PC/Mac laser or lighting software. The PC must be connected to an interface and then the ILDA cable from the interface is connected to the ILDA input socket on the rear of the laser. When connecting the ILDA plug to the laser this will override all built in standalone functions of the laser, and can then only be controlled by the PC/Mac software. Removing the ILDA cable will re-enable all standalone functions.

Please note: it should be possible for any ILDA controlled software to operate this laser, if your software is having problems controlling the laser this maybe down to a cable connection issue. Some interfaces and cables may have different wiring configuration. The fourth and seventeenth pin of the ILDA socket need to be connected. If you rectify this issue on your interface then this will cure the control issue.






DMX channels chart when ILDA IS connected

Channel	Value	Description
<b>CH1 Grating rotation</b>	000-004	No grating rotation
	005-127	Clockwise grating rotation
	128-133	No grating rotation
	134-255	Anticlockwise grating rotation
<b>CH2 Grating effect</b>	000-031	Grating effect 1 - hyper 3D effects
	032-063	Grating effect 2 - wide beam grating effects
	064-095	Grating effect 3 - northern lights effects
	096-127	Grating effect 4 - multi-grating effects
	128-159	Grating effect 5 - spirostar effects
	160-191	Grating effect 6 - kaleidoscope effects
	192-223	Grating effect 7 - star cluster effects
	224-255	Effect 8 - flat beam & in-air tunnel effects






DMX channels chart when ILDA IS NOT connected






Channel	Value	Description
<b>CH1 mode</b>	000-018	Laser OFF
	019-030	Mixed effect AUTO show - 8in1
	031-042	AUTO grating 1 (A3D) - hyper 3D effects
	043-054	AUTO grating 2 (AUY) - wide beam grating effects
	055-066	AUTO grating 3 (AUL) - northern lights effects
	067-078	AUTO grating 4 (AUN) - multi-grating effects
	079-090	AUTO grating 5 (AUQ) - spirostar effects
	091-102	AUTO grating 6 (AUO) - kaleidoscope effects
	103-114	AUTO grating 7 (AUC) - star cluster effects
	115-126	AUTO scanned beam (AUB) - in-air tunnel effects
	127-138	Mixed effect sound show - 8-in-1
	139-150	SOUND grating 1 (A3D) - hyper 3D effects
	151-162	SOUND grating 2 (SOY) - wide beam grating effects
	163-174	SOUND grating 3 (SOL) - northern lights effects
	175-186	SOUND grating 4 (SON) - multi-grating effects
	187-198	SOUND grating 5 (SOQ) - spirostar effects
	199-210	SOUND grating 6 (SOO) - kaleidoscope effects
	211-222	SOUND grating 7 (SOC) - star cluster effects
	223-234	SOUND scanned beam (SOB) - in-air tunnel effects
	235-244	DMX control, only star cluster effect, see chart 1
245-255	DMX control, grating and pattern, see chart 2	

DMX chart 1, when CH1 is at 235-244, only Starcluster effect

Channel	Value	Description
<b>CH2 Grating rotating</b>	000-004	No grating rotation
	005-127	Anticlockwise rolling 
	128-133	No grating rotation
	134-255	Clockwise rolling 
<b>CH3 Colour</b>	000-007	Original preprogrammed color
	008-015	Red
	016-023	Green
	024-031	Red and green
	032-039	Blue
	040-047	Red and blue
	048-055	Blue and green
	056-063	RGB
	064-111	Single colour change
	112-159	Multi colour change
	160-207	Multi colour speed 
	208-255	Strobe
<b>CH4 X move</b>	000-127	128 different fixed position on X axis
	128-255	Shake effect
<b>CH 5 Move speed</b>	000-255	Fast to slow of channel 4 Shake effect
<b>CH6 Y move</b>	000-127	128 different fixed position on Y axis
	128-255	Shake effect
<b>CH 7 Move speed</b>	000-255	Fast to slow of channel 6 Shake effect

DMX chart 2, when CH1 is at 245-255, grating and patterns effect

Channel	Value	Function
<b>CH 2 Group</b>	000-051	Pattern group 1
	052-103	Pattern group 2
	104-155	Pattern group 3
	156-207	Pattern group 4
	208-255	Pattern group 5
<b>CH 3 Pattern</b>	000-255	16 patterns options in each group
<b>CH 4 Grating / effect wheel</b>	000-031	Grating effect 1 - hyper 3D effects
	032-063	Grating effect 2 - wide beam grating effects
	064-095	Grating effect 3 - northern lights effects
	096-127	Grating effect 4 - multi-grating effects
	128-159	Grating effect 5 - spirostar effects
	160-191	Grating effect 6 - kaleidoscope effects
	192-255	Flat beam & in-air tunnel effects
<b>CH 5 Grating rotating</b>	000-004	No grating rotation
	005-127	Anticlockwise rolling 
	128-133	No grating rotation
	134-255	Clockwise rolling 
<b>CH 6 Colour</b>	000-007	Original preprogrammed color
	008-015	Red
	016-023	Green
	024-031	Yellow
	032-039	Blue
	040-047	Pink
	048-055	Cyan
	056-063	White
	064-111	Single colour change 
	112-159	Color Jumping
	160-207	Color Moving
	208-255	Strobe effect 
<b>CH 7 Clipping</b>	000	Full pattern without clipping
	001-127	0%~99% fixed pattern clipped
	128-255	Clipping Speed 
<b>CH 8 Zooming</b>	000-127	100%-5% fixed pattern zoomed
	128-169	Zooming IN
	170-209	Zooming OUT
	210-255	Alternately Zooming

<b>CH 9 Zoom speed</b>	000-255	Fast to Slow 
<b>CH 10 Y Axis Rolling</b>	000-127	0 - 359 degree fixed Y axis rolled
	128-191	Anticlockwise rolling
	192-255	Clockwise rolling
<b>CH 11 Roll Speed</b>	0-255	Fast to Slow 
<b>CH 12 X axis Rolling</b>	000-127	0 - 359 degree fixed X axis rolled
	128-191	Rolling & morphing effect 1
	192-255	Rolling & morphing effect 2
<b>CH 13 Roll speed</b>	0-255	Fast to Slow 
<b>CH 14 Z axis rolling</b>	000-127	0 - 359 degree fixed Z axis rolled
	128-191	Anticlockwise rolling
	192-255	Clockwise rolling
<b>CH 15 Roll speed</b>	0-255	Fast to Slow 
<b>CH 16 X axis moving</b>	000-127	128 different fixed position on X axis
	128-191	Rolling & morphing effect 1
	192-255	Rolling & morphing effect 2
<b>CH 17 Move speed</b>	0-255	Fast to Slow 
<b>CH 18 Y axis moving</b>	000-127	128 different fixed position on Y axis
	128-191	Rolling & morphing effect 1
	192-255	Rolling & morphing effect 2
<b>CH 19 Move speed</b>	0-255	Fast to Slow

## Pattern List

DMX	1	2	3	4	5
000-015					
016-031					
032-047					
048-063					
064-079					
080-095					
096-111					
112-127					
128-143					
144-159					
160-175					
176-191					
192-207					
208-223					
224-239					
240-255					

## Specification

<b>Mains Input</b>	AC100~240V, 50/60Hz
<b>Fuse</b>	250V /1.6A Slow Blow (20mm Glass)
<b>Total Power</b>	55W
<b>X/Y axis beam angle</b>	±20°
<b>Music control</b>	Audio / Sound activated
<b>Laser power</b>	550mW 638nm Red 150mW 532 Green 800mW 450nm Blue
<b>Laser classification</b>	Class 4
<b>Laser safety standard</b>	EN60825-1 2007
<b>Condition temperature</b>	10~40°C
<b>DMX connections</b>	3 pins XLR male/female
<b>DMX channels</b>	Max 19 channels
<b>Measurements</b>	290mm x 240mm x 110mm (WxDxH)
<b>Net weight</b>	4.5Kg