

Energy SD300

Multicolour animation laser with SD card input for shows

M A N U A L V E R S I O N 1.0 09-16

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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 it's 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 periodicaly, 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@lambaplc.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 3B 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 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 personel only. Improper installation can result in serious injuries and /or damage to property. Overhead rigging requires 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 using for the first time, the unit should be inspected for safety. Inspect 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	Ν
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.



What is included in the package

1 x Kam Energy SD300 laser unit

- 1 x IEC power cable
- 1 x safety key
- 1 x remote interlock key
- 1 x user manual

Front and Rear panels





Front panel features

Number	Feature	Function
1	Laser aperture	The laser light is emitted from here. Never look directly into the hole when the unit is on

Rear panel features

Number	Feature	Function	
2	Key lock	Supplied key switches the unit on and off	
3	Remote interlock key	Safety feature - removal of remote interlock key shuts down all of the laser diodes	
4	DMX out	3 pin female XLR connector for sending DMX signal	
5	DMX in	3 pin male XLR connector for receiving DMX signal	
6	Menu button	Selects menu functions from projected laser display	
7	Microphone	Detects the music / sound signal	
8	Micro SD card slot	Add an external micro SD card for additional laser shows	
9	Menu UP button	Increases parameters in menu	
10	Menu DOWN button	Decreases parameters in menu	
11	Mains power	Mains power input with IEC socket and integrated fuse holder	
12	IEC connector	Female IEC socket for connecting multiple units	
13	Safety eyelet	Used to attach a safety chain when the unit is rigged	
14	Cooling fan	Cooling fan – do not obstruct	

Function Setting Menu

Please note that this unit's operating menu is projected by the laser (it is not built into the unit), so it is suggested that the unit is pointed at a single colour surface so the menu can be easily read. The size of the menu and text will be dependent on the how far the unit is from the wall or surface. The size can also be adjusted using the Size setting within the menu (see below).

Main menu operation

Using the three function buttons (on the rear of the unit) you can set the operating mode of the unit. Press the **Menu** button to display the different functions (see table below for a description of the functions). Use the **Up** or **Down** arrow buttons to make your selection.

Function setting LED menu structure

Menu title	Function
AUDIO MODE	The unit will play built-in auto shows (in-air tunnel & beam effects) in time to any music playing
	Use the UP or DOWN buttons to change the sensitivity of the microphone
AUTO MODE Plays built-in auto shows (in-air tunnel & beam effects) in rotation	
3CH: XXX or 14CH: XXX This is the DMX setting menu - use the UP or DOWN buttons to change the DMX address	
Alignment (big cross)	(Only when no SD card is inserted) - used by qualified engineers to align the laser diodes
SIZE: XXX	Use the UP or DOWN buttons to change the size of the projection from 10 (small) to 100 (big)
3CH MODE or 14CH MODE	Use the UP or DOWN buttons to choose between 3 or 14 channel DMX modes
PRG MODE	If a micro SD card is inserted, PRG mode will play all the ILD files that are in the selected folder
	Press and hold the UP or DOWN buttons to move between the themed folders on the card
ILD MODE	If a micro SD card is inserted, ILD mode will play the first ILD file that is in the selected folder
	Use the UP or DOWN buttons to move between the ILD files in each folder
	Press and hold the UP or DOWN buttons to move between the themed folders on the card

Micro SD card operation

If a micro SD card is inserted into the laser's SD card slot, the following 2 modes will appear in the projected menu:

PRG MODE - program mode

This will play whatever ILD files are on the SD card (inside the first folder) in a rotation.

To 'move up' a folder, press and HOLD the UP button, this will move up to the next folder and then start playing the ILD files in that folder in a rotation.

When the uppermost folder is reached, press and HOLD the DOWN button to move down the folders.

ILD MODE - ILD file mode

This will play whatever the first ILD file is on the SD card (inside the first folder). It repeats the same ILD file over and over. To move to the next ILD file, you will need to press the UP button once (do not press and hold, just press once).

To 'move up' a folder, press and hold the UP button, this will move up to the next folder and then start playing the first ILD file in that folder.

When the uppermost folder is reached, you need to press and hold the DOWN button to move down the folders.

How to add your ILD files to the SD card

If you internet search for '**ILD files free**' you will find many websites that offer free downloads of laser animations and images that you can add to your SD card and your shows. Many are themed around festivals and occasions (weddings, birthdays, xmas, etc).

To add the files to your micro SD card you will need to obtain a micro SD card reader (or an SD card reader and micro SD adapter) for your computer. These are commonly available and very cheap to buy. Once you have loaded your micro SD card onto your computer and can see the 'contents' of the card you will see that the card contains a series of folders with names like 'Animals', 'Club' and 'Sports'. Inside each of these folders are a series of .ILD files as well as a single .PRG file.

The .ILD are the animation or image files.

The .PRG file contains information as to what is in each folder, enabling the unit to play the .ILD files.

To add your own group of .ILD files to your SD card, complete the following steps:

- 1. Somewhere on your computer, create a folder and name it with a simple, one word name like myshow1
- 2. Put your downloaded .ILD files inside your myshow1 folder.
- 3. Create a basic text file and name it with the exact same name as the folder. Add the suffix **.PRG** to the file. In our example your text file should be called **myshow1.PRG**
- 4. Save this .PRG file into your myshow1 folder.
- 5. List the exact names of each of your .ILD files in the text file. For example if you have added 3 files named 'Balloon.ILD', 'Cat.ILD' and 'Sun.ILD' to your folder, the .PRG text file should first look like this:

Balloon.ILD Cat.ILD Sun.ILD

6. Next you need to add a play speed and a play figure. These are added to the names on your list and seperated by commas. Your .PRG text file should now look like this:

Balloon.ILD,12,1 Cat.ILD,12,1 Sun.ILD,12,1

- 7. Save and close the **myshow1.PRG** file.
- 8. You should now have a folder called myshow1 containing three .ILD files and a .PRG file called myshow1.PRG
- 9. Copy this folder to the micro SD card. Do not put it inside any of the folders on the card, just add it to the other folders.
- 10. Eject the micro SD card and insert it into your unit, your new animations should appear amongst your other animations, you will need to navigate to the folder using the methods listed at the top of this page.

DMX address setting

When controlling lasers with a DMX controller, each unit must be set with a specific DMX address. When the laser receives a signal, it will receive the channel control signal from the DMX512 controller.

You can choose to set multiple units with the same DMX address or you can set every unit with its own DMX address. If multiple units are set with the same DMX address, they will receive DMX signal from this DMX address. If operated in this way, all units will operate in the same way, you cannot control each unit separately. When using 14 channel mode, please note that several optional operating modes were preprogrammed into the laser on DMX channel 1. Before controlling other DMX channels, please ensure that CH 1 is set to the correct value.

3 channel DMX operation

Channel	Function	Value	Description	
1	File select	0-255	Play files on SD card	
2	File select	0-255	Play individual ILD files	
3	Size/output	0-74	Laser OFF	
		75-255	Adjust image size from large to small	

14 channel DMX operation

Channel	Function	Value	Description		
1 Mode s		0-49	Auto mode		
		50-99	Audio mode (Sound-to-Light)		
	Mode select	100-149	PRG mode		
		150-199	ILD mode		
		200-255	Manual DMX mode (CH1 must be set to this mode if you wish to use the functions below)		
ŋ	Pattern/folder select	0.255	Manual mode		PRG/ILD mode
Z (ensure	(ensure CH1 is set to Manual DMX mode)	0-200	Pattern select, every 3 values = 1 pa	attern	File select
		0-10	No Strobe		
3	Flashing/file select	11-199	Auto strobe	Play file	eselect
		200-255	Audio strobe		
		0-5	Laser OFF		
		6 16	W/bito	Origina	colour
		0-10	white	White	
		17-33	Red		
		34-50	Green		
		51-67	Blue		
		68-84	Yellow		
		85-101	Purple		
4	RGB colour mode select	102-118	Cyan		
		119-135	White, red, green, blue colour select	ion	
		136-152	Blue, yellow, purple, cyan colour sel	ection	
		153-169	White, red, green, blue, yellow, purp	le, cyan d	colour selection
		170-186	White, red, green, blue 4 colour flow		
		187-203	Blue, yellow, purple, cyan 4 colour flow		
		204-220	Blue, yellow, purple, cyan 4 colour flow		
		221-237	Colour subsection by inflexion		
		238-255	Sound activated colour change		
	X position (ensure CH1 is set to Manual DMX mode)	0-125	Manually adjust X position		
		126-185	Moves circle from left to right automatically		
5		186-255	Jumps circle from right to left automatically		
		226-245	Auto jumping		
		246-255	Sound activated jumping		

6 (ensure CH1 is		0-125	Manually adjust Y position
		126-185	Moves circle from up to down automatically
	Y position	186-255	Jumps circle from down to up automatically
		226-245	Auto jumping
		246-255	Sound activated jumping
		0-10	No change
		11-87	Manually adjust size
7	Zoom +/-	88-150	Zoom out continuously
		151-200	Zoom in continuously
		201-255	Zoom in and out continuously
		0	No change
8	Rolling X	1-128	Manual rotation
		129-255	Auto rotation
		0	No change
9	Rolling Y	1-128	Manual rotation
		129-255	Auto rotation
		0	No change
10	Rolling center	1-128	Manual rotation
10	(ensure CH1 is set to Manual DMX mode)	129-192	Auto clockwise rotation
		193-255	Auto anti-clockwise rotation
		0-10	No change
		10-74	Draw pattern manually
		75-104	Auto drawing of pattern +
11	Urawing (ensure CH1 is set to Manual DMX mode)	105-144	Auto drawing of pattern -
		145-184	Auto drawing from start to finish
		185-244	End to end drawing circle +
		245-255	End to end drawing circle -
		0-9	No wave
	X	10-69	Small wave
12	X WAVE (ensure CH1 is set to Manual DMX mode)	70-129	Medium wave
	(130-189	Large wave
		190-255	Largest wave
13 (ensure		0-9	No wave
	N	10-69	Small wave
	Y WAVE (ensure CH1 is set to Manual DMX mode)	70-129	Medium wave
	(130-189	Large wave
		190-255	Largest wave
14		0-63	Normal display of pattern
	Display mode (ensure CH1 is set to Manual DMX mode)	64-127	Light dot display of pattern
		128-191	Segment display of pattern
		192-255	Dot display of pattern

Product specification			
Mains input / power consumption	AC100~240V, 50/60Hz / 14w		
Control modes	DMX512 / Auto / Sound-to-Light / PRG / ILD		
Scanner speed	10k		
Laser power	Red: 150mW / 650nm Green: 50mW / 532nm Blue: 100mW / 450nm		
Laser classification	Class 3B		
Operating temperature	10~40°		
DMX connections	3 pin XLR male/female		
Dimensions (WxDxH) / Weight	190 x 165 x 118mm (not inluding bracket) / 1.8Kg		