

USER'S MANUAL

3W Scan Laser



-Maintenance

1. Please keep the light in dryness and avoiding use in wet place.
2. Using intermittently can be extended the life.
3. Attention to clean the fan and lens usually in order to get the ventilating effects and lighting effects better.
4. Please do not wipe the crust using organic menstruum for avoid to damaged the product.

-Statement

The product has well capability and intact packing when leave factory, All of the user should comply with above warning item and manual, any misuse cause of the damages are not included in our guarantee, and also can't be responsible for any malfunction & problem owing to ignore the manual.

Please forgive that we will not be notice for technical change

-Attention Item

1. For guarantee the life of product, please do not put it on the wet place and not use it the place over 40 degree.
2. Please don't lay the product on the un-fixable or shakable place.
3. Ask for the professional to maintain the product in order to avoid the danger of get an electric shock.
4. Power supply should not be changed over +8%-10% while the light is using, it will be decreased the life of lamp if the power is too high, but it will be influenced the luminosity if the power is too low.
5. After power off, if it is need used again, please cool down over 20 minuter.
6. Please look round the manual for ensure the product can be used normally.

[MUST-READ BEFORE UNBOXING]

Laser components are highly sensitive to electrostatic discharge. Direct contact during unboxing may cause damage to the components due to electrostatic release. Please follow these steps:

- 1: Touch a metal door handle/water pipe for 3 seconds to discharge static electricity from your body.
- 2: Wear an anti-static wrist strap before handling the equipment.
- 3: First, touch the metal part on the outside of the packaging box, then take out the product.



- It is recommended to operate in an environment with an anti-static table mat.
- In dry seasons, wipe your hands with wet wipes first.
- If you find any damage to the packaging, please contact customer service immediately.

1. Safety tips

How do international standards define laser products

The International Electro technical Commission (IEC) classifies laser products into four main categories according to their potential level of danger:

Class 1: No danger. Under normal use conditions, the output power of the laser is extremely low and does not cause damage to the eyes or skin.

Class 2: Low risk. Laser light has a low output power and is usually visible light, which can cause limited damage to the eyes, but it is recommended to avoid looking directly at them for long periods of time.

Class 3: Moderate risk. It is classified into Class 3R and Class 3B, which may cause damage to the eyes and skin and requires proper protective measures.

Class 4: High risk. The output power of the laser is very high, which can cause serious injury to the eyes, skin and surrounding materials, and strict protective measures must be taken.

It is noted that some other optical devices such as cameras, camcorders, video projectors, etc. may be damaged if exposed to excessive laser radiation.

2. Precautions for operation

The laser system is a precision device containing a number of sensitive optoelectronic components. Do not drop it or subject it to physical impact.

The laser system is not waterproof or dust-proof.

If using in rain, snow or similar harsh environmental conditions, be sure to use a suitable cover or housing.

Do not place the laser system in an overheated area, such as a car in direct sunlight. High temperatures can cause serious damage to the system.

The laser system contains precision electronic circuits. Do not attempt to disassemble the laser by yourself. If the laser is suddenly brought from a cold room to a warm room, condensation may form on the laser and internal parts.

Do not open the device immediately if it is exposed to drastic temperature fluctuations, such as after transportation. The resulting condensed water may damage your equipment. Turn the device off until room temperature is reached.

Turn off the laser luminaire and allow the laser luminaire to cool for a period of time before turning it off.

Do not run the equipment without a laser light fixture!

Do not shake the equipment. Avoid brute force when installing or operating equipment.

Never lift the laser light fixture on the projector head, as it may damage the mechanism. Always fix the laser fixture on the transport handle.

When choosing a location for installation, make sure the equipment is not exposed to extreme heat, moisture, or dust. The minimum distance between the light output and the illuminated surface must be greater than 8 m.

When assembling, removing or servicing laser lamps, ensure that the area below the installation position is blocked.

Always secure the laser fixture with a suitable safety rope. Secure the safety rope only at the correct hole.

The laser fixture should only be operated after checking that the housing is firmly closed and all screws are tightened.

If the objective lens or any housing cover is open, the laser luminaire must not be lit, as discharging the laser luminaire may

They explode and emit high ultraviolet radiation, which can cause burns.

The maximum ambient temperature of 45°C shall not be exceeded.

3. Safety matters

The laser system is a precision device containing a number of sensitive optoelectronic components. Do not drop it or subject it to physical impact.

The laser system is not waterproof or dust-proof.

The laser projector should be operated by an adult trained as a Level 4 laser equipment laser display operator. The operator shall be aware of and comply with all regulations, requirements, and laws of the country in which the Level 4 laser system is operated. The manufacturer is not liable for any injury or damage caused by the use of this laser display device.

Any laser system classified as a Class 4 laser must be used with care. If you are an inexperienced laser operator, we strongly recommend that you take a laser display safety course before using this laser system in public areas. There are many places to attend quality training, and even a one-day course will give you a wealth of valuable information to use your laser equipment safely.

Unless you are very proficient in laser use and laser safety, make sure you follow at least the following basic laser safety rules:

1. Never look directly at the laser beam;
2. If the laser system is turned on, do not look directly at the laser aperture;
3. Be aware that if not used properly, the laser can burn the retina of the eye, the skin or cause a fire;
4. When projecting lasers outdoors, avoid pointing lasers at airplanes, buses, trains, etc. When turning on the laser system, do not leave it unattended.
5. Always check for reflective surfaces within laser range - these surfaces can be very dangerous (these smooth reflective surfaces can reflect the laser beam into the eyes of a crowd).
6. Do not hesitate to use emergency Stop if you believe there is a fault in the laser system or if the laser performance poses a potential hazard to people/objects.

4. Maintenance

The manufacturer is not liable for any damage resulting from non-compliance with this manual or any unauthorized modification of the equipment.

Please note that damage caused by manual modification of the equipment is not covered by the warranty.

During operation, the enclosure becomes hot). The laser luminaire was allowed to cool for about 20 minutes before operating it.

Ensure that the available voltage is not higher than the voltage indicated on the back panel.

Completely cut off the power to the device before using or cleaning or servicing the laser fixture.

Make sure the power cord is not crimp or damaged by sharp edges. Check equipment and power cord from time to time.

Always disconnect the power supply from the equipment until you are not using it or cleaning it.

Power cords can only be handled through plugs. Never pull out the plug by pulling on the power cord.

Electrical connections, repairs and maintenance must be carried out by qualified staff.

Do not connect this device to the dimmer group.

Do not turn on and off the laser luminaire for a short period of time, as this will shorten the life of the laser luminaire.

During the initial start-up, some smoke or odor may appear. This is a normal process and does not necessarily mean that the device is defective.

Do not touch the device shell with bare hands while the device is in operation (the shell gets hot)!

5. Assemble the lights

The structure used to mount the laser luminaire must safely withstand the weight of the laser luminaire placed on it. The structure must be certified.

Laser lamps (laser lamps) must be installed in accordance with national and local electrical and building codes and regulations.

For overhead installation, the laser fixture must always be secured with a safety wire,

The safety line can withstand at least 10 times the weight of the laser luminaire

1. Do not connect the device to a power source during installation. The device can only be connected to the power supply after the installation and assembly is completed.
2. Install the system only to installation points that are strong, secure and away from unauthorized access.
3. Always ensure that the system is properly tightened and does not loosen and move due to sound vibration, cable pulling, or similar external disturbances.
4. Always connect safety chains or cables between the projector and its structure such as trusses.
5. Make sure all cables are long enough to avoid getting caught.
6. Make sure the system is placed at least 20cm away from walls or any other objects, including curtains, etc.
7. Make sure the system is away from any heat sources, including spotlights, moving heads, radiators, etc. Make sure there is sufficient airflow around the laser system.
8. Do not cover the fan opening during laser operation.
9. Always comply with the laser safety regulations of the country where the laser is used.

Fire danger!

When installing equipment, ensure that there are no highly flammable materials

Materials (decorative items, etc.) within a distance of at least 4 meters.

A distance of at least 8 meters must be maintained between the light output of the device and the illuminated object!

The fixtures can be placed directly on the stage floor or can be assembled in any orientation on the trusses without changing their operational characteristics.

To secure the fixture to the truss, two safety wires with a weight of at least 10 times the weight of the fixture were installed. Use only safety wire with screw hook.

The manufacturer is not liable for damage or injury caused by improper installation of the system. Installation should be carried out by qualified installers who should comply with the laser safety regulations of their respective countries.

The cooling outlet of the device is not waterproof. Please install the lamp correctly, top facing up!

6. DMX-512 Connect

The device is equipped with 3-pin sockets for DMX input and output. The sockets are connected in parallel.

Only shielded twisted pair cables designed for 3-pin XLR plugs and connectors are used in order to connect the controller to the laser fixture or one laser fixture to another.

DMX - output

XLR mounting-sockets (rear view)



DMX-input

XLR mounting-plugs (rear view):



Building a serial DMX-chain:



Connect the DMX output of the first device in the DMX chain with the MX input of the next device. Always connect an output to the input of the next laser fixture until all laser fixtures are connected. Up to 32 lamps can be connected.

Note: In the last laser fixture, the DMX cable must be terminated with a terminator.

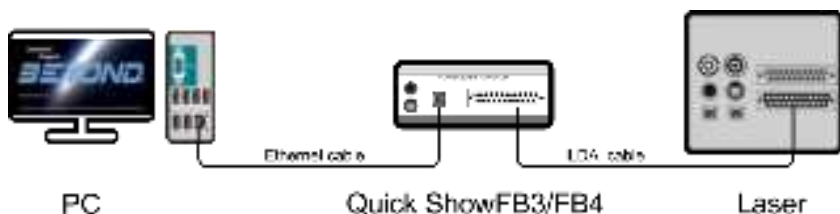
Solder the 120 Ω resistor between signal (-) and signal (+) into the 3-pin XLR plug and insert it into the DMX output of the last laser fixture.

7. QuickShow FB3/FB4 Connection diagram

Some of our laser devices with ILDA or RJ45 signal interface support Quick Show FB3 or FB4 software control, but the device itself does not include software and control box!

If you wish to use Quick Show FB3 or FB4 software to control your laser device, you will need to purchase these separately. You can contact the laser equipment supplier or purchase these control software through the official channel of the software. Typically, these programs give you a license or key that you can use to activate the software and start using it.

Here is a diagram of a Quick Show FB3 or FB4 connecting a PC to a laser device:



8. RJ45 to ILDA Connection diagram

The laser device supports RJ45 to ILDA signal input. Please connect to the laser software using our supplied RJ45 to ILDA converter. The specific sequence of ILDA DB25 cables is as follows:

Pin 1: X-axis scanner

Pin 2: Y-axis scanner

Pin 5: Red intensity

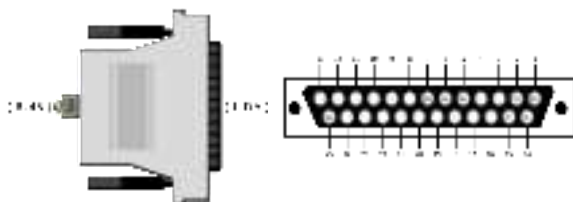
Pin 6: Green intensity

Pin 7: Blue intensity

Pin 14: X-axis scanner

Pin 15: Y-axis scanner

Pin 25: Ground



(RJ45 to ILDA converter)

Here is a diagram of connecting PC and laser device using converter for Quick Show FB3 or FB4:



9. Remote interlock connector (Remote Interlock Bypass)

The Remote Interlock Connector is located on the rear panel of the laser stage light, clearly marked with a label for identification. It is easily accessible for integration with an external safety system or interlock control. The laser will only be activated when the interlock connector is engaged is closed. When the terminals of the connector are open-circuited, The laser Immediate Shutdown.

The interlock connector operates with low voltage (typically 3V DC) control signals for enabling or disabling the laser.

The connector features a fail-safe design, ensuring that if the interlock system is disconnected or malfunctioning, the laser cannot operate.

Wiring Instructions:

Connect the external interlock's Normally Closed (NC) or Normally Open (NO) contacts to the laser device's interlock input terminals.

Example:

External Interlock NC → Laser Interlock IN (+)

External Interlock COM → Laser Interlock IN (-)

Voltage Signal Connection:

Ensure voltage levels match.

Connect the external interlock's signal output to the laser's interlock input terminals.

Caution - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure

10. Key control

This manual provides instructions for the safe and proper operation of the Laser Stage Lighting Key Controller, designed to ensure compliance with IEC 60825-1:2014 (Safety of Laser Products). The key controller acts as a safety interlock system to restrict unauthorized access to laser operation.

Access Authorization

To activate the laser system, the user must enter the predefined security code via the keypad.

Default Security Code:

1 → 2 → 1 → 2

Caution - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure

11. Laser radiation emission warning

The LED indicator is positioned on the exterior housing of the device.

LED State: Permanently off (no illumination).

LED State: Continuous blinking (Laser Emission)

Condition: The laser stage light is actively emitting laser radiation.(The blinking pattern is designed to alert users that laser output is ongoing.)

Critical Note:

The LED indicator serves as a primary visual warning for laser radiation.

Do not assume the absence of laser emission solely based on the LED being off. Always adhere to safety protocols outlined in this manual.

Warnings:

Never bypass or disable the indicator system.

Ensure the LED is visible during operation and unobstructed by covers or objects.

Caution - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure

12. Manual reset mechanism.

In order to avoid accidents caused by unattended laser, the laser system is equipped with manual reset function. After the laser emission is interrupted by using remote interlock or after the emission is interrupted by accidentally losing the main power supply, manual intervention is required to start the laser system again.

13. Scan the safety device.

When the scanning speed or amplitude changes or stops working due to any fault of the galvanometer, the laser will enter the termination emission state, and will not be brought into the emission state again until the galvanometer resumes scanning work.

14. Technical Specifications

Light source parameters	
Laser Wavelength:	R-638nm, G-520nm, B-450nm
Laser Power:	R-0.8W, G-0.8mW, B-1.5W
Spot Size (laser window spot)	5.5mm
Light Source Divergence Angle	<1.2mrad
Modulation Mode	0~5V analog, up to 50kHz/TTL
Laser Class	Class IV
Pulse width	22 μ s
Repetition frequency	412Hz
Imaging system	
Laser Color	Red, green, blue mixed colors
Evenness	>98%
Lens Horizontal Offset	-30% to +30%
Lens Vertical Offset	-30% to +30%
Imaging Mode	3D/2D pattern and animation (with software)
Projection Distance	<20M The best distance is 10~20M
Playback Rate	20 KPPS
Playback Angle	Max60°
Fail-safe system	
Safety standards	Follow the IEC60825 standard
Security project	Over current and voltage protection
Class of protection	IP20
Operating temperature	-15°C~45°C
Interface and control systems	
Control interface	DMX In/Out ,ILDA In/Out
DMX channel	16/20CH
Power supply interface	PowerCon
Power Consumption	
Power of operation	100~240V AC 50/60HZ
Power supply	Max 42W
Physical property	
Product size:	23.6*20*18cm
Product weight:	3.55kg

15. Maintenance and cleaning

Equipment must be kept clean and must not accumulate dust, dirt and smoke residue.

Otherwise, the light output of the laser fixture will be significantly reduced. Regular cleaning ensures not only maximum light output but also reliable operation throughout the service cycle.

It is recommended to use lint-free cloth of any good glass cleaning solution. Under no circumstances should alcohol or solvents be used!

Danger!

Disconnect the power supply before starting any maintenance work

The front objective lens needs to be cleaned once a week because the smoke liquid tends to accumulate residues, which can reduce the light output. Cooling fans should be cleaned once a month.






The interior of the laser fixture should be cleaned at least annually using a vacuum cleaner or air injector.

Use a soft brush and vacuum cleaner to remove dust and dirt from fans and cooling vents.

Important! Check the air filter regularly and clean it before it gets clogged!

Clean the two air filters installed in the laser lamp cover and the two air filters installed in the laser lamp base. Use a vacuum cleaner, compressed air, or you can clean them and put them back to dry.

16. Laser label

Warning label - Hazard symbol	
Alternative label for laser aperture	
Warning label - Hazard symbol	
Alternative label for Class 4	
Certification label and identification label	

17. Safety criteria for equipment and installations

Summary of inspection results				
Serial Nb.	Test item	Model	Wavelength	Test result
1	Laser safety level	SHE-La3WRGB	640+520+450nm	Class 4
2	Spectator zone MPE	SHE-La3WRGB	640nm	$5.79 \times 10^{-3} \text{ J/cm}^2$
			520nm	$5.79 \times 10^{-3} \text{ J/cm}^2$
			450nm	$2.43 \times 10^{-3} \text{ J/cm}^2$
			640+520+450nm	$2.43 \times 10^{-3} \text{ J/cm}^2$
3	Spectator zone NOHD	SHE-La3WRGB	640nm	31.70m
			520nm	33.16m
			450nm	70.22m
			640+520+450nm	99.83m

4	Performer zone (controlled location) MPE	SHE-La3WRGB	640nm	75.57J/cm ²
			520nm	75.57J/cm ²
			450nm	75.57J/cm ²
			640+520+450nm	75.57J/cm ²
5	Performer zone (controlled location) NOHD	SHE-La3WRGB	640nm	0.19m
			520nm	0.20m
			450nm	0.31m
			640+520+450nm	0.48m
6	At-risk ancillary personnel MPE	SHE-La3WRGB	640nm	5.79×10 ⁻³ J/cm ²
			520nm	5.79×10 ⁻³ J/cm ²
			450nm	5.79×10 ⁻³ J/cm ²
			640+520+450nm	5.79×10 ⁻³ J/cm ²
7	At-risk ancillary personnel NOHD	SHE-La3WRGB	640nm	31.70m
			520nm	33.16m
			450nm	45.46m
			640+520+450nm	64.64m

18. Menu interface

- To access the control menu, press the knob button.
- Rotate buttons to navigate the menu structure.
- To select a menu option or confirm your selection, press the knob button.
- Return to a higher level in the menu structure.



Locking and unlocking

If there is no action for more than 30 seconds, the screen menu will enter the automatic lock state,
You can input password (1212) to unlock.

Laser safety device:

1: Manual reset mechanism. In order to avoid accidents caused by unattended laser, the laser

system is equipped with manual reset function. After the laser emission is interrupted by using remote interlock or after the emission is interrupted by accidentally losing the main power supply, manual intervention is required to start the laser system again.

Laser emission indicator

2: Launch indicator light. The LED indicator light in the menu panel is flashing, which means that the laser is in the running launch state or to be launched. Once the laser system receives the instructions of the control software, it is ready to launch the laser. At this time, please do not face or check the laser launch hole to prevent laser damage to the eyes.

3: Safe operation device. In order to prevent accidental injury to the operator, when the laser is in the firing state, the laser will enter the stop firing state when the operator presses the key operation on the laser control panel. After 30 seconds, when the laser detects no key operation, it will resume the emission state.

4: Scan the safety device. When the scanning speed or amplitude changes or stops working due to any fault of the galvanometer, the laser will enter the termination emission state, and will not be brought into the emission state again until the galvanometer resumes scanning work.

19. Main Function

Menu	Value	Function
DMX Address	1-512	Set DMX Address
Channel	16CH	16CH DMX channel mode
	20CH	20CH DMX channel mode
Mode Set	DMX	Set Laser DMX input
	ILDA	Set Laser ILDA mode input
	RANDOM	Randomly play all animation effects
	LINE	Play Line Effects
	ANIME	Play animal pattern effects
	TEXT	Play text effect
	PROGRM	Play program effects
	DRAW	Play mobile app painting effects
	MARK	Play beam effect
	BREAK	Device standby state

Play Speed	0-100	Playback speed of mode
Size	0-100	The size of the effect
Phase	X+Y+	Laser position X+Y+
	X+Y-	Laser position X+Y-
	X-Y-	Laser position X-Y-
	X-Y+	Laser position X-Y+
	*Y+X+	Laser position X+Y+
	*Y-X+	Laser position X+Y-
	*Y-X-	Laser position X-Y+
	*Y+X-	Laser position X-Y-
Dimmer Red	0-100	Laser red dimmer
Dimmer Green	0-100	Laser green dimmer
Dimmer Blue	0-100	Laser blue dimmer
Dimmer All	0-100	Laser all dimmer
Language	EN	Language English
	CH	Language Chinese
Software	VY2.3	Current version number

20. Home Position Adjustment

To access the offset menus, long press the [ENTER] button

Menu	Value	Function
Scanner Set	15-30K	Set scanner speed 15-30
Color Set	RGB	Laser RGB color
	G	Laser G color
Dot Protect	On	When the laser is focused to a point, turn off the laser
	OFF	When the laser is focused at a point, maintain the laser output
Sound Sense	0-100	Adjustment of the sensitivity in sound mode
Backlight	On	The menu display screen is always on
	OFF	The menu display screen will turn off after 20 seconds of inactivity
RST Setting	YES	Restore factory settings

21. DMX Mode setting

Select mode Settings and press Enter to select DMX. Press the button to return to the previous menu or wait 30 seconds to automatically exit the menu mode.

22. ILDA Mode setting

Select mode Settings and press Enter to select ILDA. Press the button to return to the previous menu or wait 30 seconds to automatically exit the menu mode.

23. Mobile app download and connection

The laser product casing is embedded with an NFC chip. With just a gentle touch of your mobile device, you can quickly download our exclusive app and experience a more convenient and simple operation.



1. Usage steps:

Confirm device: Please ensure that your mobile device (such as a smartphone or tablet) supports NFC functionality and has enabled it. Most modern mobile devices come with an NFC chip built-in, which you can find and turn on in the device's settings.

Preparing to download: Open the NFC sensing area on your mobile device (usually located on the back of the phone) and make sure there are no phone cases or other obstacles blocking it.

Approaching Scan: Move your mobile device closer to the NFC chip location on our product.

Please keep the device stable and at an appropriate distance so that NFC signals can be accurately recognized.

Download APP: When the mobile device successfully recognizes the NFC chip, it will automatically jump to a page or pop up a prompt box, guiding you to download or open our exclusive APP. Please follow the instructions on the page to complete the download and installation process.

2. Matters needing attention:

Please ensure that your mobile device has sufficient battery power to avoid interruptions during the download process due to low battery.

If your mobile device fails to successfully recognize the NFC chip, please try adjusting the device's angle and distance, or check if there are any other objects interfering with the transmission of NFC signals.

When downloading the app, please ensure that your network connection is stable in order to smoothly complete the download process.

We are committed to providing you with smarter and more convenient products and services. If you encounter any problems or need assistance during use, please feel free to contact our customer service team, and we will be happy to answer and provide support for you. Wishing you a pleasant use!

3. Scan the QR code to download and install the app:



Android



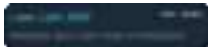
ISO

2. Connect to APP Settings

Access the Bluetooth Settings and press [Click Me To Connect] to search for the current laser device!



A-Click Me To Connect]



B-Search for devices that can be connected

3: APP function Introduction



- 1: Support to modify the DMA address of the device through the APP;
- 2: support hand-drawn and played laser pattern;
- 3: Support text input and text laser pattern playback;
- 4: Support custom programming schemes;
- 5: Play built-in custom laser effects;
- 6: Set the size range of laser scanning;
- 7: Set the initial position of the laser
- 8: Set the RGB light source output of the laser
- 9: Set the laser mode TTL or analog modulation mode

DMX Channel Summary-16 CH Mode

Channel		Value	Function
CH1	On/Off	0-255	Laser source on / off
CH2	Strobe	0-9	Strobe off
		10-255	Strobe slow to fast
CH3	Color	0-4	Full color
		5-9	Red
		10-14	Blue
		15-19	Red+Blue

		20-24	Green+Blue
		25-29	Red+Green
		30-34	Green
		35-255	Color effect
CH4	Color mode	0-9	Stop color effect
		10-127	Direct move
		128-255	Reverse directions move
CH5	CUE Groups	0-255	CUE Groups
CH6	CUE	0-255	CUE select
CH7	Zoom	0-255	CUE linear zoom (large to small)
CH8	Auto Zoom	0-15	Zoom in
		16-55	Auto zoom out (slow to fast)
		56-95	Auto zoom in (slow to fast)
		96-135	Auto zoom in and zoom out (slow to fast)
		136-175	Irregular zoom in and zoom out (slow to fast)
		176-215	X Y Irregular Zoom in and out mode 1(slow to fast)
		216-255	X Y Irregular Zoom in and out mode 2(slow to fast)
CH9	Rotate	0-127	Rotate 360°
		128-191	Clockwise Rotation
		192-255	Anti clockwise Rotation
CH10	X rotate	0-127	Clockwise Rotation
		128-255	Anti clockwise Rotation
CH11	Y rotate	0-127	Clockwise Rotation
		128-255	Anti clockwise Rotation
CH12	X move	0-255	X moving
CH13	Y move	0-255	Y moving
CH14	Twist effect	0-255	Twist effect slow to fast
CH15	Macro CUE	0-255	Macro CUE show
CH16	CUE speed	0-1	Normal speed
		2-255	Speed form slow to fast

DMX Channel Summary-20 CH Mode

Channel		Value	Function
CH1	On/Off	0-255	Laser source on / off
CH2	Red	0-37	None
		38-255	Red on
CH3	Green	0-37	None

		38-255	Green on
CH4	Blue	0-37	None
		38-255	Blue on
CH5	Strobe	0-9	Strobe off
		10-255	Strobe slow to fast
CH6	Color	0-4	Full color
		5-9	Red
		10-14	Blue
		15-19	Red+Blue
		20-24	Green+Blue
		25-29	Red+Green
		30-34	Green
		35-255	Color effect
CH7	Color mode	0-9	Stop color effect
		10-127	Direct move
		128-255	Reverse directions move
CH8	CUE Groups	0-255	CUE Groups
CH9	CUE	0-255	CUE select
CH10	Zoom	0-255	CUE linear zoom (large to small)
CH11	Auto Zoom	0-15	Zoom in
		16-55	Auto zoom out (slow to fast)
		56-95	Auto zoom in (slow to fast)
		96-135	Auto zoom in and zoom out (slow to fast)
		136-175	Irregular zoom in and zoom out (slow to fast)
		176-215	X Y Irregular Zoom in and out mode 1(slow to fast)
		216-255	X Y Irregular Zoom in and out mode 2(slow to fast)
CH12	Rotate	0-127	Rotate 360°
		128-191	Clockwise Rotation
		192-255	Anti clockwise Rotation
CH13	X rotate	0-127	Clockwise Rotation
		128-255	Anti clockwise Rotation
CH14	Y rotate	0-127	Clockwise Rotation
		128-255	Anti clockwise Rotation
CH15	X move	0-255	X moving
CH16	Y move	0-255	Y moving
CH17	Twist effect	0-255	Twist effect slow to fast
CH18	Draw mode	0-4	None

		5-62	Draw mode 1 (Manual)
		63-127	Draw mode 2 (Manual)
		128-152	Draw Add mode
		153-189	Draw Subtraction mode
		190-223	Automatic gradient (increase first, decrease later - reverse)
		224-255	Automatic gradient (increase first, decrease later - same direction)
CH19	Macro CUE	0-1	None
		2-235	Macro CUE show. (The speed and color are controlled by CH20)
		236-255	Random mode
CH20	CUE speed	0-1	Normal speed
		2-255	Speed form slow to fast

24. Safety criteria for equipment and installation

1. If the laser display or show is under the continuous control of an operator who can immediately terminate laser beams in the event of a problem, a minimum separation distance of 3 m in height and 2.5 m laterally should be maintained between beams that exceed the spectator MPE and any surface upon which spectators can reasonably be expected to stand. This condition is shown in Figure 1 and Figure 2.

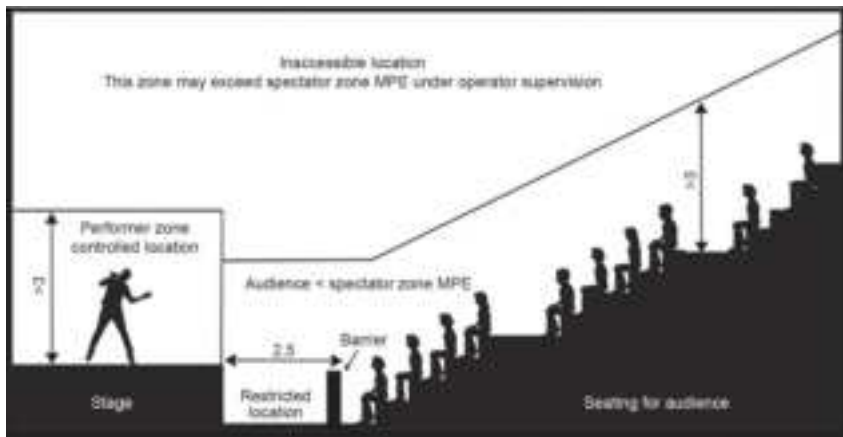
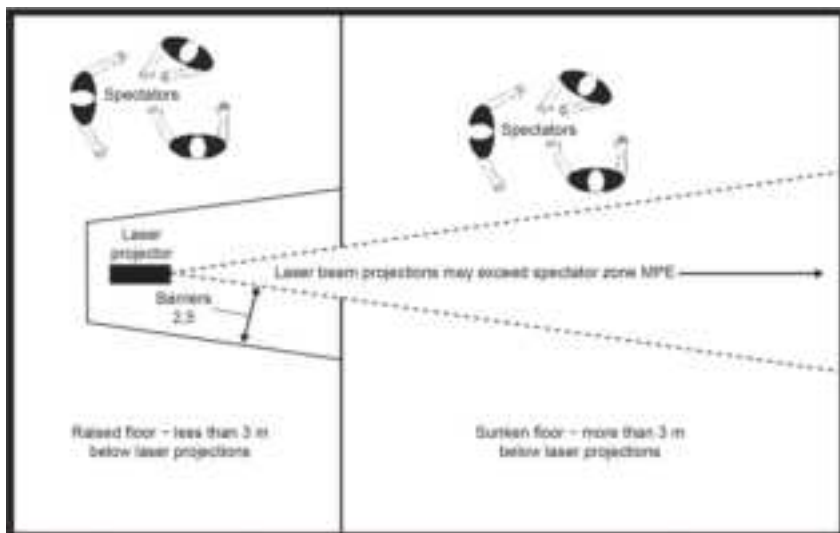
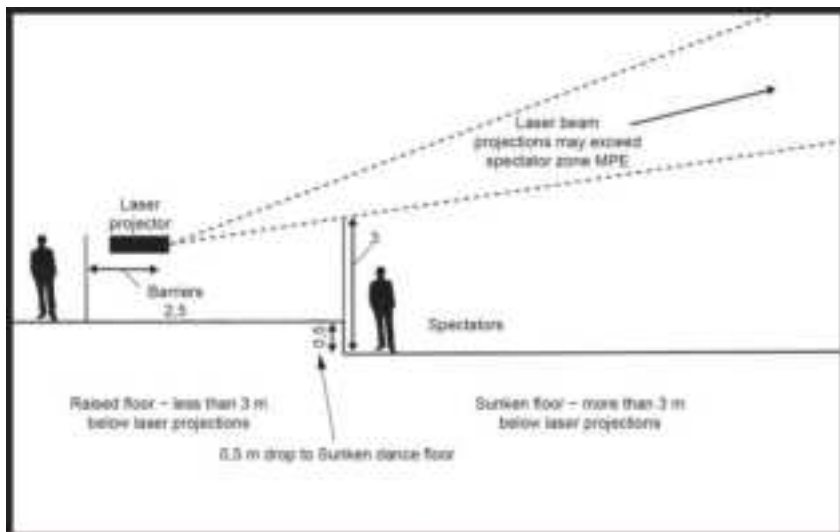


Figure 1 Audience/spectator separation auditorium scenario with operator in control



a) Plan view



b) Side elevation

Figure 2 Audience/spectator separation nightclub scenario with operator in control

4. If a projection area terminates onto a balcony or near a window, where spectators can view the laser effect, and the exposure level at the termination point is likely to be in excess of the spectator MPE, the beams should terminate no higher than the floor level of the balcony if it has an opaque solid barrier. This condition is shown in Figure 3.

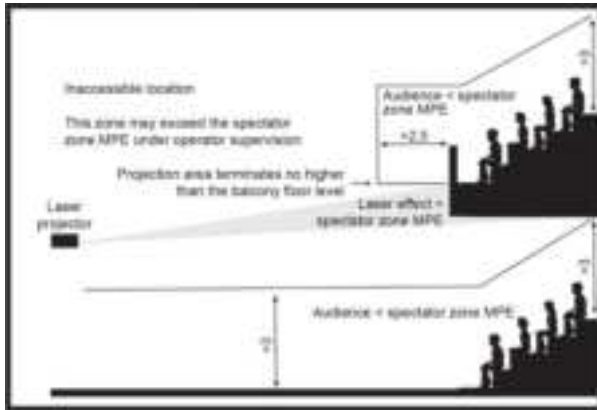


Figure 3 Audience/spectator separation near a balcony with operator in control

5. If the laser display or show is not under the continuous control of an operator who can immediately terminate laser beams in the event of a problem, a minimum separation distance of 3m in height and 2.5m laterally should be maintained between beams that exceed the spectator MPE exceeded by more than a factor of 5 in the space between 3m and 6m above any surface upon which spectators can reasonably be expected to stand. This condition is shown in Figure 4.

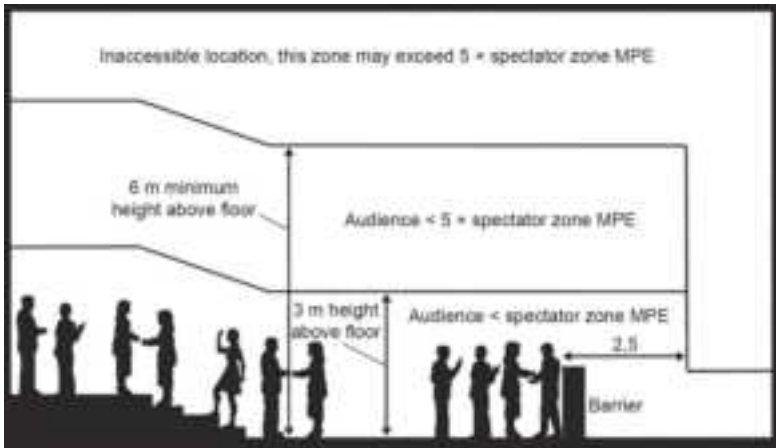


Figure 4 Audience/spectator separation from unattended beams