IVL™ LIGHTING by MINUIT UNE

USER MANUAL

IVL™ Square

www.minuitune.com | 104 avenue de la résistance 93100 Montreuil – FRANCE | + 33 (0)1 48 97 43 82
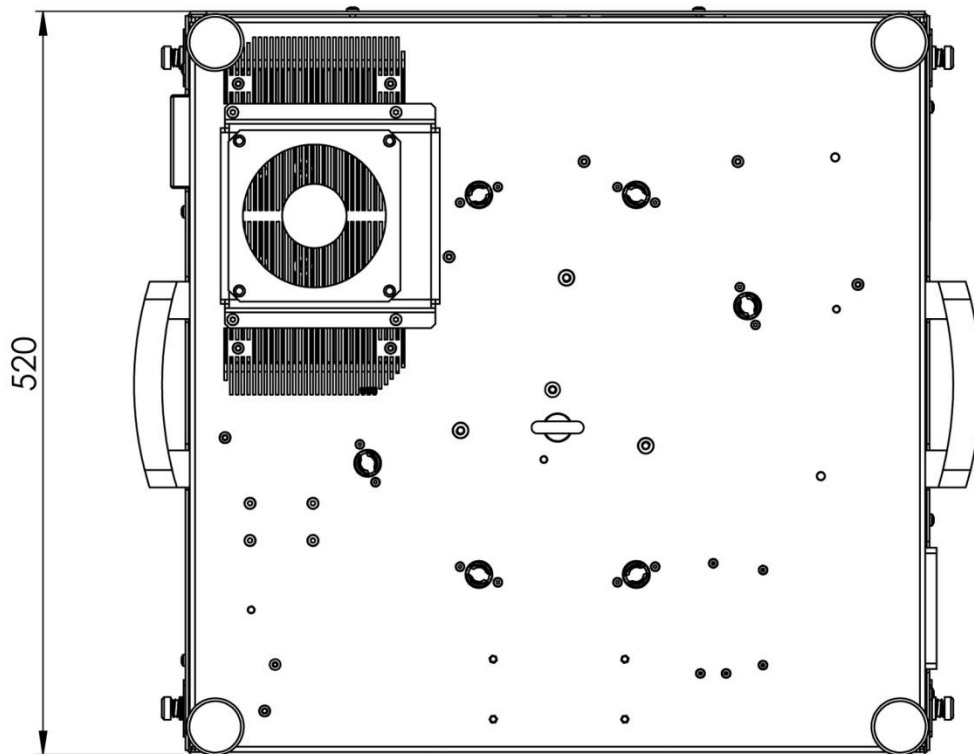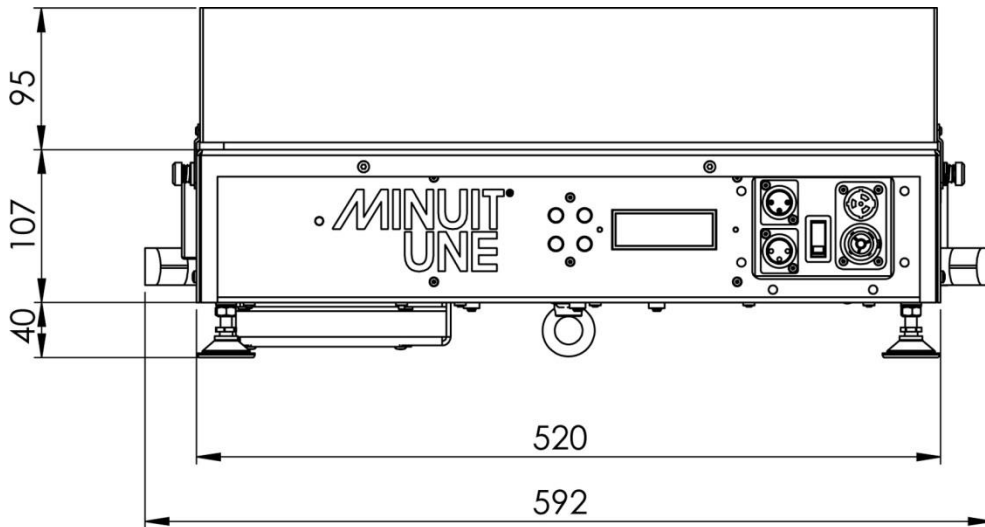support@minuitune.com

Revision of this manual: AQ

Content

Dimensions

All dimensions are given in millimetres.

IVL Square and Base Dimensions

Important Safety Information

1.Read these instructions

2.Keep these instructions

3.Heed all warnings

4.Follow all instructions

5. Do not use this apparatus near water

6. Clean only with dry cloth

7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions

8. Do not install near heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11. Only use the attachment/accessories specified by the manufacturer.

12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13. Unplug this apparatus during lightning storms or when unused for long periods of time.

14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled, or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

15. Changes or modifications not expressly approved by Minuit Une could void the user's authority to operate the equipment.

16. Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.

Risk Levels and Alert Symbols

Safety warnings, safety alert symbols, and signal words in these instructions indicate different risk levels:

⚠ DANGER!
DANGER indicates an imminent hazardous situation which, if not avoided, **will result** in death or serious injury.

⚠ WARNING!
WARNING indicates a potentially hazardous situation which, if not avoided, **may result** in death or serious injury.

⚠ CAUTION!
CAUTION indicates a potentially hazardous situation which, if not avoided, **may result** in minor or moderate injury.

NOTICE
NOTICE explains practices not related to physical injury. No safety alert symbol appears with this signal word.

Vital Precautions

⚠ DANGER!

High voltage! Risk of blindness, electric shock and fire.
Read and understand all safety information and operation instructions before you operate or install the product or the system.
Not observing the safety information or general rules of safety may cause injury, blindness, burn hazards, electric shock, falls and death to yourself and others or damage to equipment.
Use solely and exclusively as described in the instructions.
Using the product in any other ways than specified in this manual is not permitted and can damage the product and lead to associated risks such as short-circuit, fire, electric shock, etc.
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
Always check that the local AC power matches the voltage and frequency range printed on the type label of the product before use.
Always electrically earth the fixture. Only use TN or TT one phase power supplies and a power plug according to IEC 60309-1 or a similar national standard.
Never use the cables for transportation. Never hang the product from its cables.
In case of visible or suspected damage to cables or housings, the product must not be operated any longer.
The product is not to be operated with the plexiglas shape not in place or if the plexiglas shape is in any way damaged.
The laser is never to be operated if the unit is defective or if the cover, or the Plexiglas shape or seal is damaged.
Do not bypass or remove any safety feature of the product.
Any procedure or work on the product which is not described in this manual is not covered by product warranties.
Refer servicing to qualified service personal.
Any person in charge of servicing this product shall first receive service training by Minuit Une and/or by an official training center recognized by Minuit Une.
Any person in charge of servicing this product shall have read and understood all safety information and procedures in this user manual, and in the IVL Square's service manual.
To obtain information about service training, service manual or about the closest training service center in your area, please contact Minuit Une

General Safety Information

⚠ WARNING!

Humidity, Condensation and Moisture.
To reduce the risk of fire or electric shock, Do not expose this apparatus to rain or moisture. Do not use the product for 2h when it was exposed to big temperature differences as condensed moisture may damage the product electrically when switched on.
Never expose the product to dripping water or water splashes.
Never place an object filled with liquid (e.g. a vase or a bottle filled with liquid) on the product.
Do not bend the power cable directly after the connector. Water could immerse and cause short circuits and damage the connector.

⚠ WARNING!

Risk of injury and damage through falls.
Always install the product as described in this manual.
Always follow the safety information when suspending the product. Always use a secondary attachment as described in this manual to prevent falls if the primary attachment fails.
Block access area during installation of the product due to risk of injury through fall.
Always work from a stable platform.

⚠ WARNING!

Risk of electric shock and fire.
Socket outlets or external power switches used to supply the product with power must be located near the product and easily accessible to be able to isolate the product from power immediately.
The power cable is equipped with a Neutrik Powercon TRUE1 NAC3FX-W cable connector and bare ends. You can install a suitable power plug on the power cord. Always use a power plug according to IEC 60309-1 or a similar national standard.
Disconnect the product from AC power before moving it or cleaning it.
To link several products to one power chain, please observe:
- This fixture has a power consumption of 75W max.
- Always use a AWG 14 power input cable and AWG 14 power throughput cables.
- Never link more than 17 products to a power chain when using these cables.
Ensure that the airflow around the product is free and unobstructed.
Provide a minimum clearance of 0,3 m (1 in.) around fans and air vents.
No flame source, like a candlelight, should be placed on or nearby the product.
This product is intended to be used in temperate climate.
Do not operate the product if the ambient temperature is above 40° C (104° F) or below 0° C (32° F).

⚠ CAUTION!

Class 3R laser product according to IEC 60825-1:2014
Avoid direct eye exposure.
Do not look at laser devices with magnifiers, telescopes, binoculars or similar optical instruments that may concentrate the light output.
Please refer to ANSI Z136.1 "Standard for Safe Use of Lasers" for guidance on safe
use. This publication is available from Laser Institute of America.
Extended source considered for laser Classification
Note that the national and local recommendations, regulations, standards and codes of practice in laser show are different from a country to another.
Please contact your provider or Minuit Une's legal service if you have any inquiries.

Intended use

Labelling diagram

The following symbols are used in this manual or on the product to identify important safety information:
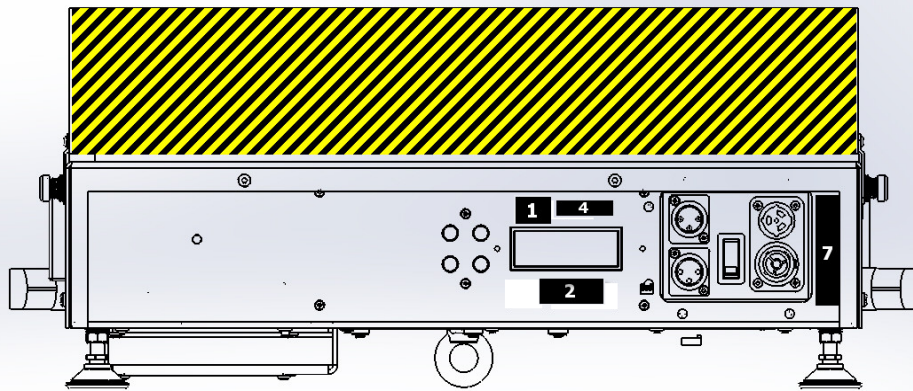
▨▨▨ : **LASER APERTURE**
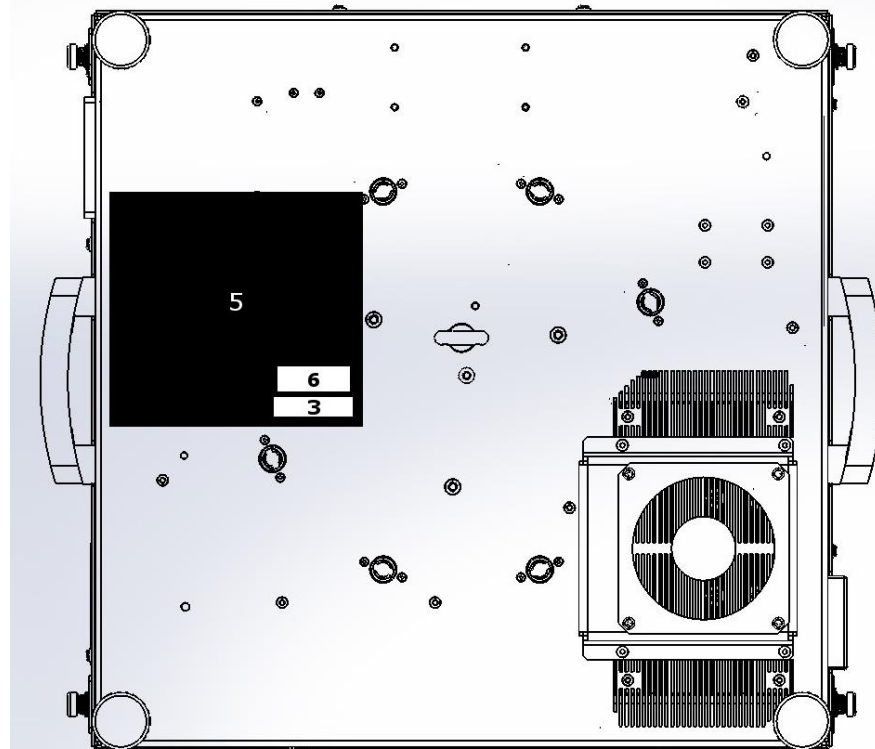
1. Hazard Warning Symbol Label

Warning! Visible and / or invisible Laser Radiation can be emitted.

2. Explanatory label

LASER LIGHT AVOID DIRECT EXPOSURE
CLASS 3R LASER PRODUCT
RAYONNEMENT LASER
EXPOSITION DIRECTE DANGEREUSE POUR LES YEUX
APPAREIL À LASER DE CLASSE 3R
448nm, 518nm, 638nm 340Hz, <15,5µJ
EN/IEC 60825-1 ed. 3 2014

This Laser product is designated as Class 3R during all procedures of operation
Laser parameters:
Wavelength: 448nm, 518nm, 638nm
Emission type: pulsed (340Hz)
Energy: <15,5uJ

3. Protective Housing Non-interlocked Label

DANGER - CLASS 4 LASER LIGHT WHEN OPEN
AVOID EYE OR SKIN EXPOSURE TO
DIRECT OR SCATTERED RADIATION

Before opening any part of the product, disconnect the AC power. Otherwise you may be exposed to a class 4 Laser. MINUIT UNE cannot be held responsible if this instruction is not respected

4. Aperture Label

LASER APERTURE
OUVERTURE LASER

This label indicates the laser aperture. On this product, the laser aperture is the whole area above the Plexiglas shape of the product.

5. Manufacturer's Identification Label

The manufacturer plate is located at the bottom of the product. It contains important information about the type, serial number, and safety. Please contact your dealer or Minuit Une when a type plate is missing as it must be present on the product and needs to be replaced.

6. Certification Label

THIS PRODUCT COMPLIES WITH FDA PERFORMANCE STANDARDS FOR LASER PRODUCTS EXCEPT FOR CONFORMANCE WITH IEC 60825-1 ED. 3., AS DESCRIBED IN LASER NOTICE NO. 56, DATED MAY 8, 2019.

7. Power Label

100 - 240V
50/60Hz
1800W max
(1 unit: 75W)

under 120V:
12A - 1500W
under 240V:
6A - 1500W
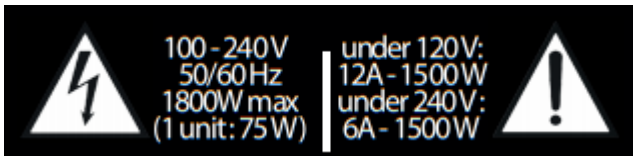
The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Introduction

IVL square is part of IVL Lighting, a new category of lighting created and patented by Minuit Une.

What is IVL Lighting?

IVL Lighting is the first-ever lighting range geared towards immersive experience.

IVL lighting by Minuit Une is based on a ground-breaking technology that redefines lighting design.

For the first time ever, create spectacular experiences without heavy logistics:

- Advanced shapes: stunning visual lighting shapes and decors.

- Unique immersive feeling: wide coverage area, calibrated output, enveloping lights covering all the available space.

- Unlimited versatility: infinite effect combinations; constantly renewed style or atmospheres within a show.

- Without a custom programming software: Intuitive programming from any DMX console.

- Without heavy infrastructure: Small-sized, light-weighted and robust, they can be hung quickly anywhere and in any direction.

The IVL Lighting is a game-changing lighting product. It creates multidimensional advanced shapes from one source of light. The IVL Lighting covers a wide area by producing 4 directive light plans perpendicular to each other. Each plan is adjustable at a 180° angle to create stunning perspectives when combined together. Each light plan of the IVL Lighting can be divided into 1, 2, 4, 8, 16, 32, 64, 128, or 256 beams. Welcome to a new world of advanced shapes and infinite possibilities!

In a time where audiences ask more and more for exciting experiences, the IVL Lighting's advanced shapes help you create truly immersive designs with their smooth enveloping textures and 3D rendering perception. It is an infinite playground for your creativity. Multiply your creative output using a standard DMX controller.

Before using the product

1. Read the "Important Safety Information" on page 2 before doing anything with the product.
2. Unpack and ensure that there is no transportation damage before using the product. Do not attempt to operate a damaged product.
3. Check that no part shipped with the product is missing. The product is shipped with:
   - A power cable with a Neutrik Powercon TRUE1 connector and bare ends,
   - 2 omega-type clamps quarter-turn fasteners

   Only use the attachments/ accessories specified by the manufacturer
4. If the product is not going to be hard-wired to a main supply, install a local power plug (not supplied) on the end of the supplied power cable.
5. Ensure that the voltage and frequency of the power supply match the power requirements of the product.

Note that whenever AC power is applied to the product, it will reset all effects and functions to their home positions. A reset usually takes approximately 8 seconds.

Overview

Fixture menu and connectors

Menu Buttons

Display

Connector Panel and Mains Switch

safety Indicator (red light)

DMX Indicator (green)
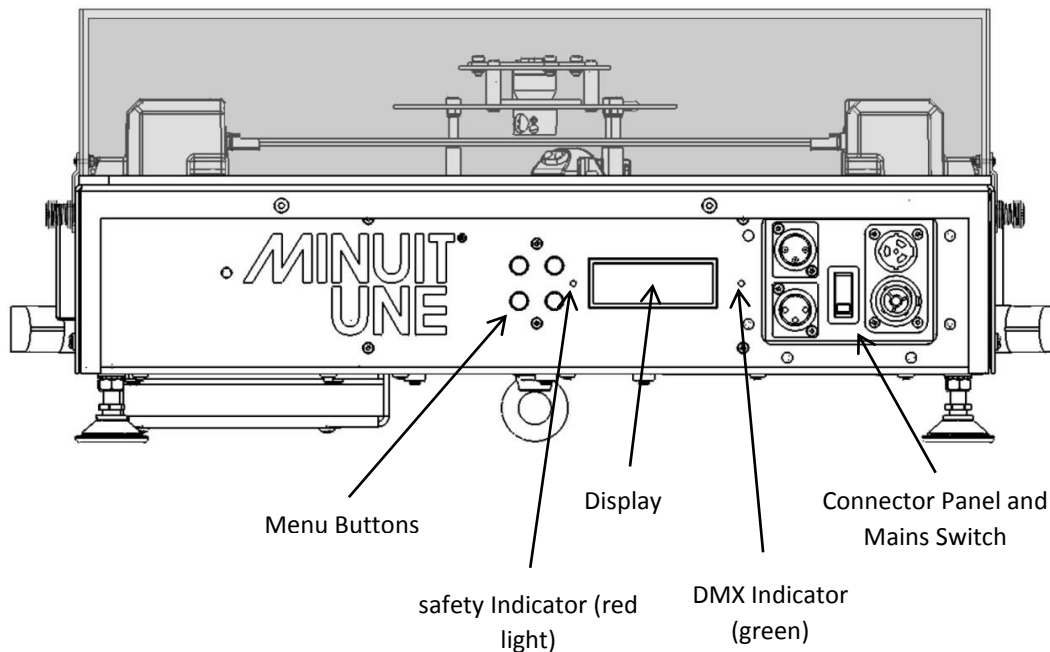
Menu buttons

ENTER	Press to open the main menu. Press to open a sub menu.
ESC	Cancel an action without saving any changes.
+ / -	Select an option or change a value.

Display

The Displays shows fixture and menu information.

Indicator LEDs

safety indicator (red, left from display)	Lights up when the scanning speed reach 340Hz.
DMX interlock indicator (green, right from display)	Lights up green when a valid DMX signal is detected at the DMX input.

DMX connectors

The product is equipped with 5-pin XLR sockets DMX input and output (through to next fixture).

The pinout of the XLR connectors is:

- pin 1 = shield
- pin 2 = cold (-)
- pin 3 = hot (+).

Pins 4 and 5 in the 5-pin XLR connectors are not used in the fixture but are available for possible additional data signals as required by the DMX512-A standard. Standard pin-out is pin 4 = data 2 cold (-) and pin 5 = data 2 hot (+).

Main Switch

Flip the main switch to power the product or to switch the product off. After powering the product, it performs a reset which takes approximately 8 seconds.

Power Connectors

The product is equipped with two Neutrik Powercon TRUE1 connectors for power in and power through. Use only Neutrik Powercon TRUE1 NAC3FX-W cable connectors to connect to power input sockets. Use only Neutrik Powercon TRUE1 NAC3MX-W cable connectors to connect to power throughout sockets.

Scanner and Tilt Mirror

Tilt mirror 3

Tilt mirror 4

Tilt Mirror 2

360° scanning system

Tilt Mirror 1

Display

Plexiglas shape fixing screw – tool only removable (4 pieces)

Bottom View

Rubber foot (4 pieces)

6 quarter-turn receptacles
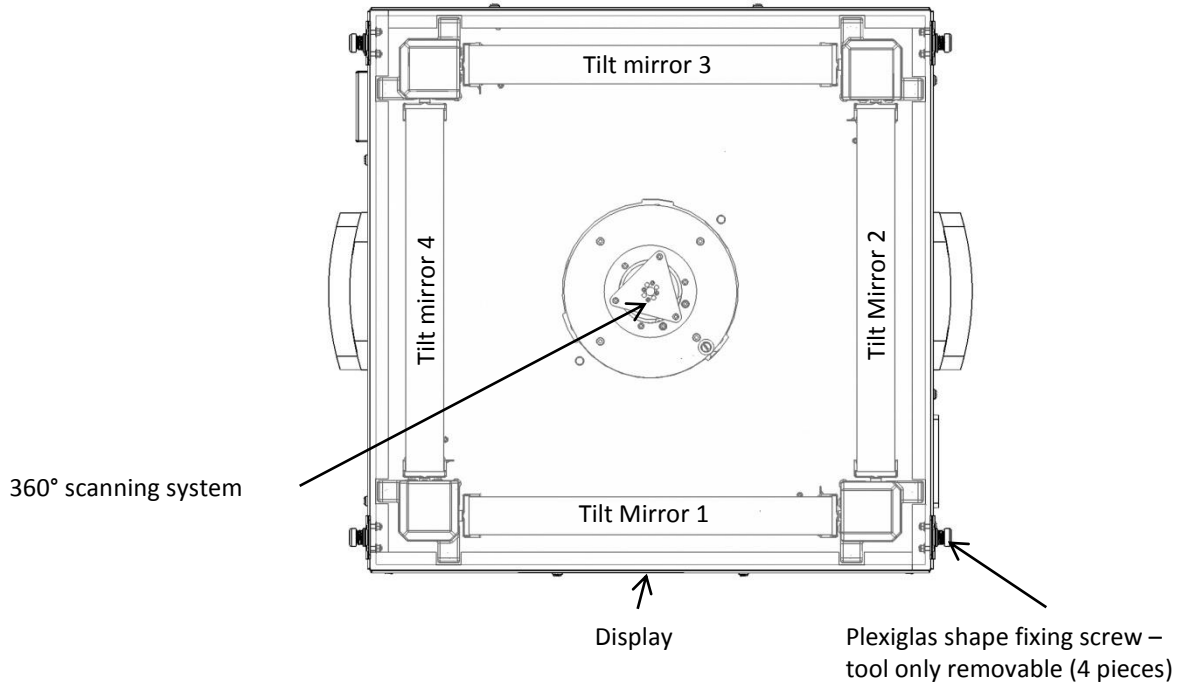
Anchor for safety cable
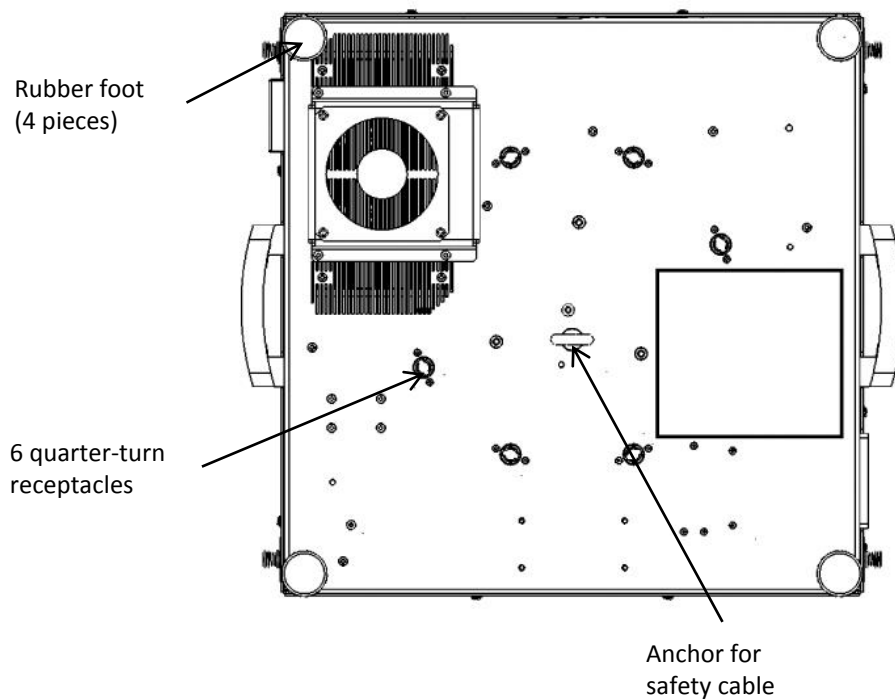
Quarter-turn Receptacles

The product is shipped with two omega-type brackets to which rigging clamps can be attached to the quarter-turn receptables duct using the brackets quarter-turn fasteners.

Anchor for Safety Cable

Secure the product with a safety cable (or other secondary attachment) that is approved for the weight of the product so that the safety cable will hold the fixture if a primary attachment fails.

Loop the safety cable through the anchor for the safety cable on the side of the product (see illustration above) and around a secure anchoring point.

If a safety cable attachment point becomes damaged or deformed, do not suspend the product above ground any more. The anchor needs to be replaced by a qualified technician.

Rubber Feet

The product is equipped with four damping rubber feet. Check if all four rubber feet are present and undamaged before placing the product on a flat surface. Replace a missing rubber foot as the product might present a risk of injury when moving during operation.

Installation

> ⚠️ **WARNING!**
>
> **Always read the "Important Safety Information" on page 2 before installing or operating the product.**
> The installation of this product must be validated by a qualified technician before it is operated.
> When suspended above ground, the product must be secured with a secondary attachment to prevent injury or damage by falls if the primary attachment fails.
> If suspended, the rigging structure must be able to bear a static suspended load that is ten times the weight of the product and all installed accessories, especially if the product is installed in a location where it may cause injury or damage if it falls.

Placing the Product on a Flat Surface

The product can be placed on a hard, fixed, flat surface. Ensure that the surface can support at least 10 times the weight of all products and equipment they will support.

Do not place the product on a surface or leave it where it can be moved or fall over. If you install the product in a location where it may cause injury or damage if it falls, secure it as directed below with a securely anchored safety cable that will hold the product if it can move and fall.

Mounting the Product on a Rigging Structure

The product can be fastened to a rigging structure in any orientation. The quarter-turn receptables (see „Overview" on page 10)

> ⚠️ **WARNING!**
>
> Always use two (2) clamps to fasten the product to the rigging structure. Lock each omega adapter with both quarter-turn fasteners. Fasteners are locked only when turned fully clockwise.
> When installing the fixture hanging vertically down, you can use an open-type clamp such as a G-clamp. When installing in any other orientation, you must use a closed-type rigging clamp such as half-coupler clamp that completely encircles the truss chord.

The product is comes with two omega-type brackets to which rigging clamps can be attached. Check that the rigging clamps are undamaged and approved for the product's weight. Securely bolt a rigging clamp to each bracket. Only use M12 bolt, grade 8.8 steel minimum, and fastened with self-locking nuts.

Align the first clamp bracket with 2 quarter-turn receptables in the base. Insert the quarter-turn fasteners in the quarter-turn receptables and turn both lever full 90° to lock them (see illustration on right). Repeat for the second clamp.
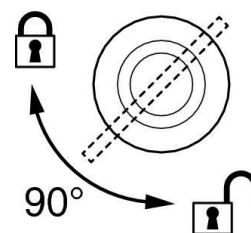
Secure product with a secondary attachment in case of primary attachment fail. Only use and approved safety cable that has been rated for the weight of the product.

Only use the anchor on the side of the product and not other attachment point such as handle.

AC Power

⚠️ DANGER!
High voltage! Risk of electric shock and fire.   Read the "Important Safety Information" on page 2 before connecting the product to AC mains power. Always connect the product directly to AC power.   Use only a Neutrik Powercon TRUE1 NAC3FX-W cable connector to connect the power cable to the power input socket. Use only a Neutrik Powercon TRUE1 NAC3MX-W cable connector to connect the power link cable to the power throughput socket.   Only use the power cable provided by the manufacturer with the product.   For protection from electric shock, the product must be electrically grounded (earthed).   Socket outlets or external power switches used to supply the product with power must be located near the product and easily accessible so that the product can easily be disconnected from power.

The product can be hard-wired to a building electrical installation if you want to permanently install it, or a power plug (not supplied) that is suitable for the local power outlets can be installed on the power cable.

If you install a power plug on the power cable, install a grounding type (earthed) plug with integral cable grip that is rated minimum 18 A at a suitable voltage for your local power system and which is compliant with your local and national requirement. . Follow the plug manufacturer's instructions and connect the wires in the power cable as shown in this table:

	Live or L	Neutral or N	Earth, Ground or ⏚
US system	Black	White	Green
EU system	Brown	Blue	Yellow/green

The product has an auto-ranging power supply that accepts AC mains power at 100-240 V at 50/60 Hz. Do not apply AC mains power at any other voltage or frequency to the product.

Linking Fixtures to Power in a Chain

The product has a power consumption of 75 W max. Do not connect products to power in a chain that will exceed the electrical ratings of any cable or connector used in the chain. Connect only the same fixtures into an interconnected chain.

If you wish to connect IVL Square products to power in a linked chain, you must obtain a AWG14 power input cable and AWG14 throughout cables.

Using these gauge cables, you can link maximum 17 IVL Square by Minuit Une.

Control Data Link

A DMX 512 data link with a ferrite (ref: 742 712 22 S) on it is required to control the product via DMX. The fixture has a 5-pin XLR connector for DMX data input and output.

A single daisy chain can consist of up to 32 devices. The total number of products in one 512-channel DMX universe is limited by the number of DMX channels required by the products. Note that if independent control of a product is required, it must have its own DMX channel range. Products that are required to behave identically can share the same DMX address and channels. To add more products or groups of products when the above limits are reached, add a DMX universe and/or split the daisy-chained link into branches using a powered DMX splitter.

Tips for a Reliable DMX Data Transmission

Use shielded twisted-pair cable designed for RS-485 devices: standard microphone cable cannot transmit control data reliably over long runs. 24 AWG cable is suitable for runs up to 300 meters (1000 ft.). Heavier gauge cable and/or an amplifier is recommended for longer runs.

A valid DMX signal is the safety interlock of the device. Please check, if every DMX cable used in the control data link is in perfect condition if the safety signal (red LED) is switching on and off constantly whereas other products in the control data link are reacting correct on DMX commands.

The pin-out of the connectors is:

- pin 1 = shield
- pin 2 = cold (-)
- pin 3 = hot (+).

Pins 4 and 5 in the 5-pin XLR connectors are not used by the product but are available for possible additional data signals as required by the DMX512-A standard. Standard pin-out is pin 4 = data 2 cold (-) and pin 5 = data 2 hot (+).

To split the link into branches, use an opto-isolated, powered DMX splitter. Terminate the link by installing a termination plug in the output socket of the last product of a DMX data link. The termination plug, which is a male XLR plug with a 120 Ohm, 0.25-watt resistor soldered between pins 2 and 3, "soaks up" the control signal so it does not reflect and cause interference. If a splitter is used, terminate each branch of the link.

To Connect the Data Link

To connect the product to the DMX data link:

1. Connect the DMX data output from the controller to the closest product's male XLR DMX input connector.
2. Connect the first product's DMX output to the DMX input of the next product and continue connecting products output to input.
3. Terminate the last product on the link with a DMX termination plug. If the last product in the control data link is an IVL product, you do not need to use a DMX termination plug as a termination resistor is integrated in the electronics board.

Fixture Menu

The IVL Square support two different DMX Modes. The active DMX Mode (DMX1 / DMX2) is displayed in the display on the front panel of the product.

The DMX address is also displayed. It is indicated by an "A:". "A:001" indicates, that the product is set to DMX start address 1. The recent internal temperature of the product is shown on the display.

To Change the DMX Mode

1. Press ENTER
2. Press ENTER again to open the DMX mode menu.
3. Press + or - to scroll through the DMX modes.
4. Press ENTER to select a DMX mode.
5. Press ESC to cancel the action without changing settings.

To Change the DMX Address

1. Press ENTER.
2. Press +.
3. Press ENTER to open the DMX address menu.
4. Press + or - to scroll to the hundreds digit. Press ENTER to select a digit.
5. Press + or - to scroll through the tens digit. Press ENTER to select a digit.
6. Press + or - to scroll through the ones digit. Press ENTER to select a digit.
7. Press ESC to cancel the action without changing settings.

Temperature and Lifetime Readout

1. Press ESC to call up the main screen.
2. Press – shortly to display the highest internal temperature since production, the hour counter and the software version.

DMX Channel Value Readout

1. Press ESC to call up the main screen.
2. Press – long to display the values of the DMX start address and the next three DMX channels received by the product.

Effects

The IVL fixture creates four light plans from a laser-based light source split at very high speed by a smart mirror system. A Specific Plexiglas Shape to release a vibrant light with a smooth RGB colour spectrum and enveloping texture.

Each light plane can be played independently with various modes: full plane, beam, frost, décor, projection with a 180° angle.

This is not a laser effect, this is a new category of lighting with unique shapes, unique textures, unique immersive feeling and standard safety.

Vibrant Light, smooth RGB

The super-fast scanning system of the IVL Lighting range (333Hz frequency rate) allows the human eye to see every single nuance of colour: A vibrant and smooth RGB colour spectrum to perfectly complete the best LED's and HALOGEN's chromatic range, with a vivid colour combination, as well as a wide range of pastel colours.

Tilt, Movement and Frost

4 brushless stepper motors control the movement of the 4 tilt mirrors on each side independently (4 separated tilts in the DMX chart). Unlimited immersive positions can be programmed and achieved just by playing with different groups of mirrors from a group of IVL Lightings.

A specific electronically augmented resolution driver allows to achieve a really smooth movement: you can create smooth movement with a really small range (%1) around your immersive advanced shapes.

Each mirror has an angle of position from 0° to 360°, this allows the creation of an infinity of advanced shapes, immersive, decoration and wash effects.

The tilt channels are used to control the angle of the four mirror bars. One side of the mirror is highly reflective while the opposite site is diffusely reflective. DMX values from 0 – 50% (0 – 127) create a single light plan at different angles. DMX values from 51 – 100% (128 – 255) convert the IVL to a diffuse light source.

DMX channels 11 to 18 control single mirror bars as shown below:

DMX channel coarse	DMX channel fine	Mirror bar (see " Scanner **and** " on page 11)
11	12	1
13	14	2
15	16	3
17	18	4

Example

- Open immersive position (11% tilt DMX value)
- Eye-capturing/straight immersive position (12.5 % tilt DMX value)
- Close background position (14% tilt DMX value)
- Decorative position (15 % tilt DMX value)
- Wash effect position: frost mode (62.5 % tilt DMX value).
- Reset function by optical sensors.

Beam Control

An intelligent electronic software synchronised in real time with the frequency rate of the scanning system allows to cut the light plan into several beams: 1, 2, 4, 8, 16, 32, 64, 128, 256 beams to create an infinity of effects such as:

- Even more intense advanced shapes,
- Beam looking effects,
- Parallel effects,
- Flower effects,
- And many more.

These beams can be positioned anywhere on the mirrors, either static or in rotation, with control on the size of the beam.

These specifications are converted via DMX consoles as an intuitive gobo system with the following equivalence:

- Gobo type: number of beams
- Gobo size: width of the beam
- Gobo indexation: static position of the beam on the mirrors
- Gobo rotation: speed and direction of rotation.

The origin (index = 0°) is located at the upper right side between mirror bars 2 and 3. Increasing the index shifts the origin of the beams counter clockwise from 0 to 360°:
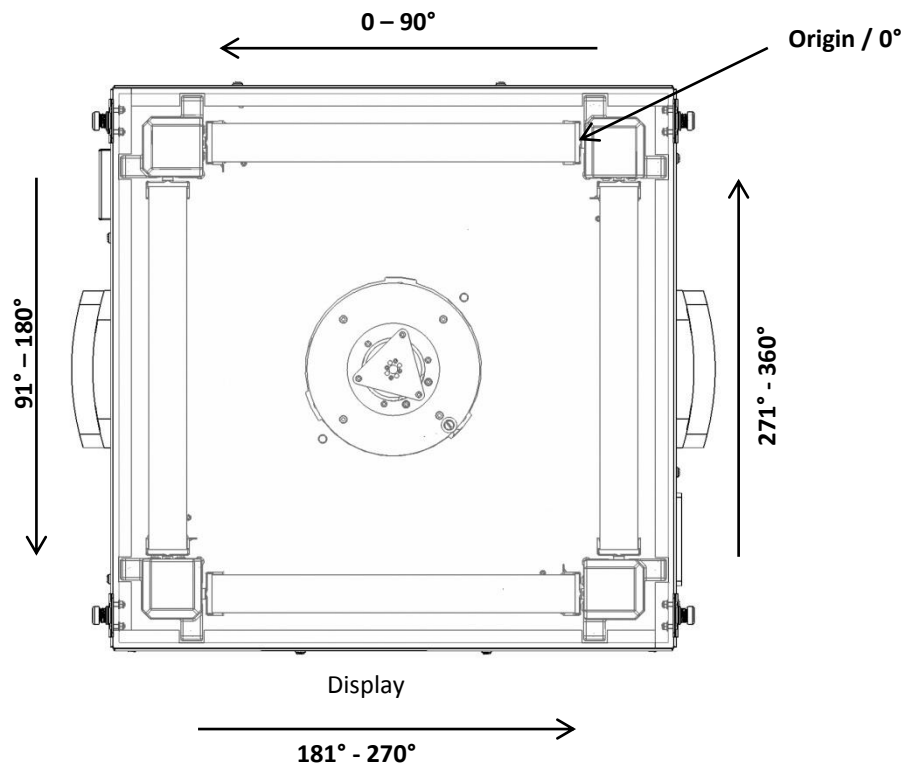
DMX mode 2 gives the creativity to control the beam parameters for the blue, the green and the red sources independently.

Decoration

The Plexiglas material of the shape has the unique property to let the light go through while creating lines of light on it. In fact, the intersection of the 4 light plans with the Plexiglas shape is visible. It gives you the unique creativity to play either with immersive effects or the decorative effects or both at the same time.

The lines created by the projection of the 4 plans in any venue is an extraordinary way to combine lighting, decoration and mapping all together: your space of creativity is even bigger, as you can enhance the architecture of any place in an absolutely stunning and unique way.

Space coverage

The directivity of the IVL Lighting covers any large indoor area with advanced shapes. The light plan crosses the space thanks to a low divergence: it is important to have the right level of haze in the whole venue to materialize the effect and create a truly amazing experience.

The aperture angle on each mirror is 180°: allowing the 3D rendering perspectives to have no limit of size and the option to fill any indoor space

Dimmer

The dimmer is a full range dimmer from 0 (no light) to 100% (full brightness). The dimmer is controlled via DMX channel 2 in both DMX modes.

Colours

The IVL light source produces red, green and blue light. The red, green and blue portion of the light is controlled via DMX channels 5 (red), 6 (green) and 7 (blue) in both DMX modes.

Shutter

The electronic shutter supports strobe effects from 30 to 1440 bpm via DMX channel 8 in both DMX modes.

Maintenance

Cleaning

> **Always disconnect the product from AC power before cleaning.**
> Always maintenance the product in a well-lit area where there is no risk of injury from falling parts, tools or other materials.

Excessive dust, smoke fluid, and particle degrades performance, causes overheating and will damage the product. Damage caused by inadequate cleaning or maintenance is not covered by the product warranty.

The product should be cleaned regularly to obtain maximum performance and brightness.

To clean the Plexiglas shape:

3. Disconnect the product from AC power.
4. Clean the external part of the Plexiglas shape. Always clean the Plexiglas components with a soft wipe and / or standard glass cleaner without alcohol and a lint-free cloth. Do not use products, solvents or abrasive materials for cleaning Plexiglas.

To clean the fan filter of the side fan:

5. Disconnect the product from AC power.
6. Remove the housing of the fan filter and the fan filter.
7. Wash the filter with warm water with a little mild detergent until it is clean.
8. Let the filter dry completely. Do not install a damp filter as moisture damages the fixture.
9. Install the fan filter back.
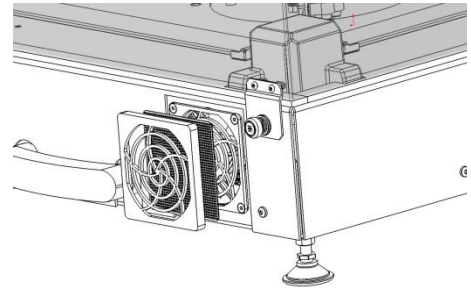
TILT Mirror Calibration

Before calibrating the tilt mirror, always verify if the Plexiglas square shape is screwed on the product.

During calibration, avoid direct eye exposure.

To calibrate the mirror: (Be careful, all DMX values are in decimal)

Turn on the IVL by holding the "+" and "−" buttons.

Now, you should see the message "Factory mode" on the screen:

- Set DMX address of the IVL on 001

- Set DMX channels 1, 3, 4, 5, 6, 7 to the value 255, and the DMX channel 2 to the value 20

- Set DMX channel 9 to the value 20

- Move channel 11 until the light plan from the first Tilt Mirror reaches its respective edge of the plexiglass
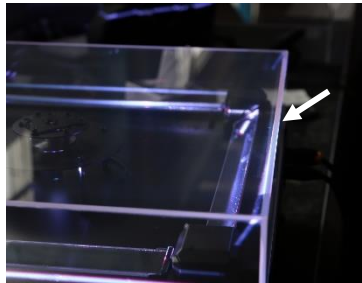
TILT Mirror 1, channel 11

- Align the other TILT Mirrors on their respective edges
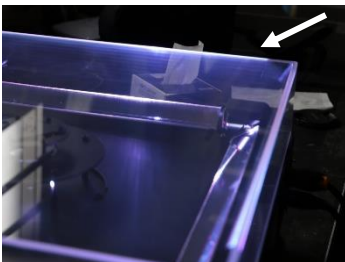
TILT Mirror 2, channel 13
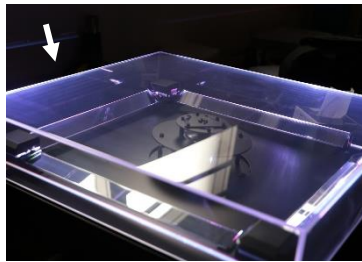
TILT Mirror 3, channel 15
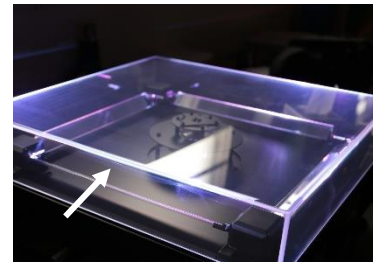
TILT Mirror 4, channel 17

- By setting DMX channel 9 to the value 0, check that each TILT Mirror is on Park Mode position

  (flat with the FROST side toward up)

- Save the calibration by setting DMX channel 19 to the value 255; leave it for a few seconds, then switch it back to 0 before shutting off the IVL

- Turn on the IVL to check that the calibration has been saved

Gobo Origin Calibration

Before calibrating the gobo origin, always verify if the Plexiglas square shape is screwed on the product.

During calibration, avoid direct eye exposure.

To calibrate the gobo origin: (Be careful, all DMX values are in decimal)

Turn the IVL on by holding the "+" and "–" buttons.

Now, you should see the message "Factory mode" on the screen:

- Set DMX address of the IVL on 001

- Set DMX channels 1, 4, 5, 6, 7 to the value 255, and the DMX channel 2 to the value 20

- Set DMX channel 3 to the value 15

- Move DMX channel 9 to value 185.

- Set DMX channel 8 to value 255 then to 0 (re-initializing of the Gobo channel)

- Set DMX channel 20 to the value 140

- Move the channel 21 until the straight end of the laser beam touch the reference zero point
  The reference zero point starts in the stepper motor screw head
  (see arrow the picture beside)

- Save the calibration by setting DMX channel 22 to the value 255; leave it for a few seconds, then switch it back to 0 before shutting off the IVL

- Turn on the IVL to check that the calibration has been saved
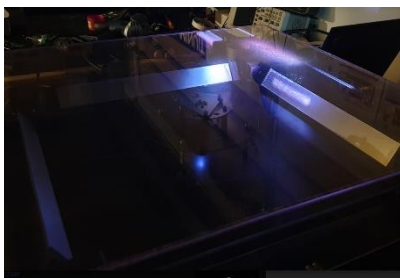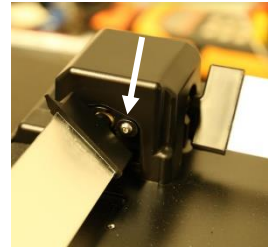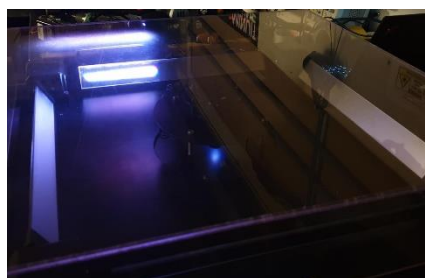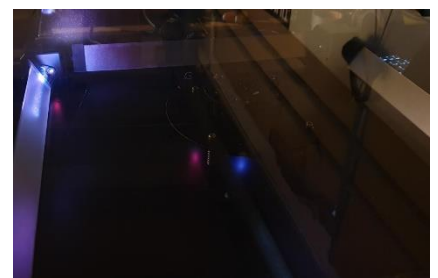
| *Channel 20 to O* | *Channel 20 to 140* | *Good position* |

DMX Protocol

Modes 1 and 2

Mode / Channel		DMX Value	Percent	Function	Default (%)
1	**2**				
1	**1**	0 – 23 24 – 49 50 – 255	0 – 9 10 – 19 20 – 100	**Control** Off Reset On	75
2	**2**	0 – 255	0 – 100	**Dimmer** Close > Open	0
3	**3**	0 – 255	0 – 100	**Blades coarse (disabled in console fixture)** 0 > 360°	100
4	**4**	0 – 255	0 – 100	**Blades fine (disabled in console fixture)**	
5	**5**	0 – 255	0 – 100	**Red** 0 > Full	100
6	**6**	0 – 255	0 – 100	**Green** 0 > Full	100
7	**7**	0 – 255	0 – 100	**Blue** 0 > Full	100
8	**8**	0 – 14 15 – 27 28 – 227 228 – 255	0 – 5 6 – 10 11 – 89 90 – 100	**Shutter** Open Closed 30 > 1440 bpm Open	0
9	**9**	0 – 12 13 – 255	0 – 5 5 – 100	**Tilt all coarse (disabled in console fixture)** Off 0 > 360°	0
10	**10**	0 – 255	0 – 100	**Tilt all fine (disabled in console fixture)**	
11	**11**	0 – 255	0 – 100	**Tilt 1 coarse** 0 > 360°	0
12	**12**	0 – 255	0 – 100	**Tilt 1 fine**	
13	**13**	0 – 255	0 – 100	**Tilt 2 coarse** 0 > 360°	0
14	**14**	0 – 255	0 – 100	**Tilt 2 fine**	
15	**15**	0 – 255	0 – 100	**Tilt 3 coarse** 0 > 360°	0
16	**16**	0 – 255	0 – 100	**Tilt 3 fine**	
17	**17**	0 – 255	0 – 100	**Tilt 4 coarse** 0 > 360°	0
18	**18**	0 – 255	0 – 100	**Tilt 4 fine**	

19				**Gobo all**	0
		0 – 27	0 – 10	1 Beam	
		28 – 55	11 – 21	2 Beams	
		56 – 83	22 – 32	4 Beams	
		84 – 111	33 – 43	8 Beams	
		112 – 139	44 – 54	16 Beams	
		140 – 167	55 – 65	32 Beams	
		168 – 195	66 – 76	64 Beams	
		196 – 223	77 – 87	128 Beams	
		224 – 255	88 – 100	256 Beams	
20				**Index / Offset coarse (inactive for rotation)**	0
		0 – 255	0 -- 100	0 > 360°	
21		0 -- 255	0 – 100	**Index / Offset fine**	
22				**Rotation**	0
		0 – 12		No rotation	
		13 – 122		Rotation counter-clockwise fast > slow	
		123 – 133		Stop at current position	
		134 – 242		Rotation clockwise slow > fast	
		243 – 255		No rotation	
23				**Gobo Size all coarse**	0
		0 – 255	0 – 100	0 > 360°	
24		0 – 255	0 – 100	**Gobo Size all fine**	0
25				**Reserved**	
	19			**Red Gobo**	0
		0 – 27	0 – 10	1 Beam	
		28 – 55	11 – 21	2 Beams	
		56 – 83	22 – 32	4 Beams	
		84 – 111	33 – 43	8 Beams	
		112 – 139	44 – 54	16 Beams	
		140 – 167	55 – 65	32 Beams	
		168 – 195	66 – 76	64 Beams	
		196 – 223	77 – 87	128 Beams	
		224 – 255	88 – 100	256 Beams	
	20			**Index / Offset Red coarse (not for rotation)**	0
		0 – 255	0 - 100	0 > 360°	
	21			**Index / Offset Red fine**	
	22			**Rotation Red coarse**	0
		0 – 12		No rotation	
		13 – 122		Rotation counter-clockwise fast > slow	
		123 – 133		Stop at current position	
		134 – 242		Rotation clockwise slow > fast	
		243 – 255		No rotation	
	23	0 – 255	0 – 100	**Rotation Red fine**	
	24	0 – 255	0 – 100	**Gobo Size Red coarse**	0
				0 > 360°	
	25	0 – 255	0 – 100	**Gobo Size Red fine**	
	26			**Green Gobo**	0
		0 – 27	0 – 10	1 Beam	
		28 – 55	11 – 21	2 Beams	
		56 – 83	22 – 32	4 Beams	
		84 – 111	33 – 43	8 Beams	
		112 – 139	44 – 54	16 Beams	
		140 – 167	55 – 65	32 Beams	
		168 – 195	66 – 76	64 Beams	
		196 – 223	77 – 87	128 Beams	
		224 – 255	88 – 100	256 Beams	

	27			**Index/Offset Green coarse (not for rotation)**	0
		0 – 255	0 - 100	0 > 360°	
	28	0 – 255	0 – 100	**Index / Offset Green fine**	
	29			**Rotation Green coarse**	0
		0 – 12		No rotation	
		13 – 122		Rotation counter-clockwise fast > slow	
		123 – 133		Stop at current position	
		134 – 242		Rotation clockwise slow > fast	
		243 – 255		No rotation	
	30	0 – 255	0 – 100	**Rotation Green fine**	
	31			**Gobo Size Green coarse**	0
		0 – 255	0 – 100	0 > 360°	
	32	0 – 255	0 – 100	**Gobo Size Green fine**	
	33			**Blue Gobo**	0
		0 – 27	0 – 10	1 Beam	
		28 – 55	11 – 21	2 Beams	
		56 – 83	22 – 32	4 Beams	
		84 – 111	33 – 43	8 Beams	
		112 – 139	44 – 54	16 Beams	
		140 – 167	55 – 65	32 Beams	
		168 – 195	66 – 76	64 Beams	
		196 – 223	77 – 87	128 Beams	
		224 – 255	88 – 100	256 Beams	
	34			**Index / Offset Blue coarse (not for rotation)**	0
		0 – 255	0 - 100	0 > 360°	
	35			**Index / Offset Blue fine**	
	36			**Rotation Blue coarse**	0
		0 – 12		No rotation	
		13 – 122		Rotation counter-clockwise fast > slow	
		123 – 133		Stop at current position	
		134 – 242		Rotation clockwise slow > fast	
		243 – 255		No rotation	
	37	0 – 255	0 – 100	**Rotation Blue fine**	
	38			**Gobo Size Blue coarse**	0
		0 – 255	0 – 100	0 > 360°	
	39	0 – 255	0 – 100	**Gobo Size Blue fine**	
	40			**Reserved**	
	41			**Reserved**	
	42			**Reserved**	
	43			**Reserved**	
	44			**Reserved**	
	45			**Reserved**	

Specification

Measurements and Weight
Overall dimensions (l x w x h)...592 x 520 x 242 mm³, 16 kg

Light Source
Class 3R laser product .... extended source
Typical Wavelength..448nm,518nm,638nm
Beam diameter (1/e) at scanning vertex ....>12mm
Beam divergence..>1,5mrad
Scan rate...340Hz
Distance from scanning vertex to closest point of human access (NPHA)................................ 286mm
Accessible Emission Limit..15,5µJ
Typical Pulse Energy at NPHA...13.8µJ
Typical Average Power at NPHA..4,7mW
Typical average power at 1m (7mm pupil analysis)..1mW
Typical average power at 1,5m (7mm pupil analysis)..0,55mW
Typical C6 factor for accommodation to infinity..C6>18,5
Typical C6 factor for accommodation to the scanning vertex...C6>272
Colour..Smooth RGB spectrum
4 light plane... .360°
Beam range .... 1 to 80°
Frost effect .... Diffuse smooth light

Housing / Construction
Housing.. Aluminium body, black matt
Plastic Shape .... Plexiglas
Protection rating IP20
Transportation..Two side handle

Scanning System
Scanning motor .... High life brushless DC motor
Constant scanning rate..340Hz
Mirror ....R>98%
Safeguard .... No scanning fail

DMX modes
Mode 1 ....25 channels
Mode 2 ....45 channels

Tilt Movement
Motor .... 4 brushless step to step motors
Mirrors ....4 side Plexiglas tilt mirrors
Angle ....0° to 360°
Resolution ....16 bit

Beam Control
Number of beams...1 to 256
Control...Intuitive gobo like system
Gobo type..Number of beams
Gobo size .... Width of the beam
Gobo indexation .... Position of the beam
Gobo rotation..Speed and direction of the beam

Power supply
Power supply unit... 100 to 240 Volts – 50/60Hz

Power ....75-Watt max

Cooling system/Thermal

Cooling ....Temperature-regulated

Safety……………………………………………™square……………………………… Protection against excessive temperatures

Installation

Standard mounting point .... Six quarter-turn locking points

.... Safety cable attachment point

Operating parameters

Positions allowed .... any

Maximum ambient temperature ....40°C (104°F)

Minimum ambient temperature ....0°C (32°F)

Connections

AC power input/output .... Neutrik PowerCon True1

DMX data in/out... 5-pin locking XLR

Standards

Safety..(Directive No : 2014/35/UE)

.... IECEE 60825-1:2014 (EN 60825-1:2014)

....21CFR 1040

....ANSI Z136.1 "Standard for Safe Use of Lasers"

....IECEE 60065:2014 (EN 60065:2014)

.... EN 62311 : 2008

EMC ....(Directive No : 2014/30/UE)

.... EN 55103-1:2009

.... EN 62311 : 2008

.... EN 55103-2 : 2009

....FCC 47 CFR part 15:2017

....ICES-003/NMB-003 edition 6 : 2016

....IEC 61000-6-3:2007/A1:2011

....IEC 61000-6-1:2007

	Disposing of this product
	IVL products are supplied in compliance with Directive 2012/19/EC of the European Parliament and of the Council of the European Union on WEEE (Waste Electrical and Electronic Equipment), where applicable. Help preserve the environment! Ensure that this product is recycled at the end of its life. Your supplier can give details of local arrangements for the disposal of IVL products.