DMX REFERENCE

BSW500

Liro Lite



Manufacturer	Liro Lite
GDTF file	Liro_Lite_BSW500_128131.gdtf
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1 About this manual

This document describes the BSW500 by Liro Lite. It was compiled from the GDTF file Liro_Lite_BSW500_128131.gdtf from the GDTF-Share library.

File revision: “Rev_1-2”.

The DMX modes, the channel functions and the technical data are given as the GDTF file states them. Installation, operation from the device's control panel, service and safety instructions are described in the manufacturer's original user manual, which takes precedence over this document.

This document was not issued or endorsed by Liro Lite; product names and trademarks belong to their owners.

Safety notices are marked with signal words according to the severity of the hazard: DANGER – an imminent hazard that will result in death or serious injury; WARNING – a potential hazard that could result in death or serious injury; CAUTION – a potential hazard that could result in minor injury or property damage; NOTE – additional information for correct and safe use.

> **NOTE** This product is designed for stage and effect lighting. It is not suitable for household room illumination.

2 Quick reference

Parameter	Value
Weight	23 kg

DMX modes

Mode	Channels	Units in one universe	First start addresses
23CH	23	22	1, 24, 47, 70, ...

No light? Check these channels

- 23CH: CH 6 Dimmer above 0; CH 7 Shutter at 104–107, 208–212 or 252–255 “Open”


Read the manual before use


Do not stare into the light


Indoor use only

3 Safety instructions



Read the manual before use



Do not stare into the light



Indoor use only

⚠ WARNING

- This device is intended for professional use. Installation, connection, setup and maintenance must be carried out only by suitably qualified persons who have read this manual.
- Use the device only for its intended purpose and as described in this manual.
- Do not open the housing and do not modify or tamper with the device. Refer all repairs to an authorized service center.
- Do not use the device if its housing, power or data cable, or a connector is damaged, if the device has been dropped, or if liquid or a foreign object has entered it. In such a case, have it checked by a service center.
- Disconnect the device from the power supply before cleaning, maintenance or any work on the connections.
- After moving the device from a cold to a warm environment, let it reach room temperature before switching it on to prevent condensation inside.
- The device is not a toy; keep it out of the reach of children.

⚠ WARNING

- This device is designed for indoor use only. Protect it from rain, splashing water, moisture and dust, and do not place containers with liquids on it.
- Do not operate the device in high humidity, near water, or where condensation can form on it.

⚠ CAUTION

- This device emits intense light. Do not look directly into the light source or the beam at close range; doing so may damage your eyes.
- Do not aim the beam at the eyes of people or animals at close range, and do not view the light source through optical instruments (binoculars, camera lenses).
- Do not aim the beam at flammable or heat-sensitive materials at close range.

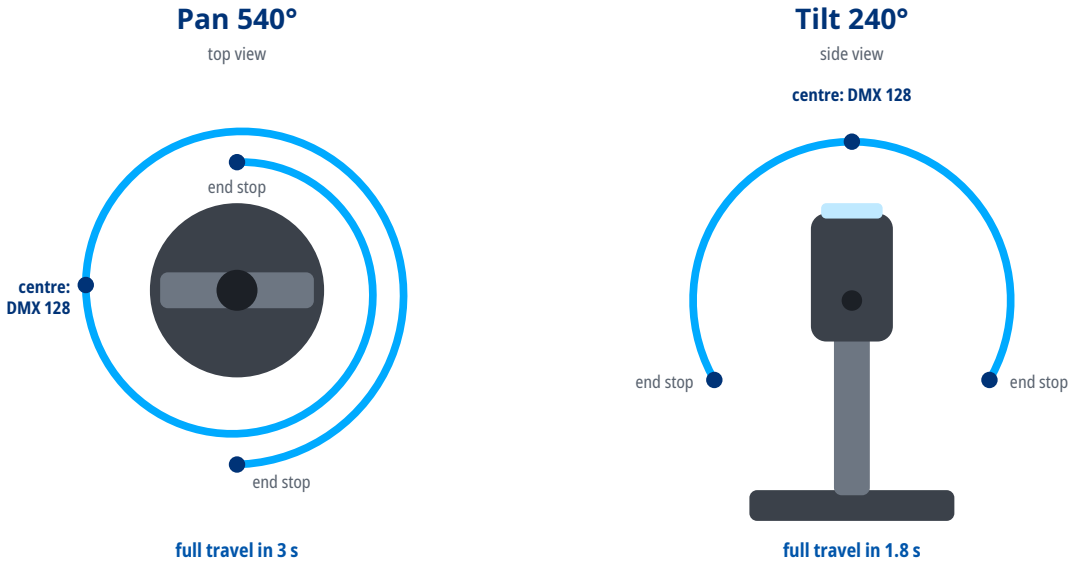
⚠ CAUTION

- Strobe and fast flashing light effects can trigger epileptic seizures in susceptible people (photosensitive epilepsy) and can cause nausea or disorientation.
- Inform the audience and performers in advance that strobe effects will be used, for example with a notice at the entrance, and do not use them longer than necessary.

> ⚠ **WARNING**
>
> - The moving parts of the device (for example the head or arms) can move quickly and unexpectedly at any time – after power-on, during a reset, or on a command from the controller.
> - Keep yourself and any objects out of the range of movement. While the device is switched on, do not touch the moving parts, move them by hand, or obstruct their movement; this can cause injury (pinching) and damage the drive.
> - Do not carry the device by its moving parts. If the device has a transport lock, engage it before transport and release it before switching on.

4 Product description

Range of movement



Full-travel times as stated in the GDTF file.

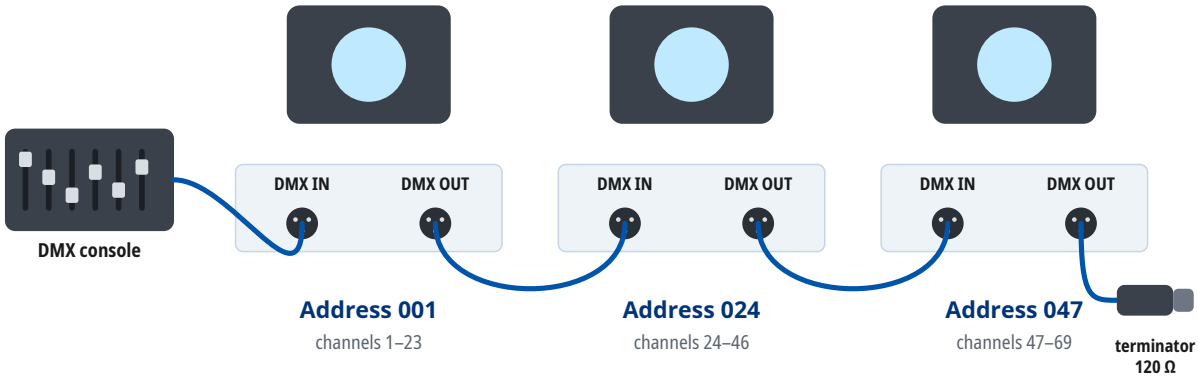
5 Installation

> ⚠ **WARNING**
>
> - Rigging must be carried out only by qualified persons in accordance with applicable regulations, in particular those for work at height.
> - The supporting structure and fixings must safely carry the weight of all suspended devices; verify their load capacity in advance.
> - Weight of the device: 23 kg.
> - Use suitable mounting hardware (for example truss clamps) and tighten all screw connections properly.
> - Always secure the suspended device against falling with a safety cable of adequate load capacity, routed through a fixed point of the device and around the supporting structure.
> - During installation and removal, keep people out of the area below the work position.
> - Regularly inspect the fixings and the safety cable for damage, corrosion and loosening.

6 Connections

- Use shielded cable designed for DMX512 with an impedance of 110 Ω. Ordinary microphone cable is not suitable for DMX, especially over longer distances.
- Connect the devices in a daisy chain: connect the DMX OUT of one device to the DMX IN of the next. Do not split the line with Y-cables or wire it in a star; the line may be split only with a DMX splitter.
- Connect the shield to pin 1 only. Do not connect the shield (ground) to the metal shell of the connector; this can cause short circuits or erratic behavior.
- XLR pin assignment: pin 1 – shield (ground), pin 2 – Data- (Data Complement), pin 3 – Data+ (Data True). On 5-pin connectors, pins 4 and 5 are not connected; a 5-pin connector can be connected to a 3-pin one with a cable adapter.
- Terminate the end of the line (for impedance matching): plug an XLR connector with a 120 Ω, ¼ W resistor between pins 2 and 3 into the DMX OUT of the last device. This reduces the risk of erratic behavior.
- Connect no more than 32 devices to one DMX line. For more devices or longer runs, use a DMX splitter or booster.

DMX line



Mode 23CH: every unit occupies 23 channels from its address. At most 32 units on one line; for more units or longer runs use a DMX splitter. A 120 Ω terminator closes the last DMX OUT.

7 Operation

Setting the DMX address

- The device occupies as many consecutive channels in the DMX universe as the selected DMX mode uses, starting at the set start address.
- Number of channels occupied in the DMX mode “23CH”: 23.
- Choose start addresses so that the channels of individual devices do not overlap and the last occupied channel does not exceed 512. Devices with the same start address and mode respond identically.
- For several devices in a row in the DMX mode “23CH”, you can use, for example, the start addresses 1, 24, 47, 70.
- The DMX mode set on the device must match the fixture profile (personality) used in the controller.

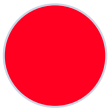
8 Functions at a glance

Functions in each DMX mode

	23CH 23 channels
Pan / Tilt	1, 3
Dimmer	6
Shutter / strobe	7
Color mixing	10–12
Color temperature	9
Color wheel	8
Gobo wheel	13, 16
Gobo rotation	16, 17
Prism	18–21
Frost	22
Zoom	14
Focus	15

Color wheel

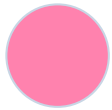
1
Color 1: Open
DMX 0–7

2 
Color 1: Red
DMX 8–23

3 
Color 1: Green
DMX 24–39

4 
Color 1: Blue
DMX 40–55

5
Color 1: Amber
DMX 56–73

6 
Color 1: Magenta
DMX 74–87

7
Color 1: Yellow
DMX 88–104

8 
Color 1: Cyan
DMX 105–119

9
Color 8
DMX 120–128

Gobo wheel 1

1
Gobo 1: Open
DMX 0–9

2 
Gobo 1
DMX 10–19

3 
Gobo 1: Gobo 2
DMX 20–29

4 
Gobo 1: Gobo 3
DMX 30–39

5 
Gobo 1: Gobo 4
DMX 40–49

6 
Gobo 1: Gobo 5
DMX 50–59

7 
Gobo 1: Gobo 6
DMX 60–69

8 
Gobo 7
DMX 70–80

Gobo wheel 2



1. Gobo 2: Open — **DMX 0–4**
2. Gobo 2: Gobo 1 — **DMX 5–9**
3. Gobo 2 — **DMX 10–14**
4. Gobo 2: Gobo 3 — **DMX 15–19**
5. Gobo 2: Gobo 4 — **DMX 20–24**
6. Gobo 2: Gobo 5 — **DMX 25–29**
7. Gobo 2: Gobo 6 — **DMX 30–34**
8. Gobo 2: Gobo 7 — **DMX 35–39**
9. Gobo 2: Gobo 8 — **DMX 40–44**
10. Gobo 2: Gobo 9 — **DMX 45–49**
11. Gobo 2: Gobo 10 — **DMX 50–54**
12. Gobo 11 — **DMX 55–60**

Prism 1



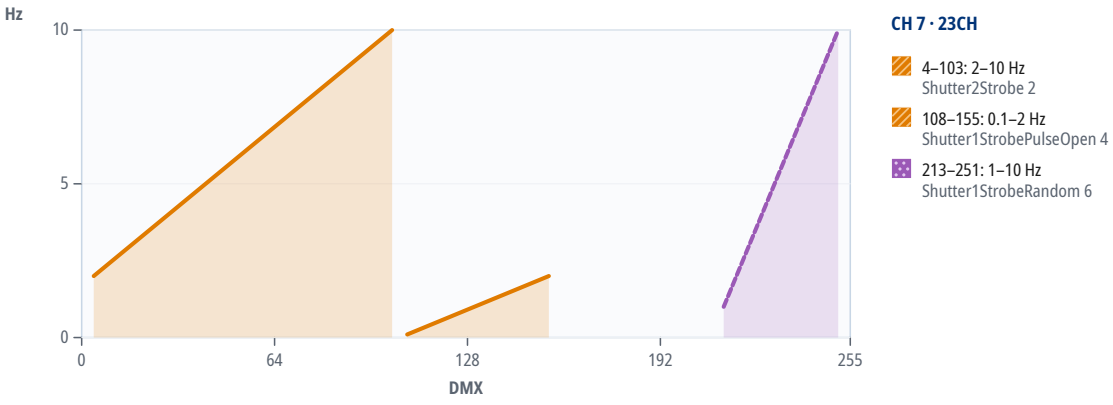
1. 8 facets
   Circular Prism
   DMX 128–255

Prism 2



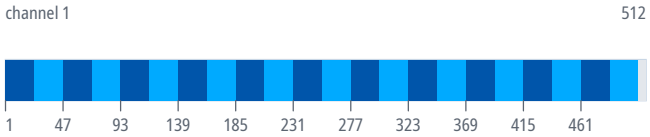
1. 6 facets
   6F Linear
   DMX 128–255

Strobe rate



9 DMX channels

Units in one DMX universe



23CH
23 channels

up to 22 units
last address 484

Start addresses of 20 units in the mode “23CH”

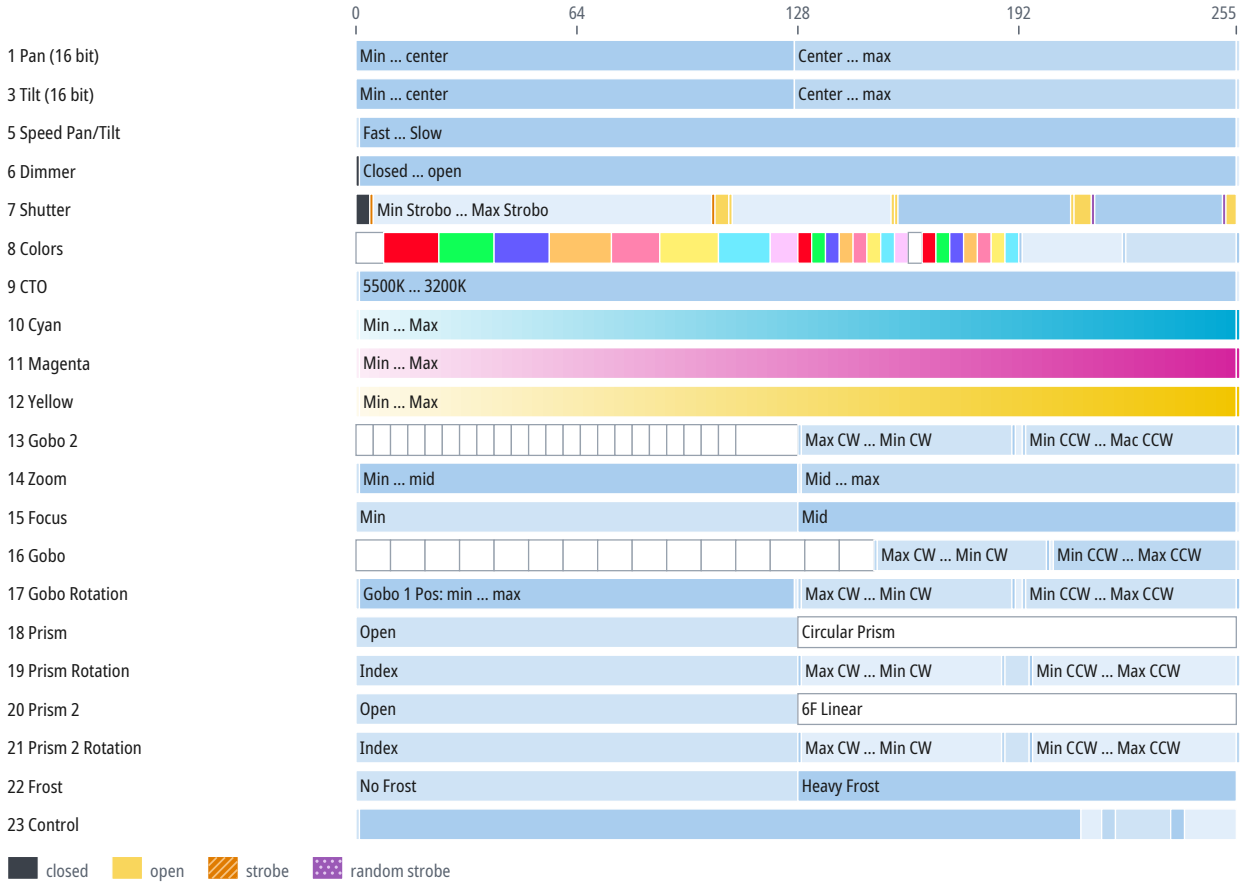
Unit	Start address	Unit	Start address	Unit	Start address	Unit	Start address
1	1	6	116	11	231	16	346
2	24	7	139	12	254	17	369
3	47	8	162	13	277	18	392
4	70	9	185	14	300	19	415
5	93	10	208	15	323	20	438

Mode 23CH

16-bit parameters use two channels, coarse and fine: value = 256 × coarse value + fine value.

If the device receives DMX in this mode but gives no light, check these channels: CH 6 Dimmer above 0; CH 7 Shutter at 104–107, 208–212 or 252–255 “Open”. The GDTF file gives these values for a console's Highlight function: CH 6 Dimmer 255, CH 7 Shutter 255, CH 8 Colors 0, CH 10 Cyan 0, CH 11 Magenta 0, CH 12 Yellow 0.

Channel functions at a glance



CH	Function	DMX	Description
1	Pan	0–127	Min ... center
		127–255	Center ... max
		255	Max
2	Pan Fine	0–255	Fine adjustment of CH 1
3	Tilt	0–127	Min ... center
		127–255	Center ... max
		255	Max
4	Tilt Fine	0–255	Fine adjustment of CH 3
5	Speed Pan/Tilt	0	Fast
		1–254	Fast ... Slow
		255	Slow
6	Dimmer	0	Closed
		1–254	Closed ... open

CH	Function	DMX	Description
6	Dimmer (continued)	255	Open
7	Shutter	0–3	Shutter 1: Closed
		4	Min Strobo
		5–102	Min Strobo … Max Strobo
		103	Max Strobo
		104–107	Shutter 1: Open
		108	Shutter 1 Strobe Pulse Open: Min Pulse Open
		109–154	Shutter 1 Strobe Pulse Open: Min Pulse Open … Max Pulse Open
		155	Shutter 1 Strobe Pulse Open: Max Pulse Open
		156	Shutter 1: Min Pulse Open
		157–206	Shutter 1: Min Pulse Open … Max Pulse Open
		207	Shutter 1: Max Pulse Open
		208–212	Shutter 1: Open
		213	Min Rnd
		214–250	Min Rnd … Max Rnd
		251	Max Rnd
		252–255	Shutter 1: Open
8	Colors	0–7	Color 1: Open
		8–23	Color 1: Red
		24–39	Color 1: Green
		40–55	Color 1: Blue
		56–73	Color 1: Amber
		74–87	Color 1: Magenta
		88–104	Color 1: Yellow
		105–119	Color 1: Cyan
		120–127	Color 1: Rosa
		128–131	Color 1 Wheel Index: Red
		132–135	Color 1 Wheel Index: Green
		136–139	Color 1 Wheel Index: Blue
		140–143	Color 1 Wheel Index: Amber
		144–147	Color 1 Wheel Index: Rosa
		148–151	Color 1 Wheel Index: Yellow
		152–155	Color 1 Wheel Index: Cyan
		156–159	Color 1 Wheel Index: Magenta
		160–163	WhiteRed
		164–167	RedGreen
		168–171	GreenBlue
		172–175	BlueAmber
		176–179	AmberRosa
		180–183	RosaYellow
		184–187	YellowCyan

CH	Function	DMX	Description
8	Colors (continued)	188–191	CyanMagenta
		192	Max CW
		193–221	Max CW ... Stop
		222	Color 1 Wheel Spin: Stop
		223–254	Stop ... Max CCW
		255	Max CCW
9	CTO	0	5500K
		1–254	5500K ... 3200K
		255	3200K
10	Cyan		Color RGB_R 1
		0	Min
		1–254	Min ... Max
		255	Max
11	Magenta		Color RGB_G 1
		0	Min
		1–254	Min ... Max
		255	Max
12	Yellow		Color RGB_B 1
		0	Min
		1–254	Min ... Max
		255	Max
13	Gobo 2	0–4	Gobo 2: Open
		5–9	Gobo 2: Gobo 1
		10–14	Gobo 2
		15–19	Gobo 2: Gobo 3
		20–24	Gobo 2: Gobo 4
		25–29	Gobo 2: Gobo 5
		30–34	Gobo 2: Gobo 6
		35–39	Gobo 2: Gobo 7
		40–44	Gobo 2: Gobo 8
		45–49	Gobo 2: Gobo 9
		50–54	Gobo 2: Gobo 10
		55–59	Gobo 2: Gobo 11
		60–64	Gobo 2 Select Shake: Gobo 1
		65–69	Gobo 2 Select Shake: Gobo 2
		70–74	Gobo 2 Select Shake: Gobo 3
		75–79	Gobo 2 Select Shake: Gobo 4
		80–84	Gobo 2 Select Shake: Gobo 5
		85–89	Gobo 2 Select Shake: Gobo 6
		90–94	Gobo 2 Select Shake: Gobo 7
		95–99	Gobo 2 Select Shake: Gobo 8
		100–104	Gobo 2 Select Shake: Gobo 9

CH	Function	DMX	Description
13	Gobo 2 (continued)	105–109	Gobo 2 Select Shake: Gobo 10
		110–127	Gobo 2 Select Shake: Gobo 11
		128	Max CW
		129–189	Max CW ... Min CW
		190	Min CW
		191–192	Gobo 2 Wheel Spin: Stop
		193	Min CCW
		194–254	Min CCW ... Mac CCW
		255	Mac CCW
14	Zoom	0	Min
		1–127	Min ... mid
		128	Mid
		129–254	Mid ... max
		255	Max
15	Focus	0–127	Min
		128–254	Mid
		255	Max
16	Gobo	0–9	Gobo 1: Open
		10–19	Gobo 1
		20–29	Gobo 1: Gobo 2
		30–39	Gobo 1: Gobo 3
		40–49	Gobo 1: Gobo 4
		50–59	Gobo 1: Gobo 5
		60–69	Gobo 1: Gobo 6
		70–79	Gobo 1: Gobo 7
		80–89	Gobo 1 Pos Shake: Gobo 1
		90–99	Gobo 1 Pos Shake: Gobo 2
		100–109	Gobo 1 Pos Shake: Gobo 3
		110–119	Gobo 1 Pos Shake: Gobo 4
		120–129	Gobo 1 Pos Shake: Gobo 5
		130–139	Gobo 1 Pos Shake: Gobo 6
		140–149	Gobo 1 Pos Shake: Gobo 7
		150	Max CW
		151–199	Max CW ... Min CW
		200	Min CW
		201	Min CCW
		202–254	Min CCW ... Max CCW
		255	Max CCW
17	Gobo Rotation	0	Gobo 1 Pos: min
		1–126	Gobo 1 Pos: min ... max
		127	Gobo 1 Pos: max
		128	Max CW

CH	Function	DMX	Description
17	Gobo Rotation (continued)	129–189	Max CW ... Min CW
		190	Min CW
		191–192	Gobo 1 Pos Rotate: Stop
		193	Min CCW
		194–254	Min CCW ... Max CCW
		255	Max CCW
18	Prism	0–127	Open
		128–255	Circular Prism
19	Prism Rotation	0–127	Index (180°)
		128	Max CW
		129–186	Max CW ... Min CW
		187	Min CW
		188–194	Prism 1 Pos Rotate: Stop
		195	Min CCW
		196–254	Min CCW ... Max CCW
		255	Max CCW
20	Prism 2	0–127	Open
		128–255	6F Linear
21	Prism 2 Rotation	0–127	Index (180°)
		128	Max CW
		129–186	Max CW ... Min CW
		187	Min CW
		188–194	Prism 2 Pos Rot: Stop
		195	Min CCW
		196–254	Min CCW ... Max CCW
		255	Max CCW
22	Frost	0–127	No Frost
		128–255	Heavy Frost
23	Control	0	Default
		1–209	Control 1 1
		210–215	Pos Reset (3sec)
		216–219	Control 1 3
		220–235	nonPos Reset (3sec)
		236–239	Control 1 5
		240–255	Reset (3sec)

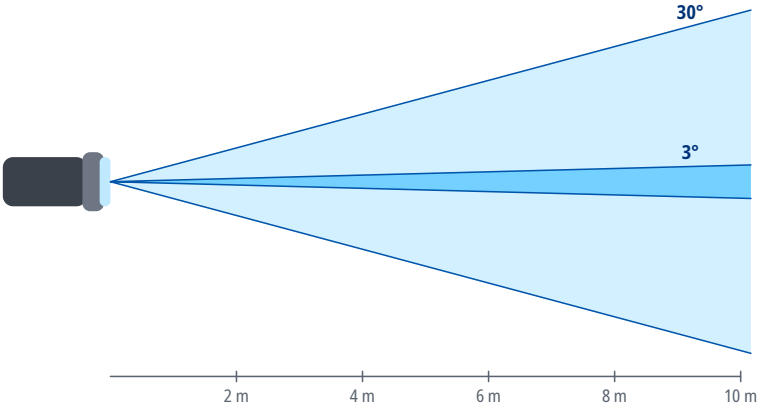
10 Technical specifications

Parameter	Value
Light	
Light source	LED
LED power	450 W
Luminous flux	12,000 lm
Color temperature	6,500 K
Color rendering index (CRI)	100
Optics	
Zoom	3–30°
Movement	
Pan	540°
Tilt	240°
Dimensions and construction	
Weight	23 kg
Operating environment	
Operating temperature	0 to 40 °C

Speeds and ranges

Parameter	Value
Color temperature range	3200–5500 K
Strobe frequency	2–10 Hz
Color wheel rotation	up to 573 °/s (95 rpm)
Gobo wheel 1 rotation	up to 57.3 °/s (9.5 rpm)
Gobo wheel 2 rotation	up to 57.3 °/s (9.5 rpm)
Gobo 1 rotation	up to 360 °/s (60 rpm)
Prism 1 rotation	up to 360 °/s (60 rpm)
Prism 2 rotation	up to 360 °/s (60 rpm)

Spot diameter



Distance	Ø 3°	Ø 30°
2 m	0.1 m	1.1 m
4 m	0.21 m	2.1 m
6 m	0.31 m	3.2 m
8 m	0.42 m	4.3 m
10 m	0.52 m	5.4 m
15 m	0.79 m	8 m

Spot diameter square to the beam axis, calculated from the beam angle.

11 Maintenance and cleaning

- Before cleaning and maintenance, switch the device off, disconnect it from the power supply and let it cool down.
- Clean the housing with a soft, dry or slightly damp cloth. Do not use solvents, abrasive cleaners or pressure washers, and make sure no liquid gets into the device.
- Clean optical parts (lenses, front glass), if the device has any, with a soft lint-free cloth and a cleaner intended for optics or glass.
- Regularly inspect the housing, cables, connectors and fixings. Have damaged parts replaced by a service center.
- How often to clean depends on the environment; dust, smoke and fog make the device dirty much faster.

12 Troubleshooting

Problem	Remedy
The device does not switch on	Check the supply voltage, the cables and the fuse, if the device has one.
The device does not respond to DMX	Check the start address, the selected DMX mode and whether it matches the profile in the controller, the cable connection to DMX IN, and the controller output (universe).
The device behaves erratically or flickers	Check the terminator at the end of the line, the condition and wiring of the cables (shield on pin 1 only), the number of devices on the line (32 at most), and that the line is not split without a splitter.
Only some devices on the line respond	Check the cable and connectors between the last working and the first non-working device, and make sure all devices on the line are switched on.
Devices respond to the wrong channels or affect each other	Check that the addresses do not overlap and that the DMX mode on the devices matches the patch in the controller.
The device or the connected load does not light up although it receives DMX	Check the values of the dimmer, shutter and strobe channels against the DMX channel table. For the DMX modes for which the sources state it, the chapter DMX channels gives under the mode's heading which channels must be open.
Movement is reversed	Check whether Pan/Tilt inversion is enabled in the device menu or in the controller.
Moving parts do not reach the correct position after power-on or transport	Switch the device off and on again to reset the position, and make sure the transport lock, if any, is released. If this does not help, contact a service center.
Movement is jerky	Check the value of the Pan/Tilt speed channel, if the device has one, and the stability of the DMX signal.

13 Disposal

The crossed-out wheeled bin symbol on the product, in the manual or on the packaging means that the product must not be disposed of with unsorted household waste at the end of its life.

Take the end-of-life equipment to a collection point, for example a municipal collection site or a retailer. Proper disposal enables materials to be recycled and helps prevent possible negative effects on the environment and human health.

Follow the regulations applicable in your country; in the Czech Republic, take-back is governed by Act No. 542/2020 Coll., on End-of-Life Products.

Recycle the packaging materials according to their type.