DMX REFERENCE

LM-420Beam

lumen

Manufacturer	lumen
GDTF file	Lumen_lm-420beam_136500.gdtf
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1 About this manual

This document describes the LM-420Beam by lumen. It was compiled from the GDTF file Lumen_lm-420beam_136500.gdtf from the GDTF-Share library.

File revision: “LM-420Beam”.

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 lumen; 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	37.5 kg

DMX modes

Mode	Channels	Units in one universe	First start addresses
mode1	16	32	1, 17, 33, 49, ...
Mode2	16	32	1, 17, 33, 49, ...
Mode	16	32	1, 17, 33, 49, ...

No light? Check these channels

- mode1: CH 7 Shutter at 105–106, 108–109 “open” or 208–212 or 252–255; CH 8 Dimmer above 0
- Mode2: CH 2 Shutter at 105–106, 108–109 “open” or 208–212 or 252–255; CH 3 Dimmer above 0
- Mode: CH 2 Shutter at 105–106, 108–109 “open” or 208–212 or 252–255; CH 3 Dimmer above 0



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

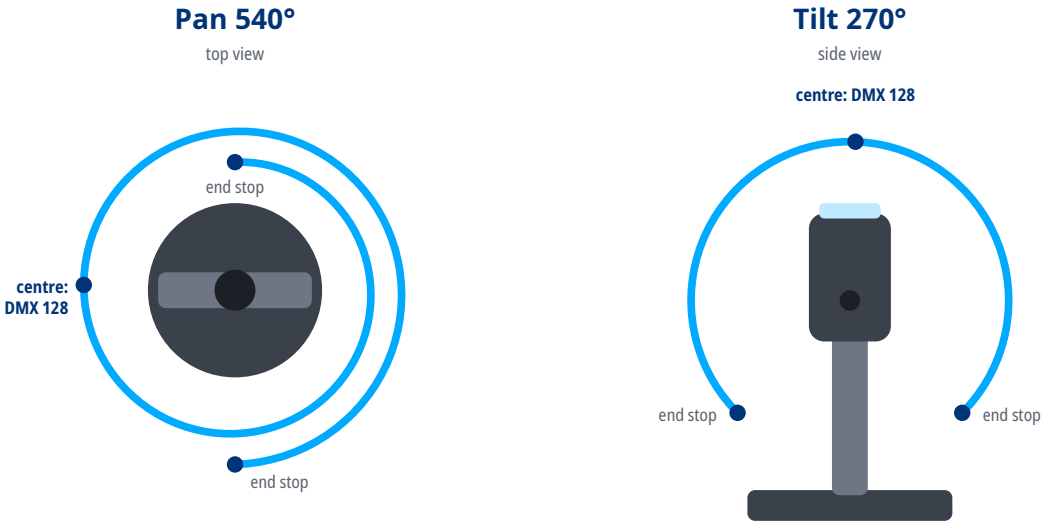
- Strobe and fast flashing light effects can trigger epileptic seizures in susceptible people (photosensitive epilepsy) and can cause nausea or disorientation.
- Inform the audience and performers in advance that strobe effects will be used, for example with a notice at the entrance, and do not use them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



5 Installation

⚠ WARNING

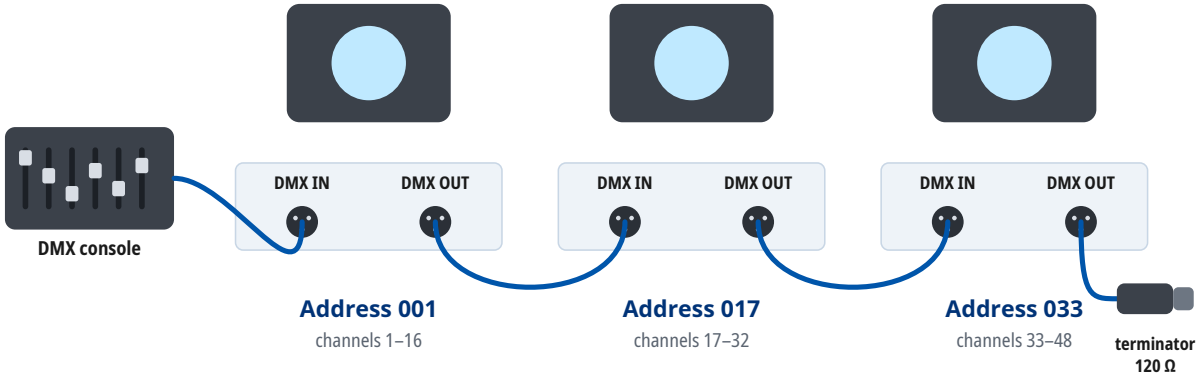
- Rigging must be carried out only by qualified persons in accordance with applicable regulations, in particular those for work at height.
- The supporting structure and fixings must safely carry the weight of all suspended devices; verify their load capacity in advance.
- Weight of the device: 37.5 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



mode1: every unit occupies 16 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 “mode1”: 16.
- 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 “mode1”, you can use, for example, the start addresses 1, 17, 33, 49.
- The DMX mode set on the device must match the fixture profile (personality) used in the controller.

8 Functions at a glance

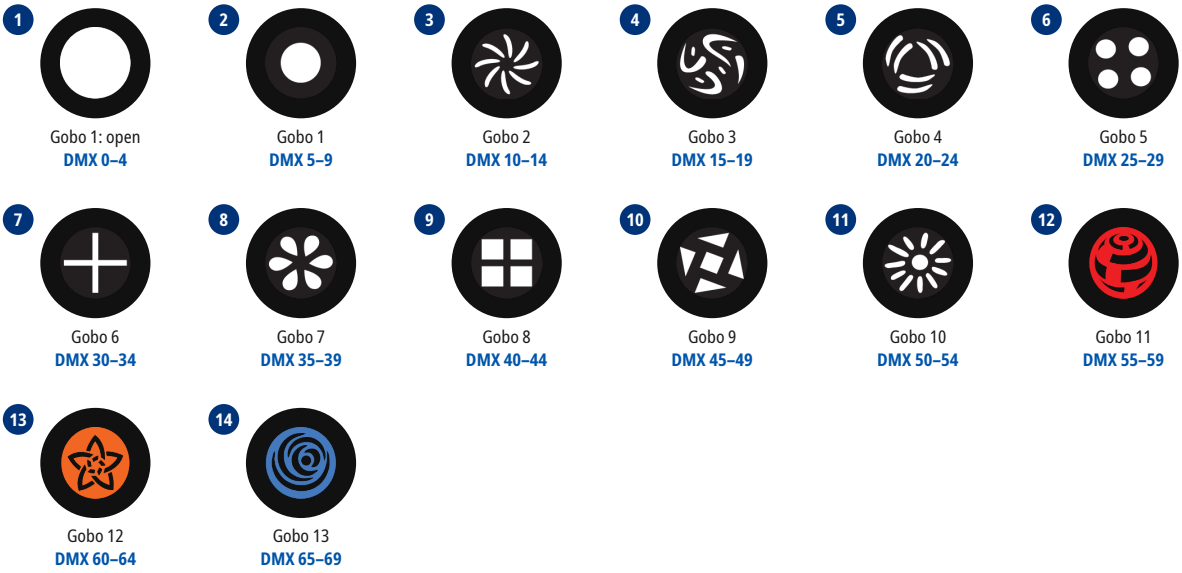
Functions in each DMX mode

	mode1 16 channels	Mode2 16 channels	Mode 16 channels
Pan / Tilt	1, 2	10, 12	10, 12
Dimmer	8	3	3
Shutter / strobe	7	2	2
Color wheel	9	1	1
Gobo wheel	11	4	4
Prism	12, 15	5, 6	5, 6
Frost	6	8	8
Focus	13	9	9

Gobo wheel 1



Gobo wheel 2



1 Gobo 1: open
DMX 0–4

2 Gobo 1
DMX 5–9

3 Gobo 2
DMX 10–14

4 Gobo 3
DMX 15–19

5 Gobo 4
DMX 20–24

6 Gobo 5
DMX 25–29

7 Gobo 6
DMX 30–34

8 Gobo 7
DMX 35–39

9 Gobo 8
DMX 40–44

10 Gobo 9
DMX 45–49

11 Gobo 10
DMX 50–54

12 Gobo 11
DMX 55–59

13 Gobo 12
DMX 60–64

14 Gobo 13
DMX 65–69

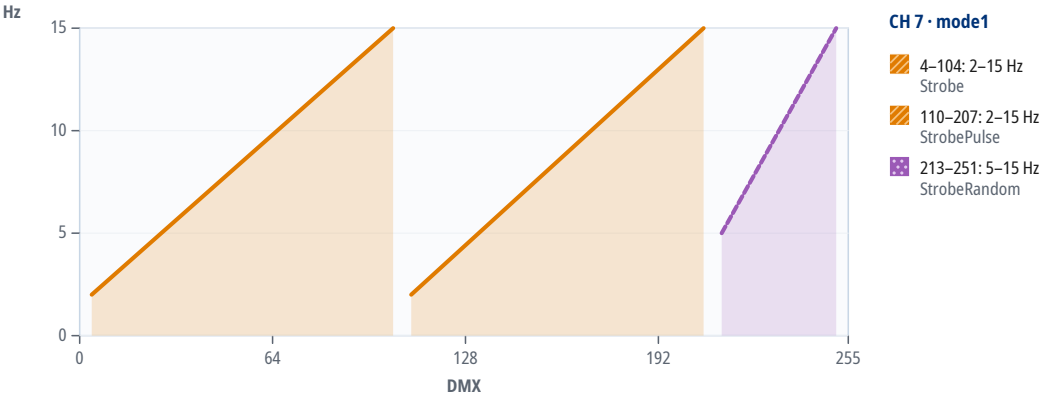
Prism



1 Open
DMX 0–127

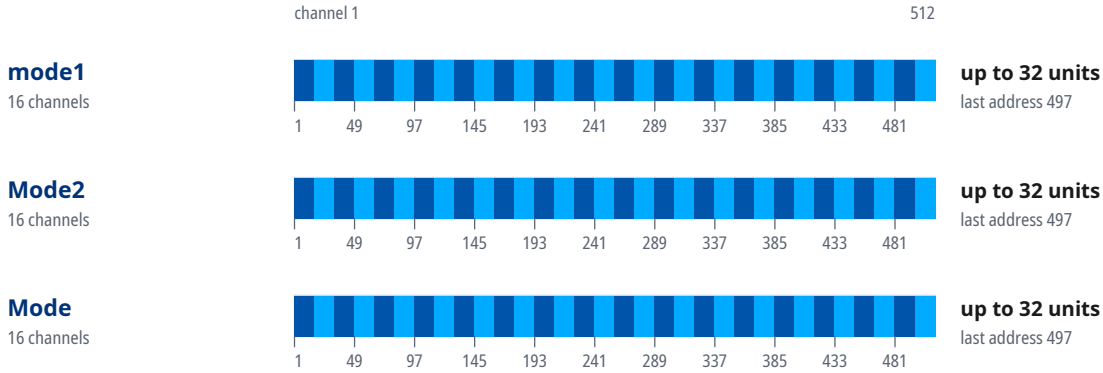
2 8 facets
Prism
DMX 128–255

Strobe rate



9 DMX channels

Units in one DMX universe



Start addresses of 20 units in the mode “mode1”

Unit	Start address	Unit	Start address	Unit	Start address	Unit	Start address
1	1	6	81	11	161	16	241
2	17	7	97	12	177	17	257
3	33	8	113	13	193	18	273
4	49	9	129	14	209	19	289
5	65	10	145	15	225	20	305

mode1

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 7 Shutter at 105–106, 108–109 “open” or 208–212 or 252–255; CH 8 Dimmer above 0. The GDTF file gives these values for a console's Highlight function: CH 7 Shutter 255, CH 8 Dimmer 255.

Channel functions at a glance



CH	Function	DMX	Description
1	Pan	0–127	Min … Center
		128–255	Center … max
		255	Max
2	Tilt	0–127	Min … Home
		128–255	Home … max
		255	Max
3	Pan Fine	0–255	Fine adjustment of CH 1
4	Tilt Fine	0–255	Fine adjustment of CH 2
5	Speed Pan/Tilt	0	Fast
		1–254	Fast … slow
		255	Slow
6	Frost	0–63	Open
		64–255	Frost
7	Shutter	0–3	Closed: close
		4	Strobe
		5	Strobe min
		6–103	Strobe min … Strobe max
		104	Strobe max
		105–106	Open
		107	open1
		108–109	Open
		110	Pulse min
		111–206	Pulse min … Pulse max
		207	Pulse max
		208–212	Open 2
		213	Rnd min
		214–250	Rnd min … Rnd max
		251	Rnd max
		252–255	Open 3
8	Dimmer	0	Closed
		1–254	Closed … Open
		255	Open
9	Colors	0–4	White Light
		5–9	White Light … Color 1
		10	Color 1
		11–19	Color 1 … Color 2
		20	Color 2
		21–29	Color 2 … Color 3
		30	Color 3
		31–39	Color 3 … Color 4
		40	Color 4

CH	Function	DMX	Description
9	Colors (continued)	41–49	Color 4 ... Color 5
		50	Color 5
		51–59	Color 5 ... Color 6
		60	Color 6
		61–69	Color 6 ... Color 7
		70	Color 7
		71–79	Color 7 ... Color 8
		80	Color 8
		81–89	Color 8 ... Color 9
		90	Color 9
		91–99	Color 9 ... Color 10
		100	Color 10
		101–109	Color 10 ... Color 11
		110	Color 11
		111–119	Color 11 ... Color 12
		120	Color 12
		121–129	Color 12 ... Color 13
		130	Color 13
		131–139	Color 1 1
		140–170	<<< (450–215.2 °/s)
		171–200	<< (up to 207.4 °/s (35 rpm))
		201–227	>> (27.4–230.9 °/s)
		228–255	>>> (238.7–450 °/s)
10	Color Effects	0–63	Open
		64–255	Rainbow
11	Gobo	0–4	Gobo 1: open
		5–9	Gobo 1
		10–14	Gobo 2
		15–19	Gobo 3
		20–24	Gobo 4
		25–29	Gobo 5
		30–34	Gobo 6
		35–39	Gobo 7
		40–44	Gobo 8
		45–49	Gobo 9
		50–54	Gobo 10
		55–59	Gobo 11
		60–64	Gobo 12
		65–69	Gobo 13
		70–74	White
		75–79	Gobo 1 Shake (0–0.08 Hz)
		80–84	Gobo 2 Shake (0.1–0.17 Hz)

CH	Function	DMX	Description
11	Gobo (continued)	85–89	Gobo 3 Shake (0.19–0.27 Hz)
		90–94	Gobo 4 Shake (0.29–0.35 Hz)
		95–99	Gobo 5 Shake (0.37–0.44 Hz)
		100–104	Gobo 6 Shake (0.46–0.54 Hz)
		105–109	Gobo 7 Shake (0.56–0.63 Hz)
		110–114	Gobo 8 Shake (0.65–0.73 Hz)
		115–119	Gobo 9 Shake (0.75–0.81 Hz)
		120–124	Gobo 10 Shake (0.83–0.9 Hz)
		125–129	Gobo 11 Shake (0.92–1 Hz)
		130–134	Gobo 12 Shake
		135–139	Gobo 13 Shake
		140	>>> (0–0.25 °/s)
		141–199	>>> ... >>
		200	>> (0.26–0.5 °/s)
		201	<< (0.5–0.76 °/s)
		202–224	<< ... <<<
		225–255	<<< (0.76–1 °/s)
12	Prism	0–127	Open
		128–255	Prism
13	Focus	0	Min
		1–254	Min ... max
		255	Max
14	Position Effect	0	None
		1–100	Y auto
		101–200	X auto
		201–255	XY autol
15	Prism Rotation Speed	0–64	Prism 1 Pos: min
		65–127	Prism 1 Pos: max
		128–160	>>> (0–0.25 °/s)
		161–191	>> (0.26–0.5 °/s)
		192–224	<< (0.5–0.76 °/s)
		225–255	<<< (0.76–1 °/s)
16	Lamp Control	0–99	None
		100–105	Lamp Off
		106–199	Lamp Off ... Lamp On
		200–205	Lamp On
		206–254	Fixture Global Reset 2
		255	Reset

Mode2

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 2 Shutter at 105–106, 108–109 “open” or 208–212 or 252–255; CH 3 Dimmer above 0. The GDTF file gives these values for a console's Highlight function: CH 2 Shutter 255, CH 3 Dimmer 255.

Channel functions at a glance



CH	Function	DMX	Description
1	Colors		Same as CH 9 in the mode “mode1” (p. 10)
2	Shutter		Same as CH 7 in the mode “mode1” (p. 10)
3	Dimmer		Same as CH 8 in the mode “mode1” (p. 10)
4	Gobo	0–5	Gobo 1 (White light)
		6–11	Gobo 2
		12–17	Gobo 3
		18–23	Gobo 4
		24–28	Gobo 5
		29–34	Gobo 6
		35–40	Gobo 7
		41–46	Gobo 8
		47–52	Gobo 9
		53–57	Gobo 10
		58–63	Gobo 11
		64–69	Gobo 1 Shake (0–0.08 Hz)
		70–75	Gobo 2 Shake (0.1–0.17 Hz)
		76–81	Gobo 3 Shake (0.19–0.27 Hz)
		82–86	Gobo 4 Shake (0.29–0.35 Hz)
		87–92	Gobo 5 Shake (0.37–0.44 Hz)
		93–98	Gobo 6 Shake (0.46–0.54 Hz)

CH	Function	DMX	Description
4	Gobo (continued)	99–104	Gobo 7 Shake (0.56–0.63 Hz)
		105–110	Gobo 8 Shake (0.65–0.73 Hz)
		111–115	Gobo 9 Shake (0.75–0.81 Hz)
		116–121	Gobo 10 Shake (0.83–0.9 Hz)
		122–127	Gobo 11 Shake (0.92–1 Hz)
		128–160	>>> (0–0.25 °/s)
		161–191	>> (0.26–0.5 °/s)
		192–224	<< (0.5–0.76 °/s)
		225–255	<<< (0.76–1 °/s)
5	Prism		Same as CH 12 in the mode “mode1” (p. 12)
6	Prism Rotation Speed		Same as CH 15 in the mode “mode1” (p. 12)
7	Color Effects		Same as CH 10 in the mode “mode1” (p. 11)
8	Frost		Same as CH 6 in the mode “mode1” (p. 10)
9	Focus		Same as CH 13 in the mode “mode1” (p. 12)
10	Pan		Same as CH 1 in the mode “mode1” (p. 10)
11	Pan Fine	0–255	Fine adjustment of CH 10
12	Tilt		Same as CH 2 in the mode “mode1” (p. 10)
13	Tilt Fine	0–255	Fine adjustment of CH 12
14	Speed Pan/Tilt		Same as CH 5 in the mode “mode1” (p. 10)
15	Position Effect		Same as CH 14 in the mode “mode1” (p. 12)
16	Lamp Control		Same as CH 16 in the mode “mode1” (p. 12)

Mode

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 2 Shutter at 105–106, 108–109 “open” or 208–212 or 252–255; CH 3 Dimmer above 0. The GDTF file gives these values for a console's Highlight function: CH 2 Shutter 255, CH 3 Dimmer 255.

Channel functions at a glance



CH	Function	DMX	Description
1	Colors		Same as CH 9 in the mode “mode1” (p. 10)
2	Shutter		Same as CH 7 in the mode “mode1” (p. 10)
3	Dimmer		Same as CH 8 in the mode “mode1” (p. 10)
4	Gobo		Same as CH 4 in the mode “Mode2” (p. 13)
5	Prism		Same as CH 12 in the mode “mode1” (p. 12)
6	Prism Rotation Speed		Same as CH 15 in the mode “mode1” (p. 12)
7	Color Effects		Same as CH 10 in the mode “mode1” (p. 11)
8	Frost		Same as CH 6 in the mode “mode1” (p. 10)
9	Focus		Same as CH 13 in the mode “mode1” (p. 12)
10	Pan		Same as CH 1 in the mode “mode1” (p. 10)
11	Pan Fine	0–255	Fine adjustment of CH 10
12	Tilt		Same as CH 2 in the mode “mode1” (p. 10)
13	Tilt Fine	0–255	Fine adjustment of CH 12
14	Speed Pan/Tilt		Same as CH 5 in the mode “mode1” (p. 10)
15	Position Effect		Same as CH 14 in the mode “mode1” (p. 12)
16	Lamp Control		Same as CH 16 in the mode “mode1” (p. 12)

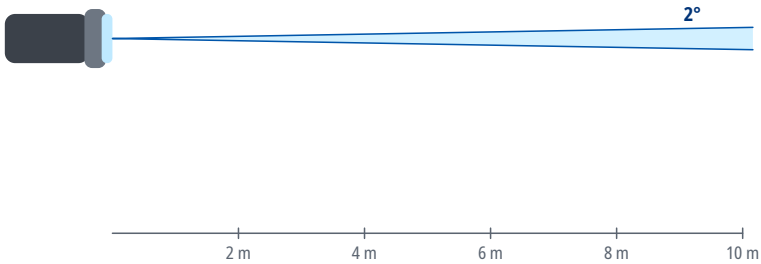
10 Technical specifications

Parameter	Value
Light	
Light source	discharge lamp
Lamp power	700 W
Luminous flux	10,000 lm
Color temperature	6,000 K
Color rendering index (CRI)	85
Optics	
Beam angle	2°
Movement	
Pan	540°
Tilt	270°
Dimensions and construction	
Weight	37.5 kg
Operating environment	
Operating temperature	0 to 40 °C

Speeds and ranges

Parameter	Value
Strobe frequency	2–15 Hz
Color wheel 1 rotation	up to 450 °/s (75 rpm)
Gobo wheel 2 rotation	up to 1 °/s (0.2 rpm)
Prism rotation	up to 1 °/s (0.2 rpm)

Spot diameter



Distance	Ø 2°
2 m	0.07 m
4 m	0.14 m
6 m	0.21 m
8 m	0.28 m
10 m	0.35 m
15 m	0.52 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.