DMX REFERENCE

BEAM WS 440 CMY

MARK



Manufacturer	MARK
GDTF file	MARK_BEAM_WS_440_CMY_129123.gdtf
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1 About this manual

This document describes the BEAM WS 440 CMY by MARK. It was compiled from the GDTF file MARK_BEAM_WS_440_CMY_129123.gdtf from the GDTF-Share library.

File revision: “FOTO”.

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 MARK; 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
Power consumption	950 W
Weight	25 kg

DMX modes

Mode	Channels	Units in one universe	First start addresses
25 CHANNELS	25	20	1, 26, 51, 76, ...
21 CHANNELS	21	24	1, 22, 43, 64, ...

No light? Check these channels

- 25 CHANNELS: CH 24 Strobe at 32–63, 96–127, 160–191 or 224–255 “Open”; CH 25 Dimmer above 0
- 21 CHANNELS: CH 20 Shutter at 32–63, 96–127, 160–191 or 224–255 “Open”; CH 21 Dimmer above 0


Read the manual before use


Risk of electric shock


Do not stare into the light


Indoor use only

3 Safety instructions


Read the manual before use


Risk of electric shock


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

- Connect the device only to a properly installed mains outlet with a protective earth (ground) contact. The outlet or other means of disconnection must remain easily accessible.
- Power supply: 100–240 V, 50/60 Hz. Before connecting, make sure that the mains voltage matches this value and the value on the rating plate of the device.
- Do not connect the device to a dimmer or to a dimmed circuit.
- Use only the original power cable or a cable with identical ratings. Protect the cable from damage, do not run it over sharp edges, and never unplug it by pulling on the cable.
- When connecting several devices to one circuit, do not exceed its permitted load.
- Do not touch the device with wet hands.

⚠ 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

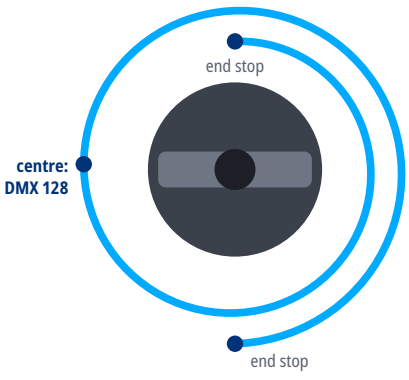
Description in the GDTF file

“BEAM WS 440 CMY es una cabeza móvil híbrida que combina una tecnología avanzada y un amplio rango de funcionalidades. En modo Spot, tiene 2 ruedas de color con 5 colores sólidos + gradiente de tono y blanco y 2 ruedas de gobos (9 gobos + y spot cada uno) con rotación, intercambiables e incluyendo la función shaking. Para el modo Wash, incluye filtro de corrección CTO y canales separados CMY. Integra prisma rotativo de 3 caras, funciones tales como estrobo, zoom y enfoque. Su pantalla táctil LCD y el encoder, permiten navegar a través de un sistema de menú completo, incluida la calibración de los motores, información del dispositivo o el control de la pantalla (incluido rotación y delay de apagado).”

Range of movement

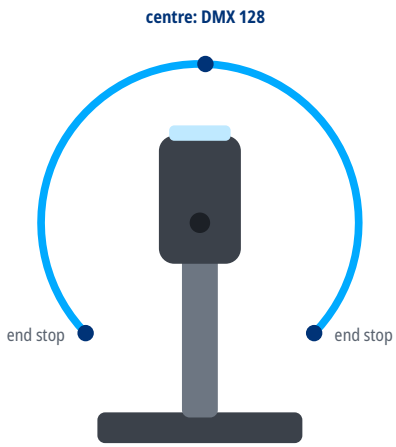
Pan 540°

top view



Tilt 268°

side view



5 Installation

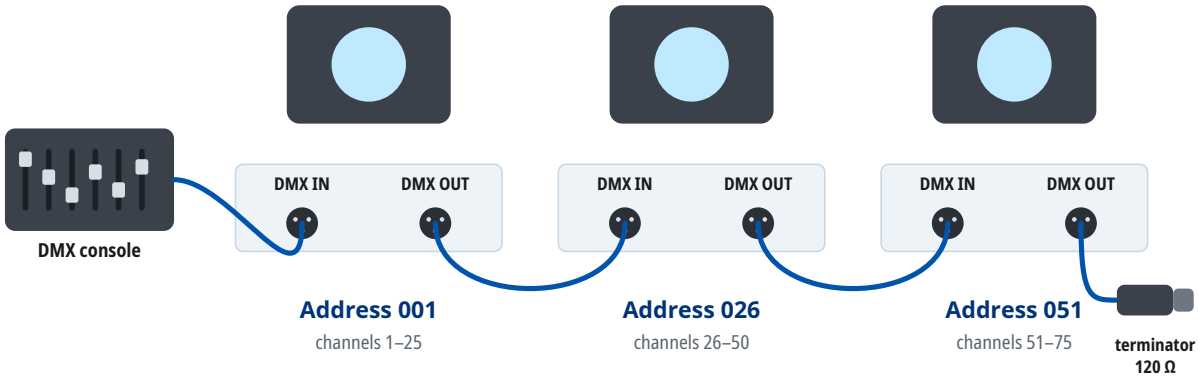
⚠ **WARNING**

- 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: 25 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 25 CHANNELS: every unit occupies 25 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 “25 CHANNELS”: 25.
- 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 “25 CHANNELS”, you can use, for example, the start addresses 1, 26, 51, 76.
- 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

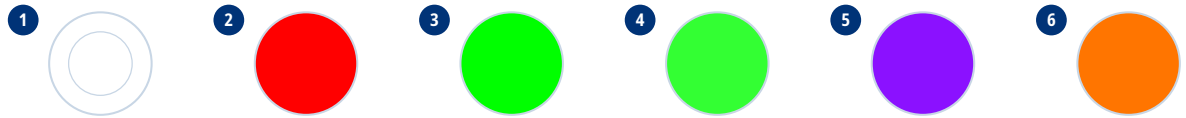
	25 CHANNELS 25 channels	21 CHANNELS 21 channels
Pan / Tilt	1, 3	1, 2
Pan / Tilt resolution	16 bit	8 bit
Dimmer	25	21
Shutter / strobe	24	20
Color mixing	10–12	8–10
Color temperature	9	7
Color wheel	7, 8	5, 6
Gobo wheel	13, 15	11, 13
Gobo rotation	13–16	11–14
Prism	17, 18	15, 16
Frost	19	17
Zoom	20	18
Focus	22	19

Color wheel 1



1	2	3	4	5	6
White DMX 0	White + Pink DMX 1–42	Pink + Light Orange DMX 44–102	Light Orange + Light Purple DMX 104–144	Light Purple + Blue DMX 146–201	Blue + Dark Blue DMX 203–254

Color wheel 2



1	2	3	4	5	6
White DMX 0	White + Dark Red DMX 1–69	Dark Red + Dark Green DMX 71–92	Dark Green + Light Green DMX 94–145	Light Green + UV DMX 147–201	UV + Dark Orange DMX 203–254

Gobo wheel 1

1 
Gobo Wheel: Open
DMX 0

2
Spot
DMX 1–4

3 
Gobo 1
DMX 5–7

4 
Gobo 2
DMX 8–10

5 
Gobo 3
DMX 11–13

6 
Gobo 4
DMX 14–16

7 
Gobo 5
DMX 17–19

8 
Gobo 6
DMX 20–22

9 
Gobo 7
DMX 23–25

10 
Gobo 8
DMX 26–28

11 
Gobo 9
DMX 29–32

Gobo wheel 2

1 
Gobo Wheel: Open
DMX 0

2
Spot
DMX 1–4

3 
Gobo 1
DMX 5–7

4 
Gobo 2
DMX 8–10

5 
Gobo 3
DMX 11–13

6 
Gobo 4
DMX 14–16

7 
Gobo 5
DMX 17–19

8 
Gobo 6
DMX 20–22

9 
Gobo 7
DMX 23–25

10 
Gobo 8
DMX 26–28

11 
Gobo 9
DMX 29–32

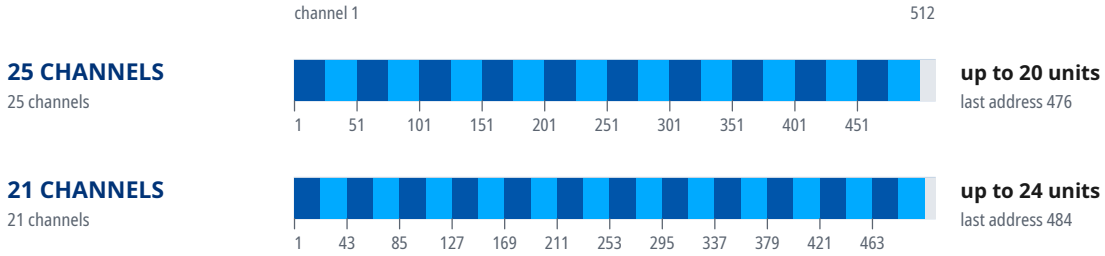
Prism

1
Open
DMX 0–5

2
Prism
DMX 6–255

9 DMX channels

Units in one DMX universe



Start addresses of 20 units in the mode “25 CHANNELS”

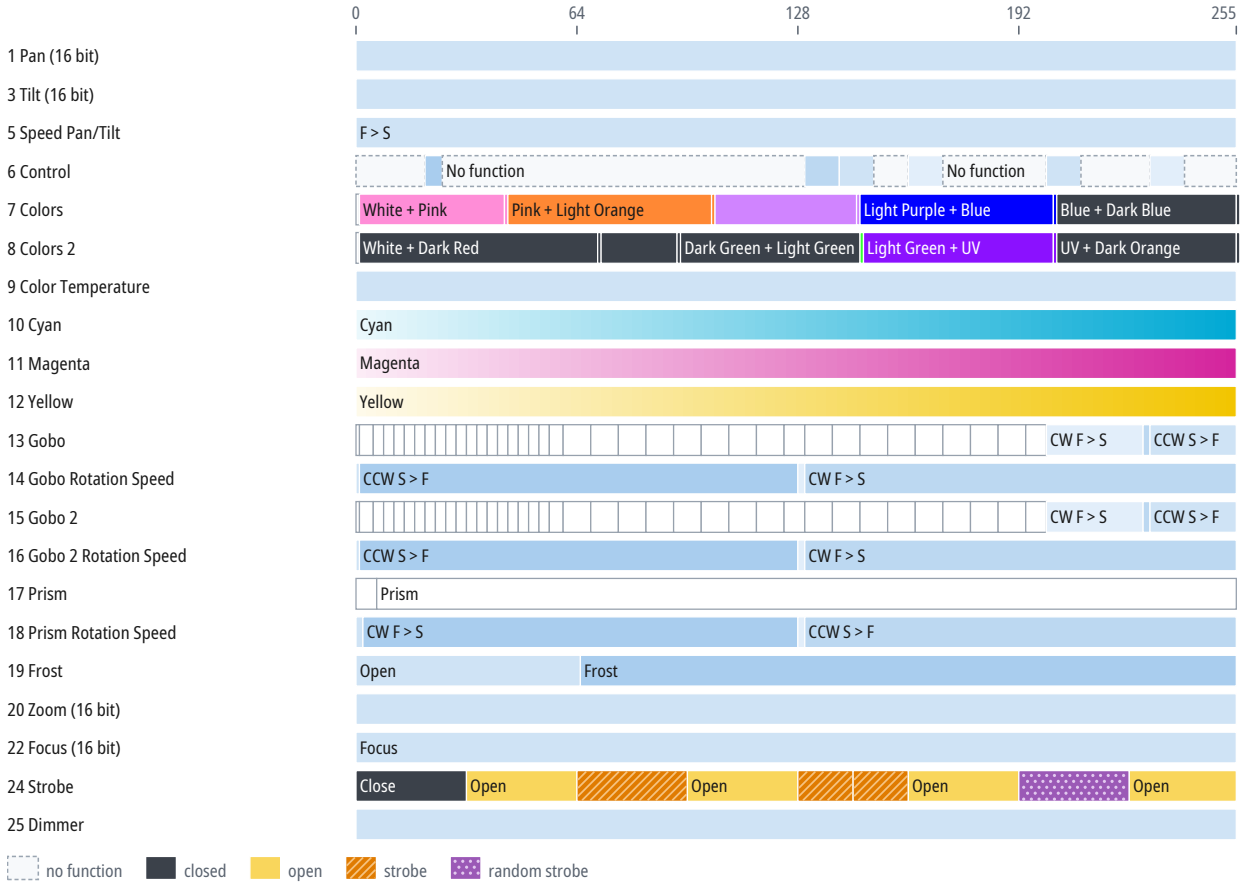
Unit	Start address	Unit	Start address	Unit	Start address	Unit	Start address
1	1	6	126	11	251	16	376
2	26	7	151	12	276	17	401
3	51	8	176	13	301	18	426
4	76	9	201	14	326	19	451
5	101	10	226	15	351	20	476

Mode 25 CHANNELS

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 24 Strobe at 32–63, 96–127, 160–191 or 224–255 “Open”; CH 25 Dimmer above 0.

Channel functions at a glance



CH	Function	DMX	Description
1	Pan	0–255	540°
2	Pan Fine	0–255	Fine adjustment of CH 1
3	Tilt	0–255	268°
4	Tilt Fine	0–255	Fine adjustment of CH 3
5	Speed Pan/Tilt		P/T Speed
		0–255	F > S
6	Control	0–19	No function
		20–24	Energy Saving Mode
		25–129	No function
		130–139	Controller Light Lamp
		140–149	P/T Reset
		150–159	No function
		160–169	Effects Reset
		170–199	No function

CH	Function	DMX	Description
6	Control (continued)	200–209	Fixture Reset
		210–229	No function
		230–239	Console Lamp Off
		240–255	No function
7	Colors		Color Wheel 1
		0	White
		1–42	White + Pink
		43	Pink
		44–102	Pink + Light Orange
		103	Light Orange
		104–144	Light Orange + Light Purple
		145	Light Purple
		146–201	Light Purple + Blue
		202	Blue
		203–254	Blue + Dark Blue
		255	Dark Blue
8	Colors 2		Color Wheel 2
		0	White
		1–69	White + Dark Red
		70	Dark Red
		71–92	Dark Red + Dark Green
		93	Dark Green
		94–145	Dark Green + Light Green
		146	Light Green
		147–201	Light Green + UV
		202	UV
		203–254	UV + Dark Orange
		255	Dark Orange
9	Color Temperature	0–255	
10	Cyan	0–255	Cyan
11	Magenta	0–255	Magenta
12	Yellow	0–255	Yellow
13	Gobo	0	Gobo Wheel: Open
		1–4	Spot
		5–7	Gobo 1
		8–10	Gobo 2
		11–13	Gobo 3
		14–16	Gobo 4
		17–19	Gobo 5
		20–22	Gobo 6
		23–25	Gobo 7
		26–28	Gobo 8

CH	Function	DMX	Description
13	Gobo (continued)	29–31	Gobo 9
		32–34	Gobo 1 Rot
		35–37	Gobo 2 Rot
		38–40	Gobo 3 Rot
		41–43	Gobo 4 Rot
		44–46	Gobo 5 Rot
		47–49	Gobo 6 Rot
		50–52	Gobo 7 Rot
		53–55	Gobo 8 Rot
		56–59	Gobo 9 Rot
		60–67	Gobo 1 Shake
		68–75	Gobo 2 Shake
		76–83	Gobo 3 Shake
		84–91	Gobo 4 Shake
		92–99	Gobo 5 Shake
		100–107	Gobo 6 Shake
		108–115	Gobo 7 Shake
		116–123	Gobo 8 Shake
		124–129	Gobo 9 Shake
		130–137	Gobo 1 Rot Shake
		138–145	Gobo 2 Rot Shake
		146–153	Gobo 3 Rot Shake
		154–161	Gobo 4 Rot Shake
		162–169	Gobo 5 Rot Shake
		170–177	Gobo 6 Rot Shake
		178–185	Gobo 7 Rot Shake
		186–193	Gobo 8 Rot Shake
		194–199	Gobo 9 Rot Shake
		200–227	CW F > S
		228–229	Gobo Wheel 1 Spin: Stop
		230–255	CCW S > F
14	Gobo Rotation Speed		Rotation Gobo Wheel 1
		0	Stop
		1–127	CCW S > F
		128–129	Stop
		130–255	CW F > S
15	Gobo 2	0	Gobo Wheel: Open
		1–4	Spot
		5–7	Gobo 1
		8–10	Gobo 2
		11–13	Gobo 3
		14–16	Gobo 4

CH	Function	DMX	Description
15	Gobo 2 (continued)	17–19	Gobo 5
		20–22	Gobo 6
		23–25	Gobo 7
		26–28	Gobo 8
		29–31	Gobo 9
		32–34	Gobo 1 Rot
		35–37	Gobo 2 Rot
		38–40	Gobo 3 Rot
		41–43	Gobo 4 Rot
		44–46	Gobo 5 Rot
		47–49	Gobo 6 Rot
		50–52	Gobo 7 Rot
		53–55	Gobo 8 Rot
		56–59	Gobo 9 Rot
		60–67	Gobo 1 Shake
		68–75	Gobo 2 Shake
		76–83	Gobo 3 Shake
		84–91	Gobo 4 Shake
		92–99	Gobo 5 Shake
		100–107	Gobo 6 Shake
		108–115	Gobo 7 Shake
		116–123	Gobo 8 Shake
		124–129	Gobo 9 Shake
		130–137	Gobo 1 Rot Shake
		138–145	Gobo 2 Rot Shake
		146–153	Gobo 3 Rot Shake
		154–161	Gobo 4 Rot Shake
		162–169	Gobo 5 Rot Shake
		170–177	Gobo 6 Rot Shake
		178–185	Gobo 7 Rot Shake
		186–193	Gobo 8 Rot Shake
		194–199	Gobo 9 Rot Shake
		200–227	CW F > S
		228–229	Gobo Wheel 2 Spin: Stop
		230–255	CCW S > F
16	Gobo 2 Rotation Speed		Rotation Gobo Wheel 2
		0	Stop
		1–127	CCW S > F
		128–129	Stop
		130–255	CW F > S
17	Prism	0–5	Open
		6–255	Prism

CH	Function	DMX	Description
18	Prism Rotation Speed		Prism Rotate
		0–1	Stop
		2–127	CW F > S
		128–129	Stop
		130–255	CCW S > F
19	Frost	0–64	Open
		65–255	Frost
20	Zoom	0–255	
21	Zoom Fine	0–255	Fine adjustment of CH 20
22	Focus	0–255	Focus
23	Focus Fine	0–255	Fine adjustment of CH 22
24	Strobe	0–31	Close
		32–63	Open
		64–95	Strobe: Slow > Fast
		96–127	Open
		128–143	Pulse: Fast > Slow
		144–159	Pulse: Slow > Fast
		160–191	Open
		192–223	Random: Slow > Fast
		224–255	Open
25	Dimmer	0–255	

Mode 21 CHANNELS

If the device receives DMX in this mode but gives no light, check these channels: CH 20 Shutter at 32–63, 96–127, 160–191 or 224–255 “Open”; CH 21 Dimmer above 0.

Channel functions at a glance



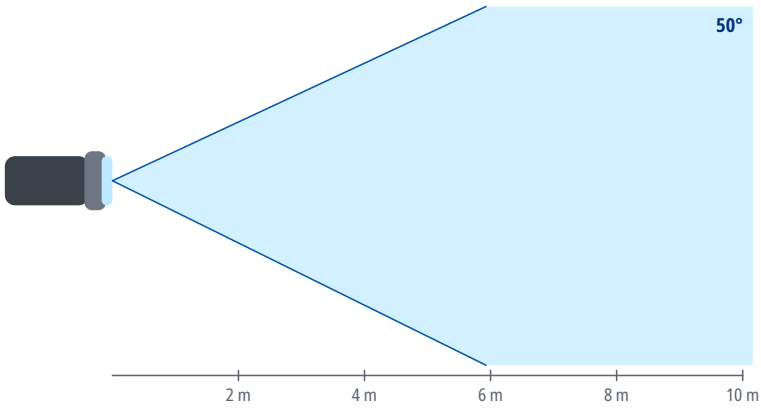
CH	Function	DMX	Description
1	Pan	0–255	540°
2	Tilt	0–255	268°
3	Speed Pan/Tilt		Same as CH 5 in the mode “25 CHANNELS” (p. 11)
4	Control		Same as CH 6 in the mode “25 CHANNELS” (p. 11)
5	Colors		Same as CH 7 in the mode “25 CHANNELS” (p. 12)
6	Colors 2		Same as CH 8 in the mode “25 CHANNELS” (p. 12)
7	Color Temperature	0–255	
8	Cyan	0–255	Cyan
9	Magenta	0–255	Magenta
10	Yellow	0–255	Yellow
11	Gobo		Same as CH 13 in the mode “25 CHANNELS” (p. 12)
12	Gobo Rotation Speed		Same as CH 14 in the mode “25 CHANNELS” (p. 13)
13	Gobo 2		Same as CH 15 in the mode “25 CHANNELS” (p. 13)
14	Gobo 2 Rotation Speed		Same as CH 16 in the mode “25 CHANNELS” (p. 14)
15	Prism		Same as CH 17 in the mode “25 CHANNELS” (p. 14)

CH	Function	DMX	Description
16	Prism Rotation Speed		Same as CH 18 in the mode “25 CHANNELS” (p. 15)
17	Frost		Same as CH 19 in the mode “25 CHANNELS” (p. 15)
18	Zoom	0–255	
19	Focus	0–255	Focus
20	Shutter	0–31	Close
		32–63	Open
		64–95	Strobe: Slow > Fast
		96–127	Open
		128–143	Pulse: Fast > Slow
		144–159	Pulse: Slow > Fast
		160–191	Open
		192–223	Random: Slow > Fast
		224–255	Open
21	Dimmer	0–255	

10 Technical specifications

Parameter	Value
Light	
Light source	LED
LED power	650 W
Luminous flux	19,506 lm
Color temperature	6,500 K
Color rendering index (CRI)	90
Optics	
Beam angle	50°
Movement	
Pan	540°
Tilt	268°
Control	
DMX connection	5-pin XLR IN/OUT
RJ45 connectors	RJ45 IN/OUT
Electrical	
Power supply	100–240 V, 50/60 Hz
Power consumption	950 W
Power connectors	powerCON TRUE1 IN
Dimensions and construction	
Weight	25 kg
Operating environment	
Operating temperature	0 to 40 °C

Spot diameter



Distance	Ø 50°
2 m	1.9 m
4 m	3.7 m
6 m	5.6 m
8 m	7.5 m
10 m	9.3 m
15 m	14 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.