DMX REFERENCE

P-20 Quad

BOS Lighting



Manufacturer	BOS Lighting
GDTF file	BOS_Lighting_P-20_Quad_64043.gdtf
GDTF revision	V002 · 2024-05-15
Generated	2026-11-23

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1 About this manual

This document describes the P-20 Quad by BOS Lighting. It was compiled from the GDTF file BOS_Lighting_P-20_Quad_64043.gdtf from the GDTF-Share library.

File revision: “V002”.

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 BOS Lighting; 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	10 kg

DMX modes

Mode	Channels	Units in one universe	First start addresses
11ch	11	46	1, 12, 23, 34, ...
27ch	27	18	1, 28, 55, 82, ...
91ch	91	5	1, 92, 183, 274, ...
80ch	80	6	1, 81, 161, 241, ...

No light? Check these channels

- 11ch: CH 1 Dimmer above 0; CH 9 Dimmer Mode above 0
- 27ch: CH 1 Dimmer above 0; CH 9 Dimmer Mode above 0
- 91ch: CH 1 Dimmer above 0; CH 9 Dimmer Mode 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.

4 Installation

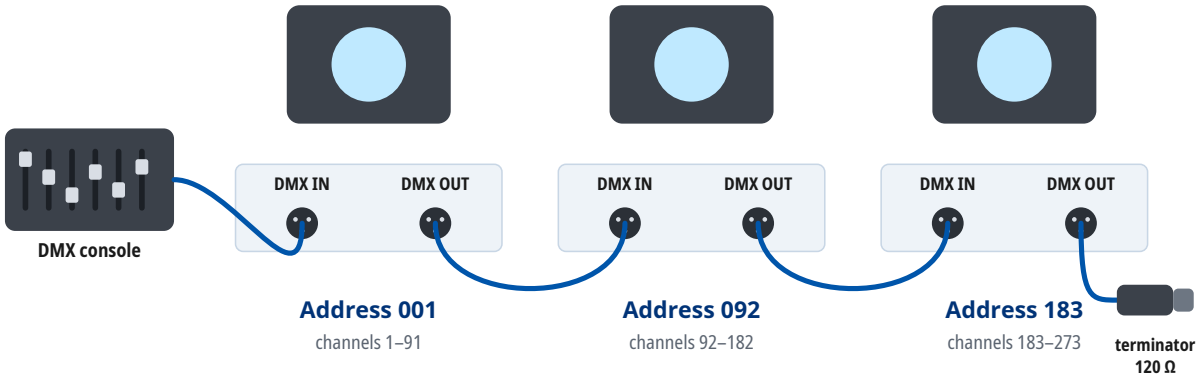
⚠ WARNING

- 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: 10 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.

5 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 91ch: every unit occupies 91 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.

6 Operation

Setting the DMX address

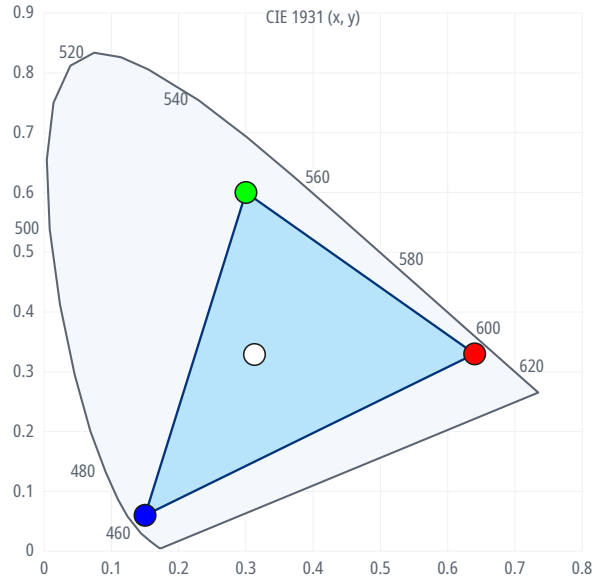
- The device occupies as many consecutive channels in the DMX universe as the selected DMX mode uses, starting at the set start address.
- Number of channels occupied in the DMX mode “91ch”: 91.
- Choose start addresses so that the channels of individual devices do not overlap and the last occupied channel does not exceed 512. Devices with the same start address and mode respond identically.
- For several devices in a row in the DMX mode “91ch”, you can use, for example, the start addresses 1, 92, 183, 274.
- The DMX mode set on the device must match the fixture profile (personality) used in the controller.

7 Functions at a glance

Functions in each DMX mode

	11ch 11 channels	27ch 27 channels	91ch 91 channels	80ch 80 channels
Dimmer	1	1	1	✓
Shutter / strobe	2	2	2	
Color mixing	3–6	3–6, 12–27	3–6, 12–91	1–80
Animation wheel	7	7	7	
Effects / macros	7, 11	7, 11	7, 11	
Pixel control		✓	20 cells	20 cells

LED colors and the colors they mix



LED	x	y
Red	0.640	0.330
Green	0.300	0.600
Blue	0.150	0.060
White	0.313	0.329

The shaded area holds the colors the LEDs can mix; the dots are the LED colors the GDTF file states.

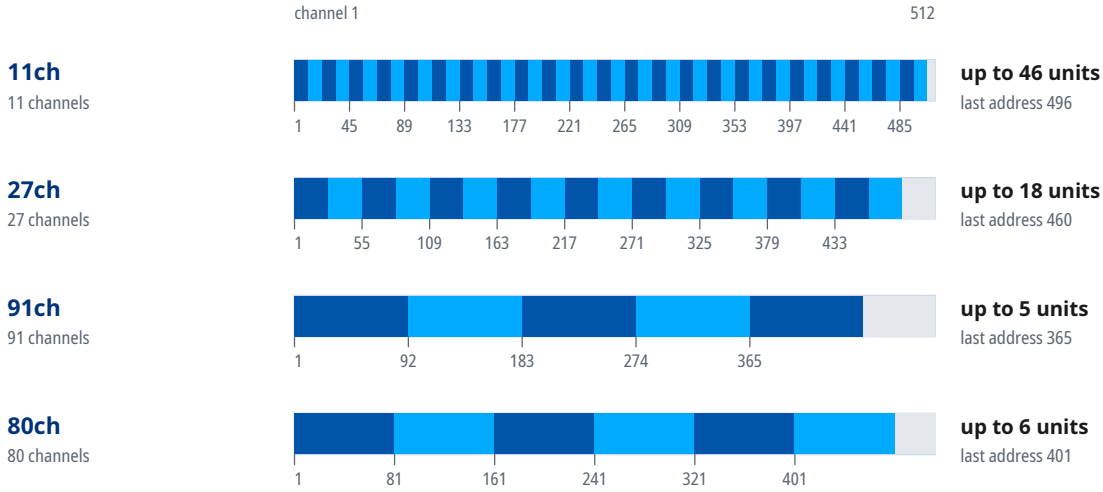
Cells (pixels)

1 CH 12	**2** CH 16	**3** CH 20	**4** CH 24	**5** CH 28	**6** CH 32	**7** CH 36	**8** CH 40	**9** CH 44	**10** CH 48
11 CH 52	**12** CH 56	**13** CH 60	**14** CH 64	**15** CH 68	**16** CH 72	**17** CH 76	**18** CH 80	**19** CH 84	**20** CH 88

20 cells in one row, left to right as the GDTF file places them (seen from above), wrapped after 10; numbered by their first DMX channel (CH) in the mode “91ch”.

8 DMX channels

Units in one DMX universe



Start addresses of 20 units in the mode “91ch”

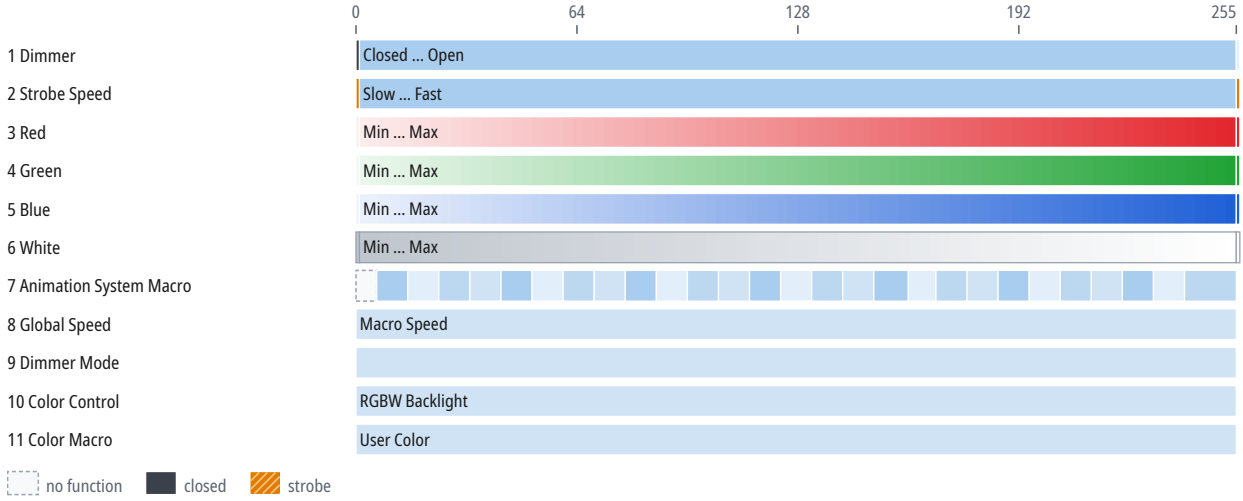
Unit	Start address	Unit	Start address	Unit	Start address	Unit	Start address
1	1	6	U2 · 1	11	U3 · 1	16	U4 · 1
2	92	7	U2 · 92	12	U3 · 92	17	U4 · 92
3	183	8	U2 · 183	13	U3 · 183	18	U4 · 183
4	274	9	U2 · 274	14	U3 · 274	19	U4 · 274
5	365	10	U2 · 365	15	U3 · 365	20	U4 · 365

Where a DMX universe is full, the next units continue in the next universe: “U2 · 1” is address 1 in the second universe, counted from the universe of the first unit.

Mode 11ch

If the device receives DMX in this mode but gives no light, check these channels: CH 1 Dimmer above 0; CH 9 Dimmer Mode above 0. The GDTF file gives these values for a console's Highlight function: CH 1 Dimmer 255, CH 3 Red 255, CH 4 Green 255, CH 5 Blue 255, CH 6 White 255.

Channel functions at a glance



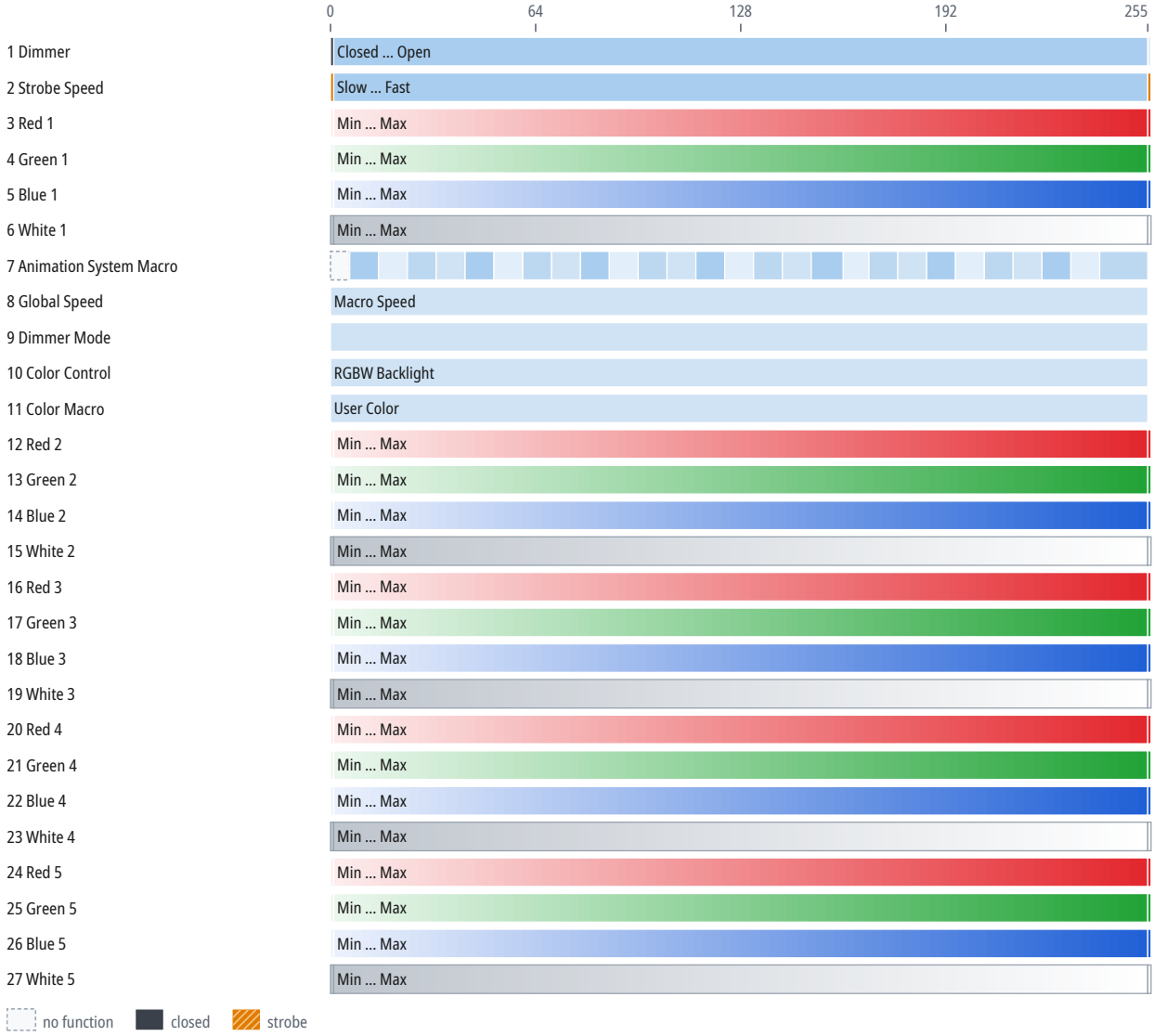
CH	Function	DMX	Description
1	Dimmer	0	Closed
		1–254	Closed ... Open
		255	Open
2	Strobe Speed	0	Slow
		1–254	Slow ... Fast
		255	Fast
3	Red	0	Min
		1–254	Min ... Max
		255	Max
4	Green	0	Min
		1–254	Min ... Max
		255	Max
5	Blue	0	Min
		1–254	Min ... Max
		255	Max
6	White	0	Min
		1–254	Min ... Max
		255	Max
7	Animation System Macro	0–5	No Function
		6–14	Macro 1
		15–23	Macro 2
		24–32	Macro 3
		33–41	Macro 4

CH	Function	DMX	Description
7	Animation System Macro (continued)	42–50	Macro 5
		51–59	Macro 6
		60–68	Macro 7
		69–77	Macro 8
		78–86	Macro 9
		87–95	Macro 10
		96–104	Macro 11
		105–113	Macro 12
		114–122	Macro 13
		123–131	Macro 14
		132–140	Macro 15
		141–149	Macro 16
		150–159	Macro 17
		160–167	Macro 18
		168–176	Macro 19
		177–185	Macro 20
		186–194	Macro 21
		195–203	Macro 22
		204–212	Macro 23
		213–221	Macro 24
		222–230	Macro 25
		231–239	Macro 26
		240–255	Macro 27
8	Global Speed		Macro Speed
		0–255	Macro Speed
9	Dimmer Mode	0–255	
10	Color Control		RGBW Backlight
		0–255	RGBW Backlight
11	Color Macro		User Color
		0–255	User Color

Mode 27ch

If the device receives DMX in this mode but gives no light, check these channels: CH 1 Dimmer above 0; CH 9 Dimmer Mode above 0. The GDTF file gives these values for a console's Highlight function: CH 1 Dimmer 255, CH 3 Red 1 255, CH 4 Green 1 255, CH 5 Blue 1 255, CH 6 White 1 255.

Channel functions at a glance



CH	Function	DMX	Description
1	Dimmer		Same as CH 1 in the mode “11ch” (p. 9)
2	Strobe Speed		Same as CH 2 in the mode “11ch” (p. 9)
3	Red 1	0	Min
		1–254	Min ... Max
		255	Max
4	Green 1	0	Min
		1–254	Min ... Max
		255	Max
5	Blue 1	0	Min

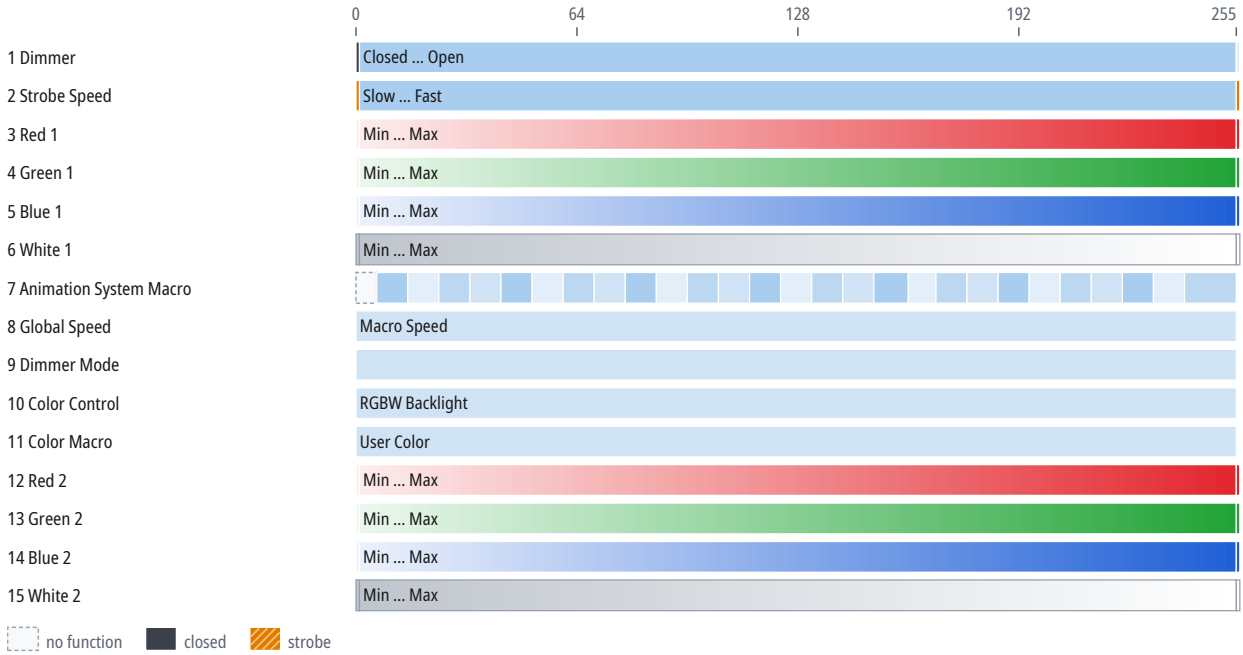
CH	Function	DMX	Description
5	Blue 1 (continued)	1–254	Min ... Max
		255	Max
6	White 1	0	Min
		1–254	Min ... Max
		255	Max
7	Animation System Macro		Same as CH 7 in the mode “11ch” (p. 9)
8	Global Speed		Same as CH 8 in the mode “11ch” (p. 10)
9	Dimmer Mode	0–255	
10	Color Control		Same as CH 10 in the mode “11ch” (p. 10)
11	Color Macro		Same as CH 11 in the mode “11ch” (p. 10)
12	Red 2	0	Min
		1–254	Min ... Max
		255	Max
13	Green 2	0	Min
		1–254	Min ... Max
		255	Max
14	Blue 2	0	Min
		1–254	Min ... Max
		255	Max
15	White 2	0	Min
		1–254	Min ... Max
		255	Max
16	Red 3	0	Min
		1–254	Min ... Max
		255	Max
17	Green 3	0	Min
		1–254	Min ... Max
		255	Max
18	Blue 3	0	Min
		1–254	Min ... Max
		255	Max
19	White 3	0	Min
		1–254	Min ... Max
		255	Max
20	Red 4	0	Min
		1–254	Min ... Max
		255	Max
21	Green 4	0	Min
		1–254	Min ... Max
		255	Max
22	Blue 4	0	Min
		1–254	Min ... Max

CH	Function	DMX	Description
22	Blue 4 (continued)	255	Max
23	White 4	0	Min
		1–254	Min ... Max
		255	Max
24	Red 5	0	Min
		1–254	Min ... Max
		255	Max
25	Green 5	0	Min
		1–254	Min ... Max
		255	Max
26	Blue 5	0	Min
		1–254	Min ... Max
		255	Max
27	White 5	0	Min
		1–254	Min ... Max
		255	Max

Mode 91ch

If the device receives DMX in this mode but gives no light, check these channels: CH 1 Dimmer above 0; CH 9 Dimmer Mode above 0. The GDTF file gives these values for a console's Highlight function: CH 1 Dimmer 255, CH 3 Red 1 255, CH 4 Green 1 255, CH 5 Blue 1 255, CH 6 White 1 255.

Channel functions at a glance



CH	Function	DMX	Description
1	Dimmer		Same as CH 1 in the mode “11ch” (p. 9)
2	Strobe Speed		Same as CH 2 in the mode “11ch” (p. 9)
3	Red 1		Same as CH 3 in the mode “27ch” (p. 11)

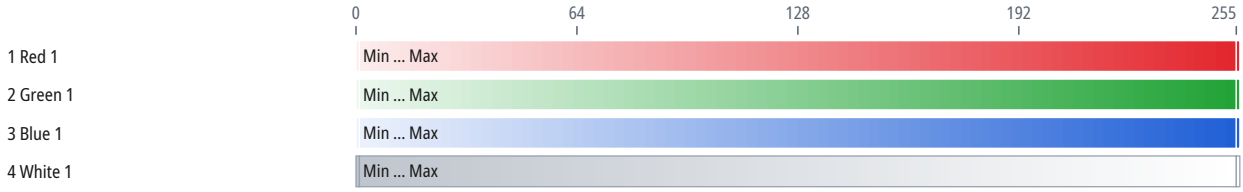
CH	Function	DMX	Description
4	Green 1		Same as CH 4 in the mode “27ch” (p. 11)
5	Blue 1		Same as CH 5 in the mode “27ch” (p. 11)
6	White 1		Same as CH 6 in the mode “27ch” (p. 12)
7	Animation System Macro		Same as CH 7 in the mode “11ch” (p. 9)
8	Global Speed		Same as CH 8 in the mode “11ch” (p. 10)
9	Dimmer Mode	0–255	
10	Color Control		Same as CH 10 in the mode “11ch” (p. 10)
11	Color Macro		Same as CH 11 in the mode “11ch” (p. 10)
12	Red 2	0	Min
		1–254	Min ... Max
		255	Max
13	Green 2	0	Min
		1–254	Min ... Max
		255	Max
14	Blue 2	0	Min
		1–254	Min ... Max
		255	Max
15	White 2	0	Min
		1–254	Min ... Max
		255	Max

CH 12–91: 20 cells of 4 channels each. Every cell works as cell 1 in the table above (CH 12–15); the table below gives each cell's channel numbers.

Cell	Red	Green	Blue	White	Cell	Red	Green	Blue	White
1	12	13	14	15	2	16	17	18	19
3	20	21	22	23	4	24	25	26	27
5	28	29	30	31	6	32	33	34	35
7	36	37	38	39	8	40	41	42	43
9	44	45	46	47	10	48	49	50	51
11	52	53	54	55	12	56	57	58	59
13	60	61	62	63	14	64	65	66	67
15	68	69	70	71	16	72	73	74	75
17	76	77	78	79	18	80	81	82	83
19	84	85	86	87	20	88	89	90	91

Mode 80ch

Channel functions at a glance



CH	Function	DMX	Description
1	Red 1	0	Min
		1–254	Min … Max
		255	Max
2	Green 1	0	Min
		1–254	Min … Max
		255	Max
3	Blue 1	0	Min
		1–254	Min … Max
		255	Max
4	White 1	0	Min
		1–254	Min … Max
		255	Max

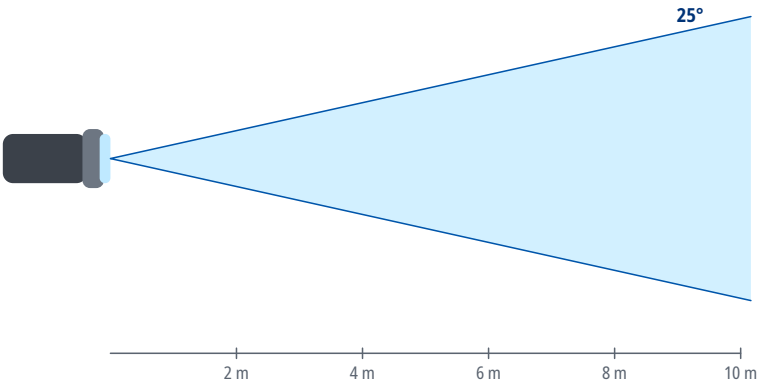
CH 1–80: 20 cells of 4 channels each. Every cell works as cell 1 in the table above (CH 1–4); the table below gives each cell's channel numbers.

Cell	Red	Green	Blue	White	Cell	Red	Green	Blue	White
1	1	2	3	4	2	5	6	7	8
3	9	10	11	12	4	13	14	15	16
5	17	18	19	20	6	21	22	23	24
7	25	26	27	28	8	29	30	31	32
9	33	34	35	36	10	37	38	39	40
11	41	42	43	44	12	45	46	47	48
13	49	50	51	52	14	53	54	55	56
15	57	58	59	60	16	61	62	63	64
17	65	66	67	68	18	69	70	71	72
19	73	74	75	76	20	77	78	79	80

9 Technical specifications

Parameter	Value
Light source	LED
Weight	10 kg
Operating temperature	-30 to 40 °C

Spot diameter



Distance	Ø 25°
2 m	0.89 m
4 m	1.8 m
6 m	2.7 m
8 m	3.5 m
10 m	4.4 m
15 m	6.7 m

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

10 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.

11 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.

12 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.