DMX REFERENCE

aek 12x 40

PLS LED ZOOM

PLS LITES



Manufacturer	PLS LITES
GDTF file	PLS_LITES_aek_12x_40_27945.gdtf
GDTF revision	EDA18C25-D1DB-409D-8C25-133F482CDABE · 2022-09-07
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1 About this manual

This document describes the PLS LED ZOOM by PLS LITES. It was compiled from the GDTF file PLS_LITES_aek_12x_40_27945.gdtf from the GDTF-Share library.

File revision: “EDA18C25-D1DB-409D-8C25-133F482CDABE”.

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 PLS LITES; 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	14.5 kg

DMX modes

Mode	Channels	Units in one universe	First start addresses
Extended 58 ch	58	8	1, 59, 117, 175, ...
Standar 17 ch	17	30	1, 18, 35, 52, ...

No light? Check these channels

- Extended 58 ch: CH 6 Dimmer above 0; CH 7 Dimmer Mode above 0; CH 8 Shutter at 108–207 or 239–251 “Open”
- Standar 17 ch: CH 6 Dimmer above 0; CH 7 Dimmer Mode above 0; CH 8 Shutter at 20–24, 65–69, 85–89, 105–109, 125–129, 145–149, 165–169, 185–189, 205–209, 225–229 or 245–255 “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

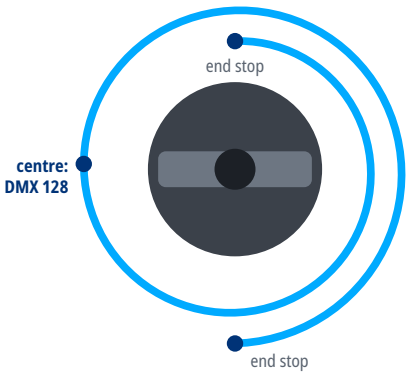
- The moving parts of the device (for example the head or arms) can move quickly and unexpectedly at any time – after power-on, during a reset, or on a command from the controller.
- Keep yourself and any objects out of the range of movement. While the device is switched on, do not touch the moving parts, 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

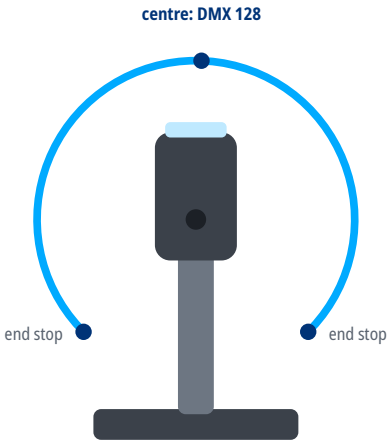
Pan 540°

top view



Tilt 270°

side view



5 Installation

⚠ WARNING

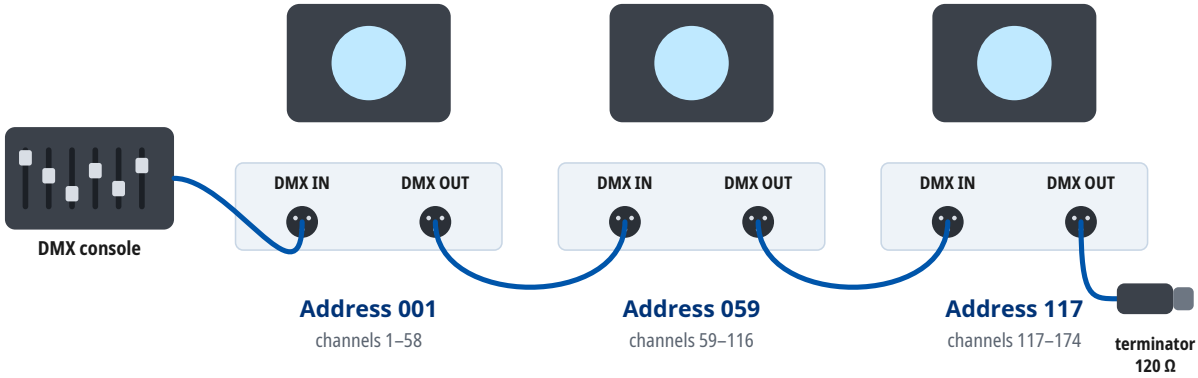
- Rigging must be carried out only by qualified persons in accordance with applicable regulations, in particular those for work at height.
- The supporting structure and fixings must safely carry the weight of all suspended devices; verify their load capacity in advance.
- Weight of the device: 14.5 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



Mode Extended 58 ch: every unit occupies 58 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 “Extended 58 ch”: 58.
- 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 “Extended 58 ch”, you can use, for example, the start addresses 1, 59, 117, 175.
- The DMX mode set on the device must match the fixture profile (personality) used in the controller.
- The device supports RDM (Remote Device Management), two-way communication with the controller over the DMX line.

8 Functions at a glance

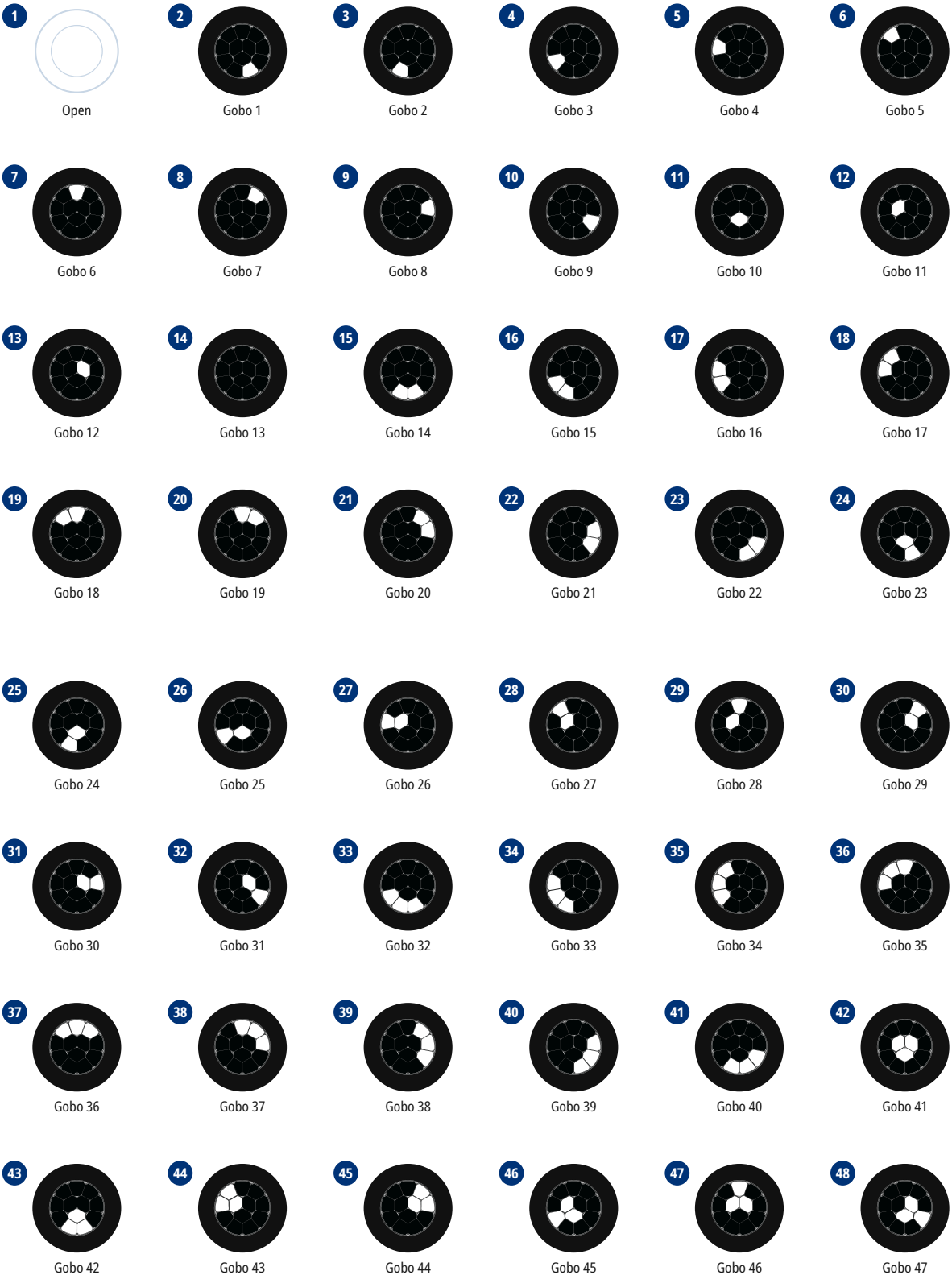
Functions in each DMX mode

	Extended 58 ch 58 channels	Standar 17 ch 17 channels
Pan / Tilt	1, 3	1, 3
Dimmer	6	6
Shutter / strobe	8	8
Color mixing	9–56	9–12
Color temperature		13
Color wheel		14
Gobo wheel		15
Zoom	57	16
Pixel control	11 cells	

Color wheel



Gobo wheel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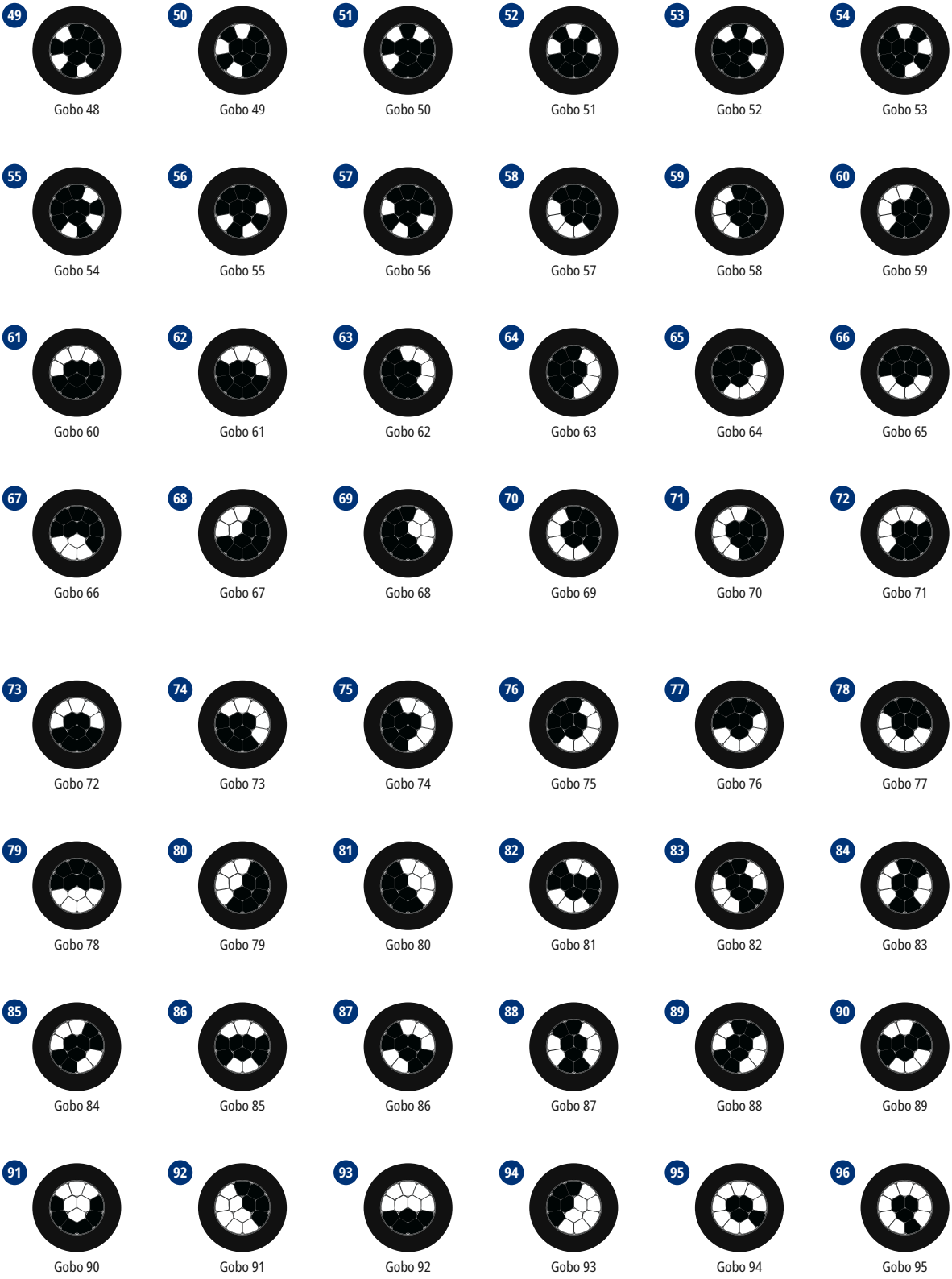
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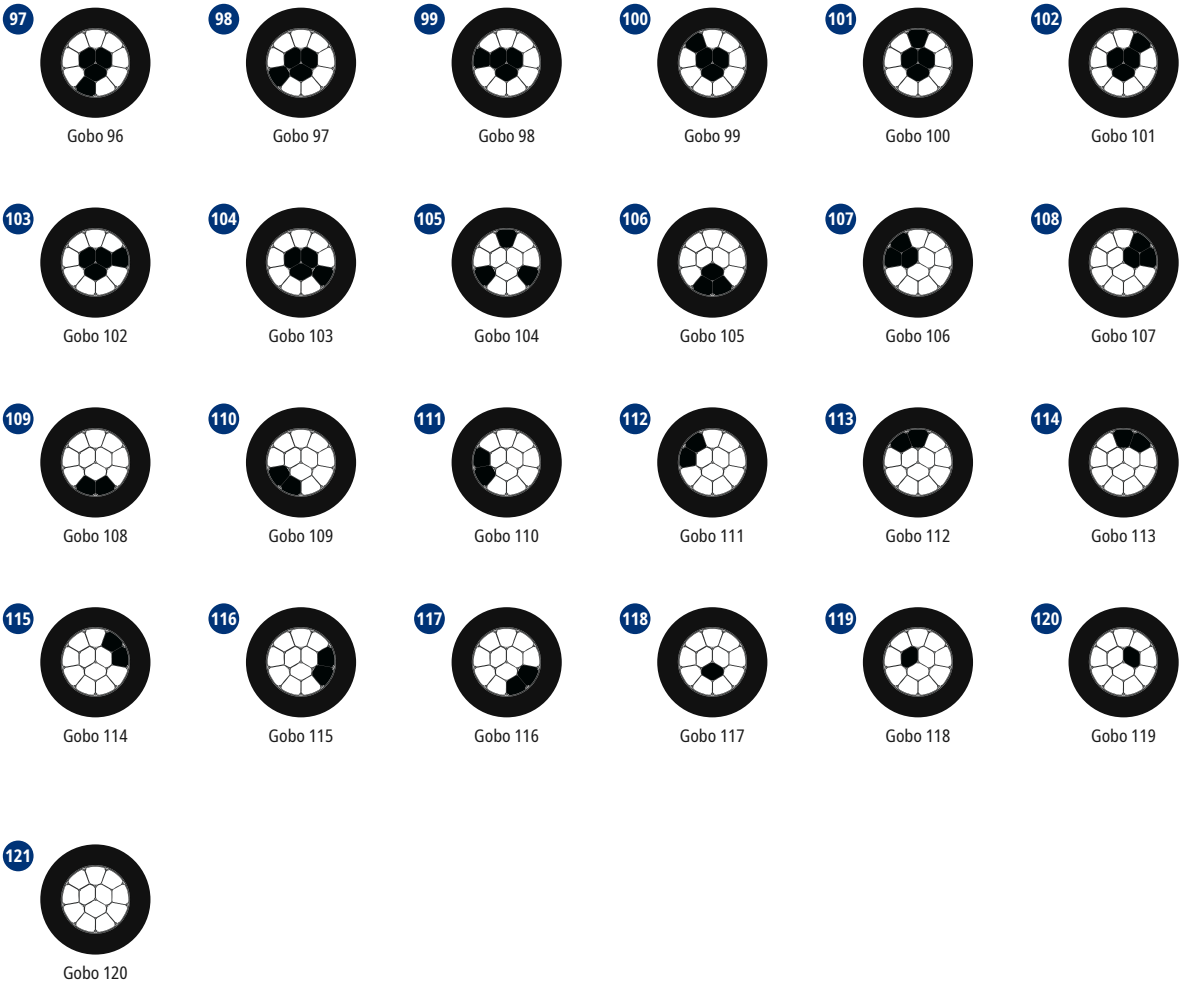
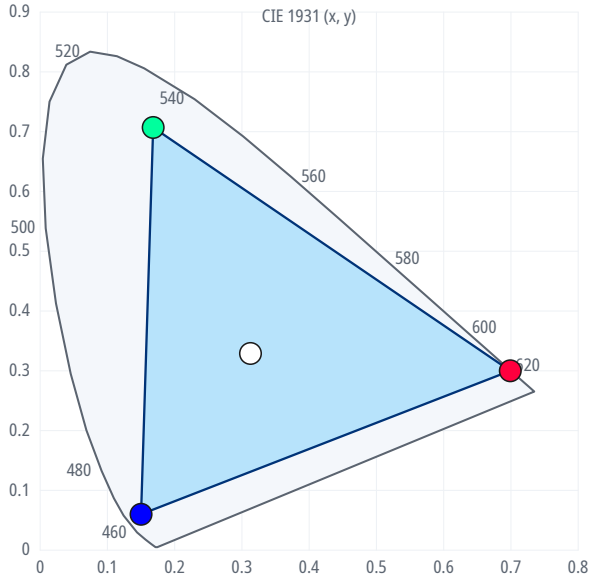


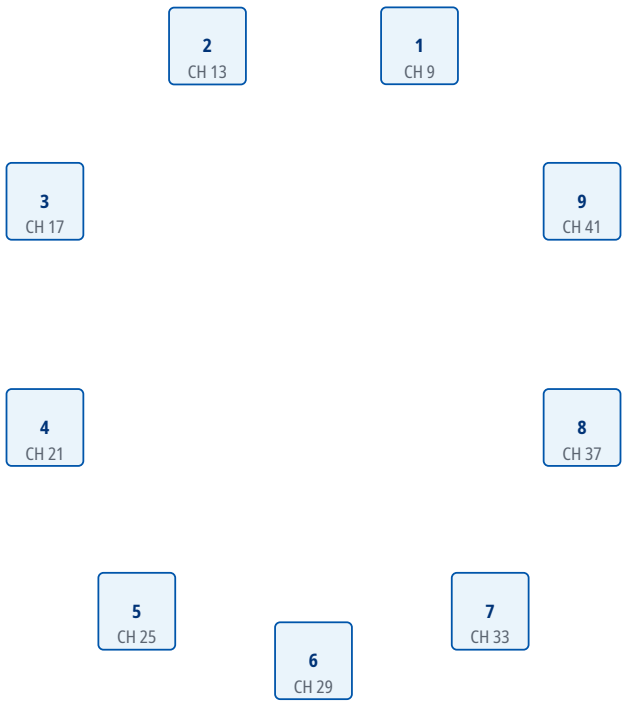
LED colors and the colors they mix



LED	x	y	nm
Red	0.699	0.300	637
Green	0.168	0.707	519
Blue	0.150	0.060	446
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.

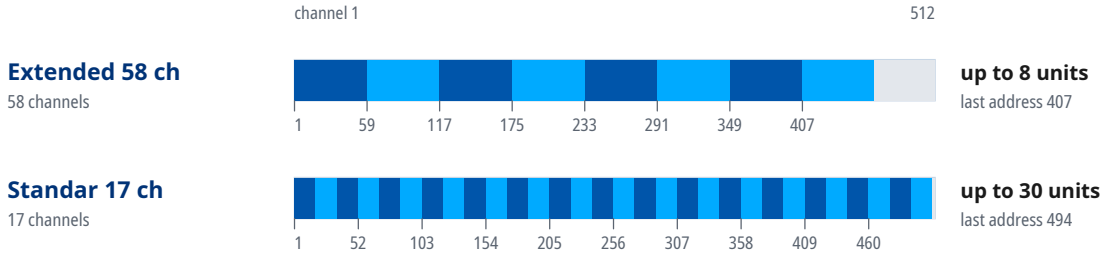
Cells (pixels)



9 cells where the GDTF file places them (seen from above), numbered by their first DMX channel (CH) in the mode “Extended 58 ch”.

9 DMX channels

Units in one DMX universe



Start addresses of 20 units in the mode “Extended 58 ch”

Unit	Start address	Unit	Start address	Unit	Start address	Unit	Start address
1	1	6	291	11	U2 · 117	16	U2 · 407
2	59	7	349	12	U2 · 175	17	U3 · 1
3	117	8	407	13	U2 · 233	18	U3 · 59
4	175	9	U2 · 1	14	U2 · 291	19	U3 · 117
5	233	10	U2 · 59	15	U2 · 349	20	U3 · 175

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.

RDM personalities

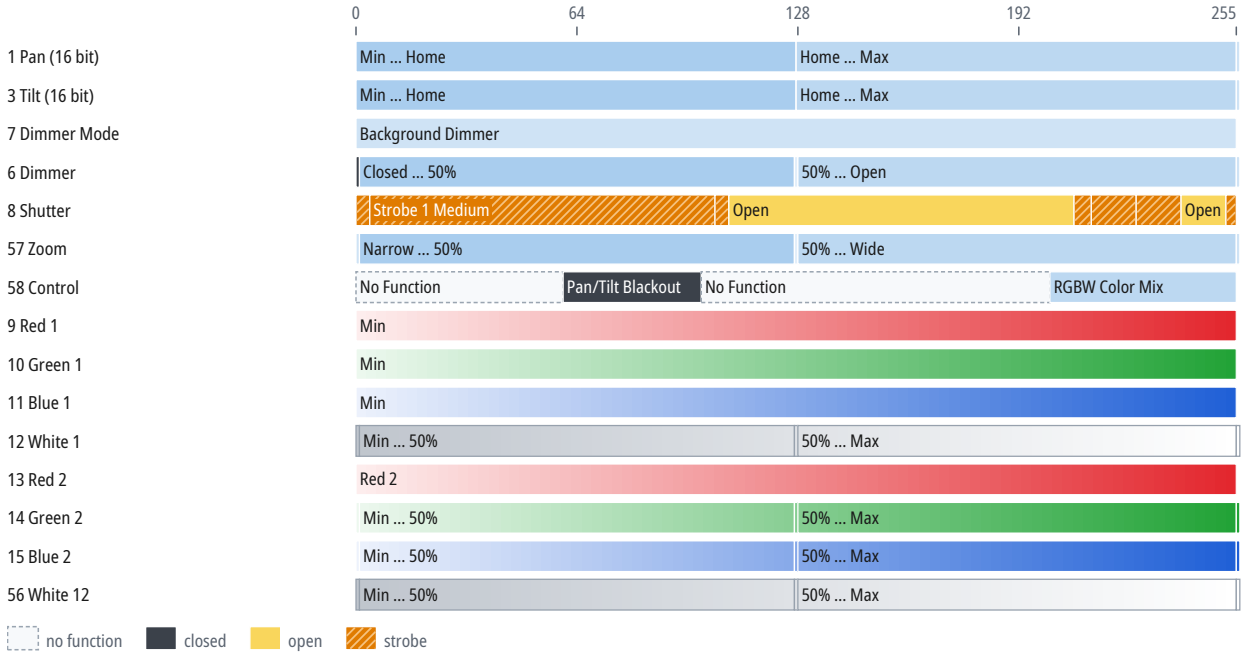
Mode	Channels	RDM personality
Extended 58 ch	58	2
Standar 17 ch	17	6

Mode Extended 58 ch

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 Dimmer Mode above 0; CH 8 Shutter at 108–207 or 239–251 “Open”. The GDTF file gives these values for a console's Highlight function: CH 6 Dimmer 255.

Channel functions at a glance



CH	Function	DMX	Description
1	Pan	0–127	Min ... Home
		128–255	Home ... Max
		255	Max
2	Pan Fine	0–255	Fine adjustment of CH 1
3	Tilt	0–127	Min ... Home
		128–255	Home ... Max
		255	Max
4	Tilt Fine	0–255	Fine adjustment of CH 3
6	Dimmer	0	Closed
		1–126	Closed ... 50%
		127	50%
		128–254	50% ... Open
		255	Open
7	Dimmer Mode		Background Dimmer
		0–255	Background Dimmer
8	Shutter	0–3	Strobe 1 Fast
		4–103	Strobe 1 Medium
		104–107	Strobe 1 Slow
		108–207	Open

CH	Function	DMX	Description
8	Shutter (continued)	208–212	Strobe 2 Fast
		213–225	Strobe 2 Medium
		226–238	Strobe 2 Slow
		239–251	Open
		252–255	Strobe 3 Fast
9	Red 1		When CH 7 is 0:
		0–255	Min
10	Green 1	0–255	Min
11	Blue 1		When CH 7 is 0:
		0–255	Min
12	White 1	0	Min
		1–126	Min … 50%
		127	50%
		128–254	50% … Max
		255	Max
13	Red 2	0–255	Red 2
14	Green 2	0	Min
		1–126	Min … 50%
		127	50%
		128–254	50% … Max
		255	Max
15	Blue 2	0	Min
		1–126	Min … 50%
		127	50%
		128–254	50% … Max
		255	Max
56	White 12		White 9
		0	Min
		1–126	Min … 50%
		127	50%
		128–254	50% … Max
		255	Max
57	Zoom	0	Narrow
		1–126	Narrow … 50%
		127	50%
		128–254	50% … Wide
		255	Wide
58	Control	0–59	No Function
		60–99	Pan/Tilt Blackout
		100–200	No Function
		201–255	RGBW Color Mix

CH 12–55: 11 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.

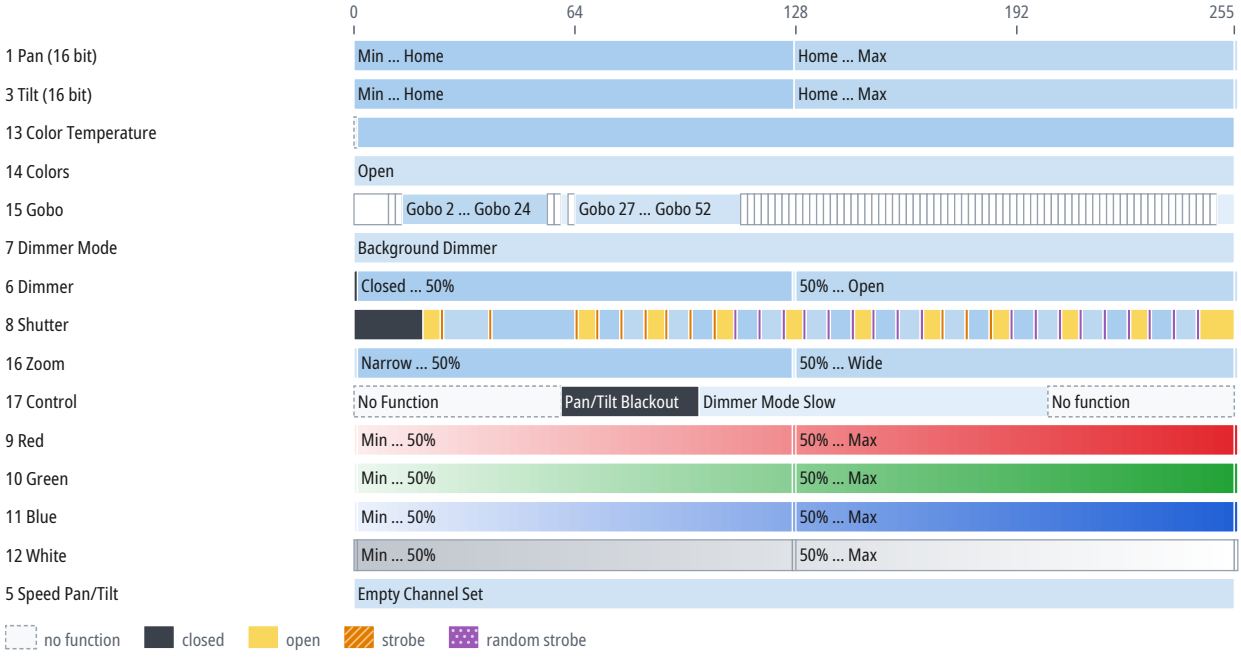
Cell	White	Red	Green	Blue	Cell	White	Red	Green	Blue
1	12	13	14	15	2	16	17	18	19
3	20	21	22	23	4	24	25	26	27
5	28	29	30	31	6	32	33	34	35
7	36	37	38	39	8	40	41	42	43
9	44	45	46	47	10	48	49	50	51
11	52	53	54	55					

Mode Standar 17 ch

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 Dimmer Mode above 0; CH 8 Shutter at 20–24, 65–69, 85–89, 105–109, 125–129, 145–149, 165–169, 185–189, 205–209, 225–229 or 245–255 “Open”. The GDTF file gives these values for a console's Highlight function: CH 6 Dimmer 255.

Channel functions at a glance



CH	Function	DMX	Description
1	Pan		Same as CH 1 in the mode “Extended 58 ch” (p. 13)
2	Pan Fine	0–255	Fine adjustment of CH 1
3	Tilt		Same as CH 3 in the mode “Extended 58 ch” (p. 13)
4	Tilt Fine	0–255	Fine adjustment of CH 3
5	Speed Pan/Tilt	0–255	Empty Channel Set
6	Dimmer		Same as CH 6 in the mode “Extended 58 ch” (p. 13)
7	Dimmer Mode		Same as CH 7 in the mode “Extended 58 ch” (p. 13)
8	Shutter	0–19	Shutter: Closed
		20–24	Shutter: Open
		25	Strobe 1 Fast

CH	Function	DMX	Description
8	Shutter (continued)	26–38	Strobe 1 Fast ... Strobe 1 Medium
		39	Strobe 1 Medium
		40–63	Strobe 1 Medium ... Strobe 1 Slow
		64	Strobe 1 Slow
		65–69	Strobe: Open
		70	Strobe 2 Fast
		71–76	Strobe 2 Fast ... Strobe 2 Medium
		77	Strobe 2 Medium
		78–83	Strobe 2 Medium ... Strobe 2 Slow
		84	Strobe 2 Slow
		85–89	Strobe: Open
		90	Strobe 3 Fast
		91–96	Strobe 3 Fast ... Strobe 3 Medium
		97	Strobe 3 Medium
		98–103	Strobe 3 Medium ... Strobe 3 Slow
		104	Strobe 3 Slow
		105–109	Strobe Random: Open
		110	Random 1 Fast
		111–116	Random 1 Fast ... Random 1 Medium
		117	Random 1 Medium
		118–123	Random 1 Medium ... Random 1 Slow
		124	Random 1 Slow
		125–129	Strobe Random: Open
		130	Random 2 Fast
		131–136	Random 2 Fast ... Random 2 Medium
		137	Random 2 Medium
		138–143	Random 2 Medium ... Random 2 Slow
		144	Random 2 Slow
		145–149	Strobe Random: Open
		150	Random 3 Fast
		151–156	Random 3 Fast ... Random 3 Medium
		157	Random 3 Medium
		158–163	Random 3 Medium ... Random 3 Slow
		164	Random 3 Slow
		165–169	Strobe Pulse: Open
		170	Pulse 1 Fast
		171–176	Pulse 1 Fast ... Pulse 1 Medium
		177	Pulse 1 Medium
		178–183	Pulse 1 Medium ... Pulse 1 Slow
		184	Pulse 1 Slow
		185–189	Strobe Pulse Random: Open
		190	Rnd Pulse 1 Fast

CH	Function	DMX	Description
8	Shutter (continued)	191–196	Rnd Pulse 1 Fast ... Rnd Pulse 1 Medium
		197	Rnd Pulse 1 Medium
		198–203	Rnd Pulse 1 Medium ... Rnd Pulse 1 Slow
		204	Rnd Pulse 1 Slow
		205–209	Strobe Pulse Random: Open
		210	Rnd Pulse 2 Fast
		211–216	Rnd Pulse 2 Fast ... Rnd Pulse 2 Medium
		217	Rnd Pulse 2 Medium
		218–223	Rnd Pulse 2 Medium ... Rnd Pulse 2 Slow
		224	Rnd Pulse 2 Slow
		225–229	Strobe Pulse Random: Open
		230	Rnd Pulse 3 Fast
		231–236	Rnd Pulse 3 Fast ... Rnd Pulse 3 Medium
		237	Rnd Pulse 3 Medium
		238–243	Rnd Pulse 3 Medium ... Rnd Pulse 3 Slow
		244	Rnd Pulse 3 Slow
		245–255	Strobe Pulse Random: Open
9	Red		Main Red
		0	Min
		1–126	Min ... 50%
		127	50%
		128–254	50% ... Max
		255	Max
10	Green		Main Green
		0	Min
		1–126	Min ... 50%
		127	50%
		128–254	50% ... Max
		255	Max
11	Blue		Main Blue
		0	Min
		1–126	Min ... 50%
		127	50%
		128–254	50% ... Max
		255	Max
12	White		Main White
		0	Min
		1–126	Min ... 50%
		127	50%
		128–254	50% ... Max
		255	Max
13	Color Temperature	0	No Function

CH	Function	DMX	Description
13	Color Temperature (continued)	1–255	CTC
14	Colors		Color Macros
		0–255	Open
15	Gobo		LED Macros
		0–9	Open
		10–11	Gobo 1
		12–13	Gobo 2
		14–55	Gobo 2 ... Gobo 24
		56–57	Gobo 24
		58–59	Gobo 25
		60–61	Gobo 25 ... Gobo 27
		62–63	Gobo 27
		64–111	Gobo 27 ... Gobo 52
		112–113	Gobo 52
		114–115	Gobo 53
		116–117	Gobo 54
		118–119	Gobo 55
		120–121	Gobo 56
		122–123	Gobo 57
		124–125	Gobo 58
		126–127	Gobo 59
		128–129	Gobo 60
		130–131	Gobo 61
		132–133	Gobo 62
		134–135	Gobo 63
		136–137	Gobo 64
		138–139	Gobo 65
		140–141	Gobo 66
		142–143	Gobo 67
		144–145	Gobo 68
		146–147	Gobo 69
		148–149	Gobo 70
		150–151	Gobo 71
		152–153	Gobo 72
		154–155	Gobo 73
		156–157	Gobo 74
		158–159	Gobo 75
		160–161	Gobo 76
		162–163	Gobo 77
		164–165	Gobo 78
		166–167	Gobo 79
		168–169	Gobo 80

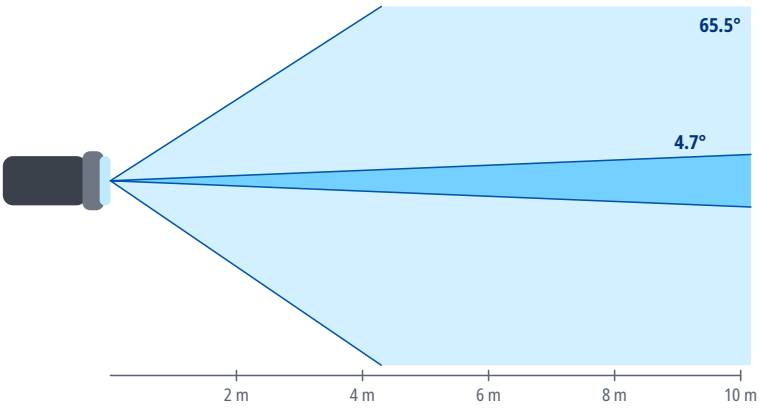
CH	Function	DMX	Description
15	Gobo (continued)	170–171	Gobo 81
		172–173	Gobo 82
		174–175	Gobo 83
		176–177	Gobo 84
		178–179	Gobo 85
		180–181	Gobo 86
		182–183	Gobo 87
		184–185	Gobo 88
		186–187	Gobo 89
		188–189	Gobo 90
		190–191	Gobo 91
		192–193	Gobo 92
		194–195	Gobo 93
		196–197	Gobo 94
		198–199	Gobo 95
		200–201	Gobo 96
		202–203	Gobo 97
		204–205	Gobo 98
		206–207	Gobo 99
		208–209	Gobo 100
		210–211	Gobo 101
		212–213	Gobo 102
		214–215	Gobo 103
		216–217	Gobo 104
		218–219	Gobo 105
		220–221	Gobo 106
		222–223	Gobo 107
		224–225	Gobo 108
		226–227	Gobo 109
		228–229	Gobo 110
		230–231	Gobo 111
		232–233	Gobo 112
		234–235	Gobo 113
		236–237	Gobo 114
		238–239	Gobo 115
		240–241	Gobo 116
		242–243	Gobo 117
		244–245	Gobo 118
		246–247	Gobo 119
		248–249	Gobo 120
		250–255	Open
16	Zoom		Same as CH 57 in the mode “Extended 58 ch” (p. 14)

CH	Function	DMX	Description
17	Control	0–59	No Function
		60–99	Pan/Tilt Blackout
		100–200	Dimmer Mode Slow
		201–255	No function

10 Technical specifications

Parameter	Value
Light	
Light source	LED
Optics	
Zoom	4.7–65.5°
Movement	
Pan	540°
Tilt	270°
Control	
DMX connection	5-pin XLR IN/OUT, 3-pin XLR IN/OUT
RJ45 connectors	RJ45 IN
RDM	yes (manufacturer ID 0x21A4, device model ID 0x04B1)
Electrical	
Power connectors	powerCON TRUE1 IN/OUT
Dimensions and construction	
Weight	14.5 kg
Operating environment	
Operating temperature	-20 to 45 °C

Spot diameter



Distance	Ø 4.7°	Ø 65.5°
2 m	0.16 m	2.6 m
4 m	0.33 m	5.1 m
6 m	0.49 m	7.7 m
8 m	0.66 m	10.3 m
10 m	0.82 m	12.9 m
15 m	1.2 m	19.3 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.