DMX REFERENCE

Beyond

Pangolin Laser Systems

Manufacturer	Pangolin Laser Systems
GDTF file	Pangolin_Laser_Systems_Beyond_68850.gdtf
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1 About this manual

This document describes the Beyond by Pangolin Laser Systems. It was compiled from the GDTF file Pangolin_Laser_Systems_Beyond_68850.gdtf from the GDTF-Share library.

File revision: “Jimmy”.

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 Pangolin Laser Systems; 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

DMX modes

Mode	Channels	Units in one universe	First start addresses
Simple	16	32	1, 17, 33, 49, ...
Mid	32	16	1, 33, 65, 97, ...
Max	50	10	1, 51, 101, 151, ...



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.

⚠ 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 Installation

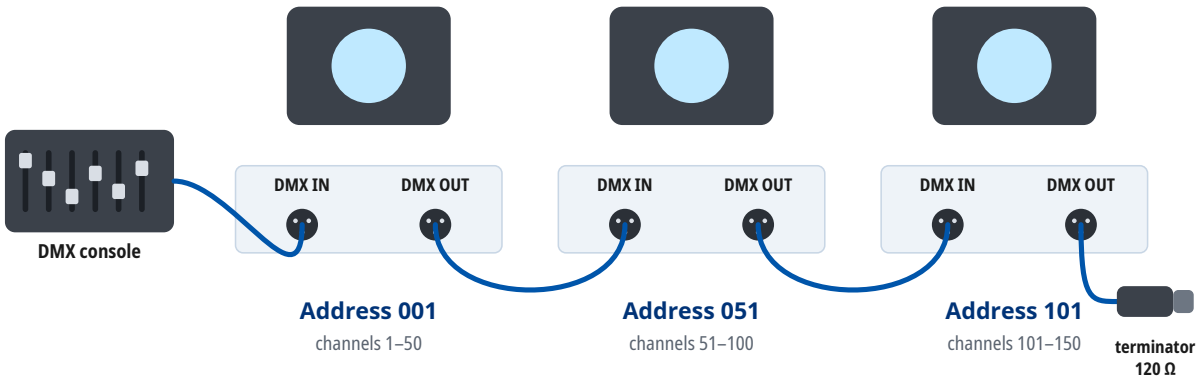
⚠ WARNING

- 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.
- 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 Max: every unit occupies 50 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 “Max”: 50.
- 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 “Max”, you can use, for example, the start addresses 1, 51, 101, 151.
- The DMX mode set on the device must match the fixture profile (personality) used in the controller.

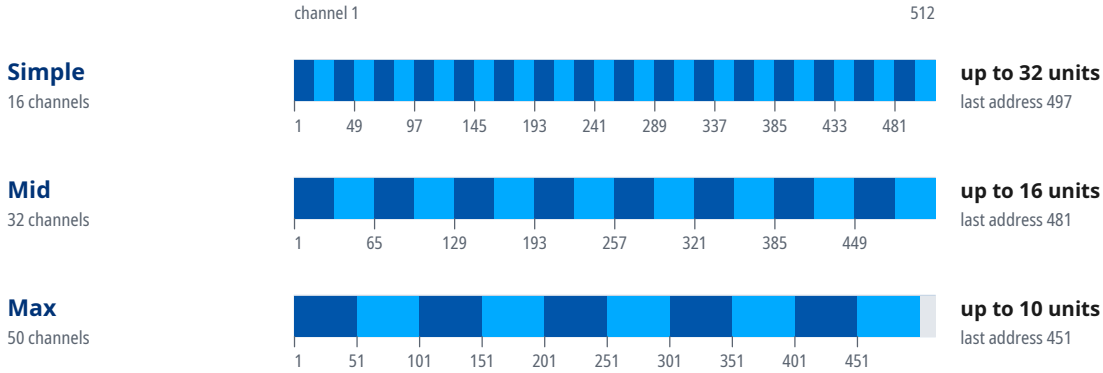
7 Functions at a glance

Functions in each DMX mode

	Simple 16 channels	Mid 32 channels	Max 50 channels
Pan / Tilt	**10, 11**	**13, 15**	**13, 15**
Pan / Tilt resolution	8 bit	16 bit	16 bit
Dimmer	**5**	**20**	**20**
Color mixing		**23–25**	**23–25**
Zoom	**6**	**17**	**17**

8 DMX channels

Units in one DMX universe



Start addresses of 20 units in the mode “Max”

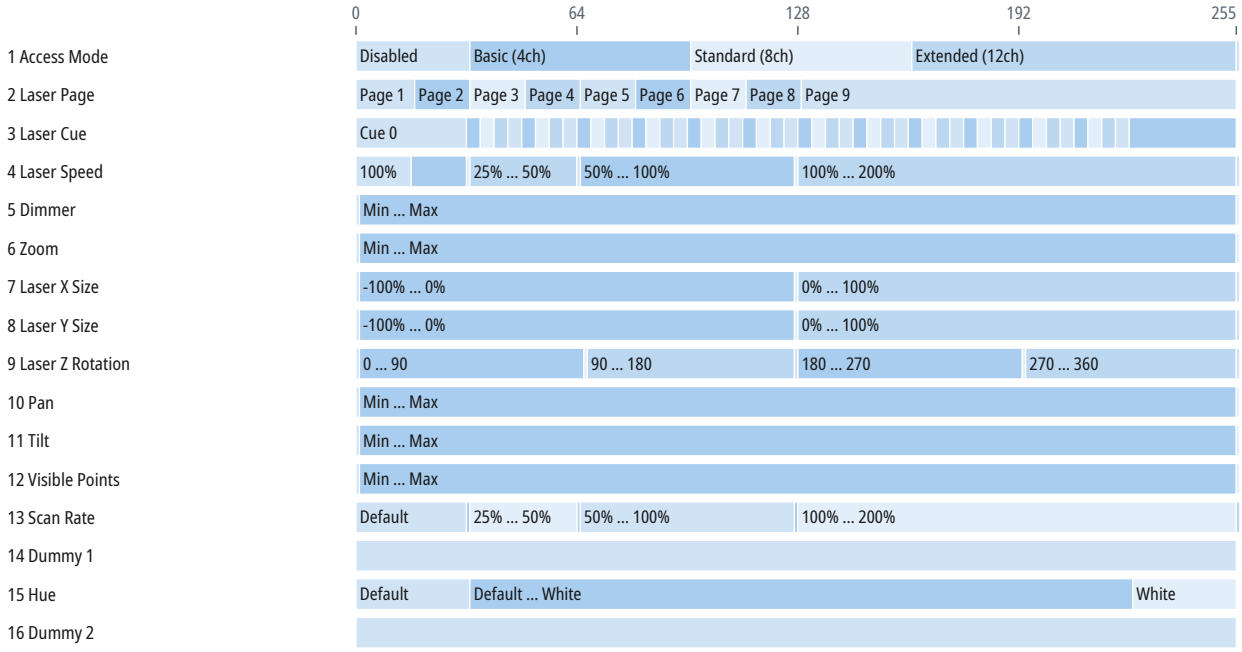
Unit	Start address	Unit	Start address	Unit	Start address	Unit	Start address
1	1	6	251	11	U2 · 1	16	U2 · 251
2	51	7	301	12	U2 · 51	17	U2 · 301
3	101	8	351	13	U2 · 101	18	U2 · 351
4	151	9	401	14	U2 · 151	19	U2 · 401
5	201	10	451	15	U2 · 201	20	U2 · 451

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 Simple

The GDTF file gives these values for a console's Highlight function: CH 5 Dimmer 255.

Channel functions at a glance



CH	Function	DMX	Description
1	Access Mode	0–32	Disabled
		33–96	Basic (4ch)
		97–160	Standard (8ch)
		161–254	Extended (12ch)
		255	Full (16ch)
2	Laser Page	0–16	Page 1
		17–32	Page 2
		33–48	Page 3
		49–64	Page 4
		65–80	Page 5
		81–96	Page 6
		97–112	Page 7
		113–128	Page 8
		129–255	Page 9
3	Laser Cue	0–31	Cue 0
		32–35	Cue 1
		36–39	Cue 2
		40–43	Cue 3
		44–47	Cue 4
		48–51	Cue 5
		52–55	Cue 6
		56–59	Cue 7
		60–63	Cue 8
		64–67	Cue 9
		68–71	Cue 10
		72–75	Cue 11
		76–79	Cue 12
		80–83	Cue 13
		84–87	Cue 14
		88–91	Cue 15
		92–95	Cue 16
		96–99	Cue 17
		100–103	Cue 18
		104–107	Cue 19
		108–111	Cue 20
		112–115	Cue 21
		116–119	Cue 22
		120–123	Cue 23
		124–127	Cue 24
		128–131	Cue 25
		132–135	Cue 26

CH	Function	DMX	Description
3	Laser Cue (continued)	136–139	Cue 27
		140–143	Cue 28
		144–147	Cue 29
		148–151	Cue 30
		152–155	Cue 31
		156–159	Cue 32
		160–163	Cue 33
		164–167	Cue 34
		168–171	Cue 35
		172–175	Cue 36
		176–179	Cue 37
		180–183	Cue 38
		184–187	Cue 39
		188–191	Cue 40
		192–195	Cue 41
		196–199	Cue 42
		200–203	Cue 43
		204–207	Cue 44
		208–211	Cue 45
		212–215	Cue 46
		216–219	Cue 47
		220–223	Cue 48
		224–255	Laser Cue 1
4	Laser Speed	0–15	100%
		16–31	100% … 25%
		32	25%
		33–63	25% … 50%
		64	50%
		65–126	50% … 100%
		127	100%
		128–254	100% … 200%
		255	200%
5	Dimmer	0	Min
		1–254	Min … Max
		255	Max
6	Zoom	0	Min
		1–254	Min … Max
		255	Max
7	Laser X Size	0	-100%
		1–126	-100% … 0%
		127	0%
		128–254	0% … 100%

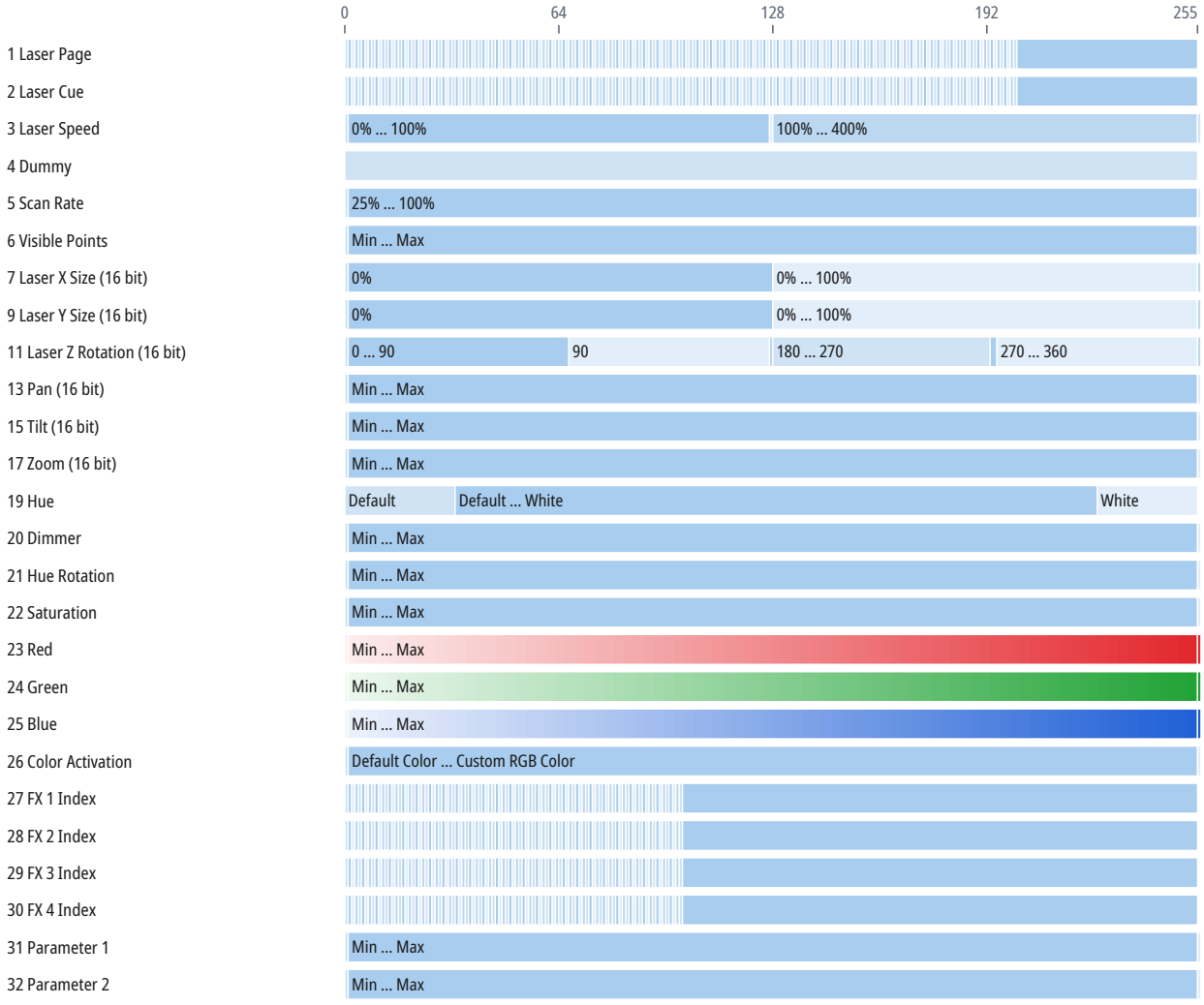
CH	Function	DMX	Description
7	Laser X Size (continued)	255	100%
8	Laser Y Size	0	-100%
		1–126	-100% … 0%
		127	0%
		128–254	0% … 100%
		255	100%
9	Laser Z Rotation	0	0
		1–65	0 … 90
		66	90
		67–126	90 … 180
		127	180
		128–192	180 … 270
		193	270
		194–254	270 … 360
		255	360
10	Pan	0	Min
		1–254	Min … Max
		255	Max
11	Tilt	0	Min
		1–254	Min … Max
		255	Max
12	Visible Points	0	Min
		1–254	Min … Max
		255	Max
13	Scan Rate	0–31	Default
		32	25%
		33–63	25% … 50%
		64	50%
		65–126	50% … 100%
		127	100%
		128–254	100% … 200%
		255	200%
14	Dummy 1	0–255	
15	Hue	0–32	Default
		33–224	Default … White
		225–255	White
16	Dummy 2	0–255	

Mode Mid

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

The GDTF file gives these values for a console's Highlight function: CH 20 Dimmer 255, CH 23 Red 255, CH 24 Green 255, CH 25 Blue 255, CH 26 Color Activation 255.

Channel functions at a glance



CH	Function	DMX	Description
1	Laser Page	0	Disabled
		1–200	Page 1...200
		201–255	Laser Page 1
2	Laser Cue	0	Disabled
		1–200	Cue 1...200
		201–255	Laser Cue 1
3	Laser Speed	0	0%
		1–126	0% ... 100%
		127	100%
		128–254	100% ... 400%
		255	400%

CH	Function	DMX	Description
4	Dummy	0–255	
5	Scan Rate	0	25%
		1–254	25% … 100%
		255	100%
6	Visible Points		Same as CH 12 in the mode “Simple” (p. 9)
7	Laser X Size	0–1	-100%
		1–128	0%
		128–255	0% … 100%
		255	100%
8	Laser X Size Fine	0–255	Fine adjustment of CH 7
9	Laser Y Size	0–1	-100%
		1–128	0%
		128–255	0% … 100%
		255	100%
10	Laser Y Size Fine	0–255	Fine adjustment of CH 9
11	Laser Z Rotation	0–1	0
		1–67	0 … 90
		67–127	90
		127–128	180
		128–193	180 … 270
		193–195	270
		195–255	270 … 360
		255	360
12	Laser Z Rotation Fine	0–255	Fine adjustment of CH 11
13	Pan	0–1	Min
		1–255	Min … Max
		255	Max
14	Pan Fine	0–255	Fine adjustment of CH 13
15	Tilt	0–1	Min
		1–255	Min … Max
		255	Max
16	Tilt Fine	0–255	Fine adjustment of CH 15
17	Zoom	0–1	Min
		1–255	Min … Max
		255	Max
18	Zoom Fine	0–255	Fine adjustment of CH 17
19	Hue		Same as CH 15 in the mode “Simple” (p. 9)
20	Dimmer		Same as CH 5 in the mode “Simple” (p. 8)
21	Hue Rotation	0	Min
		1–254	Min … Max
		255	Max
22	Saturation	0	Min

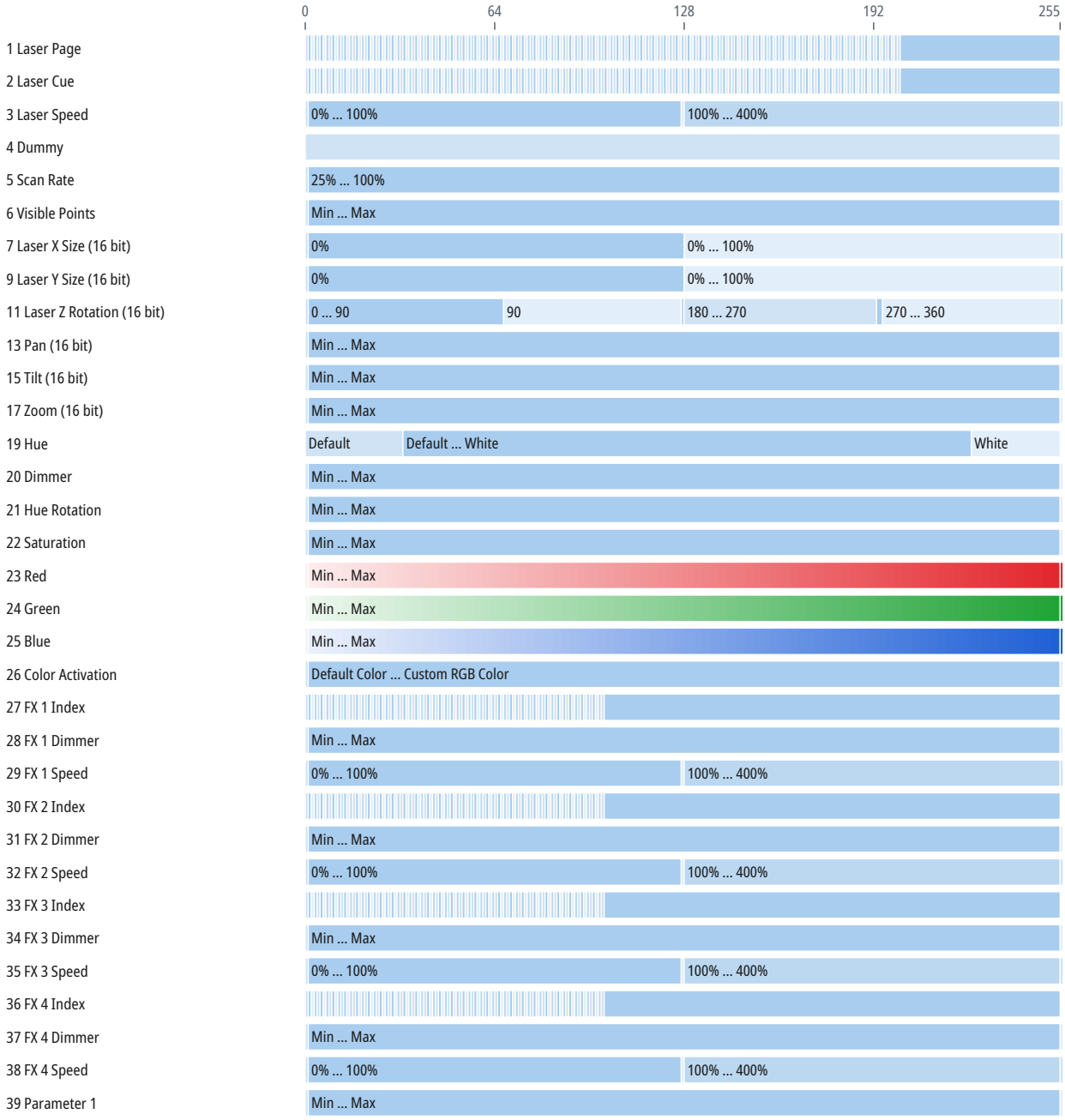
CH	Function	DMX	Description
22	Saturation (continued)	1–254	Min ... Max
		255	Max
23	Red		Color RGB_R 1
		0	Min
		1–254	Min ... Max
		255	Max
24	Green		Color RGB_G 1
		0	Min
		1–254	Min ... Max
		255	Max
25	Blue		Color RGB_B 1
		0	Min
		1–254	Min ... Max
		255	Max
26	Color Activation	0	Default Color
		1–254	Default Color ... Custom RGB Color
		255	Custom RGB Color
27	FX 1 Index	0	Disabled
		1–100	Index 1...100
		101–255	FX1 Index 1
28	FX 2 Index	0	Disabled
		1–100	Index 1...100
		101–255	FX2 Index 1
29	FX 3 Index	0	Disabled
		1–100	Index 1...100
		101–255	FX3 Index 1
30	FX 4 Index	0	Disabled
		1–100	Index 1...100
		101–255	FX4 Index 1
31	Parameter 1	0	Min
		1–254	Min ... Max
		255	Max
32	Parameter 2	0	Min
		1–254	Min ... Max
		255	Max

Mode Max

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

The GDTF file gives these values for a console's Highlight function: CH 20 Dimmer 255, CH 23 Red 255, CH 24 Green 255, CH 25 Blue 255, CH 26 Color Activation 255.

Channel functions at a glance



CH	Function	DMX	Description
1	Laser Page		Same as CH 1 in the mode “Mid” (p. 10)
2	Laser Cue		Same as CH 2 in the mode “Mid” (p. 10)
3	Laser Speed		Same as CH 3 in the mode “Mid” (p. 10)
4	Dummy	0–255	
5	Scan Rate		Same as CH 5 in the mode “Mid” (p. 11)

CH	Function	DMX	Description
6	Visible Points		Same as CH 12 in the mode “Simple” (p. 9)
7	Laser X Size		Same as CH 7 in the mode “Mid” (p. 11)
8	Laser X Size Fine	0–255	Fine adjustment of CH 7
9	Laser Y Size		Same as CH 9 in the mode “Mid” (p. 11)
10	Laser Y Size Fine	0–255	Fine adjustment of CH 9
11	Laser Z Rotation		Same as CH 11 in the mode “Mid” (p. 11)
12	Laser Z Rotation Fine	0–255	Fine adjustment of CH 11
13	Pan		Same as CH 13 in the mode “Mid” (p. 11)
14	Pan Fine	0–255	Fine adjustment of CH 13
15	Tilt		Same as CH 15 in the mode “Mid” (p. 11)
16	Tilt Fine	0–255	Fine adjustment of CH 15
17	Zoom		Same as CH 17 in the mode “Mid” (p. 11)
18	Zoom Fine	0–255	Fine adjustment of CH 17
19	Hue		Same as CH 15 in the mode “Simple” (p. 9)
20	Dimmer		Same as CH 5 in the mode “Simple” (p. 8)
21	Hue Rotation		Same as CH 21 in the mode “Mid” (p. 11)
22	Saturation		Same as CH 22 in the mode “Mid” (p. 11)
23	Red		Same as CH 23 in the mode “Mid” (p. 12)
24	Green		Same as CH 24 in the mode “Mid” (p. 12)
25	Blue		Same as CH 25 in the mode “Mid” (p. 12)
26	Color Activation		Same as CH 26 in the mode “Mid” (p. 12)
27	FX 1 Index		Same as CH 27 in the mode “Mid” (p. 12)
28	FX 1 Dimmer	0	Min
		1–254	Min … Max
		255	Max
29	FX 1 Speed	0	0%
		1–126	0% … 100%
		127	100%
		128–254	100% … 400%
		255	400%
30	FX 2 Index		Same as CH 28 in the mode “Mid” (p. 12)
31	FX 2 Dimmer	0	Min
		1–254	Min … Max
		255	Max
32	FX 2 Speed	0	0%
		1–126	0% … 100%
		127	100%
		128–254	100% … 400%
		255	400%
33	FX 3 Index		Same as CH 29 in the mode “Mid” (p. 12)
34	FX 3 Dimmer	0	Min

CH	Function	DMX	Description
34	FX 3 Dimmer (continued)	1–254	Min … Max
		255	Max
35	FX 3 Speed	0	0%
		1–126	0% … 100%
		127	100%
		128–254	100% … 400%
		255	400%
36	FX 4 Index		Same as CH 30 in the mode “Mid” (p. 12)
37	FX 4 Dimmer	0	Min
		1–254	Min … Max
		255	Max
38	FX 4 Speed	0	0%
		1–126	0% … 100%
		127	100%
		128–254	100% … 400%
		255	400%
39	Parameter 1	0	Min
		1–254	Min … Max
		255	Max

CH 39–50: 12 cells of 1 channel each. Every cell works as cell 1 in the table above (CH 39); the table below gives each cell's channel numbers.

Cell	Parameter	Cell	Parameter	Cell	Parameter	Cell	Parameter	Cell	Parameter	Cell	Parameter
1	39	2	40	3	41	4	42	5	43	6	44
7	45	8	46	9	47	10	48	11	49	12	50

9 Technical specifications

Parameter	Value
Operating temperature	0 to 40 °C

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.
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.

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.