

CHANNEL	PROTOCOL			
	STANDARD	STANDARD + FREQUENCY	SHAPE	SHAPE + FREQUENCY
1	RED	RED	RED	RED
2	RED FINE	RED FINE	RED FINE	RED FINE
3	GREEN	GREEN	GREEN	GREEN
4	GREEN FINE	GREEN FINE	GREEN FINE	GREEN FINE
5	BLUE	BLUE	BLUE	BLUE
6	BLUE FINE	BLUE FINE	BLUE FINE	BLUE FINE
7	WHITE	WHITE	WHITE	WHITE
8	WHITE FINE	WHITE FINE	WHITE FINE	WHITE FINE
9	LINEAR CTO	LINEAR CTO	LINEAR CTO	LINEAR CTO
10	MACRO COLOUR	MACRO COLOUR	MACRO COLOUR	MACRO COLOUR
11	STROBE	STROBE	STROBE	STROBE
12	DIMMER	DIMMER	DIMMER	DIMMER
13	DIMMER FINE	DIMMER FINE	DIMMER FINE	DIMMER FINE
14	PAN	PAN	PAN	PAN
15	PAN FINE	PAN FINE	PAN FINE	PAN FINE
16	TILT	TILT	TILT	TILT
17	TILT FINE	TILT FINE	TILT FINE	TILT FINE
18	FUNCTION	FUNCTION	FUNCTION	FUNCTION
19	RESET	RESET	RESET	RESET
20	ZOOM	ZOOM	ZOOM	ZOOM
21	ZOOM ROTATION	ZOOM ROTATION	ZOOM ROTATION	ZOOM ROTATION
22	-	FREQUENCY	SHAPE SELECTION	SHAPE SELECTION
23	-	-	SHAPE SPEED	SHAPE SPEED
24	-	-	SHAPE FADE	SHAPE FADE
25	-	-	SHAPE R	SHAPE R
26	-	-	SHAPE G	SHAPE G
27	-	-	SHAPE B	SHAPE B
28	-	-	SHAPE W	SHAPE W
29	-	-	SHAPE DIMMER	SHAPE DIMMER
30	-	-	BACKGROUND DIMMER	BACKGROUND DIMMER
31	-	-	SHAPE TRANSITION	SHAPE TRANSITION
32	-	-	SHAPE OFFSET	SHAPE OFFSET
33	-	-	BACKGROUND STROBE	BACKGROUND STROBE
34	-	-	BACKGROUND STROBE	BACKGROUND STROBE
35	-	-	BACKGROUND SELECT	BACKGROUND SELECT
36	-	-	-	FREQUENCY

CHANNEL	PROTOCOL
	PIXEL ENGINE RGB
1	RED LED 1
2	GREEN LED 1
3	BLUE LED 1
...	RED LED ...
...	GREEN LED ...
...	BLUE LED ...
109	RED LED 37
110	GREEN LED 37
111	BLUE LED 37

Pixel Engine need to be enabled through the FUNCTION channel (bit 103-105).

CHANNEL	PROTOCOL
	PIXEL ENGINE RGBW
1	RED LED 1
2	GREEN LED 1
3	BLUE LED 1
4	WHITE LED 1
...	RED LED ...
...	GREEN LED ...
...	BLUE LED ...
...	WHITE LED ...
145	RED LED 37
146	GREEN LED 37
147	BLUE LED 37
148	WHITE LED 37

BASIC ENGINE		DMX Value	Function
Standard	Shape		
1	1		<b>RED</b>
		000 – 255	Linear 0 – 100%
2	2	000 – 255	<b>RED FINE (16 bit)</b>
3	3		<b>GREEN</b>
		000 – 255	Linear 0 – 100%
4	4	000 – 255	<b>GREEN FINE (16 bit)</b>
5	5		<b>BLUE</b>
		000 – 255	Linear 0 – 100%
6	6	000 – 255	<b>BLUE FINE (16 bit)</b>
7	7		<b>WHITE</b>
		000 – 255	Linear 0 – 100%
8	8	000 – 255	<b>WHITE FINE (16 bit)</b>
9	9		<b>CTO</b>
		000 – 009	Unused
		010	8000K
		...	...
		054	7000K
		...	...
		090	6000K
		...	...
		117	5600K
		...	...
		144	5000K
		...	...
		198	4000K
		...	...
224	3200K		
...	...		
255	2500K		

<b>BASIC ENGINE</b>		<b>DMX Value</b>	<b>Function</b>
<b>Standard</b>	<b>Shape</b>		
<b>10</b>	<b>10</b>		<b>MACRO COLOUR</b>
		<b>000-009</b>	Macro colour OFF
		<b>010</b>	Red
		<b>011</b>	Green
		<b>012</b>	Blue
		<b>013</b>	Cyan
		<b>014</b>	Yellow
		<b>015</b>	Magenta
		<b>016</b>	White 7000 K
		<b>017</b>	White 3700 K
		<b>018</b>	White 5000 K
		<b>019</b>	Black
		<b>020-022</b>	Medium Yellow
		<b>023-026</b>	Straw Tint
		<b>027-028</b>	Surprise Peach
		<b>029</b>	Fire
		<b>030</b>	Medium Amber
		<b>031</b>	Gold Amber
		<b>032-034</b>	Dark Amber
		<b>035-044</b>	Sunrise Red
		<b>045</b>	Light Pink
		<b>046-048</b>	Medium Pink
		<b>049-061</b>	Pink Carnation
		<b>062-067</b>	Light Lavender
		<b>068-077</b>	Lavender
		<b>078-088</b>	Sky Blue
		<b>089-099</b>	Just Blue
		<b>100-109</b>	Dark yellow green
		<b>110-111</b>	Spring Yellow
		<b>112</b>	Light Amber
		<b>113</b>	Straw
		<b>114</b>	Deep Amber
		<b>115-116</b>	Orange
<b>117</b>	Light Rose		
<b>118</b>	English Rose		
<b>119</b>	Light Salmon		
<b>120</b>	Middle Rose		
<b>121-122</b>	Dark Pink		
<b>123-124</b>	Magenta		
<b>125</b>	Peacock Blue		
<b>126</b>	Med Blu Green		
<b>127</b>	Steel Blue		
<b>128</b>	Light Blue		
<b>129-130</b>	Dark Blue		
<b>131-133</b>	Leaf Green		

BASIC ENGINE		DMX Value	Function
Standard	Shape		
10	10	134-135	Dark Green
		136-137	Mauve
		138-141	Bright Pink
		142-144	Medium Blue
		145	Deep Golden Amber
		146	Pale Lavender
		147-148	Special lavender
		149-150	Primary Green
		151-156	Bright Blue
		157-161	Apricot
		162-167	Pale Gold
		168-171	Deep Orange
		172-173	Bastard Amber
		174	Flame Red
		175-178	Daylight Blue
		179	Lilac Tint
		180-183	Deep lavender
		184-190	Dark Steel Blue
		191-206	Congo Blue
207	Alice Blue		
208	Dirty White		
209-255	White		
11	11		<b>STROBE</b>
		000 – 003	Light OFF
		004 – 103	Strobe Linear from slow (1 flash/sec) to fast (25 flashes/sec)
		104 – 107	Light ON
		108 – 207	Pulsation linear slow (0,5 flash/sec) to fast (25 flash/sec)
		208 – 212	Light ON
		213 – 225	Random Strobe at low frequency
		226 – 238	Random Strobe at medium frequency
		239 – 251	Random Strobe at high frequency
252 – 255	Light ON		
12	12		<b>DIMMER</b>
		000 – 255	Linear 0 – 100%
13	13		<b>DIMMER FINE (16bit)</b>
14	14		<b>PAN</b>
		000 – 255	Pan CCW movement/positioning from 0° to 540° (default setting)
15	15		<b>PAN FINE</b>
		000 – 255	Fine Pan positioning
16	16		<b>TILT</b>
		000 – 255	Tilt CCW movement/positioning from 0° to 268° (default setting)
17	17		<b>TILT FINE</b>
		000 – 255	Fine Tilt positioning

BASIC ENGINE		DMX Value	Function
Standard	Shape		
18	18		<b>FUNCTION</b>
		000 – 011	Unused Range
		012 – 024	Pan Tilt Fast <b>(Default)</b>
		025 – 037	Pan Tilt Normal
		038 – 042	Dimmer Curve 1
		043 – 047	Dimmer Curve 2
		048 – 052	Dimmer Curve 3 <b>(Default)</b>
		053 – 057	Dimmer Curve 4
		058 – 062	RGBW Gamma curve 1 – gamma = 1.0
		063 – 067	RGBW Gamma curve 2 – gamma = 1.5 <b>(Default)</b>
		068 – 072	RGBW Gamma curve 3 – gamma = 2.0
		073 – 077	Halogen Lamp Simulation OFF <b>(Default)</b>
		078 – 082	Halogen Lamp Simulation - Linear CTO @ 0 bit - 750 W
		083 – 087	Halogen Lamp Simulation - Linear CTO @ 0 bit - 1000 W
		088 – 092	Halogen Lamp Simulation - Linear CTO @ 0 bit - 1200 W
		093 – 097	Halogen Lamp Simulation - Linear CTO @ 0 bit - 2000 W
		098 – 102	Halogen Lamp Simulation - Linear CTO @ 0 bit - 2500 W
		103 – 105	Pixel map enabled
		164	Base frequency=1000Hz
		165	Base frequency=1500Hz <b>(Default)</b>
		166	Base frequency=2400Hz
		167	Base frequency=3700Hz
		168	Base frequency=5600Hz
		169	Base frequency=9400Hz
		170	Base frequency=15100Hz
		171	Base frequency=21400Hz
		172	Base frequency=31000Hz
		173	Base frequency=43700Hz
		174 – 176	Display On/OFF
		177 – 178	Emulate K20 OFF
		179 – 180	Emulate K20 ON
		181 – 182	Silent Mode: Super Silent
		183 – 184	Silent Mode: Silent
185 – 186	Silent Mode: Standard		
187 – 250	Unused Range		
251 – 255	Reset to Default		
		<b>The functions are activated/selected passing through the unused levels range and staying in the necessary range for 5 seconds</b>	

BASIC ENGINE		DMX Value	Function			
Standard	Shape					
19	19		<b>RESET</b>			
		000 – 025	Unused range			
		026 – 076	Effects Reset Effects Reset sequence is activated passing through the unused levels range and staying in this range for 5 seconds			
		077 – 127	Pan / Tilt Reset Pan/Tilt Reset sequence passing through the unused levels range and staying in this range for 5 seconds.			
		128 – 255	Complete Reset All-effects Reset sequence passing through the unused levels range and staying in this range for 5 seconds.			
20	20		<b>ZOOM</b>			
		000 – 255	Linear (narrow 000 to wide 255)			
21	21		<b>ZOOM ROTATION</b>			
		000 – 127	Linear Zoom Rotation (Indexing from 0° to 60°)			
		128 - 190	Linear Fast to Slow Rotation (CCW from 10RPM to 3RPH)			
		191 - 192	Stop			
		193 - 255	Linear Slow to Fast Rotation (CW from 3RPH to 10RPM)			
22	-	000 – 255	<b>FREQUENCY</b> (Fine adjusting of frequency Base selected from the Function channel)  Frequency (if standard + frequency mode is selected)			
			<b>Base Frequency (see Function 2)</b>	<b>Min Freq. @ 0 bit</b>	<b>Frequency @ 128 bit</b>	<b>Max Freq. @ 255 bit</b>
			1000 Hz	746 Hz	1000 Hz	1254 Hz
			1500 Hz	1246 Hz	1500 Hz	1754 Hz
			2400 Hz	1765 Hz	2400 Hz	3035 Hz
			3700 Hz	3065 Hz	3700 Hz	4335 Hz
			5600 Hz	4330 Hz	5600 Hz	6870 Hz
			9400 Hz	6860 Hz	9400 Hz	11940 Hz
			15100 Hz	11925 Hz	15100 Hz	18275 Hz
			21400 Hz	18225 Hz	21400 Hz	24575 Hz
			31000 Hz	24650 Hz	31000 Hz	37350 Hz
	43700 Hz	37350 Hz	43700 Hz	50050 Hz		
-	22		<b>SHAPE SELECTION</b>			
		000 – 255	Allows to choose the kind of shape to be visualized amongst the 63 available ones. Each shape can be composed of a multitude of frames or be a single, static image. <b>(SEE TABLE BELOW FOR DETAILS)</b>			
-	23		<b>SHAPE SPEED</b>			
		000 – 255	Allows to set the speed at which the different frames of the selected shape are played by the unit <b>(SEE TABLE BELOW FOR DETAILS)</b>			

<b>BASIC ENGINE</b>		<b>DMX Value</b>	<b>Function</b>
<b>Standard</b>	<b>Shape</b>		
-	24		<b>SHAPE FADE</b>
		000 - 015	Snap
		016	Smooth, fading curve gamma 0.5
		017	Smooth, fading curve gamma 0.506
		018	Smooth, fading curve gamma 0.513
		...	...
		243	Smooth, fading curve gamma 1.986
		244	Smooth, fading curve gamma 1.993
		245	Smooth, fading curve gamma 2
		246 - 255	Smooth, fading curve with automatic gamma
		In case of shapes with multiple frames, it allows to select a snap or faded variation from frame to frame of the same shape. (SEE TABLE BELOW FOR DETAILS)	
-	25		<b>SHAPE R</b>
		000 - 255	Allows to select the colour of the pixels composing the selected shape, if all are left at 000 no shape will be visualized (unless the background dimmer and normal RGBW attributes of the unit are given a value, in which case a "negative" of the macro will be shown) (linear from no light to max brightness)
-	26		<b>SHAPE G</b>
		000 - 255	Same as Shape R (Linear from no light to max brightness)
-	27		<b>SHAPE B</b>
		000 - 255	Same as Shape R (Linear from no light to max brightness)
-	28		<b>SHAPE W</b>
		000 - 255	Same as Shape R (Linear from no light to max brightness)
-	29		<b>SHAPE DIMMER</b>
		000 - 255	Allows to select the overall brightness of the pixels involved in the selected shape (Linear from no light to max brightness)
-	30		<b>BACKGROUND DIMMER</b>
		000 - 255	Allows to select the overall brightness of the pixels NOT involved by the selected shape. The relevant colour is set using the normal RGBW channels of the washlight. (SEE TABLE BELOW FOR DETAILS)



<b>BASIC ENGINE</b>		<b>DMX Value</b>	<b>Function</b>
<b>Standard</b>	<b>Shape</b>		
-	31		<b>SHAPE TRANSITION</b>
		000 – 004	No fade
		005	100 ms
		...	...
		073	0.5 s
		...	...
		113	1 s
		...	...
		171	2s
		...	...
		216	3 s
		...	...
		255	4 s
Internal fade time between a shape and another one set via DMX. Using this "channel" when you change from a shape to a different one as if it was the console fade time will avoid the scrolling effect normally visible when having fades between eg. gobo changes in traditional lights. Fade time on the console should be set to 0.			
-	32		<b>SHAPE OFFSET</b>
		000 – 255	Depending on the selected shape the channel sets the "density" of the involved pixels (few random pixel, many random pixels) or enables an internal algorithm that will distribute the macro between a multitude of lights on a specific DMX line basing on their DMX starting address. <b>(SEE TABLE BELOW FOR DETAILS)</b>
-	33		<b>BACKGROUND STROBE</b>
		000 – 255	Allows to set a strobe rate for the pixels involved in a macro (SEE TABLE BELOW FOR DETAILS)
-	34		<b>BACKGROUND STROBE</b>
		000 – 255	Allows to set a strobe rate for the pixels NOT involved in a macro <b>(SEE TABLE BELOW FOR DETAILS)</b>

<b>BASIC ENGINE</b>		<b>DMX Value</b>	<b>Function</b>				
<b>Standard</b>	<b>Shape</b>						
-	35		<b>BACKGROUND SELECT</b>				
		<b>000 - 007</b>	Wash				
		<b>008</b>	No selection				
		<b>009</b>	Pixel 1				
		<b>010</b>	Ring 2				
		<b>011</b>	Ring 3				
		<b>012</b>	Ring 4				
		<b>013</b>	Pixel 1 + Ring 2				
		<b>014</b>	Pixel 1 + Ring 2 + Ring 3				
		<b>015</b>	Pixel 1 + Ring 2 + Ring 3 + Ring 4				
		<b>016</b>	Ring 2 + Ring 3 + Ring 4				
		<b>017</b>	Ring 3 + Ring 4				
		<b>018</b>	Pixel 1 + Ring 4				
		<b>019</b>	Ring 2 + Ring 3				
		<b>020</b>	Pixel 1 + Ring 3				
		<b>021</b>	Ring 2 + Ring 4				
		<b>022</b>	Pixel 1 + Ring 3 + Ring 4				
		<b>023</b>	Pixel 1 + Ring 2 + Ring 4				
			<b>024 - 254</b>	Wash			
			<b>255</b>	Mirror Effect			
Allows to reduce, if needed, the background to a lower amount of "rings". With selected macros this allows to mirror the image between the two halves of the fixture's head (in this case the RGBW channels of the washlight will set the colour of the mirrored half and the background will remain black. (SEE TABLE BELOW FOR DETAILS)							
-	36	<b>000 - 255</b>	<b>FREQUENCY</b> (Fine adjusting of frequency Base selected from the Function channel)				
			Frequency (if shape + frequency mode is selected)				
		<b>Base Frequency (see Function 2)</b>	<b>Min Freq. @ 0 bit</b>	<b>Frequency @ 128 bit</b>	<b>Max Freq. @ 255 bit</b>		
		1000 Hz	746 Hz	1000 Hz	1254 Hz		
		1500 Hz	1246 Hz	1500 Hz	1754 Hz		
		2400 Hz	1765 Hz	2400 Hz	3035 Hz		
		3700 Hz	3065 Hz	3700 Hz	4335 Hz		
		5600 Hz	4330 Hz	5600 Hz	6870 Hz		
		9400 Hz	6860 Hz	9400 Hz	11940 Hz		
		15100 Hz	11925 Hz	15100 Hz	18275 Hz		
		21400 Hz	18225 Hz	21400 Hz	24575 Hz		
		31000 Hz	24650 Hz	31000 Hz	37350 Hz		
		43700 Hz	37350 Hz	43700 Hz	50050 Hz		

Shape Selection	Shape Slot	Macro Name	Description	Random colors *1	SHAPE SPEED	SHAPE OFFSET	SHAPE FADE	BACKGROUND SELECT
0-7		Macro OFF		N.a.	N.a.	N.a.	N.a.	N.a.
8	1	Pixel 1	Static effects.  The ring or rings used by the macro are turned-on with the foreground colour.	N.a.	N.a.	N.a.	0-15 = Snap effect 16-255 = Fade effect and gamma selection	0-7 = wash 8-23 = Bkgnd rings selection 24-255 = wash
9	2	Ring 1						
10	3	Ring 2						
11	4	Ring 3						
12	5	Pixel 1+Ring 1						
13	6	Pixel 1+Ring 2						
14	7	Pixel 1+Ring 3						
15	8	Single ring (Ramp -/+)		Yes	0-63 = Radius size, static. 64-158 = max to min speed, Closing effect 159-160 = STOP 161-255 = min to max speed, Opening effect	0-9 → continuous 10-255 → random distribution of flash	0-15 = Snap effect 16-255 = Fade effect and gamma selection	0-7 = wash 8-23 = Bkgnd rings selection 24-255 = wash
16	9	Filled rings (ramp -/+)	Yes					
17	10	Open/Close 1	Yes					
18	11	Open/Close 2	Yes					
19	12	Random pixels 1		Yes	0-63 = STOP 64-158 = max to min speed, Instant-on + fadeout. 159-160 = STOP. 161-255 = min to max speed, FadeIn + FadeOut.	0-255 → select random distribution from 2 up to 20 fixtures	0-15 = Snap effect 16-255 = Fade effect and gamma selection	0-7 = wash 8-23 = Bkgnd rings selection 24-254 = wash  All Fixtures: 255 = Mirror Effect
20	13	Random pixels 2	Yes	0-255 → select pixel density				
21	14	Rainbow 1 (Variable speed)		N.a.	0-63 = Angle 0-360°, static. 64-158 = max to min speed, c.cw rotation 159-160 = STOP 161-255 = min to max speed, cw rotation	0-255 → angle offset from 0 to 360°	0-15 = Snap effect 16-255 = Fade effect and gamma selection	0-7 = wash 8-23 = Bkgnd rings selection 24-255 = wash
22	15	Rainbow 2 (Fixed speed with variable color offset)		N.a.	0-63 = STOP 64-158 = c.cw rotation 159-160 = STOP 161-255 = cw rotation  The value 64-158 or 161-255 change the rainbow angle offset (the orange starting angle).	N.a.	0-15 = Snap effect 16-255 = Fade effect and gamma selection	0-7 = wash 8-23 = Bkgnd rings selection 24-255 = wash
23	16	Fan		N.a.	0-63 = angle offset, 0-360° 64-158 = max to min speed, c.cw rotation 159-160 = STOP 161-255 = min to max speed, cw rotation	0-255 → angle offset from 0 to 360°	0-15 = Snap effect 16-255 = Fade effect and gamma selection	0-7 = wash 8-23 = Bkgnd rings selection 24-255 = wash  For all fixtures: - Macro 25, 26 255 = Mirror Effect with bkgnd color - Macro 27, 28, 29 255 = Show Alternative Color
24	17	Bar 1						
25	18	Half moon						
26	19	Triangle						
27	20	Segment 1						
28	21	Arc 1						
29	22	Arc 2						

Shape Selection	Shape Slot	Macro Name	Description	Random colors *1	SHAPE SPEED	SHAPE OFFSET	SHAPE FADE	BACKGROUND SELECT		
30	23	Bar 2 (Variable size)		N.a.	0-63 = STOP, indexed speed 64-158 = max to min speed, c.cw rotation. 159-160 = STOP. 161-255 = min to max speed cc rotation.	0-255 → select shape width	Linear fade	0-7 = wash 8-23 = Bkgnd rings selection 24-254 = wash 255 = Mirror effect with bkgnd color  <b>Note:</b> Mirror effect unavailable for macro 31. Macro 67, 68, 69: the mirror effect is available only for options 1, 3, 9		
31	24	Random explosion		Yes		0-255 → select random distribution	Linear fade and wake length			
32	25	Segment 2		N.a.		0-255 → select shape width	Linear fade and wake length			
33	26	x Bump				0-255 → select macro offset				
34	27	Image				Linear fade				
35	28	Bumping section								
36	29	Ramp by 6				Linear fade and wake length				
37	30	Ramp by 4								
38	31	Left/Right scrolling bar				Linear fade				
39	32	Up/Down scrolling bar								
40	33	Bar 3				Linear fade				
41	34	Vertical arc 1								
42	35	Vertical arc 2				Linear fade and wake length				
43	36	Horizontal arc 1								
44	37	Horizontal arc 2				Linear fade and wake length				
45	38	Mirrored pixel								
46	39	Pixel animation 1				Linear fade				
47	40	Pixel animation 2								
48	41	Pixel animation 3				Linear fade and wake length				
49	42	Pixel animation 4								
50	43	Pixel animation 5				Linear fade				
51	44	Semi arc (Ramp /+)								
52	45	Bumping arc section				Linear fade and wake length				
53	46	Pixel animation 6								
54	47	Vertical ramp by 2				Linear fade				
55	48	Following pixel by 2								
56	49	Syncopation				Linear fade and wake length				
57	50	Bumping 1								
58	51	Bumping 2				Linear fade				
59	52	Bumping 3								
60	53	Vertical pixel scrolling				Linear fade and wake length				
61	54	Random vertical section								
62	55	Random central section				Linear fade				
63	56	Random ring 2								
64	57	Random ring 3				Linear fade and wake length				
65	58	Random ring 1+3								
66	59	Random ring 2+3				Linear fade and wake length				
67	60	Single pixel ring 1								
68	61	Single pixel ring 2				Linear fade				
69	62	Single pixel ring 3								
70	63	Spiral				N.a.	0-255 → select macro width		Linear fade and wake length	
71-255	64					N.a.	N.a.		N.a.	N.a.

<b>PIXEL ENGINE</b>		<b>DMX Value</b>	<b>Function</b>
<b>RGB</b>	<b>RGBW</b>		
1...109	1...145	000 – 255	<b>RED</b> Linear 0 – 100%
2...110	2...146	000 – 255	<b>GREEN</b> Linear 0 – 100%
3...111	3...147	000 – 255	<b>BLUE</b> Linear 0 – 100%
-	4...148	000 – 255	<b>WHITE</b> Linear 0 – 100%

LED reference number for pixel mapping (TILT: channel 16 @ 200 bit)

