

DMX protocol

Preliminary – Firmware version 1.1.0 – March 27, 2014

Basic 16-bit Mode

Channel	DMX Value	Percent	Function	Fade type	Default value
1	0 - 19	0 - 7	Strobe/shutter effect Shutter closed	Snap	30
	20 - 49	8 - 19	Shutter open		
	50 - 200	20 - 78	Strobe, slow → fast		
	201 - 210	79 - 82	Shutter open		
	211 - 255	82 - 100	Random strobe, slow → fast		
2	0 - 65535	0 - 100	Dimmer fade (MSB) Closed → open	Fade	0
3			Dimmer fade, fine (LSB)	Fade	0
4	0 - 255	0 - 100	Red 0 → 100%	Fade	0
5	0 - 255	0 - 100	Green 0 → 100%	Fade	0
6	0 - 255	0 - 100	Blue 0 → 100%	Fade	0
7	0 - 10	0 - 4	CTC Disabled	Fade	101
	11 - 171	4 - 67	Color temp. from 2000 K to 10 000 K in 50 K steps (see Table 3 on page 26)		
	171 - 255	67 - 100	10 000 K		
8	0 - 10	0 - 4	'Color wheel' color selection effect Open. RGB color mixing enabled	Snap	0
	11 - 12	4 - 5	Color 1 - LEE 790 - Moroccan pink		
	13 - 14	5	Color 2 - LEE 157 - Pink		
	15 - 16	6	Color 3 - LEE 332 - Special rose pink		
	17 - 18	7	Color 4 - LEE 328 - Follies pink		
	19 - 20	7 - 8	Color 5 - LEE 345 - Fuchsia pink		
	21 - 22	8 - 9	Color 6 - LEE 194 - Surprise pink		
	23 - 24	9	Color 7 - LEE 181 - Congo Blue		
	25 - 26	10	Color 8 - LEE 071 - Tokyo Blue		
	27 - 28	11	Color 9 - LEE 120 - Deep Blue		
	29 - 30	11 - 12	Color 10 - LEE 079 - Just Blue		
	31 - 32	12 - 13	Color 11 - LEE 132 - Medium Blue		
	33 - 34	13	Color 12 - LEE 200 - Double CT Blue		
	35 - 36	14	Color 13 - LEE 161 - Slate Blue		
	37 - 38	14 - 15	Color 14 - LEE 201 - Full CT Blue		
	39 - 40	15 - 16	Color 15 - LEE 202 - Half CT Blue		
	41 - 42	16	Color 16 - LEE 117 - Steel Blue		
	43 - 44	17	Color 17 - LEE 353 - Lighter Blue		
	45 - 46	18	Color 18 - LEE 118 - Light Blue		
	47 - 48	18 - 19	Color 19 - LEE 116 - Medium Blue Green		
	49 - 50	19 - 20	Color 20 - LEE 124 - Dark Green		
	51 - 52	20	Color 21 - LEE 139 - Primary Green		
	53 - 54	21	Color 22 - LEE 089 - Moss Green		
	55 - 56	21 - 22	Color 23 - LEE 122 - Fern Green		
	57 - 58	22 - 23	Color 24 - LEE 738 - JAS Green		
	59 - 60	23	Color 25 - LEE 088 - Lime Green		
	61 - 62	24	Color 26 - LEE 100 - Spring Yellow		
	63 - 64	25	Color 27 - LEE 104 - Deep Amber		
	65 - 66	25 - 26	Color 28 - LEE 179 - Chrome Orange		
	67 - 68	26 - 27	Color 29 - LEE 105 - Orange		
	69 - 70	27	Color 30 - LEE 021 - Gold Amber		
	71 - 72	28	Color 31 - LEE 778 - Millennium Gold		
73 - 74	29	Color 32 - LEE 135 - Deep Golden Amber			
75 - 76	29 - 30	Color 33 - LEE 164 - Flame Red			
77 - 78	30	Color 34 - Magenta			
79 - 80	31	Color 35 - Medium Lavender			
81 - 82	32	Color 36 - Pure White			

Table 1: DMX Protocol - Basic 16-bit mode

Channel	DMX Value	Percent	Function	Fade type	Default value
8 (cont.)	83 - 103	32 - 40	'Color wheel rotation' effect Clockwise, fast → slow Stop (this will stop wherever the color is at the time) Counter-clockwise, slow → fast	Snap	0
	104 - 106	41			
	107 - 127	42 - 50			
	128 - 129	50	Split color Color preset 1		
	130 - 131	51	Color preset 2		
	132 - 133	52	Color preset 3		
	134 - 135	52 - 53	Color preset 4		
	136 - 137	53 - 54	Color preset 5		
	138 - 139	54	Color preset 6		
	140 - 141	55	Color preset 7		
	142 - 143	55 - 56	Color preset 8		
	144 - 145	56 - 57	Color preset 9		
	146 - 147	57	Color preset 10		
	148 - 149	58	Color preset 11		
	150 - 151	59	Color preset 12		
	152 - 153	59 - 60	Color preset 13		
	154 - 155	60 - 61	Color preset 14		
	156 - 157	61	Color preset 15		
	158 - 159	62	Color preset 16		
	160 - 161	63	Color preset 17		
	162 - 163	63 - 64	Color preset 18		
	164 - 165	64	Color preset 19		
	166 - 167	65	Color preset 20		
	168 - 169	66	Color preset 21		
	170 - 171	66 - 67	Color preset 22		
	172 - 173	67 - 68	Color preset 23		
	174 - 175	68	Color preset 24		
	176 - 177	69	Color preset 25		
	178 - 179	70	Color preset 26		
	180 - 181	70 - 71	Color preset 27		
	182 - 183	71	Color preset 28		
	184 - 185	72	Color preset 29		
	186 - 187	73	Color preset 30		
	188 - 189	73 - 74	Color preset 31		
	190 - 191	74 - 75	Color preset 32		
	192 - 193	75	Color preset 33		
194 - 195	76	Color preset 34			
196 - 197	77	Color preset 35			
198 - 199	77 - 78	Color preset 36			
200 - 220	78 - 86	'Color wheel rotation' effect Clockwise, fast → slow			
221 - 224	86 - 88	Stop (this will stop wherever the color is at the time)			
225 - 245	88 - 96	Counter-clockwise, slow → fast			
246 - 255	96 - 100	Open			
9	0 - 200 201 - 255	0 - 78 79 - 100	Zoom Flood → spot Overdrive min. → max.	Fade	200
10	0 - 65535	0 - 100	Pan, 16-bit (MSB and LSB) Left → right (32768 = neutral)	Fade	32768
11					
12	0 - 65535	0 - 100	Tilt, 16-bit (MSB and LSB) Up → down (32768 = neutral)	Fade	32768
13					

Table 1: DMX Protocol - Basic 16-bit mode

Channel	DMX Value	Percent	Function	Fade type	Default value	
14			Fixture control/settings (hold for number of seconds indicated to activate)			
	0 - 9	0 - 4	No function (disables calibration) – 5 sec.			
	10 - 14	4 - 5	Reset entire fixture – 5 sec.			
	15	6	Reset shutter/dimmer only – 5 sec.			
	16	6	Reset color only – 5 sec.			
	17	7	Reset beam only – 5 sec.			
	18	7	Reset pan and tilt only – 5 sec.			
	19 - 22	7 - 9	No function			
	23	9	Linear dimming curve – 1 sec. (menu override, setting unaffected by power off/on)			
	24	9	Square law dimming curve – 1 sec. (menu override, factory default setting, setting unaffected by power off/on)			
	25	10	Inverse square law dimming curve – 1 sec. (menu override, setting unaffected by power off/on)			
	26	10	S-curve dimming curve – 1 sec. (menu override, setting unaffected by power off/on)			
	27	11	No function			
	28	11	Fast pan and tilt speed – 1 sec. (default setting, menu override - setting returns to MENU setting after power on/off)			
	29	11	Smooth pan and tilt speed – 1 sec. (menu override - setting returns to MENU setting after power on/off)			
	30	12	Parameter shortcuts = ON (default)			
	31	12	Parameter shortcuts = OFF		Snap	0
	32 - 35	13 - 14	No function			
	36	14	Enable video tracking			
	37	14	Disable video tracking			
	38	15	Extended color (default)			
	39	15	Calibrated color			
	40 - 49	16 - 19	No function			
	50	20	Regulated fan speed, fixed intensity (default)			
	51	20	Fixed fan speed, regulated intensity			
	52	20	Turn on control panel display – 1 sec.			
	53	21	Turn off control panel display – 1 sec.			
	54 - 99	21 - 39	No function			
	100	39	Enable calibration – 5 sec.			
	101	39	Store pan and tilt calibration – 5 sec.			
	102	40	Store dimmer calibration – 5 sec.			
	103 - 110	40 - 43	No function			
	111	43	Store Beam Twister calibration – 5 sec.			
	112 - 113	44	No function			
	114	45	Store zoom calibration – 5 sec.			
	115	45	Store pan calibration – 5 sec.			
	116	45	Store tilt calibration – 5 sec.			
	117 - 198	46 - 77	No function			
	199	78	Reset all calibration values to factory defaults – 5 sec.			
	200 - 255	78 - 100	No function			

Table 1: DMX Protocol - Basic 16-bit mode

MSB = Most significant byte

LSB = Least significant byte

16-bit Extended Mode

Channel	DMX Value	Percent	Function	Fade type	Default value
1	0 - 19	0 - 7	Strobe/shutter effect Shutter closed Shutter open Strobe, slow → fast Shutter open Random strobe, slow → fast	Snap	30
	20 - 49	8 - 19			
	50 - 200	20 - 78			
	201 - 210	79 - 82			
	211 - 255	82 - 100			
2	0 - 65535	0 - 100	Dimmer fade (MSB) Closed → open	Fade	0
			Dimmer fade, fine (LSB)	Fade	0
4	0 - 10	0 - 4	CTC Disabled Color temp. from 2000 K to 10 000 K in 50 K steps (see Table 3 on page 26) 10 000 K	Fade	101
	11 - 171	4 - 67			
	171 - 255	67 - 100			
5	0 - 10	0 - 4	'Color wheel' color selection effect Open. RGB color mixing enabled Color 1 - LEE 790 - Moroccan pink Color 2 - LEE 157 - Pink Color 3 - LEE 332 - Special rose pink Color 4 - LEE 328 - Follies pink Color 5 - LEE 345 - Fuchsia pink Color 6 - LEE 194 - Surprise pink Color 7 - LEE 181 - Congo Blue Color 8 - LEE 071 - Tokyo Blue Color 9 - LEE 120 - Deep Blue Color 10 - LEE 079 - Just Blue Color 11 - LEE 132 - Medium Blue Color 12 - LEE 200 - Double CT Blue Color 13 - LEE 161 - Slate Blue Color 14 - LEE 201 - Full CT Blue Color 15 - LEE 202 - Half CT Blue Color 16 - LEE 117 - Steel Blue Color 17 - LEE 353 - Lighter Blue Color 18 - LEE 118 - Light Blue Color 19 - LEE 116 - Medium Blue Green Color 20 - LEE 124 - Dark Green Color 21 - LEE 139 - Primary Green Color 22 - LEE 089 - Moss Green Color 23 - LEE 122 - Fern Green Color 24 - LEE 738 - JAS Green Color 25 - LEE 088 - Lime Green Color 26 - LEE 100 - Spring Yellow Color 27 - LEE 104 - Deep Amber Color 28 - LEE 179 - Chrome Orange Color 29 - LEE 105 - Orange Color 30 - LEE 021 - Gold Amber Color 31 - LEE 778 - Millennium Gold Color 32 - LEE 135 - Deep Golden Amber Color 33 - LEE 164 - Flame Red Color 34 - Magenta Color 35 - Medium Lavender Color 36 - Pure White	Snap	0
	11 - 12	4 - 5			
	13 - 14	5			
	15 - 16	6			
	17 - 18	7			
	19 - 20	7 - 8			
	21 - 22	8 - 9			
	23 - 24	9			
	25 - 26	10			
	27 - 28	11			
	29 - 30	11 - 12			
	31 - 32	12 - 13			
	33 - 34	13			
	35 - 36	14			
	37 - 38	14 - 15			
	39 - 40	15 - 16			
	41 - 42	16			
	43 - 44	17			
	45 - 46	18			
	47 - 48	18 - 19			
	49 - 50	19 - 20			
	51 - 52	20			
	53 - 54	21			
	55 - 56	21 - 22			
	57 - 58	22 - 23			
	59 - 60	23			
	61 - 62	24			
	63 - 64	25			
	65 - 66	25 - 26			
	67 - 68	26 - 27			
	69 - 70	27			
	71 - 72	28			
73 - 74	29				
75 - 76	29 - 30				
77 - 78	30				
79 - 80	31				
81 - 82	32				

Table 2: DMX Protocol - 16-bit Extended Mode

Channel	DMX Value	Percent	Function	Fade type	Default value
5 (cont.)	83 - 103	32 - 40	'Color wheel rotation' effect Clockwise, fast → slow Stop (this will stop wherever the color is at the time) Counter-clockwise, slow → fast	Snap	0
	104 - 106	41			
	107 - 127	42 - 50			
	128 - 129	50	Split color Color preset 1		
	130 - 131	51			
	132 - 133	52			
	134 - 135	52 - 53			
	136 - 137	53 - 54			
	138 - 139	54			
	140 - 141	55			
	142 - 143	55 - 56			
	144 - 145	56 - 57			
	146 - 147	57			
	148 - 149	58			
	150 - 151	59			
	152 - 153	59 - 60			
	154 - 155	60 - 61			
	156 - 157	61			
	158 - 159	62			
	160 - 161	63			
	162 - 163	63 - 64			
	164 - 165	64			
	166 - 167	65			
	168 - 169	66			
	170 - 171	66 - 67			
	172 - 173	67 - 68			
	174 - 175	68			
	176 - 177	69			
	178 - 179	70			
	180 - 181	70 - 71			
	182 - 183	71			
	184 - 185	72			
186 - 187	73				
188 - 189	73 - 74				
190 - 191	74 - 75				
192 - 193	75				
194 - 195	76				
196 - 197	77				
198 - 199	77 - 78				
200 - 220	78 - 86	'Color wheel rotation' effect Clockwise, fast → slow Stop (this will stop wherever the color is at the time) Counter-clockwise, slow → fast Open			
221 - 224	86 - 88				
225 - 245	88 - 96				
246 - 255	96 - 100				
6	0 - 200 201 - 255	0 - 78 79 - 100	Zoom Flood → spot Overdrive min. → max.	Fade	200

Table 2: DMX Protocol - 16-bit Extended Mode

Channel	DMX Value	Percent	Function	Fade type	Default value
7 and 8	0 - 32768	0 - 50	Beam twister, 16-bit (MSB and LSB) Index 0 → 360	Snap	0
	32769 - 40000	50 - 61	Disable		
	40001 - 49990	61 - 77	Rotation CW Fast → CW Slow		
	49991 - 50000	77	No rotation (lens stops at its current position)		
	50001 - 59990	77 - 92	Rotation CCW Slow → CCW Fast		
	59991 - 59999	92	Disable		
	60000 - 60999	92	Position 1: Wide		
	60100 - 60199	92	Position 2: Smooth		
	60200 - 60299	92	Position 3: Texture		
	60300 - 60399	92	Position 4: Dots		
	60400 - 60499	93	Position 5: Eye		
	60500 - 60599	93	Position 6: Donut		
	60600 - 60699	93	Position 7: Beam		
	60700 - 60799	93	Position 8: Beam 2		
	60800 - 60899	93	Position 9: Beam 3		
	60900 - 60999	93	Position 10: Beam 4		
	61000 - 61099	94	Position 11: Mixed		
	61100 - 61199	94	Position 12: Separation		
	61200 - 61299	94	Position 13: Separation 2		
	61300 - 61399	94	Position 14: Rays		
	61400 - 61499	94	Position 15: Halo		
	61500 - 61599	94	Position 16: Two Areas		
	61600 - 61699	94	Position 17: Clean Colors		
61700 - 61799	95	Position 18: Crossover			
61800 - 61899	95	Position 19			
61900 - 61999	95	Position 20			
62000 - 65355	95 - 100	Disable			
9	0 - 65535	0 - 100	Pan, 16-bit (MSB and LSB) Left → right (32768 = neutral)	Fade	32768
10					
11	0 - 65535	0 - 100	Tilt, 16-bit (MSB and LSB) Up → down (32768 = neutral)	Fade	32768
12					

Table 2: DMX Protocol - 16-bit Extended Mode

Channel	DMX Value	Percent	Function	Fade type	Default value
13			Fixture control/settings <i>(hold for number of seconds indicated to activate)</i>	Snap	0
	0 - 9	0 - 4	<i>No function (disables calibration) – 5 sec.</i>		
	10 - 14	4 - 5	Reset entire fixture – 5 sec.		
	15	6	Reset shutter/dimmer only – 5 sec.		
	16	6	Reset color only – 5 sec.		
	17	7	Reset beam only – 5 sec.		
	18	7	Reset pan and tilt only – 5 sec.		
	19 - 22	7 - 9	<i>No function</i>		
	23	9	Linear dimming curve – 1 sec. <i>(menu override, setting unaffected by power off/on)</i>		
	24	9	Square law dimming curve – 1 sec. <i>(menu override, factory default setting, setting unaffected by power off/on)</i>		
	25	10	Inverse square law dimming curve – 1 sec. <i>(menu override, setting unaffected by power off/on)</i>		
	26	10	S-curve dimming curve – 1 sec. <i>(menu override, setting unaffected by power off/on)</i>		
	27	11	<i>No function</i>		
	28	11	Fast pan and tilt speed – 1 sec. <i>(default setting, menu override - setting returns to MENU setting after power on/off)</i>		
	29	11	Smooth pan and tilt speed – 1 sec. <i>(menu override - setting returns to MENU setting after power on/off)</i>		
	30	12	Parameter shortcuts = ON (default)		
	31	12	Parameter shortcuts = OFF		
	32 - 35	13 - 14	<i>No function</i>		
	36	14	Enable video tracking		
	37	14	Disable video tracking		
	38	15	Extended color (default)		
	39	15	Calibrated color		
	40 - 49	16 - 19	<i>No function</i>		
	50	20	Regulated fan speed, fixed intensity (default)		
	51	20	Fixed fan speed, regulated intensity		
	52	20	Turn on control panel display – 1 sec.		
	53	21	Turn off control panel display – 1 sec.		
	54 - 99	21 - 39	<i>No function</i>		
	100	39	Enable calibration – 5 sec.		
	101	39	Store pan and tilt calibration – 5 sec.		
	102	40	Store dimmer calibration – 5 sec.		
	103 - 110	40 - 43	<i>No function</i>		
	111	43	Store Beam Twister calibration – 5 sec.		
112 - 113	44	<i>No function</i>			
114	45	Store zoom calibration – 5 sec.			
115	45	Store pan calibration – 5 sec.			
116	45	Store tilt calibration – 5 sec.			
117 - 198	46 - 77	<i>No function</i>			
199	78	Reset all calibration values to factory defaults – 5 sec.			
200 - 255	78 - 100	<i>No function</i>			
14-18	<i>No function - reserved for future use</i>				

Color - Outer

19	0 - 255	0 - 100	Red 0 → 100%	Fade	255
20	0 - 255	0 - 100	Green 0 → 100%	Fade	255
21	0 - 255	0 - 100	Blue 0 → 100%	Fade	255

Color - Middle

22	0 - 255	0 - 100	Red 0 → 100%	Fade	255
23	0 - 255	0 - 100	Green 0 → 100%	Fade	255
24	0 - 255	0 - 100	Blue 0 → 100%	Fade	255

Table 2: DMX Protocol - 16-bit Extended Mode

Channel	DMX Value	Percent	Function	Fade type	Default value
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Color - Center

25	0 - 255	0 - 100	Red 0 → 100%	Fade	255
26	0 - 255	0 - 100	Green 0 → 100%	Fade	255
27	0 - 255	0 - 100	Blue 0 → 100%	Fade	255

Aura

28	0 - 19 20 - 49 50 - 200 201 - 210 211 - 255	0 - 7 8 - 19 20 - 78 79 - 82 82 - 100	Strobe/shutter effect Shutter closed Shutter open Strobe, slow → fast Shutter open Random strobe, slow → fast	Snap	30
29	0 - 255	0 - 100	Dimmer (MSB) Closed → open	Fade	0
30	0 - 255	0 - 100	Red 0 → 100%	Fade	255
31	0 - 255	0 - 100	Green 0 → 100%	Fade	255
32	0 - 255	0 - 100	Blue 0 → 100%	Fade	255

Table 2: DMX Protocol - 16-bit Extended Mode

Channel	DMX Value	Percent	Function	Fade type	Default value
33	0 - 10	0 - 4	'Color wheel' color selection effect	Snap	0
	11 - 15	4 - 6	Open. RGB color mixing enabled		
	16 - 20	6 - 8	Color 1 - LEE 790 - Moroccan pink		
	21 - 25	8 - 10	Color 2 - LEE 157 - Pink		
	26 - 30	10 - 12	Color 3 - LEE 332 - Special rose pink		
	31 - 35	12 - 14	Color 4 - LEE 328 - Follies pink		
	36 - 40	14 - 16	Color 5 - LEE 345 - Fuchsia pink		
	41 - 45	16 - 18	Color 6 - LEE 194 - Surprise pink		
	46 - 50	18 - 20	Color 7 - LEE 181 - Congo Blue		
	51 - 55	20 - 21	Color 8 - LEE 071 - Tokyo Blue		
	56 - 60	22 - 23	Color 9 - LEE 120 - Deep Blue		
	61 - 65	24 - 25	Color 10 - LEE 079 - Just Blue		
	66 - 70	26 - 27	Color 11 - LEE 132 - Medium Blue		
	71 - 75	28 - 29	Color 12 - LEE 200 - Double CT Blue		
	76 - 80	30 - 31	Color 13 - LEE 161 - Slate Blue		
	81 - 85	32 - 33	Color 14 - LEE 201 - Full CT Blue		
	86 - 90	34 - 35	Color 15 - LEE 202 - Half CT Blue		
	91 - 95	36 - 37	Color 16 - LEE 117 - Steel Blue		
	96 - 100	38 - 39	Color 17 - LEE 353 - Lighter Blue		
	101 - 105	39 - 41	Color 18 - LEE 118 - Light Blue		
	106 - 110	41 - 43	Color 19 - LEE 116 - Medium Blue Green		
	111 - 115	43 - 45	Color 20 - LEE 124 - Dark Green		
	116 - 120	45 - 47	Color 21 - LEE 139 - Primary Green		
	121 - 125	47 - 49	Color 22 - LEE 089 - Moss Green		
	126 - 130	49 - 51	Color 23 - LEE 122 - Fern Green		
	131 - 135	51 - 53	Color 24 - LEE 738 - JAS Green		
	136 - 140	53 - 55	Color 25 - LEE 088 - Lime Green		
	141 - 145	55 - 57	Color 26 - LEE 100 - Spring Yellow		
	146 - 150	57 - 59	Color 27 - LEE 104 - Deep Amber		
	151 - 155	59 - 61	Color 28 - LEE 179 - Chrome Orange		
	156 - 160	61 - 63	Color 29 - LEE 105 - Orange		
	161 - 165	63 - 64	Color 30 - LEE 021 - Gold Amber		
	166 - 170	65 - 66	Color 31 - LEE 778 - Millennium Gold		
171 - 175	67 - 68	Color 32 - LEE 135 - Deep Golden Amber			
176 - 180	69 - 70	Color 33 - LEE 164 - Flame Red			
181 - 185	71 - 72	Color 34 - Magenta			
186 - 190	73 - 74	Color 35 - Medium Lavender			
			Color 36 - Pure White		
			'Color wheel rotation' effect		
	191 - 214	75 - 84	Clockwise, fast → slow		
	215 - 219	84 - 86	Stop (this will stop wherever the color is at the time)		
	220 - 243	86 - 95	Counter-clockwise, slow → fast		
			Random colors		
	244 - 247	95 - 96	Fast		
	248 - 251	97 - 98	Medium		
	252 - 255	98 - 100	Slow		

Table 2: DMX Protocol - 16-bit Extended Mode

MSB = Most significant byte

LSB = Least significant byte