Kelvin™ DMX

Protocol Version 1.18

GEKKO®
TECHNOLOGY LTD

Kelvin™ DMX Protocol
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DMX Protocol

Introduction

This document details Element Labs' DMX Protocol, Rev. 1.18. The protocol defines 3 modes of operation:

- Film & Video Mode (p. 2)
- 6 Color Mode (p. 6)
- RGB Mode (p. 8)

Most modes use 10 DMX channels as shown in the table below.

DMX Ch.	Film / Video Mode	6 Color Mode	RGB Mode
1	Mode	Mode	Mode
2	Intensity	Intensity	Intensity
3	Correlated Color Temperature (CCT)	Red	Correlated Color Temperature (CCT)
4	Output Mode	Green	Red
5	Plus / Minus Green Filter	Blue	Green
6		Cyan	Blue
7		Orange	
8	AutoFade Time	White	AutoFade Time
9	Strobe Duration	Strobe Duration	Strobe Duration
10	Strobe Rate	Strobe Rate	Strobe Rate

Channel 1 defines the mode for each fixture, as shown in the table below. The default mode is Film & Video (0%/000).

DMX Percent	DMX Decimal	Mode	Mode Description
0 - 5%	000-012	1	Film & Video
6 - 15%	015-038	2	6 Color Mode
16 - 25%	040-063	3	RGB Mode

Auto Fade Mode

The DMX Auto Fade mode allows you to smoothly transition (fade) between settings. For example, set the intensity to 80% and Auto Fade Time to 1 second. Now adjust the intensity to 20%. The fixture will take 1 second to transition between 80% intensity and 20% intensity.

Film & Video Mode

DMX Channel	Function	
1	Mode	
2	Intensity	
3	Correlated Color Temperature (CCT)	
4	Output Mode	
5	Plus / Minus Green Filter	(relative to the CCT selected via channel 3)
6		
7		
8	AutoFade Time	
9	Strobe Duration	
10	Strobe Rate	

Channel 2 - Intensity

default=off (0% / 000)

percent	decimal	
0%	000	off
↓	↓	↓
100%	255	Full intensity

Channel 3 - Correlated Color Temperature

default=3200K (10% / 025)

displayed CCT values rounded to nearest 10K, some rounded to nearest target CCT (bold)

percent	decimal	cct	percent	decimal	cct	percent	decimal	cct
0%	0	**2200K**	7%	18	2500K	14%	36	2810K
0%	1	2220K	7%	19	2520K	15%	37	2820K
1%	2	2230K	8%	20	2540K	15%	38	2840K
1%	3	2250K	8%	21	2550K	15%	39	2860K
2%	4	2270K	9%	22	2570K	16%	40	2870K
2%	5	2280K	9%	23	2590K	16%	41	2890K
2%	6	2300K	9%	24	2600K	16%	42	**2900K**
3%	7	2320K	10%	25	2620K	17%	43	2930K
3%	8	2330K	10%	26	2640K	17%	44	2940K
4%	9	2350K	11%	27	2660K	18%	45	2960K
4%	10	2370K	11%	28	2670K	18%	46	2980K
4%	11	2390K	11%	29	2690K	18%	47	2990K
5%	12	2400K	12%	30	**2700K**	19%	48	**3000K**
5%	13	2420K	12%	31	2720K	19%	49	3030K
5%	14	2440K	13%	32	2740K	20%	50	3040K
6%	15	2450K	13%	33	2760K	20%	51	3060K
6%	16	2470K	13%	34	2770K	20%	52	3080K
7%	17	2490K	14%	35	2790K	21%	53	3090K

Channel 3 - Correlated Color Temperature (continued)

percent	decimal	cct	percent	decimal	cct	percent	decimal	cct
21%	54	3110K	38%	96	3820K	54%	138	4530K
22%	55	3130K	38%	97	3840K	55%	139	4540K
22%	56	3140K	38%	98	3850K	55%	140	4560K
22%	57	3160K	39%	99	3870K	55%	141	4580K
23%	58	3180K	39%	100	3890K	56%	142	4590K
23%	59	**3200K**	40%	101	3900K	56%	143	4610K
24%	60	3210K	40%	102	3920K	56%	144	4630K
24%	61	3230K	40%	103	3940K	57%	145	4650K
24%	62	3250K	41%	104	3950K	57%	146	4660K
25%	63	3260K	41%	105	3970K	58%	147	4680K
25%	64	3280K	42%	106	3990K	58%	148	4700K
25%	65	3300K	42%	107	**4000K**	58%	149	4710K
26%	66	3310K	42%	108	4020K	59%	150	4730K
26%	67	3330K	43%	109	4040K	59%	151	4750K
27%	68	3350K	43%	110	4050K	60%	152	4760K
27%	69	3360K	44%	111	4070K	60%	153	4780K
27%	70	3380K	44%	112	4090K	60%	154	4800K
28%	71	3400K	44%	113	4110K	61%	155	4810K
28%	72	3410K	45%	114	4120K	61%	156	4830K
29%	73	3430K	45%	115	4140K	62%	157	4850K
29%	74	3450K	45%	116	4160K	62%	158	4860K
29%	75	3460K	46%	117	4170K	62%	159	4880K
30%	76	3480K	46%	118	4190K	63%	160	4900K
30%	77	3500K	47%	119	4210K	63%	161	4910K
31%	78	3520K	47%	120	4220K	64%	162	4930K
31%	79	3530K	47%	121	4240K	64%	163	4950K
31%	80	3550K	48%	122	4260K	64%	164	4970K
32%	81	3570K	48%	123	4270K	65%	165	4980K
32%	82	3580K	49%	124	4290K	65%	166	**5000K**
33%	83	**3600K**	49%	125	4310K	65%	167	5020K
33%	84	3620K	49%	126	4320K	66%	168	5030K
33%	85	3630K	50%	127	4340K	66%	169	5050K
34%	86	3650K	50%	128	4360K	67%	170	5070K
34%	87	3670K	51%	129	4380K	67%	171	5080K
35%	88	3680K	51%	130	4390K	67%	172	5100K
35%	89	3700K	51%	131	4410K	68%	173	5120K
35%	90	3720K	52%	132	4430K	68%	174	5130K
36%	91	3730K	52%	133	4440K	69%	175	5150K
36%	92	3750K	53%	134	4460K	69%	176	5170K
36%	93	3770K	53%	135	4480K	69%	177	5180K
37%	94	3790K	53%	136	**4500K**	70%	178	5200K
37%	95	3800K	54%	137	4510K	70%	179	5220K

Channel 3 - Correlated Color Temperature (continued)

percent	decimal	cct	percent	decimal	cct	percent	decimal	cct
71%	180	5240K	81%	206	5670K	91%	232	6110K
71%	181	5250K	81%	207	5690K	91%	233	6130K
71%	182	5270K	82%	208	5710K	92%	234	6150K
72%	183	5290K	82%	209	5720K	92%	235	6160K
72%	184	5300K	82%	210	5740K	93%	236	6180K
73%	185	5320K	83%	211	5760K	93%	237	6200K
73%	186	5340K	83%	212	5770K	93%	238	6210K
73%	187	5350K	84%	213	5790K	94%	239	6230K
74%	188	5370K	84%	214	5810K	94%	240	6250K
74%	189	5390K	84%	215	5830K	95%	241	6260K
75%	190	5400K	85%	216	5840K	95%	242	6280K
75%	191	5420K	85%	217	5860K	95%	243	6300K
75%	192	5440K	85%	218	5880K	96%	244	6310K
76%	193	5450K	86%	219	5890K	96%	245	6330K
76%	194	5470K	86%	220	5910K	96%	246	6350K
76%	195	5490K	87%	221	5930K	97%	247	6370K
77%	196	**5500K**	87%	222	5940K	97%	248	6380K
77%	197	5520K	87%	223	5960K	98%	249	6400K
78%	198	5540K	88%	224	5980K	98%	250	6420K
78%	199	5560K	88%	225	**6000K**	98%	251	6430K
78%	200	5570K	89%	226	6010K	99%	252	6450K
79%	201	5590K	89%	227	6030K	99%	253	6470K
79%	202	5610K	89%	228	6040K	100%	254	6480K
80%	203	5620K	90%	229	6060K	100%	255	**6500K**
80%	204	5640K	90%	230	6080K			
80%	205	5660K	91%	231	6100K			

Channel 4- Plus/Minus Green Filter Details

default=none (0% / 000)

percent	decimal	Plus Green preset
0 - 5%	000-012	none
6 - 15%	015-038	Minus Green
16 - 25%	040-063	3/4 Minus Green
26 - 35%	066-089	1/2 Minus Green
36 - 45%	091-114	1/4 Minus Green
46 - 55%	117-140	1/8 Minus Green
56 - 65%	142-165	1/8 Plus Green
66 - 75%	168-191	1/4 Plus Green
76 - 85%	193-216	1/2 Plus Green
86 - 95%	219-242	3/4 Plus Green
96 - 100%	244-255	Plus Green

Channel 8 - Autofade Time

default=off (0% / 000)

percent	decimal	time
0%	000	off
0.4%	001	0.1 sec.
↓	↓	↓
100%	255	25.5 sec.

NOTE

Fade time = decimal DMX value * 0.1 seconds

Channel 9 - Strobe Duration

default=off (0% / 000)

percent	decimal	duration
0%	000	off
1%	002	1%
↓	↓	↓
100%	255	100%

NOTE

Duration = 100% will appear the same as Strobe "off" (i.e. fixture may have intensity but will not be flashing because duration is 100%).

Channel 10 - Strobe Rate

default=0.25Hz (0% / 000)
Strobe Rate step = 0.25Hz

percent	decimal	rate (Hz[1])	rate (seconds per cycle)
0%	000	Frequency = 0.25Hz	
↓	↓	↓	
100%	255	Frequency = 64Hz	
	(sample settings)		
.4	001	.5	2
.8	002	.75	1.33
1.2	003	1	1
2	005	1.5	.67
2.7	007	2.0	.5

1. Hz=cycles per second

6 Color Mode

DMX Channel	Function
1	Mode
2	Intensity
3	Red
4	Green
5	Blue
6	Cyan
7	Orange
8	White
9	Strobe Duration
10	Strobe Rate

Channel 2 - Intensity

default=off (0% / 000)

percent	decimal	
0%	000	off
↓	↓	↓
100%	255	Full intensity

Channel 3 - Red

default=off (0% / 000)

percent	decimal	
0%	000	off
↓	↓	↓
100%	255	full red

Channel 4 - Green

default=off (0% / 000)

percent	decimal	
0%	000	off
↓	↓	↓
100%	255	full green

Channel 5 - Blue

default=off (0% / 000)

percent	decimal	
0%	000	off
↓	↓	↓
100%	255	full blue

Channel 6 - Cyan

default=off (0% / 000)

percent	decimal	
0%	000	off
↓	↓	↓
100%	255	full cyan

Channel 7 - Orange

default=off (0% / 000)

percent	decimal	
0%	000	off
↓	↓	↓
100%	255	full orange

Channel 8 - White

default=off (0% / 000)

percent	decimal	
0%	0	off
↓	↓	↓
100%	255	full white

Channel 9 - Strobe Duration

default=off (0% / 000)

percent	decimal	duration
0%	000	off
1%	002	1%
↓	↓	↓
100%	255	100%

NOTE

Duration = 100% will appear the same as Strobe "off".
i.e. - fixture may have intensity but will not be flashing because duration is 100%

Channel 10 - Strobe Rate

default=0.25Hz (0% / 000)
Strobe Rate step = 0.25Hz

percent	decimal	rate (Hz[1])	rate (seconds per cycle)
0%	000	Frequency = 0.25Hz	
↓	↓	↓	
100%	255	Frequency = 64Hz	
		(sample settings)	
.4	001	.5	2
.8	002	.75	1.33
1.2	003	1	1
2	005	1.5	.67
2.7	007	2.0	.5

1. Hz=cycles per second

RGB Mode

DMX Channel	Function	
1	Mode	
2	Intensity	
3	Correlated Color Temperature	
4	Red	**NOTE** These three channels are relative to the CCT selected via channel 3.
5	Green	
6	Blue	
7		
8	AutoFade Time	
9	Strobe Duration	
10	Strobe Rate	

Channel 2 - Intensity

default=off (0% / 000)

percent	decimal	
0%	000	off
↓	↓	↓
100%	255	Full intensity

Channel 3 - Correlated Color Temperature (CCT)

Please refer to Film & Video Mode, (p. 1-2) for the full listing of the CCT settings.

Channel 4 - Red

default=off (0% / 000)

percent	decimal	
0%	000	off
↓	↓	↓
100%	255	full red

Channel 5 - Green

default=off (0% / 000)

percent	decimal	
0%	000	off
↓	↓	↓
100%	255	full green

Channel 6 - Blue

default=off (0% / 000)

percent	decimal	
0%	000	off
↓	↓	↓
100%	255	full blue

Channel 8 - Autofade Time

default=off (0% / 000)

percent	decimal	time
0%	000	AutoFade off
0.4%	001	AutoFade = 0.1 sec.
↓	↓	↓
100%	255	AutoFade = 25.5 sec.

NOTE

Fade time = decimal DMX value * 0.1 seconds

Channel 9 - Strobe Duration

default=off (0% / 000)

percent	decimal	duration
0%	000	off
1%	002	1%
↓	↓	↓
100%	255	100%

NOTE

Duration = 100% will appear the same as Strobe "off".
i.e. - fixture may have intensity but will not be flashing because duration is 100%

Channel 10 - Strobe Rate

default=0.25Hz (0% / 000)
Strobe Rate step = 0.25Hz

percent	decimal	rate (Hz[1])	rate (seconds per cycle)
0%	000	Frequency = 0.25Hz	
↓	↓	↓	
100%	255	Frequency = 64Hz	
		(sample settings)	
.4	001	.5	2
.8	002	.75	1.33
1.2	003	1	1
2	005	1.5	.67
2.7	007	2.0	.5

1. Hz=cycles per second