



amaran PT

DMX Profile Specification

Controller Firmware V1.0

Content

Mode 1: CCT & RGB (10 Channels)	3
Mode 2: CCT (6 Channels)	3
Mode 3: CCT & HSI (9 Channels)	4
Mode 4: RGB (7 Channels)	4
Mode 5: HSI (6 Channels)	5
Mode 6: System FX - List of Effects (7 Channels)	5
Mode 7: Light Engine CCT & RGB 2 Pixels (14 Channels)	13
Mode 8: Light Engine CCT & RGB 4 Pixels (28 Channels)	14
Mode 9: Light Engine CCT & RGB 8 Pixels (56 Channels)	15
Mode 10: Light Engine CCT & RGB 16 Pixels (112 Channels)	16
Mode 11: Light Engine HSI 2 Pixels (6 Channels)	17
Mode 12: Light Engine HSI 4 Pixels (12 Channels)	17
Mode 13: Light Engine HSI 8 Pixels (24 Channels)	18
Mode 14: Light Engine HSI 16 Pixels (48 Channels)	18
Equations for Conversion	19

Mode 1: CCT & RGB

Channel	Value	Percent	Function	
1	0 - 255	0 - 100	Intensity	0 - 100%
2	0 - 255	0 - 100	CCT	2700 K - 10000 K
3	0 - 10	0 - 4	G / M	Neutral / No Effect
	11 - 20	5 - 8		Full Minus Green
	21 - 119	9 - 47		- 99% - - 1%
	120 - 145	48 - 57		Neutral / No Effect
	146 - 244	58 - 96		1% - 99%
245 - 255	97 - 100	Full Plus Green		
4	0 - 255	0 - 100	CCT ↔ RGB	Crossfade to Color
5	0 - 255	0 - 100	Red	0 - 100%
6	0 - 255	0 - 100	Green	0 - 100%
7	0 - 255	0 - 100	Blue	0 - 100%
8	Reserved for Future Use			
9	Reserved for Future Use			
10	0 - 19	0 - 7	Strobe	No Effect
	20 - 255	8 - 100		1 Hz - 25 Hz

Mode 2: CCT

Channel	Value	Percent	Function	
1	0 - 255	0 - 100	Intensity	0 - 100%
2	0 - 255	0 - 100	CCT	2700 K - 10000 K
3	0 - 10	0 - 4	G / M	Neutral / No Effect
	11 - 20	5 - 8		Full Minus Green
	21 - 119	9 - 47		- 99% - - 1%
	120 - 145	48 - 57		Neutral / No Effect
	146 - 244	58 - 96		1% - 99%
245 - 255	97 - 100	Full Plus Green		
4	Reserved for Future Use			
5	Reserved for Future Use			
6	0 - 19	0 - 7	Strobe	No Effect
	20 - 255	8 - 100		1 Hz - 25 Hz

Mode 3: CCT & HSI

Channel	Value	Percent	Function	
1	0 - 255	0 - 100	Intensity	0 - 100%
2	0 - 255	0 - 100	CCT	2700 K - 10000 K
3	0 - 10	0 - 4	G / M	Neutral / No Effect Full Minus Green - 99% - - 1% Neutral / No Effect 1% - 99% Full Plus Green
	11 - 20	5 - 8		
	21 - 119	9 - 47		
	120 - 145	48 - 57		
	146 - 244	58 - 96		
245 - 255	97 - 100			
4	0 - 255	0 - 100	CCT ↔ HSI	Crossfade to Color
5	0 - 255	0 - 100	Hue	1° - 360°
6	0 - 255	0 - 100	Saturation	0 - 100%
7	Reserved for Future Use			
8	Reserved for Future Use			
9	0 - 19	0 - 7	Strobe	No Effect 1 Hz - 25 Hz
	20 - 255	8 - 100		

Mode 4: RGB

Channel	Value	Percent	Function	
1	0 - 255	0 - 100	Intensity	0 - 100%
2	0 - 255	0 - 100	Red	0 - 100%
3	0 - 255	0 - 100	Green	0 - 100%
4	0 - 255	0 - 100	Blue	0 - 100%
5	Reserved for Future Use			
6	Reserved for Future Use			
7	0 - 19	0 - 7	Strobe	No Effect 1 Hz - 25 Hz
	20 - 255	8 - 100		

Mode 5: HSI

Channel	Value	Percent	Function	
1	0 - 255	0 - 100	Intensity	0 - 100%
2	0 - 255	0 - 100	Hue	1° - 360°
3	0 - 255	0 - 100	Saturation	0 - 100%
4	Reserved for Future Use			
5	Reserved for Future Use			
6	0 - 19 20 - 255	0 - 7 8 - 100	Strobe	No Effect 1 Hz - 25 Hz

Mode 6: System FX - List of Effects

Channel	Value	Percent	Function	
1	0 - 255	0 - 100	Intensity	0 - 100%
2	0 - 9 10 - 69 70 - 255	0 - 4 5 - 27 28 - 100	Lightning	Loop Trigger Stop
	0 - 69 70 - 255	0 - 27 28 - 100	Other Effects	Loop Stop
3	0 - 9 10 - 19 20 - 29 30 - 39 40 - 49 50 - 59 60 - 69 70 - 79 80 - 89 90 - 255	0 - 4 5 - 8 9 - 12 13 - 16 17 - 20 21 - 24 25 - 28 29 - 32 33 - 36 37 - 100	FX Selection	Paparazzi Lightning TV Fire Faulty Bulb Pulsing Cop Car Party Lights Fireworks Reserved
4 - 7	See FX Parameter Tables in Following Pages			

FX Parameter: Paparazzi

Channel	Value	Percent	Function	
4	0 - 255	0 - 100	CCT	2700 K - 10000 K
5	0 - 10	0 - 4	G / M	Neutral / No Effect
	11 - 20	5 - 8		Full Minus Green
	21 - 119	9 - 47		- 0.9 - - 0.1
	120 - 145	48 - 57		Neutral / No Effect
	146 - 244	58 - 96		0.1 - 0.9
	245 - 255	97 - 100		Full Plus Green
6	0 - 9	0 - 4	Frequency	1
	10 - 19	5 - 8		2
	20 - 29	9 - 12		3
	30 - 39	13 - 16		4
	40 - 49	17 - 20		5
	50 - 59	21 - 24		6
	60 - 69	25 - 28		7
	70 - 79	29 - 32		8
	80 - 89	33 - 36		9
	90 - 99	37 - 40		10
	100 - 255	41 - 100		

FX Parameter: Lightning

Channel	Value	Percent	Function	
4	0 - 255	0 - 100	CCT	2700 K - 10000 K
5	0 - 10	0 - 4	G / M	Neutral / No Effect
	11 - 20	5 - 8		Full Minus Green
	21 - 119	9 - 47		- 0.9 - - 0.1
	120 - 145	48 - 57		Neutral / No Effect
	146 - 244	58 - 96		0.1 - 0.9
6	245 - 255	97 - 100	Frequency	Full Plus Green
	0 - 9	0 - 4		1
	10 - 19	5 - 8		2
	20 - 29	9 - 12		3
	30 - 39	13 - 16		4
	40 - 49	17 - 20		5
	50 - 59	21 - 24		6
	60 - 69	25 - 28		7
	70 - 79	29 - 32		8
	80 - 89	33 - 36		9
	90 - 99	37 - 40		10
100 - 109	41 - 44	Random		
110 - 255	45 - 100	Reserved		

FX Parameter: TV

Channel	Value	Percent	Function	
4	0 - 9	0 - 4	CCT Range	Warmer
	10 - 19	5 - 8		Natural
	20 - 29	9 - 12		Cooler
	30 - 255	13 - 100		Reserved
5	0 - 9	0 - 4	Frequency	1
	10 - 19	5 - 8		2
	20 - 29	9 - 12		3
	30 - 39	13 - 16		4
	40 - 49	17 - 20		5
	50 - 59	21 - 24		6
	60 - 69	25 - 28		7
	70 - 79	29 - 32		8
	80 - 89	33 - 36		9
	90 - 99	37 - 40		10
	100 - 109	41 - 44		Random
110 - 255	45 - 100	Reserved		

FX Parameter: Fire

Channel	Value	Percent	Function	
4	0 - 9	0 - 4	CCT Range	Warmer
	10 - 19	5 - 8		Natural
	20 - 29	9 - 12		Cooler
	30 - 255	13 - 100		Reserved
5	0 - 9	0 - 4	Speed	1
	10 - 19	5 - 8		2
	20 - 29	9 - 12		3
	30 - 39	13 - 16		4
	40 - 49	17 - 20		5
	50 - 59	21 - 24		6
	60 - 69	25 - 28		7
	70 - 79	29 - 32		8
	80 - 89	33 - 36		9
	90 - 99	37 - 40		10
	100 - 255	41 - 100		Reserved

FX Parameter: Faulty Bulb

Channel	Value	Percent	Function	
4	0 - 9	0 - 4	Mode Select	CCT
	10 - 19	5 - 8		HSI
	20 - 255	9 - 100		Reserved
CCT				
5	0 - 255	0 - 100	CCT	2700 K - 10000 K
6	0 - 10	0 - 4	G / M	Neutral / No Effect
	11 - 20	5 - 8		Full Minus Green
	21 - 119	9 - 47		- 0.9 - - 0.1
	120 - 145	48 - 57		Neutral / No Effect
	146 - 244	58 - 96		0.1 - 0.9
	245 - 255	97 - 100		Full Plus Green
7	0 - 9	0 - 4	Frequency	1
	10 - 19	5 - 8		2
	20 - 29	9 - 12		3
	30 - 39	13 - 16		4
	40 - 49	17 - 20		5
	50 - 59	21 - 24		6
	60 - 69	25 - 28		7
	70 - 79	29 - 32		8
	80 - 89	33 - 36		9
	90 - 99	37 - 40		10
	100 - 109	41 - 44		Random
	110 - 255	45 - 100		Reserved
HSI				
5	0 - 255	0 - 100	HUE	1° - 360°
6	0 - 255	0 - 100	Saturation	0 - 100%
7	0 - 255	0 - 100	Frequency	1 - 10 - Random

FX Parameter: Pulsing

Channel	Value	Percent	Function	
4	0 - 9	0 - 4	Mode Select	CCT
	10 - 19	5 - 8		HSI
	20 - 255	9 - 100		Reserved
CCT				
5	0 - 255	0 - 100	CCT	2700 K - 10000 K
6	0 - 10	0 - 4	G / M	Neutral / No Effect
	11 - 20	5 - 8		Full Minus Green
	21 - 119	9 - 47		- 0.9 - - 0.1
	120 - 145	48 - 57		Neutral / No Effect
	146 - 244	58 - 96		0.1 - 0.9
245 - 255	97 - 100	Full Plus Green		
7	0 - 9	0 - 4	Frequency	1
	10 - 19	5 - 8		2
	20 - 29	9 - 12		3
	30 - 39	13 - 16		4
	40 - 49	17 - 20		5
	50 - 59	21 - 24		6
	60 - 69	25 - 28		7
	70 - 79	29 - 32		8
	80 - 89	33 - 36		9
	90 - 99	37 - 40		10
	100 - 255	41 - 100		Reserved
HSI				
5	0 - 255	0 - 100	HUE	1° - 360°
6	0 - 255	0 - 100	Saturation	0 - 100%
7	0 - 255	0 - 100	Frequency	1 - 10 - Random

FX Parameter: Cop car

Channel	Value	Percent	Function	
4	0 - 9	0 - 4	Color Combinations	Red
	10 - 19	5 - 8		Blue
	20 - 29	9 - 12		Red + Blue
	30 - 39	13 - 16		Blue + White
	40 - 49	17 - 20		Red + Blue + White
	50 - 255	21 - 100		Reserved
5	0 - 9	0 - 4	Frequency	1
	10 - 19	5 - 8		2
	20 - 29	9 - 12		3
	30 - 39	13 - 16		4
	40 - 49	17 - 20		5
	50 - 59	21 - 24		6
	60 - 69	25 - 28		7
	70 - 79	29 - 32		8
	80 - 89	33 - 36		9
	90 - 99	37 - 40		10
	100 - 255	41 - 100		Reserved

FX Parameter: Party Lights

Channel	Value	Percent	Function	
4	0 - 255	0 - 100	Saturation	0 - 100%
5	0 - 9	0 - 4	Frequency	1
	10 - 19	5 - 8		2
	20 - 29	9 - 12		3
	30 - 39	13 - 16		4
	40 - 49	17 - 20		5
	50 - 59	21 - 24		6
	60 - 69	25 - 28		7
	70 - 79	29 - 32		8
	80 - 89	33 - 36		9
	90 - 99	37 - 40		10
	100 - 255	41 - 100		Reserved

FX Parameter: Fireworks

Channel	Value	Percent	Function	
4	0 - 9	0 - 4	Color Combinations	CCT
	10 - 19	5 - 8		HUE
	20 - 29	9 - 12		CCT+HUE
	30 - 255	13 - 100		Reserved
5	0 - 9	0 - 4	Frequency	1
	10 - 19	5 - 8		2
	20 - 29	9 - 12		3
	30 - 39	13 - 16		4
	40 - 49	17 - 20		5
	50 - 59	21 - 24		6
	60 - 69	25 - 28		7
	70 - 79	29 - 32		8
	80 - 89	33 - 36		9
	90 - 99	37 - 40		10
	100 - 109	41 - 44		Random
	110 - 255	45 - 100		Reserved

Mode 7: Light Engine CCT & RGB 2 Pixels (PT1c / PT2c / PT4c)

Channel	Value	Percent	Function	
Light Engine 1				
1	0 - 255	0 - 100	Intensity	0 - 100%
2	0 - 255	0 - 100	CCT	2700 K - 10000 K
3	0 - 10	0 - 4	G / M	Neutral / No Effect
	11 - 20	5 - 8		Full Minus Green
	21 - 119	9 - 47		- 99% - - 1%
	120 - 145	48 - 57		Neutral / No Effect
	146 - 244	58 - 96		1% - 99%
	245 - 255	97 - 100		Full Plus Green
4	0 - 255	0 - 100	CCT ↔ RGB	Crossfade to Color
5	0 - 255	0 - 100	Red	0 - 100%
6	0 - 255	0 - 100	Green	0 - 100%
7	0 - 255	0 - 100	Blue	0 - 100%
Light Engine 2				
8	0 - 255	0 - 100	Intensity	0 - 100%
9	0 - 255	0 - 100	CCT	2700 K - 10000 K
10	0 - 10	0 - 4	G / M	Neutral / No Effect
	11 - 20	5 - 8		Full Minus Green
	21 - 119	9 - 47		- 99% - - 1%
	120 - 145	48 - 57		Neutral / No Effect
	146 - 244	58 - 96		1% - 99%
	245 - 255	97 - 100		Full Plus Green
11	0 - 255	0 - 100	CCT ↔ RGB	Crossfade to Color
12	0 - 255	0 - 100	Red	0 - 100%
13	0 - 255	0 - 100	Green	0 - 100%
14	0 - 255	0 - 100	Blue	0 - 100%

Mode 8: Light Engine CCT & RGB 4 Pixels (PT1c / PT2c / PT4c)

Channel	Value	Percent	Function	
Light Engine 1				
1	0 - 255	0 - 100	Intensity	0 - 100%
2	0 - 255	0 - 100	CCT	2700 K - 10000 K
3	0 - 10	0 - 4	G / M	Neutral / No Effect
	11 - 20	5 - 8		Full Minus Green
	21 - 119	9 - 47		- 99% - - 1%
	120 - 145	48 - 57		Neutral / No Effect
	146 - 244	58 - 96		1% - 99%
	245 - 255	97 - 100		Full Plus Green
4	0 - 255	0 - 100	CCT ↔ RGB	Crossfade to Color
5	0 - 255	0 - 100	Red	0 - 100%
6	0 - 255	0 - 100	Green	0 - 100%
7	0 - 255	0 - 100	Blue	0 - 100%
8 - 21	Light Engine 2 - 3			
Light Engine 4				
22	0 - 255	0 - 100	Intensity	0 - 100%
23	0 - 255	0 - 100	CCT	2700 K - 10000 K
24	0 - 10	0 - 4	G / M	Neutral / No Effect
	11 - 20	5 - 8		Full Minus Green
	21 - 119	9 - 47		- 99% - - 1%
	120 - 145	48 - 57		Neutral / No Effect
	146 - 244	58 - 96		1% - 99%
	245 - 255	97 - 100		Full Plus Green
25	0 - 255	0 - 100	CCT ↔ RGB	Crossfade to Color
26	0 - 255	0 - 100	Red	0 - 100%
27	0 - 255	0 - 100	Green	0 - 100%
28	0 - 255	0 - 100	Blue	0 - 100%

Mode 9: Light Engine CCT & RGB 8 Pixels (PT2c / PT4c)

Channel	Value	Percent	Function	
Light Engine 1				
1	0 - 255	0 - 100	Intensity	0 - 100%
2	0 - 255	0 - 100	CCT	2700 K - 10000 K
3	0 - 10	0 - 4	G / M	Neutral / No Effect
	11 - 20	5 - 8		Full Minus Green
	21 - 119	9 - 47		- 99% - - 1%
	120 - 145	48 - 57		Neutral / No Effect
	146 - 244	58 - 96		1% - 99%
	245 - 255	97 - 100		Full Plus Green
4	0 - 255	0 - 100	CCT ↔ RGB	Crossfade to Color
5	0 - 255	0 - 100	Red	0 - 100%
6	0 - 255	0 - 100	Green	0 - 100%
7	0 - 255	0 - 100	Blue	0 - 100%
8 - 49	Light Engine 2 - 7			
Light Engine 8				
50	0 - 255	0 - 100	Intensity	0 - 100%
51	0 - 255	0 - 100	CCT	2700 K - 10000 K
52	0 - 10	0 - 4	G / M	Neutral / No Effect
	11 - 20	5 - 8		Full Minus Green
	21 - 119	9 - 47		- 99% - - 1%
	120 - 145	48 - 57		Neutral / No Effect
	146 - 244	58 - 96		1% - 99%
	245 - 255	97 - 100		Full Plus Green
53	0 - 255	0 - 100	CCT ↔ RGB	Crossfade to Color
54	0 - 255	0 - 100	Red	0 - 100%
55	0 - 255	0 - 100	Green	0 - 100%
56	0 - 255	0 - 100	Blue	0 - 100%

Mode 10: Light Engine CCT & RGB 16 Pixels (PT4c)

Channel	Value	Percent	Function	
Light Engine 1				
1	0 - 255	0 - 100	Intensity	0 - 100%
2	0 - 255	0 - 100	CCT	2700 K - 10000 K
3	0 - 10	0 - 4	G / M	Neutral / No Effect
	11 - 20	5 - 8		Full Minus Green
	21 - 119	9 - 47		- 99% - - 1%
	120 - 145	48 - 57		Neutral / No Effect
	146 - 244	58 - 96		1% - 99%
	245 - 255	97 - 100		Full Plus Green
4	0 - 255	0 - 100	CCT ↔ RGB	Crossfade to Color
5	0 - 255	0 - 100	Red	0 - 100%
6	0 - 255	0 - 100	Green	0 - 100%
7	0 - 255	0 - 100	Blue	0 - 100%
8 - 105	Light Engine 2 - 15			
Light Engine 16				
106	0 - 255	0 - 100	Intensity	0 - 100%
107	0 - 255	0 - 100	CCT	2700 K - 10000 K
108	0 - 10	0 - 4	G / M	Neutral / No Effect
	11 - 20	5 - 8		Full Minus Green
	21 - 119	9 - 47		- 99% - - 1%
	120 - 145	48 - 57		Neutral / No Effect
	146 - 244	58 - 96		1% - 99%
	245 - 255	97 - 100		Full Plus Green
109	0 - 255	0 - 100	CCT ↔ RGB	Crossfade to Color
110	0 - 255	0 - 100	Red	0 - 100%
111	0 - 255	0 - 100	Green	0 - 100%
112	0 - 255	0 - 100	Blue	0 - 100%

Mode 11: Light Engine HSI 2 Pixels (PT1c / PT2c / PT4c)

Channel	Value	Percent	Function	
Light Engine 1				
1	0 - 255	0 - 100	Intensity	0 - 100%
2	0 - 255	0 - 100	Hue	1° - 360°
3	0 - 255	0 - 100	Saturation	0 - 100%
Light Engine 2				
4	0 - 255	0 - 100	Intensity	0 - 100%
5	0 - 255	0 - 100	Hue	1° - 360°
6	0 - 255	0 - 100	Saturation	0 - 100%

Mode 12: Light Engine HSI 4 Pixels (PT1c / PT2c / PT4c)

Channel	Value	Percent	Function	
Light Engine 1				
1	0 - 255	0 - 100	Intensity	0 - 100%
2	0 - 255	0 - 100	Hue	1° - 360°
3	0 - 255	0 - 100	Saturation	0 - 100%
Light Engine 2				
4	0 - 255	0 - 100	Intensity	0 - 100%
5	0 - 255	0 - 100	Hue	1° - 360°
6	0 - 255	0 - 100	Saturation	0 - 100%
Light Engine 3				
7	0 - 255	0 - 100	Intensity	0 - 100%
8	0 - 255	0 - 100	Hue	1° - 360°
9	0 - 255	0 - 100	Saturation	0 - 100%
Light Engine 4				
10	0 - 255	0 - 100	Intensity	0 - 100%
11	0 - 255	0 - 100	Hue	1° - 360°
12	0 - 255	0 - 100	Saturation	0 - 100%

Mode 13: Light Engine HSI 8 Pixels (PT2c / PT4c)

Channel	Value	Percent	Function	
Light Engine 1				
1	0 - 255	0 - 100	Intensity	0 - 100%
2	0 - 255	0 - 100	Hue	1° - 360°
3	0 - 255	0 - 100	Saturation	0 - 100%
4 - 21	Light Engine 2 - 7			
Light Engine 8				
22	0 - 255	0 - 100	Intensity	0 - 100%
23	0 - 255	0 - 100	Hue	1° - 360°
24	0 - 255	0 - 100	Saturation	0 - 100%

Mode 14: Light Engine HSI 16 Pixels (PT4c)

Channel	Value	Percent	Function	
Light Engine 1				
1	0 - 255	0 - 100	Intensity	0 - 100%
2	0 - 255	0 - 100	Hue	1° - 360°
3	0 - 255	0 - 100	Saturation	0 - 100%
4 - 45	Light Engine 2 - 15			
Light Engine 16				
46	0 - 255	0 - 100	Intensity	0 - 100%
47	0 - 255	0 - 100	Hue	1° - 360°
48	0 - 255	0 - 100	Saturation	0 - 100%

Equations for Conversion

CCT Conversion

8-bit

CCT	DMX Value
2700 K	0
3200 K	17
3800 K	38
4300 K	56
4800 K	73
5600 K	101
6500 K	133
7500 K	168

$$\text{DMX Value} = \frac{\text{Desired CCT} - 2700}{28.627}$$

$$\text{CCT} = (\text{DMX Value} * 28.627) + 2700$$