

Hex © Luminaire DMX Control Protocol *

Revision: 1.4

27-Feb-18

Standard Protocol	
Channel	Construct
1	Pan Coarse
2	Pan Fine
3	Tilt Coarse
4	Tilt Fine
5	Mix Color Function
6	Shutter/LED Function
7	Shutter
8	Dim Coarse
9	Dim Fine
10	Mspeed
11	Macro
12	Macro Speed
13	Macro Xfade time
14	Control
15	Indigo Highlighter Function
16	Indigo Highlighter Dim
17	LED 1 X
18	LED 1 Red
19	LED 1 Green
20	LED 1 Blue
21	LED 1 White
22	LED 1 Function
23	LED 1 Dim Coarse
24	LED 1 Dim Fine
25	LED 2 X
26	LED 2 Red
27	LED 2 Green
28	LED 2 Blue
29	LED 2 White
30	LED 2 Function
31	LED 2 Dim Coarse
32	LED 2 Dim Fine
33	LED 3 X
34	LED 3 Red
35	LED 3 Green
36	LED 3 Blue
37	LED 3 White
38	LED 3 Function
39	LED 3 Dim Coarse
40	LED 3 Dim Fine
41	LED 4 X
42	LED 4 Red
43	LED 4 Green
44	LED 4 Blue
45	LED 4 White
46	LED 4 Function
47	LED 4 Dim Coarse
48	LED 4 Dim Fine
49	LED 5 X
50	LED 5 Red
51	LED 5 Green
52	LED 5 Blue
53	LED 5 White
54	LED 5 Function
55	LED 5 Dim Coarse
56	LED 5 Dim Fine
57	LED 6 X
58	LED 6 Red
59	LED 6 Green
60	LED 6 Blue
61	LED 6 White
62	LED 6 Function
63	LED 6 Dim Coarse
64	LED 6 Dim Fine

Hex Luminaire Standard DMX Control Protocol *

Channel	Marketing Construct	Description	Decimal Low	Decimal High	Percent Low	Percent High	Hex Low	Hex High	Controller Default
1	Pan	Pan Coarse	0	255	0%	100%	00h	FFh	128
2	Pan	Pan Fine	0	255	0%	100%	00h	FFh	0
3	Tilt	Tilt Coarse	0	255	0%	100%	00h	FFh	128
4	Tilt	Tilt Fine	0	255	0%	100%	00h	FFh	0
5	Mix Color Function	RGB	0	15	0%	6%	00h	0Fh	0
		RBG	16	30	6%	12%	10h	1Eh	
		BRG	31	45	12%	18%	1Fh	2Dh	
		BGR	46	60	18%	24%	2Eh	3Ch	
		GRB	61	75	24%	29%	3Dh	4Bh	
		GBR	76	90	30%	35%	4Ch	5Ah	
		CMY	91	105	36%	41%	5Bh	69h	
		CYM	106	120	42%	47%	6Ah	78h	
		YCM	121	135	47%	53%	79h	87h	
		YMC	136	150	53%	59%	88h	96h	
		MCY	151	165	59%	65%	97h	A5h	
		MYC	166	180	65%	71%	A6h	B4h	
		Cycle	181	195	71%	76%	B5h	C3h	
		Random	196	210	77%	82%	C4h	D2h	
Reserved (Note 7)	211	255	83%	100%	D3h	FFh			
6	Shutter/ LED Functions	Normal Strobe Functions	0	31	0%	12%	00h	1Fh	0
		Random Random strobe	32	63	13%	25%	20h	3Fh	
		Synchronous Random Strobe	64	95	25%	37%	40h	5Fh	
		Reserved (Note 7)	96	255	38%	100%	60h	FFh	
7	Shutter	Close	0	23	0%	9%	00h	17h	255
		Strobe Rate (slow to fast)	24	229	9%	90%	18h	E5h	
		Open	230	255	90%	100%	E6h	FFh	
8	Dim Coarse	Close	0		0%		00h		0
		Open	255		100%		FFh		
9	Dim Fine		0		0%		00h		0
			255		100%		FFh		
10	Mspeed	Disable	0	3	0%	1%	00h	03h	0
		Longest (252.7 seconds)	4		2%		04h		
		Shortest (0.15 seconds)	255		100%		FFh		
11	Inclusive Macro (Note 1)	Macro off	0		0%		00h		0
		Macro 1	1		0%		01h		
		Macro 2	2		1%		02h		
		Macro 3	3		1%		03h		
		...							
		Macro 136	136		53%		88h		
Reserved (Note 7)	137	255	54%	100%	89h	FFh			
12	Inclusive Macro Speed	Animated Macro Operation (Note 1)							192
		Reverse Play Speed Fast to x1	0	62	0%	24%	00h	3Eh	
		Reverse Play Speed x1	63		25%	0%	3Fh	00h	
		Reverse Play speed x 1 to slow	64	126	25%	49%	40h	7Eh	
		Stop	127	128	50%	50%	7Fh	80h	
		Forward Play Speed slow to x1	129	191	51%	75%	81h	BFh	
		Forward Play speed x 1	192		75%	0%	C0h	00h	
Forward Play speed x 1 to fast	193	255	76%	100%	C1h	FFh			

13	Inclusive Macro X fade	Static Macro Operation (Note 1)							128
		Disable	0	128	0%	50%	00h	80h	
		Longest (63.8 seconds)	129		51%		81h		
		Shortest (0.15 seconds)	255		100%		FFh		
		Animated Macro Operation (Note 1)							
		Stop	0		0%		00h	00h	
		Decreasing xfade time	1	127	0%	50%	01h	7Fh	
		Programmed xfade time x1	128		50%		80h		
		Increasing xfade time	129	255	51%	100%	81h	FFh	
14	Control (Note 2)	The Control channel should not be crossfaded. No shutter channel requirement.							0
		Safe (normal operation)	0	15	0%	6%	00h	0Fh	
		Pan & Tilt Mspeed Off	16	31	6%	12%	10h	1Fh	
		Display/LED's Off (send 20 packets)	32	47	13%	18%	20h	2Fh	
		Display/LED's On (send 20 packets)	48	63	19%	25%	30h	3Fh	
		Home All (send 20 packets)	64	79	25%	31%	40h	4Fh	
		Shutdown (send 80 packets)	80	95	31%	37%	50h	5Fh	
		Reserved (Note 7)	96	111	38%	44%	60h	6Fh	
		Module X Invert On	112	127	44%	50%	70h	7Fh	
		Module X Invert Off	128	143	50%	56%	80h	8Fh	
		Module Mirror On (Note 5)	144	159	56%	62%	90h	9Fh	
		Module Mirror Off	160	175	63%	69%	A0h	AFh	
		Reserved (Note 7)	176	207	69%	81%	B0h	CFh	
		Home Modules (only modules home with LEDs off) (send 20 packets)	208	223	82%	87%	D0h	DFh	
		Motion Only Macro Mode	224	239	88%	94%	E0h	EFh	
		White Balance On (Note 6)	240	247	94%	97%	F0h	F7h	
White Balance Off	248	255	97%	100%	F8h	FFh			
15	Indigo Highlighter Function	Indigo Highlighter Dim Tracking Mode						0	
		Continuous	0	15	0%	6%	00h		0Fh
		Periodic Strobe (slow to fast)	16	41	6%	16%	10h		29h
		Random Strobe (slow to fast)	42	67	16%	26%	2Ah		43h
		Reserved (Note 7)	68	127	27%	50%	44h		7Fh
		Indigo Highlighter Independent Dim Mode							
		Continuous	128	143	50%	56%	80h		8Fh
		Periodic Strobe (slow to fast)	144	169	56%	66%	90h		A9h
		Random Strobe (slow to fast)	170	195	67%	76%	AAh		C3h
Reserved (Note 7)	196	255	77%	100%	C4h	FFh			
16	Indigo Highlighter Dim	Indigo Highlighter Off	0		0%		00h		0
		Indigo Highlighter 100%	255		100%		FFh		

17	LED 1 X	LED 1 X shift (NOTE 4)	0	255	0%	100%	00h	FFh	255	
18	LED 1 Red (Note 3)	RGB Control								
		Red Off	0		0%		00h			
		Red Full Saturation	255		100%		FFh			
		RBG Control								
		Red Off	0		0%		00h			
		Red Full Saturation	255		100%		FFh			
		BRG Control								
		Blue Off	0		0%		00h			
		Blue Full Saturation	255		100%		FFh			
		BGR Control								
		Blue Off	0		0%		00h			
		Blue Full Saturation	255		100%		FFh			
		GRB Control								
		Green Off	0		0%		00h			
		Green Full Saturation	255		100%		FFh			
		GBR Control								
		Green Off	0		0%		00h			
		Green Full Saturation	255		100%		FFh			
		CMY Control								
		Red Full Saturation	0		0%		00h			
		Red Off	255		100%		FFh			
		CYM Control								
		Red Full Saturation	0		0%		00h			
		Red Off	255		100%		FFh			
		YCM Control								
		Blue Full Saturation	0		0%		00h			
		Blue Off	255		100%		FFh			
		YMC Control								
		Blue Full Saturation	0		0%		00h			
		Blue off	255		100%		FFh			
		MCY Control								
		Green Full Saturation	0		0%		00h			
		Green Off	255		100%		FFh			
MYC Control										
Green Full Saturation	0		0%		00h					
Green Off	255		100%		FFh					
Cycle & Random Modes. Scan Speed controlled by Red Channel										
Slow Rate	0		0%		00h					
Fast Rate	255		100%		FFh					

19	LED 1 Green	RGB Control					255
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		RBG Control					
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		BRG Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		BGR Control					
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		GRB Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		GBR Control					
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		CMY Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		CYM Control					
		Blue Full Saturation	0		0%	00h	
		Blue Off	255		100%	FFh	
		YCM Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	
		YMC Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		MCY Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	
		MYC Control					
Blue Full Saturation	0		0%	00h			
Blue Off	255		100%	FFh			

20	LED 1 Blue	RGB Control					255
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		RBG Control					
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		BRG Control					
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		BGR Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		GRB Control					
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		GBR Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		CMY Control					
		Blue Full Saturation	0		0%	00h	
		Blue Off	255		100%	FFh	
		CYM Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		YCM Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		YMC Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	
		MCY Control					
		Blue Full Saturation	0		0%	00h	
		Blue Off	255		100%	FFh	
		MYC Control					
Red Full Saturation	0		0%	00h			
Red Off	255		100%	FFh			

21	LED 1 White	RGB Control						255
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		RBG Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		BRG Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		BGR Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		GRB Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		GBR Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		CMY Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		CYM Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		YCM Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		YMC Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		MCY Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		MYC Control						
White Off	0		0%		00h			
White Full	255		100%		FFh			
22	LED 1 Function	LED 1 Dim Tracking Mode						0
		Continuous	0	15	0%	6%	00h 0Fh	
		Periodic Strobe (slow to fast)	16	41	6%	16%	10h 29h	
		Random Strobe (slow to fast)	42	67	16%	26%	2Ah 43h	
		Reserved (Note 7)	68	127	27%	50%	44h 7Fh	
		LED 1 Independent Dim Mode						
		Continuous	128	143	50%	56%	80h 8Fh	
		Periodic Strobe (slow to fast)	144	169	56%	66%	90h A9h	
		Random Strobe (slow to fast)	170	195	67%	76%	AAh C3h	
		Reserved (Note 7)	196	255	77%	100%	C4h FFh	
23	LED 1 Dim Coarse	LED 1 Off	0		0%		00h	0
		LED 1 100%	255		100%		FFh	
24	LED 1 Dim Fine		0		0%		00h	0
			255		100%		FFh	

25	LED 2 X	LED 2 X shift (NOTE 4)	0	255	0%	100%	00h	FFh	177	
26	LED 2 Red (Note 3)	RGB Control							255	
		Red Off	0		0%		00h			
		Red Full Saturation	255		100%		FFh			
		RBG Control								
		Red Off	0		0%		00h			
		Red Full Saturation	255		100%		FFh			
		BRG Control								
		Blue Off	0		0%		00h			
		Blue Full Saturation	255		100%		FFh			
		BGR Control								
		Blue Off	0		0%		00h			
		Blue Full Saturation	255		100%		FFh			
		GRB Control								
		Green Off	0		0%		00h			
		Green Full Saturation	255		100%		FFh			
		GBR Control								
		Green Off	0		0%		00h			
		Green Full Saturation	255		100%		FFh			
		CMY Control								
		Red Full Saturation	0		0%		00h			
		Red Off	255		100%		FFh			
		CYM Control								
		Red Full Saturation	0		0%		00h			
		Red Off	255		100%		FFh			
		YCM Control								
		Blue Full Saturation	0		0%		00h			
		Blue Off	255		100%		FFh			
		YMC Control								
		Blue Full Saturation	0		0%		00h			
		Blue off	255		100%		FFh			
		MCY Control								
		Green Full Saturation	0		0%		00h			
		Green Off	255		100%		FFh			
MYC Control										
Green Full Saturation	0		0%		00h					
Green Off	255		100%		FFh					
Cycle & Random Modes. Scan Speed controlled by Red Channel										
Slow Rate	0		0%		00h					
Fast Rate	255		100%		FFh					

27	LED 2 Green	RGB Control					255
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		RBG Control					
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		BRG Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		BGR Control					
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		GRB Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		GBR Control					
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		CMY Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		CYM Control					
		Blue Full Saturation	0		0%	00h	
		Blue Off	255		100%	FFh	
		YCM Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	
		YMC Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		MCY Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	
		MYC Control					
Blue Full Saturation	0		0%	00h			
Blue Off	255		100%	FFh			

28	LED 2 Blue	RGB Control					255
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		RBG Control					
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		BRG Control					
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		BGR Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		GRB Control					
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		GBR Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		CMY Control					
		Blue Full Saturation	0		0%	00h	
		Blue Off	255		100%	FFh	
		CYM Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		YCM Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		YMC Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	
		MCY Control					
		Blue Full Saturation	0		0%	00h	
		Blue Off	255		100%	FFh	
		MYC Control					
Red Full Saturation	0		0%	00h			
Red Off	255		100%	FFh			

29	LED 2 White	RGB Control						255
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		RBG Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		BRG Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		BGR Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		GRB Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		GBR Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		CMY Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		CYM Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		YCM Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		YMC Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
MCY Control								
White Off	0		0%		00h			
White Full	255		100%		FFh			
MYC Control								
White Off	0		0%		00h			
White Full	255		100%		FFh			
30	LED 2 Function	LED 2 Dim Tracking Mode						0
		Continuous	0	15	0%	6%	00h 0Fh	
		Periodic Strobe (slow to fast)	16	41	6%	16%	10h 29h	
		Random Strobe (slow to fast)	42	67	16%	26%	2Ah 43h	
		Reserved (Note 7)	68	127	27%	50%	44h 7Fh	
		LED 2 Independent Dim Mode						
		Continuous	128	143	50%	56%	80h 8Fh	
		Periodic Strobe (slow to fast)	144	169	56%	66%	90h A9h	
		Random Strobe (slow to fast)	170	195	67%	76%	AAh C3h	
		Reserved (Note 7)	196	255	77%	100%	C4h FFh	
31	LED 2 Dim Coarse	LED 2 Off	0		0%	00h	0	
		LED 2 100%	255		100%	FFh		
32	LED 2 Dim Fine		0		0%	00h	0	
			255		100%	FFh		

33	LED 3 X	LED 3 X shift (NOTE 4)	0	255	0%	100%	00h	FFh	113	
34	LED 3 Red (Note 3)	RGB Control							255	
		Red Off	0		0%		00h			
		Red Full Saturation	255		100%		FFh			
		RBG Control								
		Red Off	0		0%		00h			
		Red Full Saturation	255		100%		FFh			
		BRG Control								
		Blue Off	0		0%		00h			
		Blue Full Saturation	255		100%		FFh			
		BGR Control								
		Blue Off	0		0%		00h			
		Blue Full Saturation	255		100%		FFh			
		GRB Control								
		Green Off	0		0%		00h			
		Green Full Saturation	255		100%		FFh			
		GBR Control								
		Green Off	0		0%		00h			
		Green Full Saturation	255		100%		FFh			
		CMY Control								
		Red Full Saturation	0		0%		00h			
		Red Off	255		100%		FFh			
		CYM Control								
		Red Full Saturation	0		0%		00h			
		Red Off	255		100%		FFh			
		YCM Control								
		Blue Full Saturation	0		0%		00h			
		Blue Off	255		100%		FFh			
		YMC Control								
		Blue Full Saturation	0		0%		00h			
		Blue off	255		100%		FFh			
		MCY Control								
		Green Full Saturation	0		0%		00h			
		Green Off	255		100%		FFh			
		MYC Control								
Green Full Saturation	0		0%		00h					
Green Off	255		100%		FFh					
Cycle & Random Modes. Scan Speed controlled by Red Channel										
Slow Rate	0		0%		00h					
Fast Rate	255		100%		FFh					

35	LED 3 Green	RGB Control					255
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		RBG Control					
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		BRG Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		BGR Control					
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		GRB Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		GBR Control					
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		CMY Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		CYM Control					
		Blue Full Saturation	0		0%	00h	
		Blue Off	255		100%	FFh	
		YCM Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	
		YMC Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		MCY Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	
		MYC Control					
		Blue Full Saturation	0		0%	00h	
Blue Off	255		100%	FFh			

36	LED 3 Blue	RGB Control					255
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		RBG Control					
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		BRG Control					
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		BGR Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		GRB Control					
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		GBR Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		CMY Control					
		Blue Full Saturation	0		0%	00h	
		Blue Off	255		100%	FFh	
		CYM Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		YCM Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		YMC Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	
		MCY Control					
		Blue Full Saturation	0		0%	00h	
		Blue Off	255		100%	FFh	
		MYC Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	

37	LED 3 White	RGB Control						255										
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		RBG Control							255									
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		BRG Control								255								
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		BGR Control									255							
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		GRB Control										255						
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		GBR Control											255					
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		CMY Control												255				
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		CYM Control													255			
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		YCM Control														255		
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		YMC Control															255	
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		MCY Control																255
		White Off	0		0%		00h											
White Full	255		100%		FFh													
MYC Control						255												
White Off	0		0%		00h													
White Full	255		100%		FFh													
38	LED 3 Function	LED 3 Dim Tracking Mode						0										
		Continuous	0	15	0%		6%		00h 0Fh									
		Periodic Strobe (slow to fast)	16	41	6%		16%		10h 29h									
		Random Strobe (slow to fast)	42	67	16%		26%		2Ah 43h									
		Reserved (Note 7)	68	127	27%		50%		44h 7Fh									
		LED 3 Independent Dim Mode							0									
		Continuous	128	143	50%		56%			80h 8Fh								
		Periodic Strobe (slow to fast)	144	169	56%		66%			90h A9h								
		Random Strobe (slow to fast)	170	195	67%		76%			AAh C3h								
		Reserved (Note 7)	196	255	77%		100%			C4h FFh								
		39	LED 3 Dim Coarse	LED 3 Off	0					0%	00h	0						
				LED 3 100%	255					100%	FFh							
40	LED 3 Dim Fine		0		0%		00h	0										
			255		100%		FFh											

41	LED 4 X	LED 4 X shift (NOTE 4)	0	255	0%	100%	00h	FFh	113	
42	LED 4 Red (Note 3)	RGB Control							255	
		Red Off	0		0%		00h			
		Red Full Saturation	255		100%		FFh			
		RBG Control								
		Red Off	0		0%		00h			
		Red Full Saturation	255		100%		FFh			
		BRG Control								
		Blue Off	0		0%		00h			
		Blue Full Saturation	255		100%		FFh			
		BGR Control								
		Blue Off	0		0%		00h			
		Blue Full Saturation	255		100%		FFh			
		GRB Control								
		Green Off	0		0%		00h			
		Green Full Saturation	255		100%		FFh			
		GBR Control								
		Green Off	0		0%		00h			
		Green Full Saturation	255		100%		FFh			
		CMY Control								
		Red Full Saturation	0		0%		00h			
		Red Off	255		100%		FFh			
		CYM Control								
		Red Full Saturation	0		0%		00h			
		Red Off	255		100%		FFh			
		YCM Control								
		Blue Full Saturation	0		0%		00h			
		Blue Off	255		100%		FFh			
		YMC Control								
		Blue Full Saturation	0		0%		00h			
		Blue off	255		100%		FFh			
		MCY Control								
		Green Full Saturation	0		0%		00h			
		Green Off	255		100%		FFh			
MYC Control										
Green Full Saturation	0		0%		00h					
Green Off	255		100%		FFh					
Cycle & Random Modes. Scan Speed controlled by Red Channel										
Slow Rate	0		0%		00h					
Fast Rate	255		100%		FFh					

43	LED 4 Green	RGB Control					255
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		RBG Control					
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		BRG Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		BGR Control					
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		GRB Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		GBR Control					
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		CMY Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		CYM Control					
		Blue Full Saturation	0		0%	00h	
		Blue Off	255		100%	FFh	
		YCM Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	
		YMC Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		MCY Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	
		MYC Control					
Blue Full Saturation	0		0%	00h			
Blue Off	255		100%	FFh			

44	LED 4 Blue	RGB Control					255
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		RBG Control					
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		BRG Control					
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		BGR Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		GRB Control					
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		GBR Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		CMY Control					
		Blue Full Saturation	0		0%	00h	
		Blue Off	255		100%	FFh	
		CYM Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		YCM Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		YMC Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	
		MCY Control					
		Blue Full Saturation	0		0%	00h	
		Blue Off	255		100%	FFh	
		MYC Control					
Red Full Saturation	0		0%	00h			
Red Off	255		100%	FFh			

45	LED 3 White	RGB Control						255										
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		RBG Control							255									
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		BRG Control								255								
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		BGR Control									255							
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		GRB Control										255						
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		GBR Control											255					
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		CMY Control												255				
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		CYM Control													255			
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		YCM Control														255		
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		YMC Control															255	
		White Off	0		0%		00h											
		White Full	255		100%		FFh											
		MCY Control																255
		White Off	0		0%		00h											
White Full	255		100%		FFh													
MYC Control						255												
White Off	0		0%		00h													
White Full	255		100%		FFh													
46	LED 4 Function	LED 4 Dim Tracking Mode						0										
		Continuous	0	15	0%		6%		00h 0Fh									
		Periodic Strobe (slow to fast)	16	41	6%		16%		10h 29h									
		Random Strobe (slow to fast)	42	67	16%		26%		2Ah 43h									
		Reserved (Note 7)	68	127	27%		50%		44h 7Fh									
		LED 4 Independent Dim Mode							0									
		Continuous	128	143	50%		56%			80h 8Fh								
		Periodic Strobe (slow to fast)	144	169	56%		66%			90h A9h								
		Random Strobe (slow to fast)	170	195	67%		76%			AAh C3h								
		Reserved (Note 7)	196	255	77%		100%			C4h FFh								
		47	LED 4 Dim Coarse	LED 4 Off	0					0%	00h	0						
				LED 4 100%	255					100%	FFh							
48	LED 4 Dim Fine		0		0%		00h	0										
			255		100%		FFh											

49	LED 5 X	LED 5 X shift (NOTE 4)	0	255	0%	100%	00h	FFh	177	
50	LED 5 Red (Note 3)	RGB Control							255	
		Red Off	0		0%		00h			
		Red Full Saturation	255		100%		FFh			
		RBG Control								
		Red Off	0		0%		00h			
		Red Full Saturation	255		100%		FFh			
		BRG Control								
		Blue Off	0		0%		00h			
		Blue Full Saturation	255		100%		FFh			
		BGR Control								
		Blue Off	0		0%		00h			
		Blue Full Saturation	255		100%		FFh			
		GRB Control								
		Green Off	0		0%		00h			
		Green Full Saturation	255		100%		FFh			
		GBR Control								
		Green Off	0		0%		00h			
		Green Full Saturation	255		100%		FFh			
		CMY Control								
		Red Full Saturation	0		0%		00h			
		Red Off	255		100%		FFh			
		CYM Control								
		Red Full Saturation	0		0%		00h			
		Red Off	255		100%		FFh			
		YCM Control								
		Blue Full Saturation	0		0%		00h			
		Blue Off	255		100%		FFh			
		YMC Control								
		Blue Full Saturation	0		0%		00h			
		Blue off	255		100%		FFh			
		MCY Control								
		Green Full Saturation	0		0%		00h			
		Green Off	255		100%		FFh			
MYC Control										
Green Full Saturation	0		0%		00h					
Green Off	255		100%		FFh					
Cycle & Random Modes. Scan Speed controlled by Red Channel										
Slow Rate	0		0%		00h					
Fast Rate	255		100%		FFh					

51	LED 5 Green	RGB Control					255
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		RBG Control					
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		BRG Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		BGR Control					
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		GRB Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		GBR Control					
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		CMY Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		CYM Control					
		Blue Full Saturation	0		0%	00h	
		Blue Off	255		100%	FFh	
		YCM Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	
		YMC Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		MCY Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	
		MYC Control					
Blue Full Saturation	0		0%	00h			
Blue Off	255		100%	FFh			

52	LED 5 Blue	RGB Control					255
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		RBG Control					
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		BRG Control					
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		BGR Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		GRB Control					
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		GBR Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		CMY Control					
		Blue Full Saturation	0		0%	00h	
		Blue Off	255		100%	FFh	
		CYM Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		YCM Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		YMC Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	
		MCY Control					
		Blue Full Saturation	0		0%	00h	
		Blue Off	255		100%	FFh	
		MYC Control					
Red Full Saturation	0		0%	00h			
Red Off	255		100%	FFh			

53	LED 5 White	RGB Control						255
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		RBG Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		BRG Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		BGR Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		GRB Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		GBR Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		CMY Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		CYM Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		YCM Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		YMC Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		MCY Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		MYC Control						
White Off	0		0%		00h			
White Full	255		100%		FFh			
54	LED 5 Function	LED 5 Dim Tracking Mode						0
		Continuous	0	15	0%	6%	00h 0Fh	
		Periodic Strobe (slow to fast)	16	41	6%	16%	10h 29h	
		Random Strobe (slow to fast)	42	67	16%	26%	2Ah 43h	
		Reserved (Note 7)	68	127	27%	50%	44h 7Fh	
		LED 5 Independent Dim Mode						
		Continuous	128	143	50%	56%	80h 8Fh	
		Periodic Strobe (slow to fast)	144	169	56%	66%	90h A9h	
		Random Strobe (slow to fast)	170	195	67%	76%	AAh C3h	
		Reserved (Note 7)	196	255	77%	100%	C4h FFh	
55	LED 5 Dim Coarse	LED 5 Off	0		0%	00h	0	
		LED 5 100%	255		100%	FFh		
56	LED 5 Dim Fine		0		0%	00h	0	
			255		100%	FFh		

57	LED 6 X	LED 6 X shift (NOTE 4)	0	255	0%	100%	00h	FFh	255	
58	LED 6 Red (Note 3)	RGB Control								
		Red Off	0		0%		00h			
		Red Full Saturation	255		100%		FFh			
		RBG Control								
		Red Off	0		0%		00h			
		Red Full Saturation	255		100%		FFh			
		BRG Control								
		Blue Off	0		0%		00h			
		Blue Full Saturation	255		100%		FFh			
		BGR Control								
		Blue Off	0		0%		00h			
		Blue Full Saturation	255		100%		FFh			
		GRB Control								
		Green Off	0		0%		00h			
		Green Full Saturation	255		100%		FFh			
		GBR Control								
		Green Off	0		0%		00h			
		Green Full Saturation	255		100%		FFh			
		CMY Control								
		Red Full Saturation	0		0%		00h			
		Red Off	255		100%		FFh			
		CYM Control								
		Red Full Saturation	0		0%		00h			
		Red Off	255		100%		FFh			
		YCM Control								
		Blue Full Saturation	0		0%		00h			
		Blue Off	255		100%		FFh			
		YMC Control								
		Blue Full Saturation	0		0%		00h			
		Blue off	255		100%		FFh			
		MCY Control								
		Green Full Saturation	0		0%		00h			
		Green Off	255		100%		FFh			
MYC Control										
Green Full Saturation	0		0%		00h					
Green Off	255		100%		FFh					
Cycle & Random Modes. Scan Speed controlled by Red Channel										
Slow Rate	0		0%		00h					
Fast Rate	255		100%		FFh					

59	LED 6 Green	RGB Control					255
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		RBG Control					
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		BRG Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		BGR Control					
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		GRB Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		GBR Control					
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		CMY Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		CYM Control					
		Blue Full Saturation	0		0%	00h	
		Blue Off	255		100%	FFh	
		YCM Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	
		YMC Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		MCY Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	
		MYC Control					
Blue Full Saturation	0		0%	00h			
Blue Off	255		100%	FFh			

60	LED 6 Blue	RGB Control					255
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		RBG Control					
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		BRG Control					
		Green Off	0		0%	00h	
		Green Full Saturation	255		100%	FFh	
		BGR Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		GRB Control					
		Blue Off	0		0%	00h	
		Blue Full Saturation	255		100%	FFh	
		GBR Control					
		Red Off	0		0%	00h	
		Red Full Saturation	255		100%	FFh	
		CMY Control					
		Blue Full Saturation	0		0%	00h	
		Blue Off	255		100%	FFh	
		CYM Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		YCM Control					
		Green Full Saturation	0		0%	00h	
		Green Off	255		100%	FFh	
		YMC Control					
		Red Full Saturation	0		0%	00h	
		Red Off	255		100%	FFh	
MCY Control							
Blue Full Saturation	0		0%	00h			
Blue Off	255		100%	FFh			
MYC Control							
Red Full Saturation	0		0%	00h			
Red Off	255		100%	FFh			

61	LED 6 White	RGB Control						255
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		RBG Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		BRG Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		BGR Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		GRB Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		GBR Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		CMY Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		CYM Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		YCM Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
		YMC Control						
		White Off	0		0%		00h	
		White Full	255		100%		FFh	
MCY Control								
White Off	0		0%		00h			
White Full	255		100%		FFh			
MYC Control								
White Off	0		0%		00h			
White Full	255		100%		FFh			
62	LED 6 Function	LED 6 Dim Tracking Mode						0
		Continuous	0	15	0%	6%	00h 0Fh	
		Periodic Strobe (slow to fast)	16	41	6%	16%	10h 29h	
		Random Strobe (slow to fast)	42	67	16%	26%	2Ah 43h	
		Reserved (Note 7)	68	127	27%	50%	44h 7Fh	
		LED 6 Independent Dim Mode						
		Continuous	128	143	50%	56%	80h 8Fh	
		Periodic Strobe (slow to fast)	144	169	56%	66%	90h A9h	
		Random Strobe (slow to fast)	170	195	67%	76%	AAh C3h	
		Reserved (Note 7)	196	255	77%	100%	C4h FFh	
63	LED 6 Dim Coarse	LED 6 Off	0		0%	00h	0	
		LED 6 100%	255		100%	FFh		
64	LED 6 Dim Fine		0		0%	00h	0	
			255		100%	FFh		

NOTES

- 1 142 Discrete Static and Multi-Step macros will be defined. These will require macro xfade and speed channels.
Static Macro X fade and Playback operation: When changing between static macros, the X fade time from channel 13 will be applied to the change. X fade will commence when the change is received.
Playback speed operation
 0-128 fastest playback time - crossfade off
 129-255 time defined by table on accompanying chart noted on the Xfade Speed Times Tab.

Multi-Step macro X fade and Playback operation:

X fade channel operation

- 0 stops crossfade
- 1-127 decreases crossfade time (* <1)
- 128 cross fade speed is as programmed (*1)
- 129-255 crossfade time (* >1)

Playback speed operation

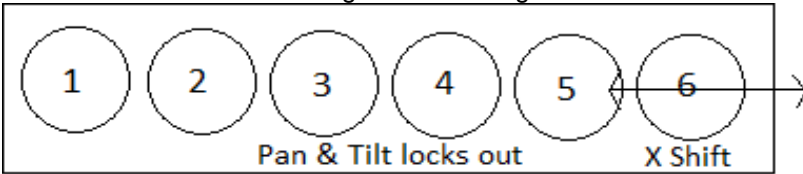
- 0-126 Reverse playback Fast to slow
- 127-128 Stop playback
- 129-255 Forward playback slow to Fast

- 2 Module Calibration allows for fine calibration of X LED module positions. Upon entering Calibration mode, the X value offsets are stored to align all beams. These calibration values are retained in eeprom, and used as X offsets to ensure that beams are aligned. This is now a menu option only.

- 3 LED modules are arranged according to the chart.

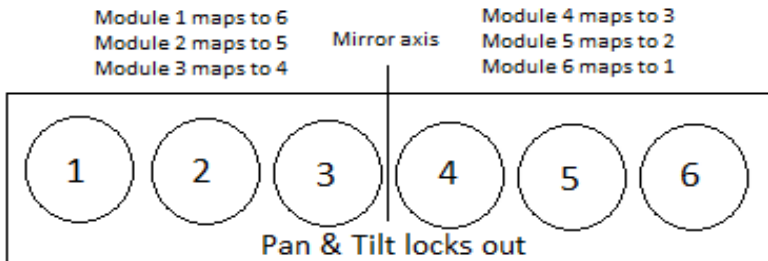


- 4 LED X shift defined according to the drawing



- 5 Module Mirror affect all module parameters (X, Red, Green, Blue, White, Function and Dim). See accompanying chart

Module Mirror: Module 1 maps to 6, Module 2 maps to 5, Module 3 maps to 4, Module 4 maps to 3, Module 5 maps to 2, Module 6 maps to 1.



- 6 White balance adjusts RGB values for a balanced white output. Default is on, this value is not retained through a power cycle.
- 7 Reserved ranges should function according to the controller default value.
- 8 RDM Manufacturers ID: 0x4c52
- 9 RDM Device ID: 0x582

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DMX	Time in seconds
0	0 Fastest move
1	0 Fastest move
2	0 Fastest move
3	0 Fastest move
4	252.69
5	250.68
6	248.68
7	246.69
8	244.7
9	242.73
10	240.76
11	238.8
12	236.85
13	234.9
14	232.97
15	231.04
16	229.12
17	227.21
18	225.3
19	223.41
20	221.52
21	219.64
22	217.77
23	215.9
24	214.05
25	212.2
26	210.36
27	208.53
28	206.7
29	204.89
30	203.08
31	201.28
32	199.49
33	197.7
34	195.93
35	194.16
36	192.4
37	190.65
38	188.9
39	187.17
40	185.44
41	183.72
42	182.01
43	180.31
44	178.61
45	176.92
46	175.24
47	173.57
48	171.91
49	170.25
50	168.61
51	166.97
52	165.33
53	163.71

54	162.1
55	160.49
56	158.89
57	157.3
58	155.71
59	154.14
60	152.57
61	151.01
62	149.46
63	147.92
64	146.38
65	144.86
66	143.34
67	141.82
68	140.32
69	138.83
70	137.34
71	135.86
72	134.39
73	132.93
74	131.47
75	130.02
76	128.59
77	127.15
78	125.73
79	124.32
80	122.91
81	121.51
82	120.12
83	118.74
84	117.36
85	115.99
86	114.64
87	113.28
88	111.94
89	110.61
90	109.28
91	107.96
92	106.65
93	105.35
94	104.05
95	102.77
96	101.49
97	100.22
98	98.95
99	97.7
100	96.45
101	95.21
102	93.98
103	92.76
104	91.55
105	90.34
106	89.14
107	87.95
108	86.77

109	85.59
110	84.43
111	83.27
112	82.12
113	80.98
114	79.84
115	78.72
116	77.6
117	76.49
118	75.38
119	74.29
120	73.2
121	72.13
122	71.06
123	69.99
124	68.94
125	67.89
126	66.85
127	65.82
128	64.8
129	63.79
130	62.78
131	61.78
132	60.79
133	59.81
134	58.84
135	57.87
136	56.91
137	55.96
138	55.02
139	54.09
140	53.16
141	52.24
142	51.33
143	50.43
144	49.54
145	48.65
146	47.77
147	46.9
148	46.04
149	45.19
150	44.34
151	43.51
152	42.68
153	41.85
154	41.04
155	40.23
156	39.44
157	38.65
158	37.87
159	37.09
160	36.33
161	35.57
162	34.82
163	34.08

164	33.34
165	32.62
166	31.9
167	31.19
168	30.49
169	29.8
170	29.11
171	28.43
172	27.76
173	27.1
174	26.45
175	25.8
176	25.17
177	24.54
178	23.92
179	23.3
180	22.7
181	22.1
182	21.51
183	20.93
184	20.36
185	19.79
186	19.23
187	18.69
188	18.14
189	17.61
190	17.09
191	16.57
192	16.06
193	15.56
194	15.07
195	14.58
196	14.1
197	13.63
198	13.17
199	12.72
200	12.28
201	11.84
202	11.41
203	10.99
204	10.58
205	10.17
206	9.77
207	9.39
208	9
209	8.63
210	8.27
211	7.91
212	7.56
213	7.22
214	6.89
215	6.56
216	6.25
217	5.94
218	5.64

219	5.34
220	5.06
221	4.78
222	4.52
223	4.25
224	4
225	3.76
226	3.52
227	3.29
228	3.07
229	2.86
230	2.66
231	2.46
232	2.27
233	2.09
234	1.92
235	1.75
236	1.6
237	1.45
238	1.31
239	1.18
240	1.05
241	0.94
242	0.83
243	0.73
244	0.64
245	0.55
246	0.47
247	0.41
248	0.35
249	0.29
250	0.25
251	0.21
252	0.19
253	0.17
254	0.15
255	0.15