

section 7
APPENDICES

DMX protocol

DMX Channel				Start code = 0		
DMX1	DMX2	DMX3	DMX4	Value	Percent	Function
				Shutter, Strobe, Reset, Lamp On/Off		
				0 - 19	0 - 7	Shutter closed
				20 - 49	8 - 19	Shutter open
				50 - 72	20 - 28	Strobe, fast→slow
				73 - 79	29 - 31	Shutter open, lamp power reduced (MAC 500 E only)
				80 - 99	31 - 39	Opening pulse, fast →slow
				100 - 119	39 - 47	Closing pulse, fast →slow
				120 - 127	47 - 50	Shutter open
				128 - 147	50 - 58	Random strobe, fast
				148 - 167	58 - 65	Random strobe, medium
				168 - 187	66 - 73	Random strobe, slow
				188 - 190	74 - 75	Shutter open
				191 - 193	75 - 76	Random opening pulse, fast
				194 - 196	76 - 77	Random opening pulse, slow
				197 - 199	77 - 78	Random closing pulse, fast
				200 - 202	78 - 79	Random closing pulse, slow
				203 - 207	80 - 81	Shutter open
				208 - 217	82 - 85	Reset fixture, see note 1
				218 - 227	85 - 89	Shutter open
				228 - 237	89 - 93	Lamp power on
				238 - 247	93 - 97	Shutter open
				248 - 255	97 - 100	Lamp power off: time > 5 seconds, see note 2
				Intensity		
				0 - 255	0 - 100	0 → 100%
				COLOR 1		
				Color Scroll		
				0 - 16	0 - 6	White → Blue 111
				16 - 32	6 - 13	Blue 111 → Red 301
				32 - 48	13 - 19	Red 301 → Magenta 507
				48 - 64	19 - 25	Magenta 507 → Green 202
				64 - 80	25 - 31	Green 202 → Yellow 604
				80 - 96	31 - 38	Yellow 604 → Purple 502
				96 - 112	38 - 44	Purple 502 → Blue 101
				112 - 128	44 - 50	Blue 101 → Pink 312
				128 - 144	50 - 56	Pink 312 → Cyan 401
				Fixed Colors		
				145 - 148	57 - 58	Cyan 401
				149 - 152	58 - 60	Pink 312
				153 - 156	60 - 61	Blue 101
				157 - 160	62 - 63	Purple 502
				161 - 164	63 - 64	Yellow 604
				165 - 168	65 - 66	Green 202
				169 - 172	66 - 67	Magenta 507
				173 - 176	68 - 69	Red 301
				177 - 180	69 - 71	Blue 111
				181 - 184	71 - 72	White
				Continuous Rotation		
				185 - 215	73 - 84	CW, fast → slow
				216 - 245	85 - 96	CCW, slow → fast
				246 - 255	96 - 100	Enable alternate color functions on channel 4.

¹ If DMX reset is disabled, a reset command may be sent if color wheel 1 set to cyan 401(144-148) and color wheel 2 is set to red 308 (157-160).

² If DMX lamp off is disabled, a lamp off command may be sent if color wheel 1 is set to cyan 401 (144-148) and color wheel 2 is set to red 308 (157-160).

DMX Channel				Start code = 0		
DMX1	DMX2	DMX3	DMX4	Value	Percent	Function
						COLOR 2: Normal Functions
						Color Scroll White → CTC 3200-4100 CTC 3200-4100 → CTC 3200-5600 CTC 3200-5600 → Blue 104 Blue 104 → Blue 108 Blue 108 → Green 206 Green 206 → Red 308 Red 308 → Yellow 603 Yellow 603 → CTC 5500-2900 CTC 5500-2900 → CTC 5500-4200
						Fixed Colors CTC 5500-4200 CTC 5500-2900 Yellow 603 Red 308 Green 206 Blue 108 Blue 104 CTC 3200-5600 CTC 3200-4100 White
						Continuous Rotation CW, fast → slow CCW, slow → fast
						Random Color Fast Medium Slow
						Alternate Functions (Enable on channel 3.)
						67 different colors in following order: white, purple, pink, magenta, red, orange, yellow, green, cyan, blue, black
						Rotating Gobo Selection Set index, direction, and speed on channel 6.
						Open gobo Gobo 1 - Indexing Gobo 2 - Indexing Gobo 3 - Indexing Gobo 4 - Indexing Gobo 5 - Indexing
						Gobo 5 - Cont. Rotation Gobo 4 - Cont. Rotation Gobo 3 - Cont. Rotation Gobo 2 - Cont. Rotation Gobo 1 - Cont. Rotation
						Rotating Gobo Index and Rotation Select gobo and function on channel 5.
						Indexing Index CCW Default index Index CW
						Continuous Rotation No rotation CW, slow → fast CCW, fast → slow No rotation
	4			0 - 16 16 - 32 32 - 48 48 - 64 64 - 80 80 - 96 96 - 112 112 - 128 128 - 144 145 - 148 149 - 152 153 - 156 157 - 160 161 - 164 165 - 168 169 - 172 173 - 176 177 - 180 181 - 184 185 - 215 216 - 245 246 - 248 249 - 251 252 - 255 0-255	0 - 6 6 - 13 13 - 19 19 - 25 25 - 31 31 - 38 38 - 44 44 - 50 50 - 56 57 - 58 58 - 60 60 - 61 62 - 63 63 - 64 65 - 66 66 - 67 68 - 69 69 - 71 71 - 72 73 - 84 85 - 96 96 - 97 98 - 98 99 - 100 0 - 100	
	5			0 - 55 56 - 75 76 - 95 96 - 115 116 - 135 136 - 155 156 - 175 176 - 195 196 - 215 216 - 235 236 - 255	0 - 22 22 - 29 30 - 37 38 - 45 45 - 53 53 - 61 61 - 69 69 - 76 77 - 84 85 - 92 93 - 100	
	6			0 - 126 127 128 - 255 0 - 2 3 - 127 128 - 252 253 - 255	0 - 49 50 50 - 100 0 - 1 1 - 50 50 - 98 99 - 100	

DMX Channel				Start code = 0		
DMX1	DMX2	DMX3	DMX4	Value	Percent	Function
				Fixed Gobos		
				Fixed gobo positions		
				0 - 9	0 - 4	Open gobo
				10 - 19	4 - 8	Gobo 1
				20 - 29	8 - 11	Gobo 2
				30 - 39	12 - 15	Gobo 3
				40 - 49	16 - 19	Gobo 4
				50 - 59	20 - 23	Gobo 5
				60 - 69	24 - 27	Gobo 6
				70 - 79	27 - 31	Gobo 7
				80 - 89	31 - 35	Gobo 8
				90 - 102	35 - 40	Gobo 9
7 Gobo mode = fixed (default)				Gobo shake, fast → slow		
				103 - 119	40 - 47	Gobo 9
				120 - 136	47 - 53	Gobo 8
				137 - 153	54 - 60	Gobo 7
				154 - 170	60 - 67	Gobo 6
				171 - 187	67 - 73	Gobo 5
				188 - 204	74 - 80	Gobo 4
				205 - 221	80 - 87	Gobo 3
				222 - 238	87 - 93	Gobo 2
				239 - 255	94 - 100	Gobo 1
				Fixed Gobos		
				0 - 180	0 - 70	Continuous scroll
				Full positions:		
				0	0	Open
				20	8	Gobo 1
				40	16	Gobo 2
				60	24	Gobo 3
				80	31	Gobo 4
				100	39	Gobo 5
				120	47	Gobo 6
				140	55	Gobo 7
				160	63	Gobo 8
				180	70	Gobo 9
7 Gobo mode = scroll (optional)				Gobo shake		
				181 - 183	71 - 72	Gobo 9 shake
				184 - 186	72 - 73	Gobo 8 shake
				187 - 189	73 - 74	Gobo 7 shake
				190 - 192	74 - 75	Gobo 6 shake
				193 - 195	75 - 76	Gobo 5 shake
				196 - 198	77 - 78	Gobo 4 shake
				199 - 201	78 - 79	Gobo 3 shake
				202 - 204	79 - 80	Gobo 2 shake
				205 - 207	80 - 81	Gobo 1 shake
				Continuous rotation		
				208 - 231	82 - 91	CW, fast → slow
				232 - 255	92 - 100	CCW, slow → fast
8				Focus		
				0 - 255	0 - 100	Infinity → 2 meters
				Iris		
				0 - 199	0 - 78	Open → close
				200 - 215	78 - 84	Close
				216 - 229	85 - 90	Pulse opening, fast → slow
				230 - 243	90 - 95	Pulse closing, fast → slow
				244 - 246	96 - 96	Random pulse opening, fast
				247 - 249	97 - 98	Random pulse opening, slow
				250 - 252	98 - 99	Random pulse closing, fast
				253 - 255	99 - 100	Random pulse closing, slow
9						

DMX Channel				Start code = 0		
DMX1	DMX2	DMX3	DMX4	Value	Percent	Function
10 Fixture type = prism (default)				0 - 19	0 - 7	Prism Prism off
				20 - 79	8 - 31	Rotating prism, CCW fast → slow
				80 - 89	31 - 35	No rotation
				90 - 149	35 - 58	Rotating prism, CW slow → fast
				150 - 215	59 - 84	Prism off
				Combined Rotating Prism and Gobo Macros		
				216 - 220	84 - 86	Macro 1
				221 - 225	87 - 88	Macro 2
				226 - 230	89 - 90	Macro 3
				231 - 235	91 - 92	Macro 4
236 - 240	93 - 94	Macro 5				
241 - 245	95 - 96	Macro 6				
246 - 250	96 - 98	Macro 7				
251 - 255	98 - 100	Macro 8				
10 Fixture type = frost (optional)				0 - 255	0 - 100	Variable Frost No frost → full frost
11	11	11	11	0 - 255	0 - 100	Pan Left → right (128 = neutral)
-	12	-	12	0 - 255	0 - 100	Pan Fine (LSB) Left → right
12	13	12	13	0 - 255	0 - 100	Tilt Up → down (128 = neutral)
-	14	-	14	0 - 255	0 - 100	Tilt Fine (LSB) Up → down
-	-	13	15	0 - 2 3 - 245 246 - 248 249 - 251 252 - 255	0 - 1 1 - 96 96 - 97 98 - 98 99 - 100	Pan/Tilt Speed Tracking Fast → slow Tracking, normal speed (override PTSP FAST) Tracking, fast speed (override PTSP NORM) Blackout while moving
n/a	n/a	14	16	0 - 2 3 - 239 240 - 242 243 - 245 246 - 248 249 - 251 252 - 255	0 - 1 1 - 94 94 - 95 95 - 96 96 - 97 98 - 98 99 - 100	Effects Speed Dimmer, iris, focus and gobo indexing Tracking mode Fast → slow Tracking, normal mode (MOdE = NORM) Tracking, studio mode (MOdE = STUd) Tracking, shortcuts disabled (SCUT = OFF) Tracking, shortcuts enabled (SCUT = ON) Maximum speed Color 1, color 2, and fixed gobo if gMod = SCRL Tracking mode Speed, fast → slow Tracking, normal mode (MOdE = NORM) Tracking, studio mode (MOdE = STUd) Tracking with shortcuts disabled, overrides SCUT ON Tracking with shortcuts enabled, overrides SCUT OFF Blackout while moving Fixed gobo if gMod = FIX Normal (as set on effect channel), no blackout Tracking, normal mode (MOdE = NORM) Tracking, studio mode (MOdE = STUd) Normal, shortcuts disabled, overrides SCUT ON Normal, shortcuts enabled, overrides SCUT OFF Blackout while moving Rotating gobo and prism Normal (as set on effect channel), no blackout Blackout while moving Gobo shake speed if gMod = SCRL Fast Speed, fast → slow Fast
0 - 239	0 - 94					
240 - 242	94 - 95					
243 - 245	95 - 96					
246 - 248	96 - 97					
249 - 251	98 - 98					
252 - 255	99 - 100					
0 - 251	0 - 98					
252 - 255	99 - 100					
0 - 2	0 - 1					
3 - 245	1 - 96					
246 - 255	96 - 100					