

# DMX protocol

Applicable when running MAC Viper Profile firmware version: 1.3.0

Basic 16-bit Mode	16-bit Extended Mode	DMX Value	Percent	Function	Fade type	Default value
1	1	0 - 19	0 - 7	<b>Strobe/shutter</b> Shutter closed (Lamp switches to 800 watt mode after shutter is closed for 10 seconds)	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	2	0 - 65535	0 - 100	<b>Dimmer fade (MSB)</b> Closed → open	Fade	0
	3			<b>Dimmer fade, fine (LSB)</b>	Fade	0
3	4	0 - 255	0 - 100	<b>Cyan</b> White → full cyan	Fade	0
4	5	0 - 255	0 - 100	<b>Magenta</b> White → full magenta	Fade	0
5	6	0 - 255	0 - 100	<b>Yellow</b> White → full yellow	Fade	0
6	7	0 - 255	0 - 100	<b>CTO</b> Open (6000 K) → warm (3200 K)	Fade	0

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<b>7</b>	<b>8</b>			<b>Color Wheel</b>				
				<i>Continuous Scroll</i>				
		0	0	Open				
		1 - 14	1 - 5	Open → Slot 1				
		15	6	Slot 1				
		16 - 29	6 - 11	Slot 1 → Slot 2				
		30	12	Slot 2				
		31 - 44	12 - 17	Slot 2 → Slot 3				
		45	18	Slot 3				
		46 - 59	18 - 23	Slot 3 → Slot 4				
		60	23	Slot 4				
		61 - 74	24 - 29	Slot 4 → Slot 5				
		75	29	Slot 5				
		76 - 89	30 - 35	Slot 5 → Slot 6				
		90	35	Slot 6				
		91 - 104	36 - 41	Slot 6 → Slot 7				
		105	41	Slot 7				
		106 - 119	41 - 46	Slot 7 → Slot 8				
		120	47	Slot 8				
		121 - 134	47 - 52	Slot 8 → Open				
		135 - 140	53 - 55	Open		Snap	0	
						<i>Stepped Scroll (snap to full color positions)</i>		
				141 - 145	55 - 57	Slot 1		
				146 - 150	57 - 59	Slot 2		
				151 - 155	59 - 61	Slot 3		
				156 - 160	61 - 63	Slot 4		
				161 - 165	63 - 64	Slot 5		
				166 - 170	65 - 66	Slot 6		
				171 - 175	67 - 68	Slot 7		
				176 - 180	69 - 70	Slot 8		
				181 - 185	71 - 73	Open		
						<i>Continuous Rotation</i>		
				186 - 211	73 - 82	CW, Fast → Slow		
				212 - 217	83 - 85	Stop (This will stop the color wheel wherever it is at the time)		
				218 - 243	85 - 95	CCW, Slow → Fast		
						<i>Random color</i>		
		244 - 247	95 - 96	Fast				
		248 - 251	97 - 98	Medium				
		252 - 255	98 - 100	Slow				

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Basic 16-bit Mode	16-bit Extended Mode	DMX Value	Percent	Function	Fade type	Default value
8	9	0 - 9	0 - 4	<b>Breakup wheel (wheel 1): gobo selection, indexing, shake, rotation</b> <i>Indexed gobo: set indexed angle on channels 9/10 (16-bit) or 10/11 (16-bit ext.)</i> Open	Snap	0
		10 - 14	4 - 5	Gobo 1		
		15 - 19	5 - 8	Gobo 2		
		20 - 24	8 - 10	Gobo 3		
		25 - 29	10 - 12	Gobo 4		
		30 - 34	12 - 13	Gobo 5		
		35 - 39	14 - 16	<i>Continuous gobo rotation: set gobo rotation speed on channels 9/10 (16-bit) or 10/11 (16-bit ext.)</i> Gobo 1		
		40 - 44	16 - 17	Gobo 2		
		45 - 49	18 - 19	Gobo 3		
		50 - 54	20 - 21	Gobo 4		
		55 - 59	21 - 23	Gobo 5		
		60 - 89	23 - 35	<i>Gobo shake centered on indexed position: set indexed angle on channels 9/10 (16-bit) or 10/11 (16-bit ext.). Shake angle increments in following steps: 10°, 15°, 30°, 45°, 60°, 90°, 135°, 180°, 270° and 360°</i> Gobo 1, 360° slow → 10° fast		
		90 - 119	35 - 46	Gobo 2, 360° slow → 10° fast		
		120 - 149	47 - 58	Gobo 3, 360° slow → 10° fast		
150 - 179	59 - 70	Gobo 4, 360° slow → 10° fast				
180 - 209	70 - 82	Gobo 5, 360° slow → 10° fast				
210 - 232	82 - 91	<i>Continuous gobo wheel scroll with continuous gobo rotation: set gobo rotation speed on channels 9/10 (16-bit) or 10/11 (16-bit extended)</i> CW gobo wheel scroll, fast → slow				
233 - 255	91 - 100	CCW gobo wheel scroll, slow* → fast				
9	10	0 - 65535	0 - 100	<b>Breakup wheel (wheel 1): gobo indexing, rotation (16-bit fine, MSB and LSB)</b> <i>If indexed gobo is selected on channel 8 (16-bit) or 9 (16-bit ext.)</i> Gobo indexing, -197.5° → +197.5° (default DMX value 32768 sets gobo to 0°)	Fade	32768
				<i>If continuous gobo rotation is selected on channel 8 (16-bit) or 9 (16-bit ext.)</i>		
10	11	0 - 600	0	No gobo rotation, gobo indexed at 0°		
		601 - 32130	1 - 49	CW, fast → slow		
		32131 - 32895	49 - 50	No gobo rotation, gobo stops at current position		
		32896 - 64515	50 - 99	CCW, slow → fast		
64516 - 65535	100	No gobo rotation, gobo indexed at 90°				

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Basic 16-bit Mode	16-bit Extended Mode	DMX Value	Percent	Function	Fade type	Default value
11	12	0 - 9	0 - 4	<b>Aerial wheel (wheel 2): gobo selection, indexing, shake, rotation</b> <i>Indexed gobo: set indexed angle on channels 12/13 (16-bit) or 13/14 (16-bit ext.)</i> Open	Snap	0
		10 - 14	4 - 5	Gobo 1		
		15 - 19	5 - 8	Gobo 2		
		20 - 24	8 - 10	Gobo 3		
		25 - 29	10 - 12	Gobo 4		
		30 - 34	12 - 14	Gobo 5		
		35 - 39	14 - 16	<i>Continuous gobo rotation: set gobo rotation speed on channels 12/13 (16-bit) or 13/14 (16-bit ext.)</i> Gobo 1		
		40 - 44	16 - 18	Gobo 2		
		45 - 49	18 - 20	Gobo 3		
		50 - 54	20 - 22	Gobo 4		
		55 - 59	22 - 24	Gobo 5		
		60 - 89	24 - 34	<i>Gobo shake centered on indexed position: set indexed angle on channels 12/13 (16-bit) or 13/14 (16-bit ext.). Shake angle increments in following steps: 10°, 15°, 30°, 45°, 60°, 90°, 135°, 180°, 270° and 360°</i> Gobo 1, 360° slow → 10° fast		
		90 - 119	35 - 45	Gobo 2, 360° slow → 10° fast		
		120 - 149	46 - 56	Gobo 3, 360° slow → 10° fast		
150 - 179	57 - 67	Gobo 4, 360° slow → 10° fast				
180 - 209	68 - 78	Gobo 5, 360° slow → 10° fast				
210 - 232	79 - 89	<i>Continuous gobo wheel scroll with continuous gobo rotation: set gobo rotation speed on channels 12/13 (16-bit) or 13/14 (16-bit extended)</i> CW gobo wheel scroll, fast → slow				
233 - 255	90 - 100	CCW gobo wheel scroll, slow* → fast				
12	13	0 - 65535	0 - 100	<b>Aerial wheel (wheel 2): gobo indexing, rotation (16-bit fine, MSB and LSB)</b> <i>If indexed gobo is selected on channel 11 (16-bit) or 12(16-bit ext.)</i> Gobo indexing, -197.5° → +197.5° (default DMX value 32768 sets gobo to 0°)	Fade	32768
				<i>If continuous gobo rotation is selected on channel 11 (16-bit) or 12 (16-bit ext.)</i>		
13	14	0 - 600	0	No gobo rotation, gobo indexed at 0°		
		601 - 32130	1 - 49	CW, fast → slow		
		32131 - 32895	49 - 50	No gobo rotation, gobo stops at current position		
		32896 - 64515	50 - 99	CCW, slow → fast		
64516 - 65535	100	No gobo rotation, gobo indexed at 90°				

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Basic 16-bit Mode	16-bit Extended Mode	DMX Value	Percent	Function	Fade type	Default value
<b>14</b>	<b>15</b>			<b>FX wheel (wheel 3) static gobos and animation effect selection, rotation, animation movement type</b>	Fade	0
				<i>Continuous FX wheel scrolling</i>		
		0	0	Open		
		1 - 9	0 - 4	Open → Gobo 1		
		10	4	Gobo 1		
		11 - 19	4 - 7	Gobo 1 → Gobo 2		
		20	8	Gobo 2		
		21 - 29	8 - 11	Gobo 2 → Gobo 3		
		30	12	Gobo 3		
		31 - 39	12 - 15	Gobo 3 → Gobo 4		
		40	16	Gobo 4		
		41 - 49	16 - 19	Gobo 4 → Position 5		
		50	20	Position 5		
		51 - 59	20 - 23	Position 5 → Position 6		
		60	23	Position 6		
		61 - 69	24 - 27	Position 6 → Position 7		
		70	27	Position 7		
		71 - 79	28 - 31	Position 7 → Position 8		
		80	31	Position 8		
		81 - 89	32 - 35	Position 8 → Position 9		
		90	35	Position 9		
		91 - 99	35 - 40	Position 9 → Open		
		100 - 110	39 - 43	Open		
				<i>Stepped FX wheel scrolling</i>		
				Gobo 1		
				Gobo 2		
				Gobo 3		
				Gobo 4		
				Position 5		
				Position 6		
				Position 7		
				Position 8		
				Position 9		
				Open		
		<i>Continuous FX wheel rotation: set rotation speed on channel 15 (16-bit) or 16 (16-bit extended)</i>				
		63 - 74	CW FX wheel rotation, fast → slow			
		74	FX wheel stops at its current position			
		75 - 86	CCW FX wheel rotation, slow* → fast			
		86 - 88	No function			
		<i>Animation movement functions: set speed on channel 15 (16-bit) or 16 (16-bit extended)</i>				
		89	Smooth			
		90 - 91	Organic			
		91 - 92	Metronome			
		92 - 93	Run forwards, fast rewind			
		93 - 94	Run backwards, fast rewind			
		95	Random bounce			
		95 - 96	Interference			
		96 - 97	Random animation range position			
		98	Random gobo position			
		99 - 100	Random FX wheel position			
<b>15</b>	<b>16</b>	0 - 10 11 - 255	0 - 4 4 - 100	<b>FX wheel animation speed</b> Stop Animation speed slow → fast	Fade	128
<b>16</b>	<b>17</b>	0 - 255	0 - 100	<b>Frost</b> No frost → full frost	Fade	0
<b>17</b>	<b>18</b>	0 - 10 11 - 138 139 - 255	0 - 4 4 - 54 54 - 100	<b>Prism</b> Prism off Prism indexing: set angle on ch. 18 (16-bit) or 19 (16-bit ext.) Prism rotation: set direction and speed on ch. 18 (16-bit) or 19 (16-bit ext.)	Snap	0

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<b>18</b>	<b>19</b>	0 - 255	0 - 100	<b>Prism indexing angle, rotation speed and direction</b> <i>If prism indexing is selected on channel 17 (16-bit) or 18 (16-bit ext.):</i> Indexed angle 0° - maximum	Fade	128
		0 - 2	0	<i>If prism rotation is selected on channel 17 (16-bit) or 18 (16-bit ext.):</i> Prism stop, indexed at 0°		
		3 - 126	1 - 50	CW rotation, fast → slow		
		127 - 129	51	Prism stop at its current position		
		130 - 253	52 - 99	CCW rotation, slow → fast		
		254 - 255	100	Prism stop, indexed at 45°		
<b>19</b>	<b>20</b>	0 - 255	0 - 100	<b>Iris</b> Open → closed	Fade	0
<b>20</b>	<b>21</b>	0 - 65535	0 - 100	<b>Zoom, 16-bit (MSB and LSB)</b> Flood → spot	Fade	32768
	<b>22</b>					
<b>21</b>	<b>23</b>	0 - 65535	0 - 100	<b>Focus, 16-bit (MSB and LSB)</b> Infinity → near	Fade	32768
	<b>24</b>					
<b>22</b>	<b>25</b>	0 - 65535	0 - 100	<b>Pan, 16-bit (MSB and LSB)</b> Left → right (32768 = neutral)	Fade	32768
<b>23</b>	<b>26</b>					
<b>24</b>	<b>27</b>	0 - 65535	0 - 100	<b>Tilt, 16-bit (MSB and LSB)</b> Up → down (32768 = neutral)	Fade	32768
<b>25</b>	<b>28</b>					

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Basic 16-bit Mode	16-bit Extended Mode	DMX Value	Percent	Function	Fade type	Default value
<b>26</b>	<b>29</b>			<b>Fixture control/settings</b> (hold for number of seconds indicated to activate)	Snap	0
		0 - 9	0 - 4	No function (disables calibration) – 5 sec.		
		10 - 14	4 - 5	Reset entire fixture – 5 sec.		
		15 - 19	6 - 7	Reset dimmer and shutter only – 5 sec.		
		20 - 24	8 - 9	Reset CMY, CTO and color wheel only – 5 sec.		
		25 - 29	10 - 11	Reset effects (breakup, aerial and FX wheels, iris, prism, frost, zoom, focus) only – 5 sec.		
		30 - 34	12 - 13	Reset pan and tilt only – 5 sec.		
		35 - 39	14 - 15	No function		
		40 - 44	16 - 17	Lamp on		
		45 - 49	18 - 19	Lamp off – 5 sec.		
		50 - 54	20 - 21	No function		
		55 - 59	21 - 23	Enable calibration – 5 sec.		
		60 - 64	23 - 25	Linear dimming curve – 1 sec. (menu override, setting unaffected by power off/on)		
		65 - 69	25 - 27	Square law dimming curve – 1 sec. (menu override, factory default setting, setting unaffected by power off/on)		
		70 - 74	28 - 29	Inverse square law dimming curve – 1 sec. (menu override, setting unaffected by power off/on)		
		75 - 79	29 - 31	S-curve dimming curve – 1 sec. (menu override, setting unaffected by power off/on)		
		80 - 84	32 - 33	Normal pan and tilt speed – 1 sec. (menu override - setting returns to MENU setting after power on/off)		
		85 - 89	34 - 35	Fast pan and tilt speed – 1 sec. (default setting, menu override - setting returns to MENU setting after power on/off)		
		90 - 94	35 - 37	Slow pan and tilt speed – 1 sec. (menu override - setting returns to MENU setting after power on/off)		
		95 - 99	37 - 39	Effect shortcuts = ON – 1 sec. (default setting, menu override, setting stays at factory default ON at power off/on)		
		100 - 104	39 - 41	Effect shortcuts = OFF – 1 sec. (menu override, setting returns to factory default ON at power off/on)		
		105 - 109	41 - 43	Disable zoom/focus linking – 1 sec.		
		110 - 114	43 - 45	Enable zoom/focus linking, near distance – 1 sec.		
		115 - 119	45 - 46	Enable zoom/focus linking, medium distance (default setting) – 1 sec.		
		120 - 124	47 - 48	Enable zoom/focus linking, far distance – 1 sec.		
		125 - 126	49	Ballast output full, set to 100% (default setting)		
		127 - 128	50	Ballast output reduced to 90%		
		129 - 130	50 - 51	Ballast output reduced to 80%		
		131 - 132	51 - 52	Ballast output reduced to 70%		
		133 - 134	52	Ballast output reduced to 60%		
		135 - 139	53 - 54	Beam smoothing = ON – 1 sec.		
		140 - 144	55 - 56	Beam smoothing = OFF – 1 sec. (default setting)		
		145 - 149	57 - 58	Auto blackout = ON – 1 sec.		
		150 - 154	59 - 60	Auto blackout = OFF – 1 sec. (default setting)		
		155 - 159	61 - 62	Turn on display – 1 sec.		
		160 - 164	62 - 63	Turn off display – 1 sec.		
165 - 169	64 - 66	Store pan and tilt calibration – 5 sec.				
170 - 174	66 - 68	Store dimmer calibration – 5 sec.				
175 - 179	68 - 70	Store cyan calibration – 5 sec.				
180 - 184	70 - 72	Store magenta calibration – 5 sec.				
185 - 189	72 - 74	Store yellow calibration – 5 sec.				
190 - 194	74 - 76	Store CTC calibration – 5 sec.				
195 - 199	76 - 78	Store all CMY and CTC calibration – 5 sec.				
200 - 204	78 - 80	Store breakup wheel (wheel 1) current slot index calibration – 5 sec.				
205 - 209	80 - 82	Store aerial wheel (wheel 2) current slot index calibration – 5 sec.				
210 - 214	82 - 84	Store FX wheel (wheel 3) index calibration – 5 sec.				
215 - 219	84 - 86	Store prism index calibration – 5 sec.				
220 - 224	86 - 88	Store iris calibration – 5 sec.				
225 - 229	88 - 89	Store focus calibration – 5 sec.				
230 - 234	90 - 91	Store zoom calibration – 5 sec.				
235 - 239	92 - 93	Store pan calibration – 5 sec.				
240 - 244	94 - 95	Store tilt calibration – 5 sec.				
245 - 249	96 - 97	Reset all calibration values to factory defaults – 5 sec.				
250 - 255	98 - 100	No function				
-	<b>30</b>			Reserved for future use		

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-	<b>31</b>			Reserved for future use		
-	<b>32</b>			Reserved for future use		
-	<b>33</b>			Reserved for future use		
-	<b>34</b>			Reserved for future use		

**Table 1: DMX Protocol**

*MSB = Most significant byte*

*LSB = Least significant byte*