

DMX protocol

A range of protocols is available for the MAC 401 Dual™. The protocol used depends on how the fixture is configured. For information about configuring for DMX, see “DMX” on page 15.

RGB HSV	RGBX HSX	DMX Value	Percent	Function	Snap/ fade	Default value
1	1	0 - 19	0 - 7	Strobe/Virtual shutter effect Shutter closed	Snap	020
		20 - 49	8 - 19	Shutter open		
		50 - 64	20 - 25	Strobe (fast → slow)		
		65 - 69	26 - 27	Shutter open		
		70 - 84	28 - 33	Opening pulse (fast → slow)		
		85 - 89	34 - 35	Shutter open		
		90 - 104	36 - 41	Closing pulse (fast → slow)		
		105 - 109	42 - 43	Shutter open		
		110 - 124	44 - 49	Random strobe (fast → slow)		
		125 - 129	50 - 51	Shutter closed		
		130 - 144	52 - 57	Random opening pulse (fast → slow)		
		145 - 149	58 - 59	Shutter open		
		150 - 164	60 - 65	Random closing pulse (fast → slow)		
		165 - 169	66 - 67	Shutter closed		
		170 - 184	68 - 73	Burst pulse (fast → slow)		
		185 - 189	74 - 75	Shutter open		
		190 - 204	76 - 81	Random burst pulse (fast → slow)		
		205 - 209	82 - 83	Shutter closed		
210 - 224	84 - 89	Sine wave (fast → slow)				
225 - 229	90 - 91	Shutter open				
230 - 244	92 - 97	Electronic burst (fast → slow)				
245 - 255	98 - 100	Shutter open				
2	2	0 - 255	0 - 100	Virtual dimmer Closed → open	Fade	0

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RGB HSV	RGBX HSX	DMX Value	Percent	Function	Snap/ fade	Default value
—	3	0 - 19	0 - 7	Dynamic effect 1 No Effect	Snap	0
		20 - 39	7 - 16	Effect 1 - White Single Segment Chase		
		40 - 59	17 - 24	Effect 2 - White Double Segment Chase		
		60 - 79	25 - 32	Effect 3 - Red Single Segment Chase		
		80 - 84	30 - 31	Effect 4 - Green Single Segment Chase		
		85 - 89	32 - 33	Effect 5 - Blue Single Segment Chase		
		90 - 94	34 - 35	Effect 6 - Cyan Single Segment Chase		
		95 - 99	36 - 37	Effect 7 - Magenta Single Segment Chase		
		100 - 104	38 - 39	Effect 8 - Yellow Single Segment Chase		
		105 - 109	40 - 41	Effect 9 - Red Double Segment Chase		
		110 - 114	42 - 43	Effect 10 - Green Double Segment Chase		
		115 - 119	44 - 45	Effect 11 - Blue Double Segment Chase		
		120 - 124	46 - 47	Effect 12 - Cyan Double Segment Chase		
		125 - 129	48 - 49	Effect 13 - Magenta Double Segment Chase		
		130 - 134	50 - 51	Effect 14 - Yellow Double Segment Chase		
		135 - 139	52 - 53	Effect 15 - Yellow Blue Pulse		
		140 - 144	54 - 55	Effect 16 - Green Magenta Pulse		
		145 - 149	56 - 57	Effect 17 - Red Cyan Pulse		
		150 - 154	58 - 59	Effect 18 - Red Green Pulse		
		155 - 159	60 - 61	Effect 19 - Red Blue Pulse		
		160 - 164	62 - 63	Effect 20 - Red Flip 1		
		165 - 169	64 - 65	Effect 21 - Red Flip 2		
		170 - 174	66 - 67	Effect 22 - Green Flip 1		
		175 - 179	68 - 69	Effect 23 - Green Flip 2		
		180 - 184	70 - 71	Effect 24 - Blue Flip 1		
		185 - 189	72 - 73	Effect 25 - Blue Flip 2		
		190 - 194	74 - 75	Effect 26 - White Flip 1		
		195 - 199	76 - 77	Effect 27 - White Flip 2		
		200 - 204	78 - 79	Effect 28 - White Flicker Chase		
		205 - 209	80 - 81	Effect 29 - Rising Pulse		
		210 - 214	82 - 83	Effect 30 - White Flicker		
		215 - 219	84 - 85	Effect 31 - Strobe Pulse		
		220 - 224	86 - 87	Effect 32 - Single segment chase (needs RGB set for color)		
		225 - 229	88 - 89	Effect 33 - Two segment chase (needs RGB set for color)		
		230 - 234	90 - 91	Effect 34 - Double horiz. seg. chase (needs RGB for color)		
		235 - 239	92 - 93	Effect 35 - Double vert. seg. chase (needs RGB for color)		
		240 - 244	94 - 95	Effect 36 - Double opposite chase (needs RGB set for color)		
		245 - 249	96 - 97	Effect 37 - Reserved for future use		
250 - 255	98 - 100	Effect 38 - Reserved for future use				
—	4	0 - 2	0	Dynamic effect 1 speed Stop	Fade	128
		3 - 126	1 - 49	Clockwise rotation, fast → slow		
		127 - 129	50	Stop		
		130 - 253	51 - 99	Counter-clockwise rotation, slow → fast		
		254 - 255	100	Stop		
—	5	0 - 255	0 - 100	Dynamic effect 1 x-fade No fade → max. fade	Fade	0
—	6	0 - 255	0 - 100	Dynamic effect 1 intensity Zero → 100%	Fade	0

Table 3: DMX Protocol

RGB HSV	RGBX HSX	DMX Value	Percent	Function	Snap/fade	Default value
—	7	0 - 19	0 - 7	Dynamic effect 2 No Effect	Snap	0
		20 - 39	7 - 16	Effect 1 - White Single Segment Chase		
		40 - 59	17 - 24	Effect 2 - White Double Segment Chase		
		60 - 79	25 - 32	Effect 3 - Red Single Segment Chase		
		80 - 84	30 - 31	Effect 4 - Green Single Segment Chase		
		85 - 89	32 - 33	Effect 5 - Blue Single Segment Chase		
		90 - 94	34 - 35	Effect 6 - Cyan Single Segment Chase		
		95 - 99	36 - 37	Effect 7 - Magenta Single Segment Chase		
		100 - 104	38 - 39	Effect 8 - Yellow Single Segment Chase		
		105 - 109	40 - 41	Effect 9 - Red Double Segment Chase		
		110 - 114	42 - 43	Effect 10 - Green Double Segment Chase		
		115 - 119	44 - 45	Effect 11 - Blue Double Segment Chase		
		120 - 124	46 - 47	Effect 12 - Cyan Double Segment Chase		
		125 - 129	48 - 49	Effect 13 - Magenta Double Segment Chase		
		130 - 134	50 - 51	Effect 14 - Yellow Double Segment Chase		
		135 - 139	52 - 53	Effect 15 - Yellow Blue Pulse		
		140 - 144	54 - 55	Effect 16 - Green Magenta Pulse		
		145 - 149	56 - 57	Effect 17 - Red Cyan Pulse		
		150 - 154	58 - 59	Effect 18 - Red Green Pulse		
		155 - 159	60 - 61	Effect 19 - Red Blue Pulse		
		160 - 164	62 - 63	Effect 20 - Red Flip 1		
		165 - 169	64 - 65	Effect 21 - Red Flip 2		
		170 - 174	66 - 67	Effect 22 - Green Flip 1		
		175 - 179	68 - 69	Effect 23 - Green Flip 2		
		180 - 184	70 - 71	Effect 24 - Blue Flip 1		
		185 - 189	72 - 73	Effect 25 - Blue Flip 2		
		190 - 194	74 - 75	Effect 26 - White Flip 1		
		195 - 199	76 - 77	Effect 27 - White Flip 2		
		200 - 204	78 - 79	Effect 28 - White Flicker Chase		
		205 - 209	80 - 81	Effect 29 - Rising Pulse		
		210 - 214	82 - 83	Effect 30 - White Flicker		
		215 - 219	84 - 85	Effect 31 - Strobe Pulse		
		220 - 224	86 - 87	Effect 32 - Single segment chase (needs RGB set for color)		
		225 - 229	88 - 89	Effect 33 - Two segment chase (needs RGB set for color)		
		230 - 234	90 - 91	Effect 34 - Double horiz. seg. chase (needs RGB for color)		
		235 - 239	92 - 93	Effect 35 - Double vert. seg. chase (needs RGB for color)		
		240 - 244	94 - 95	Effect 36 - Double opposite chase (needs RGB set for color)		
		245 - 249	96 - 97	Effect 37 - Reserved for future use		
250 - 255	98 - 100	Effect 38 - Reserved for future use				
—	8	0 - 2	0	Dynamic effect 2 speed Stop	Fade	128
		3 - 126	1 - 49	Clockwise rotation, fast → slow		
		127 - 129	50	Stop		
		130 - 253	51 - 99	Counter-clockwise rotation, slow → fast		
		254 - 255	100	Stop		
—	9	0 - 255	0 - 100	Dynamic effect 2 x-fade No fade → max. fade	Fade	0
—	10	0 - 255	0 - 100	Dynamic effect 2 intensity Zero → 100%	Fade	0
3	11	0 - 200 201 - 210 211 - 255	0 - 77 78 - 81 82 - 100	Zoom Zoom wide → narrow Hypermode No function	Fade	0
4	12	0 - 255	0 - 100	Pan Pan 0 - 630° (128 = centered)	Fade	128
5	13	0 - 255	0 - 100	Pan fine Pan fine (Least Significant Byte)	Fade	0
6	14	0 - 255	0 - 100	Tilt Tilt 0 - 300° (128 = centered)	Fade	128
7	15	0 - 255	0 - 100	Tilt fine Tilt fine (Least Significant Byte)	Fade	0

Table 3: DMX Protocol

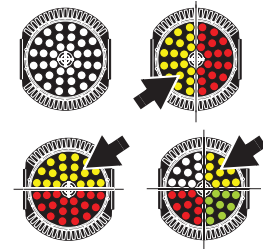
RGB HSV	RGBX HSX	DMX Value	Percent	Function	Snap/fade	Default value
8	16	0 - 9	0 - 1	Fixture control No function	Snap	0
		10 - 14	2 - 3	Reset Entire fixture1		
		15 - 19	4 - 5	No function		
		20 - 24	6 - 7	Reset Effects only1		
		25 - 29	8 - 9	No function		
		30 - 34	10 - 11	Reset Pan & Tilt Only1		
		35 - 39	12 - 13	No function		
		40 - 44	14 - 15	PTSP = NORM (Menu override. Setting unaffected by power on/off)		
		45 - 49	16 - 17	PTSP = FAST (Menu override. Unaffected by power on/off)		
		50 - 54	18 - 19	No function		
		55 - 59	20 - 21	Reserved for Future Use		
		60 - 64	22 - 23	No function		
		65 - 69	24 - 25	Fan Mode - Full (Menu override. Setting unaffected by power on/off)		
		70 - 74	26 - 27	No function		
		75 - 79	28 - 29	Fan Mode - Regulated (Menu override. Setting unaffected by power on/off)		
		80 - 84	30 - 31	No function		
		85 - 89	32 - 33	Fan Mode - Silent (Menu override. Setting unaffected by power on/off)		
		90 - 94	34 - 35	No function		
		95 - 99	36 - 37	Dimmer Curve = LIN (Menu override. Setting unaffected by power on/off)		
		100 - 104	38 - 39	No function		
		105 - 109	40 - 41	Dimmer Curve = SQR (Menu override. Setting unaffected by power on/off)		
		110 - 114	42 - 43	No function		
		115 - 119	44 - 45	Dimmer Curve = ISQR (Menu override. Setting unaffected by power on/off)		
		120 - 124	46 - 47	No function		
		125 - 129	48 - 49	Dimmer Curve = SCUR (Menu override. Setting unaffected by power on/off)		
		130 - 249	50 - 97	No function, reserved for future use		
		250 - 255	98 - 100	Illuminate Display		

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RGB HSV	RGBX HSX	DMX Value	Percent	Function	Snap/fade	Default value
9	17	0 - 9	0 - 1	Color wheel effect (see also "LEE colors and their RGB equivalents" on page 29) Open (white)	Fade	0
		10 - 14	2 - 3	LEE 790 - Moroccan Pink		
		15 - 19	4 - 5	LEE 157 - Pink		
		20 - 24	6 - 7	LEE 332 - Special Rose Pink		
		25 - 29	8 - 9	LEE 328 - Follies Pink		
		30 - 34	10 - 11	LEE 345 - Fuchsia Pink		
		35 - 39	12 - 13	LEE 194 - Surprise Pink		
		40 - 44	14 - 15	LEE 181 - Congo Blue		
		45 - 49	16 - 17	LEE 071 - Tokyo Blue		
		50 - 54	18 - 19	LEE 120 - Deep Blue		
		55 - 59	20 - 21	LEE 079 - Just Blue		
		60 - 64	22 - 23	LEE 132 - Medium Blue		
		65 - 69	24 - 25	LEE 200 - Double CT Blue		
		70 - 74	26 - 27	LEE 161 - Slate Blue		
		75 - 79	28 - 29	LEE 201 - Full CT Blue		
		80 - 84	30 - 31	LEE 202 - Half CT Blue		
		85 - 89	32 - 33	LEE 117 - Steel Blue		
		90 - 94	34 - 35	LEE 353 - Lighter Blue		
		95 - 99	36 - 37	LEE 118 - Light Blue		
		100 - 104	38 - 39	LEE 116 - Medium Blue Green		
		105 - 109	40 - 41	LEE 124 - Dark Green		
		110 - 114	42 - 43	LEE 139 - Primary Green		
		115 - 119	44 - 45	LEE 089 - Moss Green		
		120 - 124	46 - 47	LEE 122 - Fern Green		
		125 - 129	48 - 49	LEE 738 - JAS Green		
		130 - 134	50 - 51	LEE 088 - Lime Green		
		135 - 139	52 - 53	LEE 100 - Spring Yellow		
		140 - 144	54 - 55	LEE 104 - Deep Amber		
		145 - 149	56 - 57	LEE 179 - Chrome Orange		
		150 - 154	58 - 59	LEE 105 - Orange		
		155 - 159	60 - 61	LEE 021 - Gold Amber		
		160 - 164	62 - 63	LEE 778 - Millennium Gold		
165 - 169	64 - 65	LEE 135 - Deep Golden Amber				
170 - 174	66 - 67	LEE 164 - Flame Red				
175 - 179	68 - 69	Open (white)				
180 - 201	70 - 78	Color wheel rotation effect Clockwise, fast → slow				
202 - 207	79 - 80	Color wheel stop (freezes at current color)				
208 - 229	81 - 89	Counter-clockwise, slow → fast				
230 - 234	90 - 91	Open (white)				
235 - 239	92 - 93	Random color Fast				
240 - 244	94 - 95	Medium				
245 - 249	96 - 97	Slow				
250 - 255	98 - 100	Open (white)				

The **PGRP** option on the control menu on the fixture defines which LEDs the following 4 channels control. See "Pixel grouping" on page 14. The channels can control:

- All of the LEDs (**PGRP** set to "**ALL**"), or
- Group **A** of 2 vertically split LED groups (**PGRP** set to "**2V**" and four other channels control the opposite segment), or
- Group **A** of 2 horizontally split LED groups (**PGRP** set to "**2H**" and four other channels control the opposite segment), or
- Group **A** of 4 quadrant split LED groups (**PGRP** set to "**1**" and three groups of four other channels control the other three segments).



10	18	0 - 255	0 - 100	Red or Hue (depending on operating mode) Color wheel channel must be set to a DMX value from 0 - 9. Zero → 100%	Fade	0
11	19	0 - 255	0 - 100	Green or Saturation (depending on operating mode) Color wheel channel must be set to a DMX value from 0 - 9. Zero → 100%	Fade	0
12	20	0 - 255	0 - 100	Blue or Value (depending on operating mode) Color wheel channel must be set to a DMX value from 0 - 9. Zero → 100%	Fade	0
13	21	0 - 19 20 - 255	0 - 7 8 - 100	CTC (Color Temperature Control) No function CTC 10 000 K → 2 000 K	Fade	0

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RGB HSV	RGBX HSX	DMX Value	Percent	Function	Snap/fade	Default value
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The following block of four channels is *only available and used if individual quarter or half groups of LEDs are to be controlled*. The level of control is set using the **PGRP** option on the control menu on the fixture. See "Pixel grouping" on page 14. When available, the channels control:



- Group **B** of 2 vertically split LED groups (**PGRP** set to "2V"), or
- Group **B** of 2 horizontally split LED groups (**PGRP** set to "2H"), or
- Group **B** of 4 quadrant split LED groups (**PGRP** set to "1").

14	22	0 - 255	0 - 100	Red or Hue (depending on operating mode) Color wheel channel must be set to a DMX value from 0 - 9. Zero → 100%	Fade	0
15	23	0 - 255	0 - 100	Green or Saturation (depending on operating mode) Color wheel channel must be set to a DMX value from 0 - 9. Zero → 100%	Fade	0
16	24	0 - 255	0 - 100	Blue or Value (depending on operating mode) Color wheel channel must be set to a DMX value from 0 - 9. Zero → 100%	Fade	0
17	25	0 - 19 20 - 255	0 - 7 8 - 100	CTC (Color Temperature Control) No function CTC 10 000 K → 2000 K	Fade	0

The following four channels are *only available and used if individual quarter groups of LEDs are to be controlled (PGRP is set to "1")*. The level of control is set using the **PGRP** option on the control menu on the fixture. See "Pixel grouping" on page 14. The channels control Group **C** of quadrant split LEDs.



18	26	0 - 255	0 - 100	Red or Hue (depending on operating mode) Color wheel channel must be set to a DMX value from 0 - 9. Zero → 100%	Fade	0
19	27	0 - 255	0 - 100	Green or Saturation (depending on operating mode) Color wheel channel must be set to a DMX value from 0 - 9. Zero → 100%	Fade	0
20	28	0 - 255	0 - 100	Blue or Value (depending on operating mode) Color wheel channel must be set to a DMX value from 0 - 9. Zero → 100%	Fade	0
21	29	0 - 19 20 - 255	0 - 7 8 - 100	CTC (Color Temperature Control) No function CTC 10 000 K → 2000 K	Fade	0

The following four channels are *only available and used if individual quarter groups of LEDs are to be controlled (PGRP is set to "1")*. The level of control is set using the **PGRP** option on the control menu on the fixture. See "Pixel grouping" on page 14. The channels control Group **D** of quadrant split LEDs.



22	30	0 - 255	0 - 100	Red or Hue (depending on operating mode) Color wheel channel must be set to a DMX value from 0 - 9. Zero → 100%	Fade	0
23	31	0 - 255	0 - 100	Green or Saturation (depending on operating mode) Color wheel channel must be set to a DMX value from 0 - 9. Zero → 100%	Fade	0
24	32	0 - 255	0 - 100	Blue or Value (depending on operating mode) Color wheel channel must be set to a DMX value from 0 - 9. Zero → 100%	Fade	0
25	33	0 - 19 20 - 255	0 - 7 8 - 100	CTC (Color Temperature Control) No function CTC 10 000 K → 2000 K	Fade	0

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¹ If DMX Reset is disabled in the onboard control menus, a reset command can only be executed if channel 2 is set to DMX value 232 and channel 1 is set to zero.

The DMX protocol is repeated in full for the second module if fitted to the head. Pan/tilt and fixture control channels have no effect in the second module's DMX protocol.