

# SolaSpot 3000® Luminaire DMX Control Protocol \*

1.00

1-Dec-18

## Revision History

Revision    Revision Notes  
1.00 Initial Release protocol

Standard Protocol	
Channel	Construct
1	Pan Coarse
2	Pan Fine
3	Tilt Coarse
4	Tilt Fine
5	Mix Color Function
6	Cyan
7	Magenta
8	Yellow
9	CTO
10	Static Color 1 Function
11	Static Color 1 Position
12	Gobo 1 Function
13	Gobo 1 Position
14	Gobo 1 Rotate Function
15	Gobo 1 Rotate Coarse
16	Gobo 1 Rotate Fine
17	Gobo 2 Function
18	Gobo 2 Position
19	Gobo 2 Rotate Function
20	Gobo 2 Rotate Coarse
21	Gobo 2 Rotate Fine
22	Gobo 3 Function
23	Gobo 3 Position
24	Animation 1 Function
25	Animation 2 Function
26	Prism 1 & 2 Selection
27	Prism 1 & 2 Function
28	Prism 1 & 2 Rotate Coarse
29	Prism 1 & 2 Rotate Fine
30	Frost 1 & 2 Selection
31	Frost 1 & 2
32	Focus Coarse
33	Focus Fine
34	Zoom Coarse
35	Zoom Fine
36	Auto Focus
37	Auto Focus Fine
38	Iris
39	Shutter/LED Function
40	Shutter/LED
41	Dim Coarse
42	Dim Fine
43	LED Animations
44	LED Animation Speed
45	LED Animation Xfade
46	Mspeed
47	Control

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# SolaSpot 3000 Luminaire DMX Control Protocol \*

Channel	Marketing Construct	Description	Decimal Low	Decimal High	Percent Low	Percent High	Hex Low	Hex High	Controller Defaults		
1	Pan	Pan Coarse	0	255	0%	100%	00h	FFh	127		
2	Pan	Pan Fine	0	255	0%	100%	00h	FFh	255		
3	Tilt	Tilt Coarse	0	255	0%	100%	00h	FFh	127		
4	Tilt	Tilt Fine	0	255	0%	100%	00h	FFh	255		
5	Color Mix Function	Pure Mix	0	31	0%	12%	00h	1Fh	0		
		Cycle	32	47	13%	18%	20h	2Fh			
		Random	48	63	19%	25%	30h	3Fh			
		Reserved (Note 5)	64	255	25%	100%	40h	FFh			
6 7 8	Cyan Magenta Yellow	Pure Mix							255		
		Full Saturation	0		100%		00h				
		Open	255		0%		FFh				
		Cycle & Random Modes. Scan Speed controlled by Cyan Channel									
		Slow Rate	0		0%		00h				
		Fast Rate	255		100%		FFh				
9	CTO	Full Saturation	0		0%		00h		255		
		Open (White)	255		100%		FFh				
10	Static Color 1 Function (Note 1)	Indexed	0	15	0%	6%	00h	0Fh	48		
		Forward Spin	16	31	6%	12%	10h	1Fh			
		Reverse Spin	32	47	13%	18%	20h	2Fh			
		Continuous	48	63	19%	25%	30h	3Fh			
		Fast Scan	64	79	25%	31%	40h	4Fh			
		Random	80	95	31%	37%	50h	5Fh			
		Reserved (Note 5)	96	255	38%	100%	60h	FFh			
11	Static Color Position	Indexed modes								0	
		1. Open (White)	0	16	0%	6%	00h	10h			
		2. Open/Red	17	32	7%	13%	11h	20h			
		3. Red	33	48	13%	19%	21h	30h			
		4. Red/Blue	49	64	19%	25%	31h	40h			
		5. Blue	65	80	25%	31%	41h	50h			
		6. Blue/Green	81	96	32%	38%	51h	60h			
		7. Green	97	112	38%	44%	61h	70h			
		8. Green/TM-30	113	128	44%	50%	71h	80h			
		9. TM-30	129	144	51%	56%	81h	90h			
		10. TM-30/Orange	145	160	57%	63%	91h	A0h			
		11. Orange	161	176	63%	69%	A1h	B0h			
		12. Orange/Dark Blue)	177	192	69%	75%	B1h	C0h			
		13. Dark Blue	193	208	76%	82%	C1h	D0h			
		14. Dark Blue/Open	209	224	82%	88%	D1h	E0h			
		1. Open (White)	225	255	88%	100%	E1h	FFh			
		Scan modes									
		1. Open/Red	0	32	0%	13%	00h	20h			
		2. Red/Blue	33	64	13%	25%	21h	40h			
		3. Blue/Green	65	96	25%	38%	41h	60h			
		4. Green/TM-30	97	128	38%	50%	61h	80h			
		5. TM-30/Orange	129	160	51%	63%	81h	A0h			
		6. Orange/Dark Blue	161	192	63%	75%	A1h	C0h			
		7. Dark Blue/Open	193	224	76%	88%	C1h	E0h			
		1. Open/Red	225	255	88%	100%	E1h	FFh			
		Spin & Random modes									
		Stop	0		0%	0%	00h	00h			
		Slowest to fastest	255		100%	0%	FFh	00h			
		Continuous mode									
		Positioning from 0-360 degrees	0	255	0%	100%	00h	FFh			

12	Gobo 1 Function (Note 1)	Indexed (Note 1)	0	15	0%	6%	00h	0Fh	0	
		Forward Wheel Spin	16	31	6%	12%	10h	1Fh		
		Reverse Wheel Spin	32	47	13%	18%	20h	2Fh		
		Scan	48	63	19%	25%	30h	3Fh		
		Random	64	79	25%	31%	40h	4Fh		
		Reserved (Note 5)	80	255	31%	100%	50h	FFh		
13	Gobo 1 Position	Indexed, & Scan modes								0
		1. (Open)	0	15	0%	6%	00h	0Fh		
		2. Bar	16	47	6%	18%	10h	2Fh		
		3. Stripe Strips	48	79	19%	31%	30h	4Fh		
		4. Crescents	80	111	31%	44%	50h	6Fh		
		5. Geoswirl	112	143	44%	56%	70h	8Fh		
		6. Seashell	144	175	56%	69%	90h	AFh		
		7. Pinwheel Dots	176	207	69%	81%	B0h	CFh		
		8. Ice	208	239	82%	94%	D0h	EFh		
		1. (Open)	240	255	94%	100%	F0h	FFh		
		Spin & Random modes								
		Rotate Stop	0	3	0%	1%	00h	03h		
Slowest to fastest	4	255	2%	100%	04h	FFh				
14	Gobo 1 Rotate Function (Note 1)	Indexed (Note 1)	0	15	0%	6%	00h	0Fh	0	
		Forward Rotate	16	31	6%	12%	10h	1Fh		
		Reverse Rotate	32	47	13%	18%	20h	2Fh		
		Forward Strobe Rotate (Gobo animate)	48	63	19%	25%	30h	3Fh		
		Reverse Strobe Rotate (Gobo animate)	64	79	25%	31%	40h	4Fh		
		Reserved (Note 5)	80	255	31%	100%	50h	FFh		
15	Gobo 1 Rotate Coarse	Indexed/Blink Modes								127
		Position 0-360 degrees	0	255	0%	100%	00h	FFh		
		Forward/Reverse/Forward Strobe/Reverse Strobe Rotate Modes								
		Rotate Stop	0	3	0%	1%	00h	03h		
Rotate Slowest to Fastest	4	255	2%	100%	04h	FFh				
16	Gobo 1 Rotate Fine	Indexed Mode								255
		Low Order Byte 0-360 degrees	0	255	0%	100%	00h	FFh		
17	Gobo 2 Function (Note 1)	Indexed (Note 1)	0	15	0%	6%	00h	0Fh	0	
		Forward Wheel Spin	16	31	6%	12%	10h	1Fh		
		Reverse Wheel Spin	32	47	13%	18%	20h	2Fh		
		Scan	48	63	19%	25%	30h	3Fh		
		Random	64	79	25%	31%	40h	4Fh		
		Reserved (Note 5)	80	255	31%	100%	50h	FFh		
18	Gobo 2 Position	Indexed & Scan modes								0
		1. (Open)	0	15	0%	6%	00h	0Fh		
		2. Zeotrope	16	47	6%	18%	10h	2Fh		
		3. Jungle	48	79	19%	31%	30h	4Fh		
		4. Thin Branches	80	111	31%	44%	50h	6Fh		
		5. Tiny Triangles	112	143	44%	56%	70h	8Fh		
		6. Starvolver	144	175	56%	69%	90h	AFh		
		7. Stainglass	176	207	69%	81%	B0h	CFh		
		8. Box	208	239	82%	94%	D0h	EFh		
		1. (Open)	240	255	94%	100%	F0h	FFh		
		Spin & Random modes								
		Rotate Stop	0	3	0%	1%	00h	03h		
Slowest to fastest	4	255	2%	100%	04h	FFh				
19	Gobo 2 Rotate Function (Note 1)	Indexed (Note 1)	0	15	0%	6%	00h	0Fh	0	
		Forward Rotate	16	31	6%	12%	10h	1Fh		
		Reverse Rotate	32	47	13%	18%	20h	2Fh		
		Forward Strobe Rotate (Gobo animate)	48	63	19%	25%	30h	3Fh		
		Reverse Strobe Rotate (Gobo animate)	64	79	25%	31%	40h	4Fh		
		Reserved (Note 5)	80	255	31%	100%	50h	FFh		

20	Gobo 2 Rotate Coarse	Indexed/Blink Modes						127		
		Position 0-360 degrees	0	255	0%	100%	00h FFh			
		Forward/Reverse/Forward Strobe/Reverse Strobe Rotate Modes								
		Rotate Stop	0	3	0%	1%	00h 03h			
21	Gobo 2 Rotate Fine	Indexed Mode						255		
		Low Order Byte 0-360 degrees	0	255	0%	100%	00h FFh			
		Indexed (Note 1)							0	
		Forward Wheel Spin	16	31	6%	12%	10h 1Fh			
Reverse Wheel Spin	32	47	13%	18%	20h 2Fh					
Scan	48	63	19%	25%	30h 3Fh					
22	Gobo 3 Function (Note 1)	Random	64	79	25%	31%	40h 4Fh			
		Reserved (Note 5)	80	255	31%	100%	50h FFh			
		1. (Open)						0		
		2. Tunnel	16	47	6%	18%	10h 2Fh			
3. Triangles	48	79	19%	31%	30h 4Fh					
4. Organic	80	111	31%	44%	50h 6Fh					
23	Gobo 3 Position	5. Shower	112	143	44%	56%	70h 8Fh			
		6. Abstract	144	175	56%	69%	90h AFh			
		7. Cobble	176	207	69%	81%	B0h CFh			
		8. Endgrain	208	239	82%	94%	D0h EFh			
		1. (Open)	240	255	94%	100%	F0h FFh			
		Disengaged						0		
		24	Animation 1 Function	Engaged, Forward Spin speed slow to fast	9	70	4%		27%	09h 46h
				Engaged, Reverse Spin speed slow to fast	71	131	28%		51%	47h 83h
Engaged, Forward Strobe rotate slow to fast	132			193	52%	76%	84h C1h			
Engaged, Reverse Strobe Rotate slow to fast	194			255	76%	100%	C2h FFh			
Disengaged						0				
25	Animation 2 Function	Engaged, static	4	6	2%		2%	04h 06h		
		Engaged, motion stopped	7	8	3%		3%	07h 08h		
		Forward Spin speed slow to fast	9	70	4%		27%	09h 46h		
		Reverse Spin speed slow to fast	71	131	28%		51%	47h 83h		
		Forward Strobe Rotate slow to fast	132	193	52%		76%	84h C1h		
		Reverse Strobe Rotate slow to fast	194	255	76%		100%	C2h FFh		
		Disengaged (Note 6)						0		
26	Prism 1 & 2 Selection	Prism 1 Selected	16	31	6%	12%	10h 1Fh			
		Prism 2 Selected	32	47	13%	18%	20h 2Fh			
		Reserved (Note 5)	48	255	19%	100%	30h FFh			
		Continuous						0		
27	Prism 1 & 2 Function	Forward Spin	16	31	6%	12%	10h 1Fh			
		Reverse Spin	32	47	13%	18%	20h 2Fh			
		Forward Strobe Rotate (Effect animate)	48	63	19%	25%	30h 3Fh			
		Reverse Strobe Rotate (Effect animate)	64	79	25%	31%	40h 4Fh			
		Reserved (Note 5)	80	255	31%	100%	50h FFh			
		Continuous mode						127		
28	Prism 1 & 2 Rotate Coarse	Position 0-360 degrees	0	255	0%	100%	00h FFh			
		Forward/Reverse/Forward Strobe/Reverse Strobe Rotate Modes								
		Rotate Stop	0	3	0%	1%	00h 03h			
		Rotate Slowest to Fastest	4	255	2%	100%	04h FFh			
29	Prism 1 & 2 Rotate Fine	Continuous mode						255		
		Low Order Byte 0-360 degrees	0	255	0%	100%	00h FFh			

30	Frost 1 & 2 Selection	Disengaged (Note 7)	0	15	0%	6%	00h	0Fh	0
		Frost 1 Selected (Light Frost)	16	31	6%	12%	10h	1Fh	
		Frost 2 Selected (Heavy Frost)	32	47	13%	18%	20h	2Fh	
		Reserved (Note 5)	48	255	19%	100%	30h	FFh	
31	Frost 1 & 2	Open	0		0%		00h		0
		Full Frost	255		100%		FFh		
32	Focus Coarse	Focus In	0		0%		00h		127
		Focus Out	255		100%		FFh		
33	Focus Fine	Focus In	0		0%		00h		255
		Focus Out	255		100%		FFh		
34	Zoom Coarse	Zoom In	0		0%		00h		127
		Zoom Out	255		100%		FFh		
35	Zoom Fine	Zoom In	0		0%		00h		255
		Zoom Out	255		100%		FFh		
36	Auto Focus	Auto Focus Off	0	15	0%	6%	00h	0Fh	0
		5m	16	31	6%	12%	10h	1Fh	
		7.5m	32	47	13%	18%	20h	2Fh	
		10m	48	255	19%	100%	30h	FFh	
37	Auto Focus Fine	Focus In Fine	0		0%		00h		0
		Focus Out Fine	255		100%		FFh		
38	Iris	Iris Closed	0		0%		00h		255
		Iris Open	255		100%		FFh		
39	Shutter/LED Functions	Normal Shutter Functions	0	31	0%	12%	00h	1Fh	0
		Random Random strobe	32	63	13%	25%	20h	3Fh	
		Synchronous Random Strobe (Note 3)	64	95	25%	37%	40h	5Fh	
		Reserved (Note 5)	96	255	38%	100%	60h	FFh	
40	Shutter/LED	Normal/Random/Sync Random shutter functions.							255
		Close	0	23	0%	9%	00h	17h	
		Strobe Rate (slow to fast)	24	229	9%	90%	18h	E5h	
		Open	230	255	90%	100%	E6h	FFh	
41	Dim Coarse	Close	0		0%		00h		0
		Open	255		100%		FFh		
42	Dim Fine		0		0%		00h		0
			255		100%		FFh		

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LED  
Macro  
(Note 2)

Macro off	0	3	0%	1%	00h	03h
Macro 1 L to R - 1	4	7	2%	3%	04h	07h
Macro 2 Scan - 1	8	11	3%	4%	08h	0Bh
Macro 3 R to L - 1	12	15	5%	6%	0Ch	0Fh
Macro 4 L to R - 2	16	19	6%	7%	10h	13h
Macro 5 Scan - 2	20	23	8%	9%	14h	17h
Macro 6 R to L - 2	24	27	9%	11%	18h	1Bh
Macro 7 L to R - 3	28	31	11%	12%	1Ch	1Fh
Macro 8 Scan - 3	32	35	13%	14%	20h	23h
Macro 9 R to L - 3	36	39	14%	15%	24h	27h
Macro 10 L to R - 4	40	43	16%	17%	28h	2Bh
Macro 11 Scan - 4	44	47	17%	18%	2Ch	2Fh
Macro 12 R to L - 4	48	51	19%	20%	30h	33h
Macro 13 L to R - 5	52	55	20%	22%	34h	37h
Macro 14 Scan - 5	56	61	22%	24%	38h	3Dh
Macro 15 R to L - 5	62	65	24%	25%	3Eh	41h
Macro 16 L to R - 6	66	69	26%	27%	42h	45h
Macro 17 Scan - 6	70	73	27%	29%	46h	49h
Macro 18 R to L - 6	74	77	29%	30%	4Ah	4Dh
Macro 19 L to R - 7	78	81	31%	32%	4Eh	51h
Macro 20 Scan - 7	82	85	32%	33%	52h	55h
Macro 21 R to L - 7	86	89	34%	35%	56h	59h
Macro 22 L to R - 8	90	93	35%	36%	5Ah	5Dh
Macro 23 Scan - 8	94	97	37%	38%	5Eh	61h
Macro 24 R to L - 8	98	101	38%	40%	62h	65h
Macro 25 Alternate - 6	102	105	40%	41%	66h	69h
Macro 26 Invert L to R - 1	106	109	42%	43%	6Ah	6Dh
Macro 27 Invert scan - 1	110	113	43%	44%	6Eh	71h
Macro 28 Invert R to L - 1	114	117	45%	46%	72h	75h
Macro 29 Invert L to R - 2	118	121	46%	47%	76h	79h
Macro 30 Invert scan - 2	122	125	48%	49%	7Ah	7Dh
Macro 31 Invert R to L - 2	126	129	49%	51%	7Eh	81h
Macro 32 Invert L to R - 3	130	133	51%	52%	82h	85h
Macro 33 Invert scan - 3	134	137	53%	54%	86h	89h
Macro 34 Invert R to L - 3	138	141	54%	55%	8Ah	8Dh
Macro 35 Invert L to R - 4	142	145	56%	57%	8Eh	91h
Macro 36 Invert scan - 4	146	149	57%	58%	92h	95h
Macro 37 Invert R to L - 4	150	163	59%	64%	96h	A3h
Macro 38 Invert L to R - 5	164	167	64%	65%	A4h	A7h
Macro 39 Invert scan - 5	168	171	66%	67%	A8h	ABh
Macro 40 Invert R to L - 5	172	175	67%	69%	ACh	AFh
Macro 41 Invert L to R - 6	176	179	69%	70%	B0h	B3h
Macro 42 Invert scan - 6	180	183	71%	72%	B4h	B7h
Macro 43 Invert R to L - 6	184	187	72%	73%	B8h	BBh
Macro 44 Invert L to R - 7	188	191	74%	75%	BCh	BFh
Macro 45 Invert scan - 7	192	195	75%	76%	C0h	C3h
Macro 46 Invert R to L - 7	196	199	77%	78%	C4h	C7h
Macro 47 Invert L to R - 8	200	203	78%	80%	C8h	CBh
Macro 48 Invert scan - 8	204	207	80%	81%	CCh	CFh
Macro 49 Invert R to L - 8	208	211	82%	83%	D0h	D3h
Macro 50 Out/in - 2	212	215	83%	84%	D4h	D7h
Macro 51 Out/in - 3	216	219	85%	86%	D8h	DBh
Macro 52 Out/in - 4	220	223	86%	87%	DCh	DFh
Macro 53 Alternate - 1	224	227	88%	89%	E0h	E3h
Macro 54 Alternate - 2	228	231	89%	91%	E4h	E7h
Macro 55 Alternate - 3	232	235	91%	92%	E8h	EBh
Macro 56 Alternate - 4	236	239	93%	94%	ECh	EFh
Macro 57 Alternate - 5	240	243	94%	95%	F0h	F3h
...						
Macro 63	245	255	96%	100%	F5h	FFh

0

44	LED Animation Speed	Stop	0		0%	0%	00h	00h	128	
		Decreasing speed	1	127	0%	50%	01h	7Fh		
		Programmed speed x1	128				80h			
		Increasing speed	129	255	51%	100%	81h	FFh		
45	LED Animation X fade	Stop	0		0%		00h	00h	128	
		Decreasing speed	1	127	0%	50%	01h	7Fh		
		Programmed speed x1	128		50%		80h			
		Increasing speed	129	255	51%	100%	81h	FFh		
46	Mspeed	Disable	0	3	0%	1%	00h	03h	0	
		Longest (252.7 seconds)	4		2%		04h			
		Shortest (0.15 seconds)	255		100%		FFh			
47	Control	The Control channel should not be crossfaded. No shutter channel requirement.								0
		Safe (normal operation )	0	9	0%	4%	00h	09h		
		Pan & Tilt Mspeed Off	10	19	4%	7%	0Ah	13h		
		Display Off (send 20 packets)	20	28	8%	11%	14h	1Ch		
		Display On (send 20 packets)	29	35	11%	14%	1Dh	23h		
		Reserved (Note 5)	36	48	14%	19%	24h	30h		
		Home All (send 20 packets)	49	68	19%	27%	31h	44h		
		Shutdown (send 80 packets)	69	75	27%	29%	45h	4Bh		
		Fan Control Modes (Note 4)								
		Studio fan control mode (send 20 packets)	76	82	30%	32%	4Ch	52h		
		Continuous fan control mode (send 20 packets)	83	89	33%	35%	53h	59h		
		Standard fan control mode (send 20 packets)	90	96	35%	38%	5Ah	60h		
		Studio Continuous fan control mode (Note 4)	97	103	38%	40%	61h	67h		
		Disable Pan/Tilt motors	104	109	41%	43%	68h	6Dh		
		Outrig Mode On	110	115	43%	45%	6Eh	73h		
		Outrig Mode Off	116	122	45%	48%	74h	7Ah		
		Reserved (Note 5)	123	160	48%	63%	7Bh	A0h		
		Internal Prog 1 scene 1-8 EEPROM	161	171	63%	67%	A1h	ABh		
		Internal Prog 2 scene 9-16 EEPROM	172	182	67%	71%	ACh	B6h		
		Internal Prog 3 scene 17-24 EEPROM	183	193	72%	76%	B7h	C1h		
		Internal Prog 4 scene 25-32 EEPROM	194	204	76%	80%	C2h	CCh		
Internal Prog 5 scene 33-40 EEPROM	205	215	80%	84%	CDh	D7h				
Internal Prog 6 scene 41-48 EEPROM	216	226	85%	89%	D8h	E2h				
Internal Prog 7 scene 49-56 EEPROM	227	237	89%	93%	E3h	EDh				
Reserved (Note 5)	238	255	93%	100%	Eeh	FFh				

## NOTES

- 1 Continuous/Indexed mode should take quickest path from 255-0, and 0-255.  
Continuous mode color wheel aperture centers

Color	Center of color DMX value
Open	0
Red	36
Blue	72
Green	109
TM-30	146
Orange	183
Dark Blue	220

- 2 56 of 63 Discrete multi step LED animations to be defined. These will require macro speed and x fade channels.  
The macros will operate independently. The Xfade and speed channels act as multipliers of the programmed speed in the discrete macro steps.  
**Speed / X fade channel operation**  
0 stops playback or crossfade  
1-127 decreases playback speed / crossfade time (\* <1)  
128 playback or cross fade speed is as programmed (\*1)  
129-255 increases playback speed / crossfade time (\* >1)
- 3 Synchronous Random Strobes are synchronous across fixtures.
- 4 Fan control modes are retentive. When the fixture is turned off it will retain the selected fan mode.
- 5 Reserved ranges should function according to the controller default value.
- 6 Prism selection allows the Prism 1&2 channel to control either Prism 1, or Prism 2
- 7 Frost selection allows the Frost 1&2 channel to control either Frost 1, or Frost 2
- 8 RDM Manufacturers ID: 0x4c52
- 9 RDM Device ID: 0x5c4

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