# SolaHyBeam 1000© Luminaire DMX Control Protocol *

Revision: 1.4 27-Feb-18

| Standard Production Prototocol | |
|---|---|
| **Channel** | **Construct** |
| 1 | Pan Coarse |
| 2 | Pan Fine |
| 3 | Tilt Coarse |
| 4 | Tilt Fine |
| 5 | Color Mix 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 | Frost 1 |
| 18 | Frost 2 |
| 19 | Focus Coarse |
| 20 | Focus Fine |
| 21 | Zoom Coarse |
| 22 | Zoom Fine |
| 23 | Iris |
| 24 | Shutter/LED Function |
| 25 | Shutter/LED |
| 26 | Dim Coarse |
| 27 | Dim Fine |
| 28 | Dim Macro |
| 29 | Dim Macro Speed |
| 30 | Dim Macro Xfade |
| 31 | Mspeed |
| 32 | Control |

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| 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 4) | 64 | 255 | 25% | 100% | 40h | FFh | |
| 6 | Cyan | Pure Mix | | | | | | | 255 |
| | | Full Saturation | 0 | | 100% | | 00h | | |
| | | Open | 255 | | 0% | | FFh | | |
| 7 | Magenta | Cycle & Random Modes. Scan Speed controlled by Cyan Channel | | | | | | | |
| 8 | Yellow | 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 | 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 (Note 1) | 48 | 63 | 19% | 25% | 30h | 3Fh | |
| | | Fast Scan | 64 | 79 | 25% | 31% | 40h | 4Fh | |
| | | Random | 80 | 95 | 31% | 37% | 50h | 5Fh | |
| | | Reserved (Note 4) | 96 | 255 | 38% | 100% | 60h | FFh | |
| 11 | Static Color 1 Position | Indexed, Scan & Blink modes | | | | | | | 0 |
| | | 1. Open (White) | 0 | 14 | 0% | 5% | 00h | 0Eh | |
| | | 2. (Open/Red) | 15 | 29 | 6% | 11% | 0Fh | 1Dh | |
| | | 3. (Red) | 30 | 44 | 12% | 17% | 1Eh | 2Ch | |
| | | 4. (Red/Blue) | 45 | 59 | 18% | 23% | 2Dh | 3Bh | |
| | | 5. (Blue) | 60 | 74 | 24% | 29% | 3Ch | 4Ah | |
| | | 6. (Blue/Green) | 75 | 89 | 29% | 35% | 4Bh | 59h | |
| | | 7. (Green) | 90 | 104 | 35% | 41% | 5Ah | 68h | |
| | | 8. (Green/Yellow) | 105 | 119 | 41% | 47% | 69h | 77h | |
| | | 9. (Yellow) | 120 | 134 | 47% | 53% | 78h | 86h | |
| | | 10. (Yellow/Orange) | 135 | 149 | 53% | 58% | 87h | 95h | |
| | | 11. (Orange) | 150 | 164 | 59% | 64% | 96h | A4h | |
| | | 12. (Orange/Magenta) | 165 | 179 | 65% | 70% | A5h | B3h | |
| | | 13. (Magenta) | 180 | 194 | 71% | 76% | B4h | C2h | |
| | | 14. (Magenta/Dark Blue) | 195 | 209 | 76% | 82% | C3h | D1h | |
| | | 15. (Dark Blue) | 210 | 224 | 82% | 88% | D2h | E0h | |
| | | 16. (Dark Blue/Open) | 225 | 239 | 88% | 94% | E1h | EFh | |
| | | 1. Open (White) | 240 | 255 | 94% | 100% | F0h | 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 | Full Speed Control | | | | | | | 0 |
| | | Indexed | 0 | 15 | 0% | 6% | 00h | 0Fh | |
| | | 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 4) | 80 | 255 | 31% | 100% | 50h | FFh | |
| 13 | Gobo 1 Position | Indexed, Scan & Blink modes | | | | | | | 0 |
| | | 1. (Open) | 0 | 31 | 0% | 12% | 00h | 1Fh | |
| | | 2. (Spokes) | 32 | 63 | 13% | 25% | 20h | 3Fh | |
| | | 3. (Dots) | 64 | 95 | 25% | 37% | 40h | 5Fh | |
| | | 4. (Perfora) | 96 | 127 | 38% | 50% | 60h | 7Fh | |
| | | 5. (Monovekto) | 128 | 159 | 50% | 62% | 80h | 9Fh | |
| | | 6. (Bars) | 160 | 191 | 63% | 75% | A0h | BFh | |
| | | 7. (Psych) | 192 | 223 | 75% | 87% | C0h | DFh | |
| | | 1. (Open) | 224 | 255 | 88% | 100% | E0h | 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 | Full Speed Control | | | | | | | 0 |
| | | Indexed | 0 | 15 | 0% | 6% | 00h | 0Fh | |
| | | 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 4) | 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 | Frost 1 | Open | 0 | | 0% | | 00h | | 0 |
| | | Full Frost (Light Frost) | 255 | | 100% | | FFh | | |
| 18 | Frost 2 | Open | 0 | | 0% | | 00h | | 0 |
| | | Full Frost (Heavy Frost) | 255 | | 100% | | FFh | | |
| 19 | Focus Coarse | Focus In | 0 | | 0% | | 00h | | 127 |
| | | Focus Out | 255 | | 100% | | FFh | | |
| 20 | Focus Fine | Focus In | 0 | | 0% | | 00h | | 255 |
| | | Focus Out | 255 | | 100% | | FFh | | |
| 21 | Zoom Coarse | Zoom In | 0 | | 0% | | 00h | | 127 |
| | | Zoom Out | 255 | | 100% | | FFh | | |
| 22 | Zoom Fine | Zoom In | 0 | | 0% | | 00h | | 255 |
| | | Zoom Out | 255 | | 100% | | FFh | | |
| 23 | Iris | Iris Closed | 0 | | 0% | | 00h | | 255 |
| | | Iris Open | 255 | | 100% | | FFh | | |
| 24 | 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 | 64 | 95 | 25% | 37% | 40h | 5Fh | |
| | | Reserved (Note 4) | 96 | 255 | 38% | 100% | 60h | FFh | |
| 25 | 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 | |
| 26 | Dim Coarse | Close | 0 | | 0% | | 00h | | 0 |
| | | Open | 255 | | 100% | | FFh | | |
| 27 | Dim Fine | | 0 | | 0% | | 00h | | 0 |
| | | | 255 | | 100% | | FFh | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 28 | LED Animations (Note 2) | Macro off | 0 | 3 | 0% | 1% | 00h | 03h | 0 |
| | | Macro 1 | 4 | 7 | 2% | 3% | 04h | 07h | |
| | | Macro 2 | 8 | 11 | 3% | 4% | 08h | 0Bh | |
| | | Macro 3 | 12 | 15 | 5% | 6% | 0Ch | 0Fh | |
| | | Macro 4 | 16 | 19 | 6% | 7% | 10h | 13h | |
| | | … | | | | | | | |
| | | Macro 23 | 92 | 95 | 36% | 37% | 5Ch | 5Fh | |
| | | Reserved (Note 4) | 96 | 255 | 38% | 100% | 60h | FFh | |
| 29 | 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 | |
| 30 | 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 | |
| 31 | Mspeed | Disable | 0 | 3 | 0% | 1% | 00h | 03h | 0 |
| | | Longest (252.7 seconds) | 4 | | 2% | | 04h | | |
| | | Shortest (0.15 seconds) | 255 | | 100% | | FFh | | |
| 32 | Control (Note 3) | The Control channel should not be crossfaded. No shutter channel requirement. | | | | | | | 0 |
| | | Safe (normal operation ) | 0 | 9 | 0% | 4% | 00h | 09h | |
| | | Reserved (Note 4) | 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 4) | 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 | |
| | | 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 | |
| | | Disable Pan/Tilt motors | 97 | 103 | 38% | 40% | 61h | 67h | |
| | | Reserved (Note 4) | 104 | 130 | 41% | 51% | 68h | 82h | |
| | | Audio Sync | 131 | 160 | 51% | 63% | 83h | 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 4) | 238 | 255 | 93% | 100% | EEh | FFh | |

NOTES

1 Continuous 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 | 32 |
| Blue | 64 |
| Green | 96 |
| Yellow | 128 |
| Orange | 160 |
| Magenta | 192 |
| Dark Blue | 224 |

2 63 Discrete multi step macros to be defined later. 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 Fan control modes are not retentive. When the fixture is turned off it will default back to Standard mode.

4 Reserved ranges should function according to the controller default value.

5 RDM Manufacturers ID: 0x4c52

6 RDM Device ID: 0x546