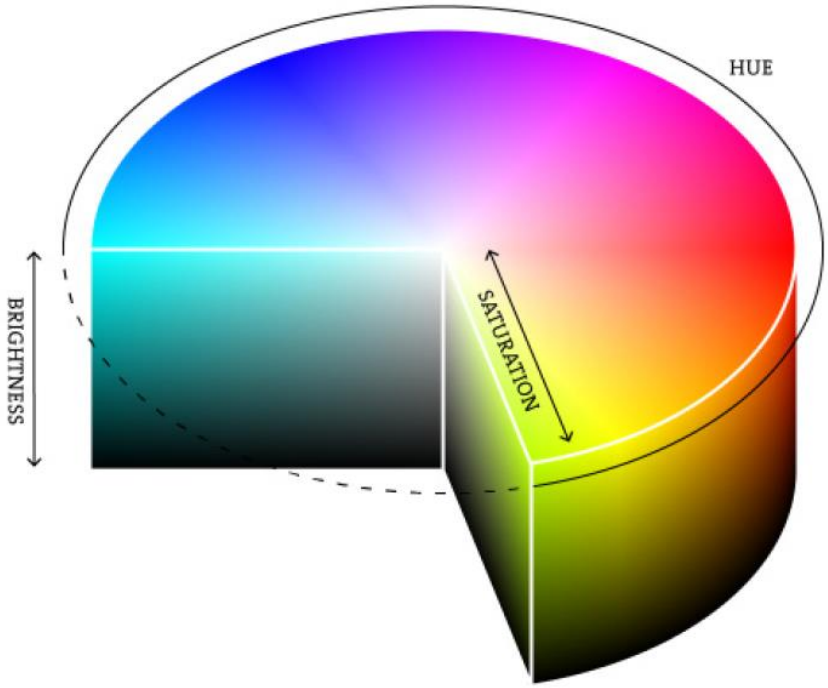
# OPERATING MODES

**The projector has 4 operating modes: Raw Mode, HSV, RGB emulation and CMY emulation. Raw Mode enables specific control of each color. HSV Mode is based on a complex algorithm for a new type of management of both color and white light. In this mode, the CRI is kept constantly above 97 CRI, irrespective of colour temperature. HSV mode has the following characteristics:**




# DMX MODES

| DMX Mode | Parameter | Color Control Mode | RAW Mode |
|---|---|---|---|
| Basic RGB | 19 | RGB or CMY | Not available |
| Basic HSV | 19 | HSV | Not available |
| Extended RGB | 32 | RGB or CMY | CCMode RAW |
| Extended HSV | 32 | HSV | CCMode RAW |

# BASIC MODE

| Number | RGB | HSV | Note |
|---|---|---|---|
| 1 | Red/Cyan | Hue | Cyan with CCMOD CMY |
| 2 | Green/Magenta | Hue fine | Magenta with CCMOD CMY |
| 3 | Blue/Yellow | Saturation | Yellow with CCMOD CMY |
| 4 | CTO | CTO | |
| 5 | Macro color | Macro color | Not enabled yet |
| 6 | Strobe | Strobe | |
| 7 | Dimmer | Dimmer | |
| 8 | Dimmer fine | Dimmer fine | |
| 9 | Crossfade | Crossfade | Not enabled yet |
| 10 | Path | Path | Not enabled yet |
| 11 | Tint | Tint | |
| 12 | Pan | Pan | |
| 13 | Pan fine | Pan fine | |
| 14 | Tilt | Tilt | |
| 15 | Tilt fine | Tilt fine | |
| 16 | Zoom | Zoom | |
| 17 | Function | Function | |
| 18 | Reset | Reset | |
| 19 | Frequency | Frequency | |

# BASIC MODE

| RGB | HSV | DMX value | Function |
|---|---|---|---|
| 1 | - | | **RED / CYAN** |
| | | 0 - 255 | Red colour linearly increases from no-light to maximum intensity |
| 2 | - | | **GREEN / MAGENTA** |
| | | 0 - 255 | Green colour linearly increases from no-light to maximum intensity |
| 3 | - | | **BLUE /YELLOW** |
| | | 0 - 255 | Blue colour linearly increases from no-light to maximum intensity |
| - | 1 | | **HUE** |
| | | 0 - 255 | Linear Hue setting, define the target point color in the HSV color representation system (range from 0° (Red) to 360°) |
| - | 2 | | **HUE FINE** |
| | | 0 - 255 | Fine Hue setting |
| - | 3 | | **SATURATION** |
| | | 0 - 255 | Linear Saturation setting, define the INTENSITY/PURITY of the color at a constant lightness level. It ranges from 100% (pure color) to 0% (white) |
| 4 | 4 | | **CTO** |
| | | | Colour Temperature linearly change from 8000K to 2500K |
| | | 0 | OFF |
| | | 1 … | 8000 K |
| | | … 47 … | 7000 K |
| | | … 93 … | 6000 K |
| | | … 112 … | 5600 K |
| | | … 139 … | 5000 K |
| | | … 186 … | 4000 K |
| | | … 222 … | 3200 K |
| | | … 245 … | 2700 K |
| | | … 255 | 2500 K |
| 5 | 5 | | **MACRO COLOR** |
| | | TBD | |
| 6 | 6 | | **STROBE** |
| | | 0 - 3 | Light OFF |
| | | 4 - 103 | Strobe at linearly variable frequency from low (1Hz) to fast (16Hz) |
| | | 104 - 107 | Light ON |
| | | 108 - 207 | Pulsation at linearly variable speed from slow (0.5 Hz) to fast (25 Hz) |
| | | 208 - 212 | Light ON |
| | | 213 - 255 | Random Slow Strobe |
| | | 226 - 238 | Random Medium Strobe |
| | | 239 - 251 | Random Fast Strobe |
| | | 252 - 255 | Light ON |

| RGB | HSV | DMX value | Function |
|---|---|---|---|
| 7 | 7 | | **DIMMER** |
| | | 0 - 255 | Light output linearly increases from off to maximum brightness |
| 8 | 8 | | **DIMMER FINE** |
| | | 0 - 255 | Fine Dimmer positioning |
| 9 | 9 | | **CROSSFADE** |
| | | 0 - 255 | Faded Transition with selectable timing between two sets of color points. In accordance with the selected PATH, during the faded transition all the intermediate color along the route will be displayed |
| 10 | 10 | | **PATH** |
| | | 0 - 255 | Not activated yet |
| 11 | 11 | | **TINT** |
| | | 0-127 | Linear Tint setting, define the target point correction from Magenta to OFF |
| | | 128 | OFF |
| | | 129-255 | Linear Tint setting, define the target point correction from OFF to Green |
| 12 | 12 | | **PAN** |
| | | 0 - 255 | Pan movement/positioning <<< counter-clockwise from 0° to 540° (invert Pan=Off; Invert Tilt=Off) |
| 13 | 13 | | **PAN FINE** |
| | | 0 - 255 | Fine Pan positioning |
| 14 | 14 | | **TILT** |
| | | 0 - 255 | Tilt movement/positioning >>>>> clockwise from 0° to 210° (invert Pan=Off; Invert Tilt=Off) |
| 15 | 15 | | **TILT FINE** |
| | | 0 - 255 | Fine Tilt positioning |
| 16 | 16 | | **ZOOM** |
| | | 0 - 255 | Zoom linearly moves from narrow to wide beam |

| RGB | HSV | DMX value | Function | |
|---|---|---|---|---|
| 17 | 17 | | **FUNCTION** | |
| | | 0 - 11 | None | |
| | | 12 - 24 | Fast P&T speed (Default) | |
| | | 25 - 37 | Normal P&T speed | |
| | | 38 - 42 | Dimmer curve 1 (Default) | Details at page 13 |
| | | 43 - 47 | Dimmer curve 2 | |
| | | 48 - 52 | Dimmer curve 3 | |
| | | 53 - 57 | Dimmer curve 4 | |
| | | 58 - 62 | Raw color channels gamma 1 | Details at page 13 |
| | | 63 - 67 | Raw color channels gamma 1.5 | |
| | | 68 - 72 | Raw color channels gamma 2.2 (Default) | |
| | | 73 - 77 | Halogen mode disabled (Default) | |
| | | 78 - 82 | Halogen mode 1, 750W lamp emulation | |
| | | 83 - 87 | Halogen mode 2, 1000W lamp emulation | |
| | | 88 - 92 | Halogen mode 3, 1200W lamp emulation | |
| | | 93 - 97 | Halogen mode 4, 2000W lamp emulation | |
| | | 98 - 102 | Halogen mode 5, 2500W lamp emulation | |
| | | 103 - 105 | Reserved | |
| | | 106 - 108 | CCMOD: RAW (Default) | |
| | | 109 - 111 | CCMOD: RGB or HSV | |
| | | 112 - 114 | CCMOD: CMY | |
| | | 115 – 117 | CCMOD: WHITE (not yet implemented) | |
| | | 118 – 122 | Reserved | |
| | | 123 | CTO Filt (Default) | |
| | | 124 | CTO White | |
| | | 125-163 | Reserved | |
| | | 164 | Base frequency=1000Hz | |
| | | 165 | Base frequency=1500Hz (Default) | |
| | | 166 | Base frequency=2400Hz | |
| | | 167 | Base frequency=3700Hz | |
| | | 168 | Base frequency=5600Hz | |
| | | 169 | Base frequency=9400Hz | |
| | | 170 | Base frequency=15100Hz | |
| | | 171 | Base frequency=21400Hz | |
| | | 172 | Base frequency=31000Hz | |
| | | 173 | Base frequency=43700Hz | |
| | | 174-250 | Reserved | |
| | | 251 - 255 | Default function recall<br>Note: all the functions, except P&T speed, are non-volatile settings. Non-volatil means that the configuration still remains active after power off. | |

| RGB | HSV | DMX value | Function |
|---|---|---|---|
| 18 | 18 | | **RESET** |
| | | 0 - 25 | Unused range |
| | | 26 - 76 | Zoom Reset<br>Zoom Reset sequence is activated passing through the unused levels range and staying in this range for 5 seconds |
| | | 77 - 127 | Pan / Tilt Reset<br>Pan/Tilt Reset sequence passing through the unused levels range and staying in this range for 5 seconds. |
| | | 128 - 255 | Complete Reset<br>All-effects Reset sequence passing through the unused levels range and staying in this range for 5 seconds. |
| 19 | 19 | | **FREQUENCY** |
| | | 0 – 255 | Fine adjusting of frequency Base selected from the Function parameter (17) - Details at page 15 |

# EXTENDED MODE

| Number | RGB | HSV | Note |
|---|---|---|---|
| 1 | Red | Red | Active in RAW mode only |
| 2 | Red fine | Red fine | Active in RAW mode only |
| 3 | PC Amber | PC Amber | Active in RAW mode only |
| 4 | PC Amber fine | PC Amber fine | Active in RAW mode only |
| 5 | PC Green | PC Green | Active in RAW mode only |
| 6 | PC Green fine | PC Green fine | Active in RAW mode only |
| 7 | Green | Green | Active in RAW mode only |
| 8 | Green fine | Green fine | Active in RAW mode only |
| 9 | Cyan | Cyan | Active in RAW mode only |
| 10 | Cyan fine | Cyan fine | Active in RAW mode only |
| 11 | Blu | Blu | Active in RAW mode only |
| 12 | Blu fine | Blu fine | Active in RAW mode only |
| 13 | CTO | CTO | Only with CTO White option in RAW mode |
| 14 | Macro color | Macro color | Not enabled yet |
| 15 | Strobe | Strobe | |
| 16 | Dimmer | Dimmer | |
| 17 | Dimmer fine | Dimmer fine | |
| 18 | Red/Cyan | Hue | Cyan with CCMOD CMY |
| 19 | Green/Magenta | Hue fine | Magenta with CCMOD CMY |
| 20 | Blue/Yellow | Saturation | Yellow with CCMOD CMY |
| 21 | Crossfade | Crossfade | Not enabled yet |
| 22 | Path | Path | Not enabled yet |
| 23 | Dummy | Dummy | Not enabled yet |
| 24 | Tint | Tint | Not activated in RAW mode |
| 25 | Pan | Pan | |
| 26 | Pan fine | Pan fine | |
| 27 | Tilt | Tilt | |
| 28 | Tilt fine | Tilt fine | |
| 29 | Zoom | Zoom | |
| 30 | Function | Function | |
| 31 | Reset | Reset | |
| 32 | Frequency | Frequency | |

# EXTENDED MODE



| RGB | HSV | DMX value | Function |
|---|---|---|---|
| 1 | 1 | | **RED** |
| | | 0 - 255 | Red colour linearly increases from no-light to maximum intensity |
| 2 | 2 | | **RED FINE** |
| | | 0 - 255 | Red fine intensity |
| 3 | 3 | | **AMBER** |
| | | 0 - 255 | Amber colour linearly increases from no-light to maximum intensity |
| 4 | 4 | | **AMBER FINE** |
| | | 0 - 255 | Amber fine intensity |
| 5 | 5 | | **LIME** |
| | | 0 - 255 | Lime colour linearly increases from no-light to maximum intensity |
| 6 | 6 | | **LIME FINE** |
| | | 0 - 255 | Lime fine intensity |
| 7 | 7 | | **GREEN** |
| | | 0 - 255 | Green colour linearly increases from no-light to maximum intensity |
| 8 | 8 | | **GREEN FINE** |
| | | 0 - 255 | Green fine intensity |
| 9 | 9 | | **CYAN** |
| | | 0 - 255 | Cyan colour linearly increases from no-light to maximum intensity |
| 10 | 10 | | **CYAN FINE** |
| | | 0 - 255 | Cyan fine intensity |
| 11 | 11 | | **BLUE** |
| | | 0 - 255 | Blue colour linearly increases from no-light to maximum intensity |
| 12 | 12 | | **BLUE FINE** |
| | | 0 - 255 | Blue fine intensity |
| 13 | 13 | | **CTO** |
| | | | Colour Temperature linearly change from 8000K to 2500K |
| | | 0 | OFF |
| | | 1 … | 8000 K |
| | | … 47 … | 7000 K |
| | | … 93 … | 6000 K |
| | | … 112 … | 5600 K |
| | | … 139 … | 5000 K |
| | | … 185 … | 4000 K |
| | | … 222 … | 3200 K |
| | | … 245 … | 2700 K |
| | | … 255 | 2500 K |

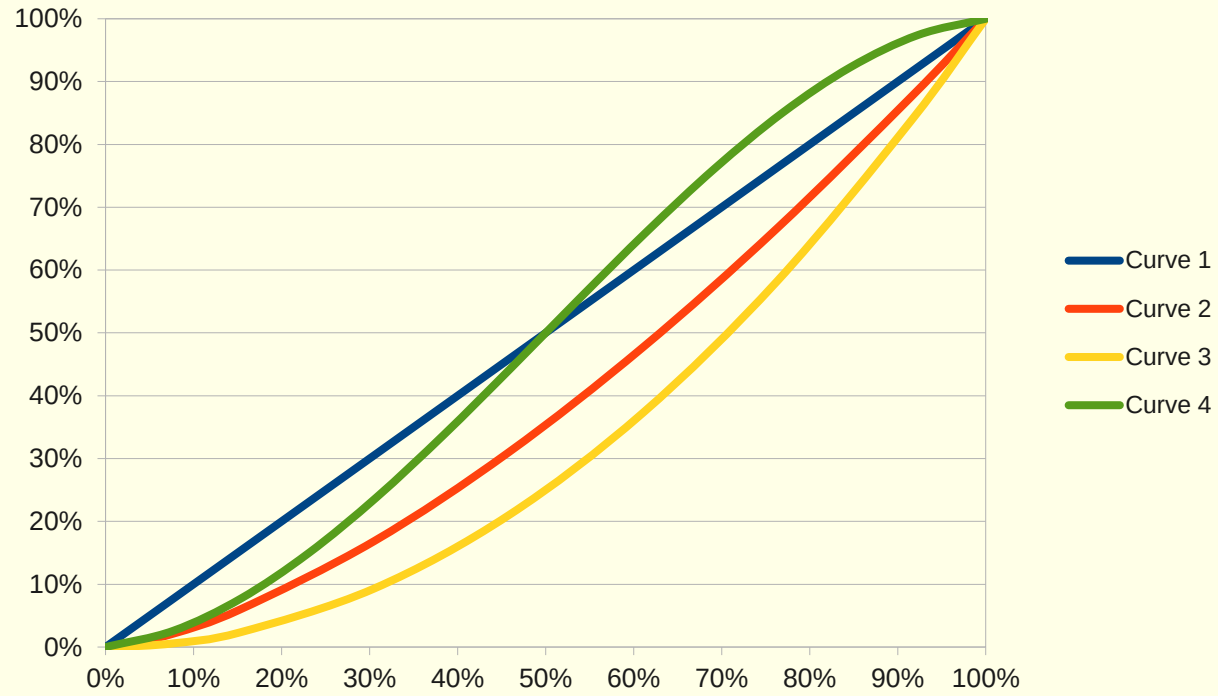
| RGB | HUE | DMX value | Function |
|---|---|---|---|
| 14 | 14 | | **MACRO COLOR** |
| | | TBD | |
| 15 | 15 | | **STROBE** |
| | | 0 - 3 | Light OFF |
| | | 4 - 103 | Strobe at linearly variable frequency from low (1Hz) to fast (16Hz) |
| | | 104 - 107 | Light ON |
| | | 108 - 207 | Pulsation at linearly variable speed from slow (0.5 Hz) to fast (25 Hz) |
| | | 208 - 212 | Light ON |
| | | 213 - 255 | Random Slow Strobe |
| | | 226 - 238 | Random Medium Strobe |
| | | 239 - 251 | Random Fast Strobe |
| | | 252 - 255 | Light ON |
| 16 | 16 | | **DIMMER** |
| | | 0 - 255 | Light output linearly increases from off to maximum brightness |
| 17 | 17 | | **DIMMER FINE** |
| | | 0 - 255 | Fine Dimmer positioning |
| 18 | - | | **RED / CYAN** |
| | | 0 - 255 | Red colour linearly increases from no-light to maximum intensity |
| 19 | - | | **GREEN / MAGENTA** |
| | | 0 - 255 | Green colour linearly increases from no-light to maximum intensity |
| 20 | - | | **BLUE / YELLOW** |
| | | 0 - 255 | Blue colour linearly increases from no-light to maximum intensity |
| - | 18 | | **HUE** |
| | | 0 - 255 | Linear Hue setting, define the target point color in the HSV color representation system (range from 0° (Red) to 360°) |
| - | 19 | | **HUE FINE** |
| | | 0 - 255 | Fine Hue setting |
| - | 20 | | **SATURATION** |
| | | 0 - 255 | Linear Saturation setting, define the INTENSITY/PURITY of the color at a constant lightness level. It ranges from 100% (pure color) to 0% (white) |
| 21 | 21 | | **CROSSFADE** |
| | | 0 - 255 | Faded Transition with selectable timing between two sets of color points. In accordance with the selected PATH, during the faded transition all the intermediate color along the route will be displayed |

| RGB | HSV | DMX value | Function |
|---|---|---|---|
| 22 | 22 | | **PATH** |
| | | 0 - 255 | Selection of the different types of route for the functionality “Crossfade” (example: along a straight line connecting directly the two points, clockwise or anticlockwise along the saturated color on the gamut border connecting the two points) |
| 23 | 23 | | **DUMMY** |
| | | 0 - 255 | Not activated yet |
| 24 | 24 | | **TINT** |
| | | 0-127 | Linear Tint setting, define the target point correction from Magenta to OFF |
| | | 128 | OFF |
| | | 129-255 | Linear Tint setting, define the target point correction from OFF to Green |
| 25 | 25 | | **PAN** |
| | | 0 - 255 | Pan movement/positioning <<< counter-clockwise from 0° to 540° (invert Pan=Off; Invert Tilt=Off) |
| 26 | 26 | | **PAN FINE** |
| | | 0 - 255 | Fine Pan positioning |
| 27 | 27 | | **TILT** |
| | | 0 - 255 | Tilt movement/positioning >>>>> clockwise from 0° to 210° (invert Pan=Off; Invert Tilt=Off) |
| 28 | 28 | | **TILT FINE** |
| | | 0 - 255 | Fine Tilt positioning |
| 29 | 29 | | **ZOOM** |
| | | 0 - 255 | Zoom linearly moves from narrow to wide beam |

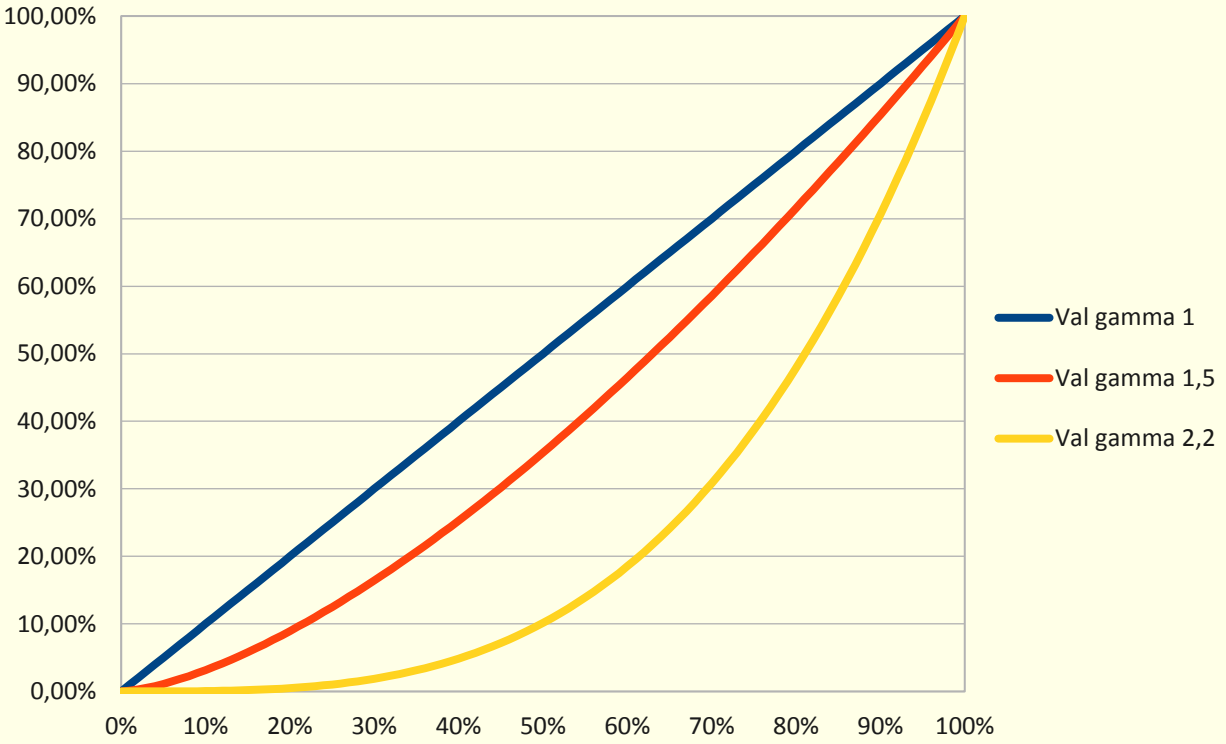
| RGB | HSV | DMX value | Function | |
|---|---|---|---|---|
| 30 | 30 | | **FUNCTION** | |
| | | 0 - 11 | None | |
| | | 12 - 24 | Fast P&T speed (Default) | |
| | | 25 - 37 | Normal P&T speed | |
| | | 38 - 42 | Dimmer curve 1 (Default) | Details at page 13 |
| | | 43 - 47 | Dimmer curve 2 | |
| | | 48 - 52 | Dimmer curve 3 | |
| | | 53 - 57 | Dimmer curve 4 | |
| | | 58 - 62 | Raw color channels gamma 1 | Details at page 13 |
| | | 63 - 67 | Raw color channels gamma 1.5 | |
| | | 68 - 72 | Raw color channels gamma 2.2 (Default) | |
| | | 73 - 77 | Halogen mode disabled (Default) | |
| | | 78 - 82 | Halogen mode 1, 750W lamp emulation | |
| | | 83 - 87 | Halogen mode 2, 1000W lamp emulation | |
| | | 88 - 92 | Halogen mode 3, 1200W lamp emulation | |
| | | 93 - 97 | Halogen mode 4, 2000W lamp emulation | |
| | | 98 - 102 | Halogen mode 5, 2500W lamp emulation | |
| | | 103 - 105 | Reserved | |
| | | 106 - 108 | CCMOD: RAW (Default) | |
| | | 109 - 111 | CCMOD: RGB or HSV | |
| | | 112 - 114 | CCMOD: CMY | |
| | | 115 – 117 | CCMOD: WHITE (not yet implemented) | |
| | | 118 – 122 | Reserved | |
| | | 123 | CTO Filt (Default) | |
| | | 124 | CTO White | |
| | | 125-163 | Reserved | |
| | | 164 | Base frequency=1000Hz | |
| | | 165 | Base frequency=1500Hz (Default) | |
| | | 166 | Base frequency=2400Hz | |
| | | 167 | Base frequency=3700Hz | |
| | | 168 | Base frequency=5600Hz | |
| | | 169 | Base frequency=9400Hz | |
| | | 170 | Base frequency=15100Hz | |
| | | 171 | Base frequency=21400Hz | |
| | | 172 | Base frequency=31000Hz | |
| | | 173 | Base frequency=43700Hz | |
| | | 174-250 | Reserved | |
| | | 251 - 255 | Default function recall | |
| | | | Note: all the functions, except P&T speed, are non-volatile settings. Non-volatil means that the configuration still remains active after power off. | |

| RGB | HSV | DMX value | Function |
|---|---|---|---|
| 31 | 31 | | **RESET** |
| | | 0 - 25 | Unused range |
| | | 26 - 76 | Zoom Reset<br>Zoom Reset sequence is activated passing through the unused levels range and staying in this range for 5 seconds |
| | | 77 - 127 | Pan / Tilt Reset<br>Pan/Tilt Reset sequence passing through the unused levels range and staying in this range for 5 seconds. |
| | | 128 - 255 | Complete Reset<br>All-effects Reset sequence passing through the unused levels range and staying in this range for 5 seconds. |
| 32 | 32 | | **FREQUENCY** |
| | | 0 – 255 | Fine adjusting of frequency Base selected from the Function parameter (30) - Details at page 15 |

## DIMMER CURVE GRAPHIC




## GAMMA CURVE GRAPHIC



# Macro Color List

| DMX Value | LEE Filter | Description |
|---|---|---|
| 0 – 9 bit | - | Macro OFF |
| TBD | 4 | Med bastard amber |
| TBD | 9 | Pale amber gold |
| TBD | 19 | Fire |
| TBD | 26 | Bright Red |
| TBD | 35 | Light pink |
| TBD | 58 | Lavender |
| TBD | 68 | Sky blue |
| TBD | 71 | Tokyo blue |
| TBD | 103 | Straw |
| TBD | 111 | Dark pink |
| TBD | 115 | Peacock blue |
| TBD | 116 | Med blue-green |
| TBD | 117 | Steel blue |
| TBD | 124 | Dark green |
| TBD | 128 | Bright pink |
| TBD | 131 | Marine blue |
| TBD | 132 | Med blue |
| TBD | 134 | Golden amber |
| TBD | 136 | Pale lavender |
| TBD | 138 | Pale green |
| TBD | 141 | Bright blue |
| TBD | 147 | Apricot |
| TBD | 154 | Pale rose |
| TBD | 161 | Slate blue |
| TBD | 165 | Daylight blue |
| TBD | 169 | Lilac tint |
| TBD | 180 | Dark lavender |
| TBD | 182 | Light red |
| TBD | 200 | Double c.t. blue |
| TBD | 201 | Full c.t. blue |
| TBD | 202 | ½ c.t. blue |
| TBD | 203 | ¼ c. t. blue |
| TBD | 204 | Full c.t. orange |
| TBD | 205 | ½ c. t orange |
| TBD | 206 | ¼ c. t. orange |
| TBD | 241 | Lee fluor 5700K |
| TBD | 242 | Lee fluor 4300K |
| TBD | 248 | ½ minus green |
| TBD | 328 | Follies pink |
| TBD | 706 | King fals lavender |
| TBD | 711 | Cold blue |
| TBD | 728 | Steel green |
| TBD | 747 | Easy white |
| | | |

# Frequency parameter levels

| Base Frequency setting | Value at 128 bit | Min value at 0 bit | Max value at 255 bit |
|---|---|---|---|
| 1000 Hz | 1000 Hz | 746 Hz | 1254 Hz |
| 1500 Hz (Default) | 1500 Hz | 1246 Hz | 1754 Hz |
| 2400 Hz | 2400 Hz | 1765 Hz | 3035 Hz |
| 3700 Hz | 3700 Hz | 3065 Hz | 4335 Hz |
| 5600 Hz | 5600 Hz | 4330 Hz | 6870 Hz |
| 9400 Hz | 9400 Hz | 6860 Hz | 11940 Hz |
| 15100 Hz | 15100 Hz | 11925 Hz | 18275 Hz |
| 21400 Hz | 21400 Hz | 18225 Hz | 24575 Hz |
| 31000 Hz | 31000 Hz | 24650 Hz | 37350 Hz |
| 43700 Hz | 43700 Hz | 37350 Hz | 50050 Hz |