impression X5

User Manual

-G-L-P-

Document revisions

Revision number	Notes	Date released
20220720-01	First version available. Covers firmware v. 1.0.0	July, 2022

Table of Contents

1. Safety

Key to symbols

The following symbols are used in the product's user documentation:

Warning! Safety hazard. Risk of severe injury or death.

Warning! Hazardous voltage. Risk of lethal or severe electric shock.

Warning! See user documentation for important safety information.

Warning! Fire hazard.

Warning! Risk of eye injury.

Warning! Hot surface. Risk of burn injury.

Warning! Read the Quick Start and Safety Manual supplied with the impression X5 lighting fixture and available for download from www.glp.de before installing, operating or servicing the fixture. The Quick Start and Safety Manual contains important information for the safe use of impression X5 fixtures. If you fail to read that information, you may create a safety hazard with a risk of injury, death or damage.

If you have any doubts or questions about how to use the product safely, please contact your GLP® supplier, who will be happy to help.

The user documentation for GLP impression X5 lighting fixtures consists of:

● The **impression X5 Quick Start and Safety Manual**, supplied with impression X5 fixtures and available for download from www.glp.de. The Quick Start and Safety Manual contains important safety information and installation instructions that the installer and user must read. It also contains a detailed product overview, dimensions drawings and technical specifications for the product.

● The **impression X5 User Manual**, available for download from www.glp.de. The User Manual explains features and control of impression X5 fixtures.

● The **impression X5 DMX Channel Index**, containing the DMX control channel layout and DMX commands available in the fixture. This information is also included in the User Manual.

The impression X5 is intended for use by experienced professionals with the knowledge and skills to set up, operate, and maintain high-powered, remotely controlled lighting equipment safely and efficiently. These operations require expertise that may not be provided in this manual.

- Respect all warnings and directions given in the product's user documentation and on the product. Read the user documentation and familiarize yourself with the safety precautions it contains before installing, using or servicing the product. GLP and affiliated companies will take no responsibility for damage or injury resulting from disregard for the information in the user documentation.

- Check the GLP website at www.glp.de and make sure that you have the latest versions of the product's user documentation.

- Check the fixture software version indicated on page 2 of this User Manual and then use the fixture's control panel to check the version installed in the fixture. If the versions are not the same, the user manual may still cover the fixture, because software updates do not always affect the use of the fixture. However, it is possible that this User Manual does not match the fixture perfectly. Software release notes can help clarify this question. You can consult software release notes and download the correct version of this manual on the GLP website if necessary.

- Make both the Quick Start and Safety Manual and this User Manual available to all persons who will install, operate or service the product. Save both documents for future reference.

- If you have any questions about the safe operation of the product, please contact an authorized GLP distributor (see list of distributors at www.glp.de).

- Use the product only as directed in this manual. Observe all markings in this manual and on the product.

GLP Service and Support

Contact information for the nearest GLP Service and Support is available online at www.glp.de/en/service, by email at info@glp.de, or by telephone at the following numbers:

- GLP Germany: +49 (7248) 927 19-55

- GLP N. America: +1 818 767-8899

- GLP UK: +44 1392 690140

- GLP Asia: +852 (3151) 7730

- GLP Nordic: +46 737 57 11 40

Avoiding damage to the fixture

The Quick Start and Safety Manual contains important information that is intended to help you avoid possible damage to the fixture from other light sources, during transportation, etc. Read that information before storing, transporting or using the fixture.

2. Features

Light source

The impression X5's light source is a powerful group of 19 x 40 W RGBL LEDs.

Control options

The impression X5 is compatible with DMX 512 and RDM. See the impression X5 Quick Start and Safety Manual for more details.

The fixture also features GLP's FPO (Flexible Protocol Option) Port. This port allows you to use control options such as LumenRadio CRMX or others on request. Contact your GLP supplier for details.

Pan and tilt

The impression X5 pans through 540° by default and tilts through 264° with coarse and fine control channels.

The directions of pan and tilt can be reversed using the control panel or via DMX on the *Special/Control* channel.

Pan range can be changed from 540° (Standard) to 650° (Extended) if needed using the **Fixture Settings → Pan range** setting (see'Pan Range' on page 21.

Tilt range can be limited using the **Fixture Settings → Accessory** setting (see'Accessories and tilt range' on page 21) if external accessories are installed on the head.

When the fixture is powered up and no valid DMX signal is present, the head moves automatically to its home position (center/center).

You can adjust the speed (and noise level) of pan and tilt movement, as well as the speed of all other mechanical effects, by selecting from three different performance options using the **Fixture Settings → Performance** setting (see 'Performance settings' on page 17).

Direction of pan and tilt movement

With the fixture standing on the ground, increasing the pan DMX value moves the yoke clockwise from its home position. Pan direction can be reversed using the **Fixture Settings → Pan Invert** setting (see 'Pan Invert' on page 20) or via DMX on the Special/Control channel.

With the fixture standing on the ground, increasing the tilt DMX value moves the head towards the front from its home position. Tilt direction can be reversed using the **Fixture Settings → Tilt Invert** setting (see 'Tilt Invert' on page 20) or via DMX on the Special/Control channel.

Pan and tilt position feedback and self-correction

The fixture has a pan/tilt position feedback and self-correction system that brings the head back to its correct position if it was unintentionally moved. When correcting pan and/or tilt, the fixture at first tries twice to move to the correct position. If it cannot move to this position, it waits for a short period and then tries again.

Position feedback is automatically disabled for a short time if you press one of the control panel buttons on the yoke. This feature lets an operator move the yoke manually for more convenient use of the control panel and display. Pan and tilt remain automatically disabled while you are using the fixture's control panel.

Position feedback can also be set to constantly disabled using the **Fixture Settings →** **Position Feedback** setting (see 'Position feedback' on page 20) or via DMX on the Special/Control channel.

Zoom

The impression X5 has a zoom range that lets you vary the beam angle from 3.5° to 37° (half-peak) / vary the field angle from 4.9° to 57° (one-tenth peak).

Control on the Zoom DMX channel moves from spot to flood as the DMX value increases.

You can adjust the speed (and noise level) of the zoom effect, as well as the speed of all other mechanical effects, by selecting from three different performance options using the **Fixture Settings → Performance** setting (see 'Performance settings' on page 17).

Main and Sub modules

Some control modes divide the fixture into two or more modules (Main module and Sub modules). For example, Control Mode 2 divides the Washlight into:

● Main module (Layer 1 = one RGB(L) Wash fixture)

● Sub module (Layer 2 = pattern engine with segment or individual pixel control).

The Sub module has its own intensity and shutter channels. Professional controllers will handle this setup in a smart multi-fixture profile.

The **Subfixture Mode** setting lets you decide whether the Sub module should be subordinate to or independent of the Main module (see below).

Subfixture Mode

The fixture offers two different options for control of the Main module and Sub modules using the **Fixture Settings → Subfixture Mode** setting (see also 'Subfixture Mode' on page 18):

● **Normal** mode makes the Sub module channels subordinate to the Main module. This means that the intensity and shutter of the Main module act as global intensity and global shutter.

● **Independent** mode makes the Sub module channels completely independent of the Main module.

Color Mix Mode

The main module of the impression X5 features 16-bit color mixing with RGB, RGBL and x;y (CIE 1931) color control. You can change the color mixing mode using the **Fixture Settings → Color Mix Mode** setting (see 'Color Mix Mode' on page 16) or via DMX on the Special/Control channel.

Sub module color mixing is always RGB.

Mix Priority

The Mix Priority channel defines how the color mixing output of the Main module and the color mixing output of the Sub module are merged together – or which value has higher priority – in the X5's color mixing output.

The default setting (DMX 000) is **Main and Sub (HTP)**, where the highest color value of the Main or the Sub module determines the output color.

The Mix Priority channel gives the following options:

● **Main + Sub (HTP)** – The fixture takes whichever color value of the Main module or Sub module is highest and uses that value to determine the output color (Highest Takes Priority).

● **Main Only** – The Sub module color value is ignored. The fixture uses the color value of the Main module.

● **Sub Only** – The Main module color value is ignored. The fixture uses the color value of the Sub module.

● **Main + Sub additive** – The Sub module color value is added to the Main module color value. The fixture uses the sum of both values.

● **Main - Sub subtractive** – The Sub module color value is subtracted from the Main module color value.

● **Sub - Main subtractive** – The Main module color value is subtracted from the Sub module color value.

● **TrueColor Main over Sub Snap** – Sub module color stays in the background. Main module color has higher priority and will not mix with Sub module color. As soon the Main module color value is greater than zero, Sub module color blacks out and the fixture uses the Main module color.

● **TrueColor Sub over Main Snap** – Main module color stays in the background. Sub module color has higher priority and will not mix with the Main module color. As soon as Sub module color value is greater than zero, Main module color blacks out and the fixture uses Sub module color.

● **TrueColor Main over Sub Crossfade** – Sub module color stays in the background. Main module color has higher priority. If you fade in a Main module color, Sub module color will crossfade to the Main module color.

● **TrueColor Sub over Main Crossfade** – Main module color stays in the background. Sub module color has higher priority. If you fade in a Main module color, Sub module color will crossfade to the Main module color.

- **Main to Sub Crossfade –** Manually crossfading from Main module color only → Main and Sub module color (HTP) → Sub module color only.

Color temperature control (CTC)

The impression X5's three color mixing control modes (RGB, RGBL and x;y) all offer a separate Color Temperature Correction channel which lets you shift the color temperature obtained by the Main module and Sub module when all colors are set to 100% (i.e. R255/G255/B255 in RGB mode or R255/G255/B255/L255 in RGBL mode). A CTC range of 10 000 K to 2500 K is available.

Depending on the selected Color Mix Mode (RGB, RGBL or x;y), if you select a color temperature on the CTC channel, the fixture will no longer use the specific open color and will instead use the selected color temperature.

If you select a color temperature on the CTC channel, it is still possible to manipulate the color temperature using the RGB and RGBL channels.

Note

To obtain the desired color temperature on the CTC channel, all ColorMix channels need to be set to 100%. If they are not at 100%, the system will mix color relative to the selected white point of the CTC channel.

The CTC channel affects all the fixture's modules. Setting the CTC channel to a specific color temperature will affect the open white of the Main module <u>and</u> Sub modules.

Color Quality Control (CQC)

The CQC channel lets you modify the spectral mix of the white color output in order to achieve a balance between better color rendering or higher output. Physically, the richer light spectrum created when deploying multiple LEDs will give better color rendering but will also give lower output. On the other hand, you can obtain higher output if you accept lower color rendering.

While using white colored light, the CQC channel lets you change between white with priority on high-quality color rendering and white with priority on highest output.

Additionally, the CQC channel lets you smoothly desaturate colors. If you have set a saturated color in the color mix, the CQC channel lets you smoothly desaturate the color from saturated to fully unsaturated (= white).

The following options are available:

- **High Quality (HQ)** – Color is mixed with priority given to the best white color rendering quality. Saturated colors will have maximum saturation at DMX 000 and will smoothly become unsaturated until they reach 0% saturation (= white) at DMX value 127.

- **High Output (HO)** - Color is mixed with priority given to the highest output in white. Saturated colors will have maximum saturation at DMX 255 and will smoothly become unsaturated until they reach 0% saturation (= white) at DMX value 128.

> **Note**
>
> The CQC channel affects all the fixture's modules. Setting the CQC channel to a specific value will affect the colors of the Main module <u>and</u> Sub modules.

Magenta/Green Shift (M/G Shift)

The Magenta/Green Shift channel lets you move the color coordinate of a white point, a mixed color or a selected CTC color along a vertical line on the color temperature curve in all three ColorMix modes. The corresponding white point is either shifted towards Green or Magenta.

If M/G Shift is enabled, it immediately affects all mixed colors as well as the color temperature that is selected on the CTC channel. It has no effect on the colors of the virtual color wheel.

> **Note**
>
> The M/G Shift channel affects the entire fixture. Setting the M/G Shift channel to a specific value will affect the output of the Main module and Sub modules.

Color wheel

The impression X5 features a virtual color wheel channel that gives quick access to a wide range of LEE-referenced colors in all three ColorMix modes. Color wheel color presets are always mixed with the best available spectrum. Color filter color coordinates are based on a Source C (daylight) light source.

Besides static color presets, the color wheel channel also offers continuous color scrolling in rainbow colors. When set to Rainbow, the fixture runs through the typical colors of a rainbow with speed variable from slow to fast.

The crossfade time of a color change is relative to the speed: at slow speeds colors crossfade smoothly and at fast speeds colors snap.

If a color coordinate is outside the possible color gamut of the light source, the fixture tries to match the target color as closely as possible.

> **Note**
>
> Color wheel color presets have higher priority than the ColorMix, CTO and M/G Shift channels.
>
> The virtual color wheel channel must be set to DMX 000 in order to use normal RGB, RGBL or x:y color mixing.

Tungsten simulation

When a tungsten lamp is dimmed, there is a small delay in intensity changes and there is a color shift along the black body line. The tungsten simulation channel allows the user to select between different tungsten options in all three ColorMix modes.

The first part of the Tungsten channel offers standard tungsten features with fixed color temperature, red shift and delayed intensity changes. The color temperature as well as the color shift and inertia of the selected light source are fully simulated. Tungsten mode has higher priority than the color wheel or CTC.

The second part of the Tungsten channel lets you apply one of the corresponding tungsten effects (color shift and inertia) to the currently set mixed color or currently selected color temperature on the CTC channel.

Note

The Tungsten channel affects the entire fixture. Setting the Tungsten channel to a specific value will affect the output of the Main module <u>and</u> Sub module.

Shutter

The impression X5's shutter channel offers continuous blackout, continuous open and a range of intensity effects.

Depending on the selected Subfixture Mode, the shutter channel of the Main module channel group acts as either a master shutter or as the shutter channel of the Main module independently of the Sub module.

The following shutter effects are available:

- **Single flash** performs exactly one single flash with each value change within this DMX value slot.

- **Pulse** dims up and down smoothly with the same fade-in and fade-out times. Speed can be adjusted from slow to fast.

- **Pulse open** fades in and then snaps to blackout. Speed can be adjusted from slow to fast.

- **Pulse close** fades out and then snaps to full. Speed can be adjusted from slow to fast.

- **Strobe double flash** provides a quick double flash. Speed can be adjusted from slow to fast.

- **Strobe pixel random** (only available when the fixture is set to a DMX mode with individual pixel control) strobes individual pixels at random to give a kind of sparkling effect. Speed can be adjusted from slow to fast.

- **Strobe random** strobes all of one fixture's pixels together at random intervals, allowing a random strobe between multiple fixtures. Speed can be adjusted from slow to fast. *Note that the random effect across multiple fixtures really is random!*

- **Strobe** strobes all of one fixture's pixels together and also perfectly synchronizes the strobe in multiple fixtures so that all the fixtures flash at exactly the same time. Speed can be adjusted from slow to fast.

> **Note**
>
> Depending on the selected Subfixture Mode, the dimmer and shutter channels of the Sub modules can operate independently of or subordinately to the dimmer and shutter channels of the Main module.

Dimmer

The electronic dimming effect provides smooth 16-bit dimming of the Main module and Sub modules.
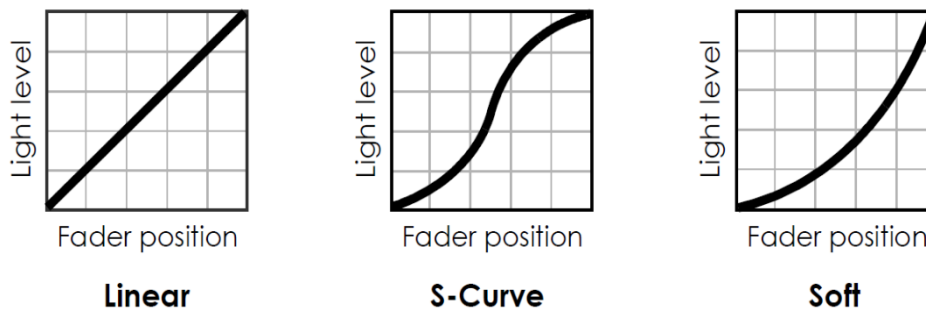
Figure 1. Dimming curves

Dimming curves

See Figure 1. Three dimming curve options are available: **Linear**, **S-Curve** and **Soft**.

- The **Linear** setting gives a dimming curve that the eye perceives as linear.
- The **S-Curve** setting gives finer control at lower light levels and at higher light levels, with coarser control at medium light levels.
- The **Soft** setting gives finer control at lower light levels, where the eye is most sensitive to changes in light intensity, and coarser control at higher light levels.

You can select the dimming curve using the control panel or via DMX on the Special/Control channel.

> **Note**
>
> Depending on the selected Subfixture Mode, the dimmer and shutter channels of the Sub modules can operate independently of or subordinately to the dimmer and shutter channels of the Main module.

Individual Segment or Pixel Control

The impression X5 offers 19 individually controllable pixels. Each pixel cell houses a 40 W RGBL LED that can be controlled individually in intensity and color for creating dynamic effects and pixel mapping.

The fixture's different DMX control modes offer different options for working with the individual segments or pixels.

● In nearly all DMX modes, the Main module gives color mixing control of all pixels together as one segment.

● Mode 2 (Normal) adds a Sub module as a second layer with pattern effects and color mixing of all 19 pixels as one segment.

● Mode 3 (Segment) adds a Sub module as a second layer with pattern effects and color mixing of the segments: the inner, middle and outer rings.

● Mode 4 (Multipixel Advanced) adds a Sub module as a second layer with pattern effects and RGB color mixing of each individual pixel.

● Mode 5 is a pure pixel mapping mode which is reduced to the main overall control options plus RGB color mixing of each individual pixel.

Pattern Control

The impression X5 offers a wide range of static and dynamic pre-programmed FX patterns on the Sub modules. The Sub module color control channels define the color of the pattern effects. The Sub module Color Mix Mode is always RGB.

A static pattern is a fixed pattern with only one pattern step. This allows you a very quick selection of a non-dynamic effect. It has active and inactive pixels. Each active pixel shows the selected pattern color while each inactive pixel is fully transparent.

A dynamic pattern is a sequence of multiple pattern steps and has active and inactive pixels. Each active pixel shows the selected pattern color while each inactive pixel is fully transparent. You can set pattern steps to automatically change continuously (Pattern Speed) or you can directly select pattern steps (Pattern Index).

Note

The Mix Priority channel lets you decide how the output of the Main module and the Sub module (pattern or pixel mapping) should be merged.

Pattern selection

The pattern selection channel offers a choice of 59 static patterns, 50 dynamic patterns and some special patterns. The dynamic patterns offer multiple pattern steps for individual step selection or continuous pattern step chasers.

Pattern 0 (DMX 000) is the idle pattern and just sets all pixels to active.

The Random Pixel FX pattern at the end of the Pattern Select channel randomly selects pixels to create an attractive sparkle effect.

Pattern speed/index

As a dynamic pattern is a sequence of multiple pattern steps, you can select:

● an automatic clockwise or counterclockwise continuous run-through of the pattern steps with different speeds (dynamic speed control = DMX values 002 … 127), or

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- one of the available specific pattern steps (static indexing = DMX values 128 … 255).

Note

Bear in mind that different patterns can have a different number of pattern steps. This can affect synchronization between fixtures, for example, if you run different patterns in multiple fixtures.

Pattern Step Crossfade

The Pattern Step Crossfading channel lets you choose how one step in a pattern should change into the next step. This change can be a snap, a normal crossfade or a fade with tail (quick fade In and variable long fade out).

Pattern Transition

The Pattern Transition channel lets you choose how a Pattern A should change into Pattern B. This change can be a snap, a soft crossfade, a Fade Over Blackout (FOB) or Fade Over Full (FOF).

Special/Control DMX channel

The *Special/Control* DMX channel lets you change fixture settings and perform a fixture reset from the control desk (a possibility that can be very useful during a show or for a specific scene). To apply a command on the *Special/Control* channel, you must hold the command for the time indicated in the DMX channel index section at the end of this user manual.

To trigger a reset using the *Special/Control* channel, you must send the DMX value for this function for 3 seconds. If you want to trigger an additional reset using the *Special/Control* channel, you must first move away from the Reset DMX value and then return to this value. This requirement to change DMX values eliminates the risk of the fixture entering an unwanted Reset loop if it is patched wrongly.

Accessory channels 1and 2

It is possible to install optional electromechanical effect modules on the front of the impression X5 head. These modules can be supplied with power and control data using the power and data connection available on the back of the head. The two accessory channels supply two sets of DMX control data at this connection.

3. Settings

The settings described in this chapter let you customize the impression X5. Settings can be available in the control panel on the fixture's yoke, via DMX and/or via RDM.

Color Mix Mode

The Color Mix Mode setting offers three different options for color mixing:

● **RGB** – RGB Mode mixes color using Red, Green and Blue channels. The Lime LED is mixed automatically using the fixture's internal GLP iQ.Gamut algorithm.

RGB Mode also offers a clean default white light at open which is considered to be the white point (RGB at 100%). Fixed white point selection or temporary CTC channel value selection lets you set different color temperatures.

M/G shift and CQC adjustment are available in this mode.

● **RGBL –** RGBL Mode mixes color using Red, Green, Blue and Lime channels. The color gamut is still calibrated to the X5 range, but the white point (open) is not adjusted to the black body line and will show a white that is mixed using 100% RGBL.

The CTC channel lets you quickly change to any white on the black body line.

M/G Shift correction is available.

● **x;y –** x;y Mode lets you send x;y color coordinates to the fixture via DMX. The internal color algorithm mixes the four LED colors perfectly to match the x:y color coordinates.

White point setting is disabled. CTC channel values overwrite x:y values.

M/G Shift and CQC adjustment are available in this mode.

Note

Color mixing of Sub modules is always RGB.

White point

White point selection is available in RGB Mode and determines the fixture's color temperature at "open". The following white points (color temperatures) are available:

● **8000 K** (effect light)
● **6500 K** (daylight – default)
● **5600 K** (TV and studio)
● **4200 K** (CDM)
● **3200 K** (tungsten)

If a white point is enabled, the fixture mixes colors with reference to it. GLP iQ.Gamut navigates through the color space using the preferred Color Mode color mixing method.

iQ.Gamut

iQ.Gamut is the new LED calibration technology from GLP. The iQ.Gamut settings let you choose a calibrated color gamut within which the fixture operates.

- **FULL** (default): Color mixing is calibrated to the X5 color gamut. This setting gives best results for applications where deep saturated colors are needed.

- **Rec.2020**: Color mixing is matched to the limits of the Rec.2020 gamut. This setting gives best results for UHD TV applications and avoids color clipping.

- **Rec.709**: Color mixing is matched to the limits of the Rec.709 gamut. This setting gives best results for HD TV applications and avoids color clipping.

Performance settings

You can select between three different settings for the movement speed of the fixture's mechanical effects (pan/tilt and zoom):

- **Normal** sets mechanical effects movement to give an optimum balance between speed, quietness and smoothness. **Normal** is the default setting.

- **Fast** sets movement to maximum speed. This setting gives very fast effect movement but can result in higher noise levels.

- **Smooth** optimizes the smoothness of the mechanical effects and gives lowest-noise performance. This setting gives extremely low noise and smooth performance, but effect movement will be slower than in **Normal** mode.

Fan modes

Five cooling fan modes let you give priority to lowest fan noise or most powerful cooling:

- **Regulated** mode gives priority to light output and only operates fans as necessary. If the fixture is blacked out, fans run at minimum speed. When light output intensity is increased, temperature regulation increases fan speed to the level necessary to keep the fixture at optimum temperature.

  If light output is set to maximum intensity but the fans can keep the fixture at optimum temperature, there is no regulation of light intensity. If the fixture begins to exceed optimum temperature and the fans are running at maximum speed, light intensity is limited until optimum temperature can be maintained.

- **High** mode sets the fixture to give maximum light output and suits operation in high ambient temperatures. Fans are set to constant operation at high speed. Light output intensity is limited smoothly if it becomes necessary in order to keep fixture temperature at optimum level.

  You can also use **High** mode to cool down a fixture quickly after a period of operation or to help remove dust from cooling fans.

- **Medium** mode sets fans to constant operation at medium speed. Light output intensity is reduced to a level where it will normally remain constant at ambient temperatures of up to 45° C (113° F). Intensity is smoothly limited further if it becomes necessary in order to keep fixture temperature at optimum level.

- **Low** mode sets fans to constant operation at low speed and is optimized for minimum noise. Light output intensity is reduced to a level where it will normally remain constant at ambient temperatures of up to 30° C (86° F). Intensity is smoothly limited further if it becomes necessary in order to keep fixture temperature at optimum level.

- **Off** disables all fans which are not necessary to cool important electronic components. These fans will rotate as slowly as possible in order to reduce the noise level to a minimum. Light output intensity is reduced as much as becomes necessary.

Note

In all fan modes, if fixture temperature reaches a dangerous level, the LEDs are shut down for a period until the fans have brought the temperature down to a safe level.

Subfixture Mode

The impression X5 offers two different options for controlling the Main module and Sub modules.

- **Normal** – In this mode, all Sub module channels are subordinate to the Main module channel group. This means that the intensity and shutter of the Main module act as master intensity and master shutter for the whole fixture.

- **Independent** – In this mode, the Sub module channel group can be controlled independently of the Main module channel group and act as an independent fixture.

Note

No matter which **Subfixture Mode** setting you select:

- The **Mix Priority** channel is still active and will affect how the two dependent or independent fixtures will be mixed.

- Some of the general color management channels of the Main module such as CTC, CQC, M/G-Shift and Tungsten effects will still affect the Sub module.

PWM Frequency

This setting lets you select between different PWM frequencies for different applications and adjust LED frequencies to give the best results at different camera shutter frequencies. Changing the PWM frequency can help to avoid flicker and beat frequencies in video images.

The following PWM settings are available:

- **Optimum** (defaults) sets the fixture to a PWM frequency of approx. 3000 Hz, which offers best results when dimming.

- **High1** sets the PWM frequency to approx. 4800 Hz

- **High2** sets the PWM frequency to approx. 9600 Hz

- **Max** increases the PWM frequency to the highest possible frequency the fixture can operate at. Use this setting for slow motion video or high speed camera applications. Dimming resolution at the Max setting is the least smooth when compared with the other PWM settings.

Note that a higher PWM frequency may affect dimming performance. The PWM frequency setting is stored in the fixture and is not affected by cycling power off and on. However, it will be affected if you use the Factory Defaults command in the control menus. As a rule, you should set all the fixtures in an installation to the same PWM frequency in order to ensure the same performance.

You can set the PWM frequency using the control panel or the *Special/Control* DMX channel.

Pixel mirror

The **Pixel mirror** setting lets you flip the fixture's pixel layout on the x-axis, y-axis or both x- and y-axis:

- **Off** gives the standard pixel layout:
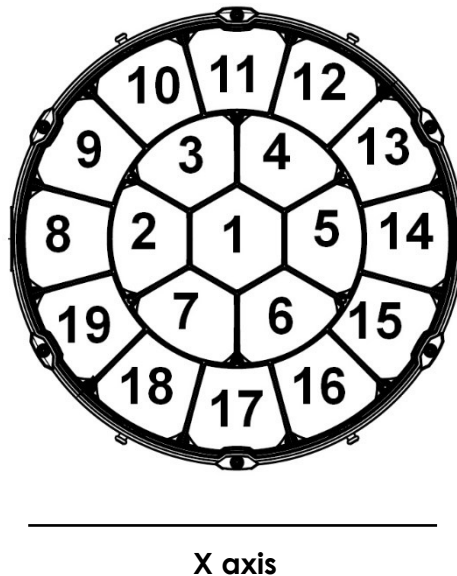
X axis

   The drawing above shows the pixel layout with the fixture standing on the ground, pan at 50% (home position) and tilt at 50% (front).

- **x-mirror** flips the pixel layout along the x-axis.
- **y-mirror** flips the pixel layout along the y-axis.
- **x:y mirror** flips the pixel layout along the x-axis and the y-axis.

Pixel rotation

Lets you rotate the fixture's pixel layout by: **0° – 60° – 120° – 180° – 240° – 300°**.

No signal

The **No signal** settings let you manage how the fixture behaves if no DMX signal is present (if the fixture is being controlled by DMX but the DMX signal stops, or if you apply power to the fixture when no DMX signal is present):

- **Blackout** sets the fixture to black out whenever it is not receiving a DMX signal. This is the default setting.

- **Hold** sets the fixture to continue using the last DMX values it received.

- **Scene (Stand-alone)** sets the fixture to play its stored stand-alone scene (see **Capture DMX Values** below) when the fixture is not receiving a DMX signal. If no stand-alone scene is stored in memory, the fixture will black out.

   If the fixture is set to **Scene (Stand-alone)** and if a stand-alone scene has been stored in its memory using the **Capture DMX Values** command, it will display its stand-alone scene at all times when it is powered on but not receiving a DMX signal. You can therefore use this setting if you want fixtures to automatically start stand-alone operation when you apply power to them.

- **Capture DMX Values** takes a snapshot of the DMX values that are currently being received and stores them in the fixture's memory as its captured scene. The fixture will display this scene if it is set to **Scene (Stand-alone)** (see above) and is not receiving a DMX signal.

Pan Invert

Reverses the direction of pan.

- **Off** – In the normal setting, increasing the pan value turns the yoke clockwise (as seen with the fixture standing on the ground).

- **On** – In the inverted setting, increasing the pan value turns the yoke counterclockwise (towards the grey safety eyelet).

Tilt Invert

Reverses the direction of tilt.

- **Off** – In the normal setting, increasing the tilt value turns the head to the FRONT (towards the black safety eyelet).

- **On** – In the inverted setting, increasing the tilt value will turn the head to the BACK (towards the grey safety eyelet).

Position feedback

Manages pan and tilt auto-correction.

- Pan and tilt position feedback is normally enabled (**Position Feedback = On**).

- If disabled (**Position Feedback = Off**), the fixture will not auto-correct pan and tilt position.

If you need to return pan and tilt to their correct positions, you must perform a reset.

Pan Range

The X5 can move the yoke to the mechanical end positions. However, for normal use and to make swapping fixtures easier, pan is normally limited to a standard 540° maximum pan angle.

However, for special applications (for example to get a greater pan angle or if an accessory is installed) it is possible to adjust the maximum pan angle. Two settings are available:

- **Normal** (default): Pan = 540°

- **Extended**: Pan = 650° (mechanical maximum)

Accessories and tilt range

If an external accessory is installed on the head, it may be necessary to limit the fixture's tilt angle. The following settings are available:

- **None** (default): The tilt angle is not limited: Maximum tilt angle is possible.

- **Egg Crate**: Maximum tilt angle is limited to allow the installation of an optical accessory such as the GLP Egg Crate Extension.

- **Snoot**: Maximum tilt angle is limited to allow the installation of an optical accessory such as a Snoot.

Display Mode

Gives different display behavior options. This can be helpful in case of errors or service situations.

- **Auto** (default): In this setting, the display automatically switches off after a few seconds if the fixture is receiving a valid control signal and has not detected an error. If the fixture is not receiving a valid control signal, the display will flash. If the fixture has detected an error, the display remains constantly on and shows the error.

- **On**: The display stays on constantly. This setting can be useful if you are configuring or servicing the fixture.

- **Off**: The display will automatically switch off after a few seconds even if the fixture is not receiving a valid control signal or if it has detected an error. Pressing any button turns on the display again.

Display Orientation

Lets you select **Normal**, **Upside-down** or **Auto** display orientation.

If **Display Orientation** is set to **Auto**, changing the display orientation by pressing UP and DOWN at the same time will only change the display orientation until the next power cycle.

Hibernation

Lets you put the fixture into energy-saving mode and disables all electronic components apart from the DMX receiving module. You can take the fixture out of

hibernation mode with a power off/on cycle, via RDM or using the Control / Settings DMX channel. If you do this, the fixture will perform a fixture reset before returning to normal operation.

Load User Settings

Lets you load different custom fixture configurations or return the fixture to the default fixture settings.

*To save a custom setting preset from 1 to 3, see **Service → Advanced → Save_Settings**.*

- **Load User Settings 1** to **3** loads one of three specific custom fixture settings. You must confirm the function for 3 seconds before the new settings are loaded (see **Fixture Settings → Load User Settings**).

- **Save User Settings 1** to **3** saves the current fixture settings as a set of user settings. You must confirm the function for 2 seconds in order to save the settings as one of the three custom settings presets (see **Service → Advanced → Save User Settings**).

Note

The **Load User Setting Presets** and **Load User Setting Defaults** commands will only affect settings in the **Fixture Settings** group and will not affect DMX Address, Control Mode, Protocol Type, IP Settings, etc. This helps avoid loss of communication with the controller.

Information

The **Information** submenu provides readouts of all relevant information such as the error list if any errors have been detected, the fixture's serial number, firmware version, device info, device hours counter, power cycles counter, DMX input monitor, signal quality etc.

Manual Control

This submenu gives different options for resetting the fixture manually. It can be helpful for service or stand-alone issues.

- **Reset All**: Performs a full fixture reset to initialize all features and effects.
- **Reset P/T**: Resets pan and tilt only to initialize pan and tilt positions.
- **Reset Head**: Resets all the features in the head.

Manual DMX

Gives individual control of the fixture using the fixture user interface. The menu timeout function is disabled as long this menu is open.

- **Manual Control**: Manually sets a DMX value for each function.
- **Load No-Signal Scene**: Loads the values of the captured scene stored using the **No-Signal** function.

- **Save as No-Signal Scene**: Saves the current manual control values as the captured scene for the **No-Signal** function.

- **Capture DMX values**: Captures the current external DMX signal values and uses them as the manual control values.

- **Reset Manual values**: Resets all manual control values to default.

> *Note*
>
> When entering manual control, be prepared for the fixture to start moving.
>
> External DMX values will always have higher priority than manual control commands. Disconnect the fixture from the data source when using manual control.

Service

The **Service** menu is split into two levels: **Service** and **Service Advanced**. The **Service Advanced** level is for trained technicians only. Read the user manual carefully before entering this level.

The Service menu contains the following items:

- **Live Diagnostic**: Calls up an overview of all main fixture information, signal quality and settings. This can be helpful while troubleshooting or talking to GLP Service.

- **iQ.Service Connect**: Enables connectivity to the GLP iQ.Service App.

  The fixture can also link to *iQ.Service Collect&Connect* by NFC, or connectivity can also be triggered by pressing and holding ENTER for 6 seconds.

- **Test All**: Runs a test sequence of all LEDs for a quick test of the fixture. Press BACK to stop the test sequence.

- **Test Pan/Tilt**: Runs a test sequence of tilt movement only. Press BACK to stop the test sequence.

- **Test LED**: Runs a test sequence of the LED pixel only. Press BACK to stop the test sequence.

- **Test Zoom**: Runs a test sequence of Zoom functionality only. Press BACK to stop the test sequence.

- **Test Fans**: Runs a test sequence of the Wash LEDs only for a quick test of the fixture. Press BACK to stop the test sequence.

Advanced Service

The **Advanced Service** level is for trained technicians only. Read the user manual carefully before entering this level.

You need to confirm by pressing and holding ENTER for 3 seconds before you can enter this level.

This level contains the following items:

- **Service Mode**: Disables pan, tilt and all display timeouts to make servicing inside the fixture head mechanics easier. This mode is automatically disabled after a power cycle.

- **Job Offset**: Lets you set +/- offsets on mechanical effects. Custom offsets let you adjust fixtures in multiple installations to compensate for the different positions of the fixtures in the rig, for example.

  Custom offsets that you create here will not affect the fixture's effect calibration.

  All custom offsets created here are deleted if you apply a **Load Factory Defaults** command.

- **Reset Counters**: Resets the different resettable fixture counters.

  Device counters are not deleted by a **Load Factory Backup** command.

- **Save Settings**: Lets you save the current fixture settings to one of the three user settings presets. You can load a user settings preset that you have saved with a **Load User Settings** command (see **Fixture Settings → Load User Settings**). The default fixture preset cannot be changed.

- **Firmware Push (Fixture2Fixture)**: Pushes the fixture's firmware (flash storage) to all other fixtures of the same type via the DMX link.

Load Factory Defaults

Reloads all factory defaults over the entire fixture and brings the fixture into standard show condition.

You must confirm the function for 3 seconds before the default settings are loaded.

Important! *The factory default settings that are reloaded with this command include all data and network configuration parameters such as DMX start address, IP configuration etc. You may therefore lose communication with your controller.*

*The **Load Factory Defaults** command does not affect device counters and calibration.*

Factory Menu

Important! Do not enter the Factory Menu if you are not a trained service professional with service documentation or clear instructions from GLP Service. Read the user and service documentation carefully before entering this menu. In the Factory Menu you can apply critical settings which can damage the fixture.

The Factory Menu is a hidden menu for the manufacturer or professional service technicians only. This special menu allows fixture calibration and the adjustment of all mechanical features following the manufacturer's instructions.

To enable the Factory Menu, apply power to the fixture and press the ENTER and BACK buttons together while the pre-boot screen is being displayed. You can release the buttons as soon as FACTORY MODE appears in the black display. After doing this, **Factory Menu** is visible as the last item in the main menu. The Factory Menu will remain available until the next power cycle. While the Factory Menu is enabled, all display timeouts are disabled to make working on the fixture easier and a Factory symbol is visible in the main screen.

4. Control panel

Warning! DMX control is disabled when the control menus are active. Be prepared for the head to move as soon as you exit the control menus.

The control panel and backlit graphic LCD display with self-charging battery allow you to change fixture settings, view readouts and use utilities quickly and intuitively, even when the fixture is disconnected from power.

To allow comfortable use of the control panel, pan and tilt are automatically disabled for a few seconds if you turn the yoke manually. Pressing any button on the control panel also disables pan and tilt for a few seconds. Pan and tilt remain disabled for as long you are working in the control panel. If no button is pressed for a few seconds, head movement is re-enabled with pan and tilt correction applied.
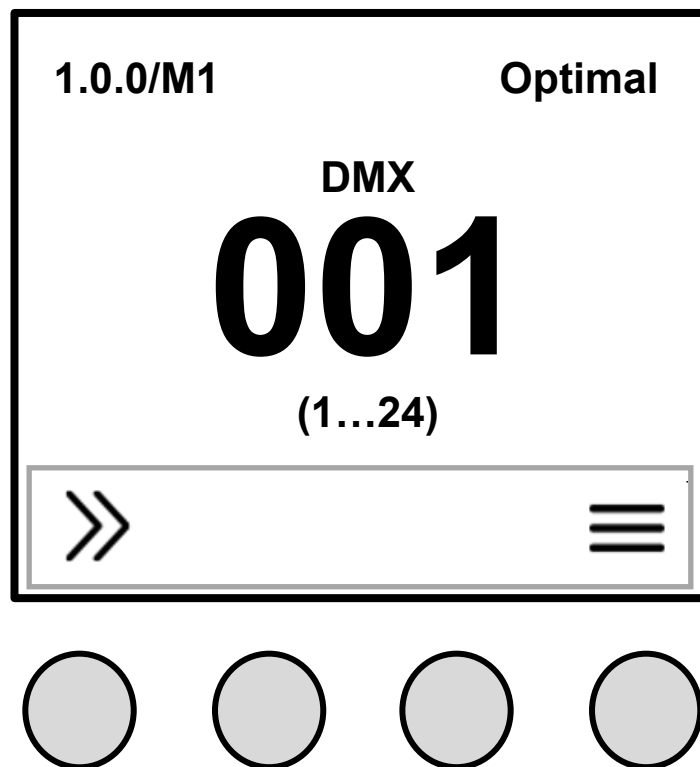
Figure 2. Default information screen

Default information screen

When power is applied, the fixture performs a reset. After the reset has completed, the default information screen appears in the control panel display on the side of the yoke.

At any other time, you can press any key to unlock the control panel. Doing this also calls up the default information screen in the control panel display.

See Figure 2. The top line of the default information screen consists of, from left to right:

● Main CPU firmware version

● DMX Mode

● LED PWM frequency

The center of the screen shows the following information:

● Fixture's current DMX address in large characters. If the fixture's self-diagnosis system detects an error, the fixture will flash the error code alternately with the DMX address. This lets you see the DMX address or error code at a distance from the fixture.

● Below the current DMX address, the fixture displays in smaller characters the DMX channels that it is currently using.

In the example shown in Figure 2**Error! Reference source not found.**:

● The fixture is running CPU software version 1.0.0

● The fixture is set to DMX Mode 1

● The LED PWM frequency is set to Optimal

● The fixture is set to receive data via DMX (standard DMX 512 link,)

● The fixture's DMX start address is 001

● The fixture is using DMX channels 001 to 024

Note

See 'Setting up the control protocol' on page 29 for details of how to configure the fixture

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Using the control panel

The four control panel buttons under the display have the following functions.

In the main screen:

    ≫   QUICK MENU – Activates the Quick Menu

    ↑ ↓   UP/DOWN – Press three times to open the live diagnostic tool

    ≡   MENU – Activates the control panel if it is in sleep mode, then opens the main menu

---

When navigating through the menus:

✕   BACK – Goes back one level towards the top of the menu

↑   UP – Scrolls up or increments a number

↓   DOWN – Scrolls down or decreases a number

✓   ENTER – Confirms a setting or implements a command

At any time:
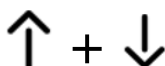
↑ + ↓   UP and DOWN at the same time – Temporarily rotates the display 180°

Control button shortcuts

Battery Eco Mode (available in Battery Mode only)

While in Battery Mode, holding MENU and ENTER together for 10 seconds activates Battery Eco Mode. This switches off the display completely to avoid any unwanted discharge of the battery and can be very useful when a fixture is put into long-term storage.

Live Diagnostics

Pressing UP or DOWN three times calls up an overview of all main fixture information, signal quality and settings. This can be useful if you are troubleshooting or if you are in contact with GLP Service.

Toggle Display Orientation

Pressing and releasing UP and DOWN together rotates the display through 180°.

Note

If **Display Orientation** is set to **Auto**, changing the display orientation by pressing UP and DOWN at the same time will only change the display orientation until the next power cycle. To change the display orientation permanently, go to **Fixture Settings → Display Orientation** in the control panel menus.

Trigger iQ.Service Connect

Pressing and holding ENTER for 6 seconds enables connectivity to the GLP iQ.Connect Service App for 5 minutes.

Error codes

If the fixture detects an error, it displays an error code in the display. Error codes are 'sticky' – they will continue to be shown in the display until the next power cycle or reset.

See 'Error codes' on page 36 for a key to the codes that the impression X5 can display.

Loss of DMX signal

The display flashes if the DMX signal is lost.

5. Setting up the control protocol

The impression X5 can be controlled via:

- USITT512 DMX over a standard DMX cable link using the fixture's 5-pin XLR connectors,

- wireless CRMX if a CRMX module is installed in the fixture, or

- GLP's wireless iQ.Mesh technology (in preparation).

This section explains how to configure the fixture to use one of these control data protocols.

Note

The **Protocol Setup** settings are not affected if you apply a **Fixture Settings → Load User Settings → Setting Defaults** command in the fixture's control panel, but they are returned to factory defaults if you apply a **Load Factory Defaults** command in the main menu.

DMX

The fixture is set up for control via a standard DMX cable link by default.

If the control data protocol has been changed and you want to return to DMX control over a standard DMX cable link, open the menus in the fixture's control panel and make the following adjustments:

1. In the main menu, open **DMX Address** and give the fixture a suitable DMX address.

2. In the **Protocol Setup → Data In** menu, set the control protocol to **DMX**.

6. Control menus

Quick menu

The control panel's Quick Menu gives you quick access to the most frequently used commands. To open the Quick Menu, press the left-hand control button marked ≫ when the display is showing the default information screen.

The Quick Menu contains the following items:

Menus			Notes
Reset All			*Resets the entire fixture (takes a few seconds).*
Live Diagnostic			*Calls up overview of all main fixture information, signal quality and settings.*
iQ.Service Connect	>>>Connect<<<		*Enables connectivity to the GLP iQ.Service App for 5 minutes.*
Load User Settings	User Setting 1	>>>Confirm<<<	*Loads custom user settings*
	User Setting 2	>>>Confirm<<<	
	User Setting 3	>>>Confirm<<<	
	Setting Defaults	>>>Confirm<<<	*Returns fixture to default settings (not including DMX address, protocol type, Ethernet / CRMX configuration, user offsets, user presets and counters).*
Load Factory Defaults (!)	*Displays Message: Fixture may lose connection to controller* >>>Confirm<<<		*Restores all factory default settings (including DMX address, protocol type, Ethernet / CRMX configuration, user offsets and user presets).* **Important! The fixture may lose contact with the controller!**

Main menu

The following menus and commands are available in the impression X5 control panel.

Menus		*Notes*
DMX Address		
1-512		*Set fixture's DMX start address. Highest possible address depends on control mode.*
Control Mode		
M1 Basic (24CH)		*Set fixture's DMX control mode.*
M2 Normal (35CH)		
M3 Segment (41CH)		
M4 Multipix Advanced (89CH)		
M5 Multipix Compressed (71CH)		
Protocol Setup		
Data In	**DMX**	*Control via DMX protocol*
	iQ.Mesh	*Control via GLP iQ.Mesh*
	CRMX	*Control via CRMX (only visible if CRMX module is installed)*
Linking options	iQ.Mesh Unlink	*Unlink from GLP iQ,Mesh link*
	CRMX (FPO) Unlink	*Unlink from CRMX*
Fixture Settings		
Color Mix Mode	**RGB**	*Direct RGB control, Lime added automatically*
	RGBL	*Direct RGBL control*
	xy	*x:y color co-ordinate control*
White Point	8000 K	*Set fixture white point when RGB is at 100% (**NB**: only available in RGB Color Mix Mode)*
	6500 K	
	5600 K	
	4200 K	
	3200 K	
iQ.Gamut	**FULL**	*Maximum color gamut*
	Rec.2020	*Color gamut limited to Rec.2020 (UHD)*
	Rec.709	*Color gamut limited to Rec.709 (HD).*
Dimmer Curve	Linear	*Linear dimming curve*
	Soft	*Soft (square law) dimming curve*
	S-Curve	*Finer dimming control at low and high intensity*

Fan Mode	**Regulated**	*Fan speed temperature-regulated*
	High	*Fan speed constant high*
	Medium	*Fan speed constant medium*
	Low	*Fan speed constant low*
	Off	*All fans disabled*
Subfixture Mode	**Normal**	*Main module's dimmer and shutter channels act as global dimmer/shutter and affect Sub module output*
	Independent	*Sub module is independent of Main module*
Performance	Fast	*Mechanical effects speed optimized for speed*
	Normal	*Mechanical effects speed balanced for speed and smoothness*
	Smooth	*Mechanical effects speed limited for optimized smoothness and low noise*
PWM Frequency	**Optimal (0)**	*PWM at approx. 3000 Hz, optimal frequency for best dimming results*
	High 1 (H1)	*PWM at approx. 4800 Hz, helps avoid flicker on TV cameras*
	High 2 (H2)	*PWM at approx. 9600 Hz, helps avoid flicker on TV cameras*
	High 2 (H2)	*PWM >20 kHz, helps avoid flicker on TV cameras at very high shutter speeds*
Pixel Mirror	**Off**	*Normal pixel layout*
	Mirror X	*Pixels mirrored on x-axis*
	Mirror Y	*Pixels mirrored on y-axis*
	Mirror XY	*Pixels mirrored on x-axis and y-axis*
Pixel rotation	**Off**	*Pixel layout rotated clockwise*
	60°	
	120°	
	180°	
	240°	
	300°	

No Signal	No Signal Mode		Blackout	*Fixture blacks out if no DMX signal received*
			Hold	*Fixture continues to display current effect if no DMX signal received*
			Scene	*Plays the stored captured scene (see next menu item) if no DMX signal received*
	Capture DMX Values		>>>*Confirm*<<<	*Captures current scene and stores it for use in **No Signal Mode → Scene***
Pan Invert	**OFF**			*Reverse direction of pan movement*
	ON			
Tilt Invert	**OFF**			*Reverse direction of tilt movement*
	ON			
Position feedback	OFF			*Enable/disable pan/tilt position correction*
	ON			
Pan Disable	**OFF**			*Disables pan motor*
	ON			
Tilt Disable	**OFF**			*Disables tilt motor*
	ON			
Pan range	**Normal**			*Pan range limited to 540°*
	Extended			*Pan range = maximum*
Accessory	**None**			*Tilt angle not limited*
	Egg crate			*Tilt angle limited to allow for egg crate*
	Snoot			*Tilt angle further limited to allow for installation of snoot or similar accessory*
Display Mode	**Auto**			*Display dims after a short period of inactivity if no errors and valid DMX signal*
	On			*Display constantly on*
	Off			*Display dims even if there are errors / no DMX signal*
Display Orientation	**Auto**			*Display automatically inverts to match installation position*
	Normal			*Display normal (for use when fixture is standing)*
	Upside-down			*Display inverted (for use when fixture is flown head-down)*
Hibernation	ON			*Fixture enters energy saving mode, all electronics except DMX receiver are disabled. Cycling power off and on exits hibernation.*

Load User Settings	User Settings 1	>>> Confirm<<<	*Apply a user preset to fixture settings*
	User Settings 2	>>> Confirm<<<	
	User Settings 3	>>> Confirm<<<	
	Setting Defaults	>>> Confirm<<<	*Return fixture to default settings (not including DMX address, protocol type, Ethernet / CRMX configuration, user offsets, user presets and counters)*
Information			
Live diagnostic			*Shows overview of fixture information*
Show errors			*Shows any stored errors*
Show temperature			*Shows fixture temperature*
Show fan status			*Shows current cooling fan status*
Show controllers info			*Shows controllers info*
Show iQ.Mesh status			*Shows current GLP iQ.Mesh status*
Show LED calibration			*Shows LED calibration information*
Show fixture counters			*Shows total device hours (non-resettable), resettable device hours, total power cycles (non-resettable), resettable power cycles, resettable air filter hours*
Show DMX input			*Shows DMX values being received*
Show DMX info			*Shows info about any lost DMX packages*
Show LED calibration			*Shows any stored errors*
Manual Control			
Reset All			*Reset all effects*
Reset Pan & Tilt			*Reset pan and tilt*
Reset Head			*Reset all effects except pan and tilt*
Manual DMX **Warning! Fixture will start moving!** Press **Enter**	Pan	< 001..**128**..255 >	*Manually control all effects*
	Tilt	< 001..**128**..255 >	
	… *scroll through effects*		
	Load **No-Signal** Scene	Confirm *(press Enter)*	*Display the scene that is stored as Captured Scene*
	Save as **No-Signal** Scene	Confirm *(press Enter)*	*Capture current scene and store it as captured scene for use in* **No Signal** *menu*
	Capture DMX Values	Confirm for 3 seconds *(press Enter)*	*Sets all manual DMX values to the values currently being received via DMX*
	Reset Manual Values	Confirm for 3 seconds *(press Enter)*	*Reset all manually entered DMX values to zero*

Service				
Live diagnostic				*Shows overview of fixture information*
iQ.Service Connect	>>> Connect <<<			*Enables connectivity to the GLP iQ.Service app.*
Tests	Test All			*Run test sequence of all effects including pan and tilt. Stop with BACK.*
	Test P/T			*Run test sequence of pan and tilt only. Stop with BACK.*
	Test LED			*Run test sequence of all LEDs. Stop with BACK.*
	Test Zoom			*Run test sequence of zoom effect. Stop with BACK.*
	Test Fans (Auto)			*Run fan self test. Tries to detect fan errors, clears if successful.*
	Test Fans (Manual)			*Manually test fans one by one*
	Test Encoders			*Auto test for all encoders*
Advanced *(Press and hold for 3 secs.)*	Service Mode	**OFF**		*Normal operation*
		ON		*Disable pan, tilt and display timeouts (exit by cycling power off and on.)*
	Job offsets	Pan Tilt Zoom		*Create custom offsets in home positions of all effects. Default offset = **0***
	Reset counters	Device hours	Confirm 2 seconds	*Zero the device hours counter*
		Device power cycles	Confirm 2 seconds	*Zero the power cycles counte*
		Max. temperatures	Confirm 2 seconds	*Zero the max. temperatures log (total max. temperatures = non-resettable, max. temperatures = resettable)*
		Air filter	Confirm 2 seconds	*Zero the air filter hours counter*
	Save User Settings	Preset 1	Confirm 2 seconds	*Saves current fixture settings as user settings preset*
		Preset 2	Confirm 2 seconds	
		Preset 3	Confirm 2 seconds	
	Firmware push (Fixture2fixture)	>>> Confirm <<<		*Push fixture's firmware to all other fixtures of the same type over the DMX link*
Load factory defaults				
>>>Confirm<<<				*Reloads all factory default settings and default fixture configuration settings.*

*Default settings are written in **BOLD type***

7. Error codes

The impression X5's self-diagnosis system can display the following error codes:

Code	Comment	Action
HEAT	Overtemperature condition detected. Fixture will be powered off and cooldown sequence will be initiated.	Disconnect fixture from power. Find reason for overheating and rectify.
MEMER	Communication with onboard flash memory not possible, or written data in flash memory cannot be read properly (inability to read flash data can be due to end of flash memory lifetime)	Disconnect fixture from power. Discuss issue with GLP Support.
FANER	Fan error	Disconnect fixture from power. Find reason for fan error and rectify. If necessary, discuss issue with GLP Support.
NETER	Network engine error	Disconnect fixture from power. Discuss issue with GLP Support.
VERER	Version error – mismatch of one or more driver version numbers from the expected packet version numbers	Disconnect fixture from power. Check currently available firmware for fixture. Discuss issue with GLP Support.

8. DMX control modes overview

The impression X5 offers the following DMX control modes.

DMX Mode 1: Basic

24 DMX Channels

Basic DMX Mode gives control of the fixture's main functions. Pan, tilt, dimming and the color mixing channels are available with 16-bit control resolution. A shutter channel gives direct change between open and blackout plus a range of intensity effects. Zoom is also available with 8-bit resolution. The Control/Settings channel lets you adjust fixture settings via DMX. Two insert accessory channels allow control of an optional GLP accessory mounted on the head of the fixture.

The color control channels in the Main Module offer color mixing using either (a) RGB, (b) RGBL or (c) x;y color gamut coordinates, depending on which of these three methods is active. You can select the color mixing method via DMX on the Control/Settings channel, via RDM or using the fixture's control panel. Additional color options channels include a color wheel with a wide range of color presets, a CTC channel, magenta/green shift adjustment and a tungsten simulation channel. The CQC channel lets you select if the fixture should give priority to color rendering or output intensity in its white output. This channel also offers an easy way of desaturating colors.

Mode 1 Basic		
Main module 1.1	Pan	1
		2
	Tilt	3
		4
	Intensity	5
		6
	Shutter	7
	Zoom	8
	Control / Settings	9
	Accessory 1	10
	Accessory 2	11
	[1] RGB – Red [2] RGBL – Red [3] x;y – x	12
		13
	[1] RGB – Green [2] RGBL – Green [3] x;y – y	14
		15
	[1] RGB – Blue [2] RGBL – Blue [3] x;y – not used	16
		17
	[1] RGB – not used [2] RGBL – Lime [3] x;y – not used	18
		19
	Color wheel	20
	CTC (Color temperature control)	21
	CQC (Color quality control)	22
	M/G shift	23
	Tungsten simulation	24

DMX Mode 2: Normal (default)

35 DMX channels

Normal DMX Mode is split into a **Main Module** and a **Sub Module**.

The **Main Module** gives control of the main functions, as in **Basic** DMX Mode. Pan, tilt, dimming and the color mixing channels have 16-bit control resolution. A shutter channel gives direct change between open and blackout plus a range of intensity effects. Zoom is also available with 8-bit resolution. The Control/Settings channel lets you adjust fixture settings via DMX. Two insert accessory channels allow control of an optional GLP accessory mounted on the head of the fixture.

The color control channels in the Main Module offer color mixing using either (a) RGB, (b) RGBL or (c) x;y color gamut coordinates, depending on which of these three methods is active. You can select the color mixing method via DMX on the Control/Settings channel, via RDM or using the fixture's control panel. Additional color options channels include a color wheel with a wide range of color presets, a CTC channel, magenta/green shift adjustment and a tungsten simulation channel. The CQC channel lets you select if the fixture should give priority to color rendering or output intensity in its white output. This channel also offers an easy way of desaturating colors.

The Mix Priority channel defines how the output of the Main and Sub Modules is merged or overlayed.

The **Sub Module** forms a second layer. The Sub Module channels provide intensity and shutter control, a powerful static and dynamic pattern effects engine with step crossfading and pattern transition options, plus RGB color control of all 19 pixels as one group.

Mode 2 Normal	
Pan	1
	2
Tilt	3
	4
Intensity	5
	6
Shutter	7
Zoom	8
Control / Settings	9
Accessory 1	10
Accessory 2	11
[1] RGB – Red / [2] RGBL – Red	12
[3] x;y – x	13
[1] RGB – Green / [2] RGBL – Green	14
[3] x;y – y	15
[1] RGB – Blue / [2] RGBL – Blue	16
[3] x;y – not used	17
[1] RGB – not used	18
[2] RGBL – Lime / [3] x;y – not used	19
Color wheel	20
CTC (Color temperature control)	21
CQC (Color quality control)	22
M/G shift	23
Tungsten simulation	24
Mix priority	25

Sub module 1.2	
Intensity Layer 2	26
	27
Shutter Layer 2	28
Pattern selection Layer 2	29
Pattern step / speed Layer 2	30
Pattern step crossfading Layer 2	31
Pattern transition Layer 2	32
Red, pixels 1-19	33
Green, pixels 1-19	34
Blue, pixels 1-19	35

X5

DMX Mode 3: Segments

41 DMX channels

Segments DMX Mode is split into a Main Module and a Sub Module.

The **Main Module** gives control of the main functions, as in **Basic** DMX Mode. Pan, tilt, dimming and the color mixing channels have 16-bit control resolution. A shutter channel gives direct change between open and blackout plus a range of intensity effects. Zoom is also available with 8-bit resolution. The Control/Settings channel lets you adjust fixture settings via DMX. Two insert accessory channels allow control of an optional GLP accessory mounted on the head of the fixture.

The color control channels in the Main Module offer color mixing using either (a) RGB, (b) RGBL or (c) x;y color gamut coordinates, depending on which of these three methods is active. You can select the color mixing method via DMX on the Control/Settings channel, via RDM or using the fixture's control panel. Additional color options channels include a color wheel with a wide range of color presets, a CTC channel, magenta/green shift adjustment and a tungsten simulation channel. The CQC channel lets you select if the fixture should give priority to color rendering or output intensity in its white output. This channel also offers an easy way of desaturating colors.

The Mix Priority channel defines how the output of the Main and Sub Modules is merged or overlayed.

The **Sub Module** forms a second layer. The Sub Module channels provide intensity and shutter control, a powerful static and dynamic pattern effects engine with step crossfading and pattern transition options, plus RGB color control of three pixel groups as segments.

Mode 3 Segments			
		Pan	1
			2
		Tilt	3
			4
		Intensity	5
			6
		Shutter	7
		Zoom	8
Main module	1.1	Control / Settings	9
		Accessory 1	10
		Accessory 2	11
		[1] RGB – Red	12
		[2] RGBL – Red [3] x;y – x	13
		[1] RGB – Green	14
		[2] RGBL – Green [3] x;y – y	15
		[1] RGB – Blue	16
		[2] RGBL – Blue [3] x;y – not used	17
		[1] RGB – not used	18
		[2] RGBL – Lime [3] x;y – not used	19
		Color wheel	20
		CTC (Color temperature control)	21
		CQC (Color quality control)	22
		M/G shift	23
		Tungsten simulation	24
		Mix priority	25

Sub module	1.2	Intensity Layer 2	26
			27
		Shutter Layer 2	28
		Pattern selection Layer 2	29
		Pattern step / speed Layer 2	30
		Pattern step crossfading Layer 2	31
		Pattern transition Layer 2	32
	1.3	Red, segment 01	33
		Green, segment 01	34
		Blue, segment 01	35
	1.4	Red, segment 02-07	36
		Green, segment 02-07	37
		Blue, segment 02-07	38
	1.5	Red, segment 08-19	39
		Green, segment 08-19	40
		Blue, segment 08-19	41

DMX Mode 4: Multipix advanced

89 DMX Channels

Multipix Advanced DMX Mode is split into a Main Module and a Sub Module.

The **Main Module** gives control of the main functions, as in **Basic** DMX Mode. Pan, tilt, dimming and the color mixing channels have 16-bit control resolution. A shutter channel gives direct change between open and blackout plus a range of intensity effects. Zoom is also available with 8-bit resolution. The Control/Settings channel lets you adjust fixture settings via DMX. Two insert accessory channels allow control of an optional GLP accessory mounted on the head of the fixture.

The color control channels in the Main Module offer color mixing using either (a) RGB, (b) RGBL or (c) x;y color gamut coordinates, depending on which of these three methods is active. You can select the color mixing method via DMX on the Control/Settings channel, via RDM or using the fixture's control panel. Additional color options channels include a color wheel with a wide range of color presets, a CTC channel, magenta/green shift adjustment and a tungsten simulation channel. The CQC channel lets you select if the fixture should give priority to color rendering or output intensity in its white output. This channel also offers an easy way of desaturating colors.

The Mix Priority channel defines how the output of the Main and Sub Modules is merged or overlayed.

The **Sub Module** forms a second layer. The Sub Module channels provide intensity and shutter control, a powerful static and dynamic pattern effects engine with step crossfading and pattern transition options, plus RGB color control of each individual pixel.

Mode 4 Multipix Advanced		

Main module	1.1	Pan	1
			2
		Tilt	3
			4
		Intensity	5
			6
		Shutter	7
		Zoom	8
		Control / Settings	9
		Accessory 1	10
		Accessory 2	11
		[1] RGB – Red	12
		[2] RGBL – Red	
		[3] x;y – x	13
		[1] RGB – Green	14
		[2] RGBL – Green	
		[3] x;y – y	15
		[1] RGB – Blue	16
		[2] RGBL – Blue	
		[3] x;y – not used	17
		[1] RGB – not used	18
		[2] RGBL – Lime	
		[3] x;y – not used	19
		Color wheel	20
		CTC (Color temperature control)	21
		CQC (Color quality control)	22
		M/G shift	23
		Tungsten simulation	24
		Mix priority	25

Sub module	1.2	Intensity Layer 2	26
			27
		Shutter Layer 2	28
		Pattern selection Layer 2	29
		Pattern step / speed Layer 2	30
		Pattern step crossfading Layer 2	31
		Pattern transition Layer 2	32
	1.3	Red, pixel 01	33
		Green, pixel 01	34
		Blue, pixel 01	35
	1.4 … 1.20	… RGB Pixels 02 – 18 …	…
	1.21	Red, pixel 19	87
		Green, pixel 19	88
		Blue, pixel 19	89

DMX Mode 5: Multipix compressed

70 DMX Channels

MultiPix compressed DMX Mode gives control of the main functions, as in **Basic** DMX Mode. Pan, tilt and dimming have 16-bit control resolution. A shutter channel gives direct change between open and blackout plus a range of intensity effects. Zoom is also available with 8-bit resolution. The Control/Settings channel lets you adjust fixture settings via DMX. Two insert accessory channels allow control of an optional GLP accessory mounted on the head of the fixture.

Color mixing is carried out on the individual pixel control channels.

The CTC Channel lets you temporarily change from the fixed white point to any other color temperature. The CQC channel lets you select if the fixture should give priority to color rendering or output intensity in its white output. This channel also offers an easy way of desaturating colors.

Mode 5 Multipix Compressed			
Main module	1.1	Pan	1
			2
		Tilt	3
			4
		Intensity	5
			6
		Shutter	7
		Zoom	8
		Control / Settings	9
		Accessory 1	10
		Accessory 2	11
		CTC (Color temperature control)	12
		CQC (Color quality control)	13
	1.2	Red, pixel 01	14
		Green, pixel 01	15
		Blue, pixel 01	16
	1.3 ... 1.19	... RGB Pixels 02 – 18 ...	...
	1.20	Red, pixel 19	68
		Green, pixel 19	69
		Blue, pixel 19	70

9. DMX control channel layout

In the following DMX channel layout tables:

- Default settings are indicated with **bold type**.
- Where commands are followed by (3s hold) you must send that value continuously for 3 seconds (or other duration if indicated in the table) to apply the command.
- Some commands on the Control / Settings channel require the DMX value zero to be sent first and then moved directly to the DMX value required by the command concerned.

Pixel positions

The X5 fixture's standard pixel layout is as shown below:
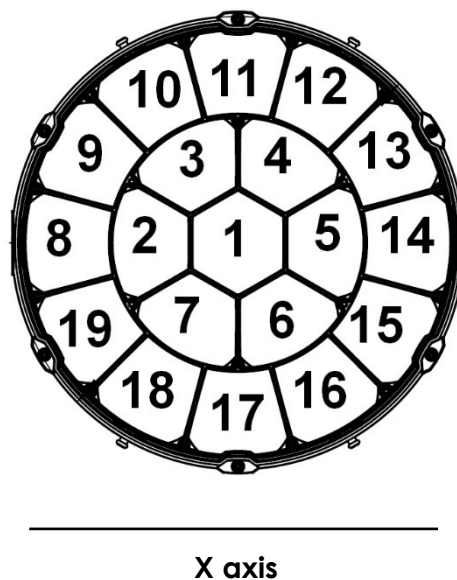
X axis

The drawing above shows the standard pixel layout with the fixture standing on the ground, pan at 50% (home position) and tilt at 50% (front).

Note that pixel rotation, x-axis pixel mirror and y-axis pixel mirror options are available via DMX on the Control / Settings channel and using the menus in the fixture's control panel.

DMX Mode 1: Basic

24 DMX Channels

Channel		Command	DMX range		Percent %		Default DMX	Fade
Main Module Basic control								
1	**Pan coarse**	Pan left → right	0	65535	0	100	32768	Fade
2	**Pan fine**							
3	**Tilt coarse**	Tilt back → front	0	65535	0	100	32768	Fade
4	**Tilt fine**							
5	**Intensity coarse**	Intensity 0 → 100%	0	65535	0	100	0	Fade
6	**Intensity fine**							
7	**Shutter**	Closed	0	4	0	1.6	0	Snap
		Single flash if value changed within the range 005 → 009	5	9	2.0	3.5		Fade
		Pulse slow → fast	10	39	3.9	15.3		Fade
		Pulse opening slow → fast	40	69	15.7	27.1		Fade
		Pulse closing slow → fast	70	99	27.5	38.8		Fade
		Double flash slow → fast	100	129	39.2	50.6		Fade
		Strobe random pixel slow → fast	130	159	51.0	62.4		Fade
		Strobe random all slow → fast	160	199	62.7	78.0		Fade
		Strobe sync all pixel slow → fast	200	250	78.4	98.0		Fade
		Open	251	255	98.4	100		Snap
8	**Zoom**	Zoom narrow → wide	0	255	0	100	0	Snap
9	**Control/Settings**	*See 'Control / Settings channel' on page 71*						
10	**Accessory 1**	Effect parameter 1	0	255	0	100	0	Snap
11	**Accessory 2**	Effect parameter 2	0	255	0	100	0	Snap
12		[1] RGB - Red coarse [2] RGBL - Red coarse [3] x;y - x coarse	0	65535	0	100	65535	Fade
13		[1] RGB - Red fine [2] RGBL - Red fine [3] x;y - x fine						
14		[1] RGB - Green coarse [2] RGBL - Green coarse [3] x;y – y coarse	0	65535	0	100	65535	Fade
15	**RGB / RGBL / x,y color control** (see 'Key to conversion of x and y coordinates' on page 75)	[1] RGB - Green fine [2] RGBL - Green fine [3] x;y - y fine						
16		[1] RGB – Blue coarse [2] RGBL - Blue coarse [3] x;y – *not used*	0	65535	0	100	65535	Fade
17		[1] RGB - Blue fine [2] RGBL - Blue fine [3] x;y - *not used*						
18		[1] RGB - *not used* [2] RGBL - Lime coarse [3] x;y - *not used*	0	65535	0	100	65535	Fade
19		[1] RGB - *not used* [2] RGBL - Lime fine [3] x;y - *not used*						

Main Module Basic Control (continued)

20	**Color Wheel** (for exact colors see 'Color wheel specifications' on page 76)	Open (Selected white point)	0	9	0	3.5	0	Snap
		Filter 004, Medium Bastard Amber	10	12	3.9	4.7		
		Filter 019, Fire	13	15	5.1	5.9		
		Filter 025, Sunset Red	16	18	6.3	7.1		
		Filter 026, Bright Red	19	21	7.5	8.2		
		Filter 036, Medium Pink	22	24	8.6	9.4		
		Filter 049, Medium Purple	25	27	9.8	10.6		
		Filter 058, Lavender	28	30	11.0	11.8		
		Filter 068, Sky Blue	31	33	12.2	12.9		
		Filter 088, Lime Green	34	36	13.3	14.1		
		Filter 089, Moss Green	37	39	14.5	15.3		
		Filter 090, Dark Yellow Green	40	42	15.7	16.5		
		Filter 102, Light Amber	43	45	16.9	17.6		
		Filter 103, Straw	46	48	18.0	18.8		
		Filter 106, Primary Red	49	51	19.2	20.0		
		Filter 111, Dark Pink	52	54	20.4	21.2		
		Filter 115, Peacock Blue	55	57	21.6	22.4		
		Filter 117, Steel Blue	58	60	22.7	23.5		
		Filter 118, Light Blue	61	63	23.9	24.7		
		Filter 121, Filter Green	64	66	25.1	25.9		
		Filter 122, Fern Green	67	69	26.3	27.1		
		Filter 124, Dark Green	70	72	27.5	28.2		
		Filter 126, Mauve	73	75	28.6	29.4		
		Filter 128, Bright Pink	76	78	29.8	30.6		
		Filter 131, Marine Blue	79	81	31.0	31.8		
		Filter 132, Medium Blue	82	84	32.2	32.9		
		Filter 134, Golden Amber	85	87	33.3	34.1		
		Filter 135, Deep Golden Amber	88	90	34.5	35.3		
		Filter 136, Pale Lavender	91	93	35.7	36.5		
		Filter 137, Special Lavender	94	96	36.9	37.6		
		Filter 138, Pale Green	97	99	38.0	38.8		
		Filter 140, Summer Blue	100	102	39.2	40.0		
		Filter 141, Bright Blue	103	105	40.4	41.2		
		Filter 143, Pale Navy Blue	106	108	41.6	42.4		
		Filter 147, Apricot	109	111	42.7	43.5		
		Filter 148, Bright Rose	112	114	43.9	44.7		
		Filter 152, Pale Gold	115	117	45.1	45.9		
		Filter 154, Pale Rose	118	120	46.3	47.1		
		Filter 157, Pink	121	123	47.5	48.2		
		Filter 162, Bastard Amber	124	126	48.6	49.4		
		Filter 164, Flame Red	127	129	49.8	50.6		
		Filter 165, Daylight Blue	130	132	51.0	51.8		
		Filter 169, Lilac Tint	133	135	52.2	52.9		
		Filter 170, Deep Lavender	136	138	53.3	54.1		
		Filter 172, Lagoon Blue	139	141	54.5	55.3		
		Filter 180, Dark Lavender	142	144	55.7	56.5		
		Filter 182, Light Red	145	147	56.9	57.6		
		Filter 194, Surprise Pink	148	150	58.0	58.8		
		Filter 197, Alice Blue	151	153	59.2	60.0		
		Filter 201, Full C.T. Blue	154	156	60.4	61.2		
		Filter 202, Half C.T. Blue	157	159	61.6	62.4		
		Filter 203, Quarter C.T. Blue	160	162	62.7	63.5		
		Filter 204, Full C.T. Orange	163	165	63.9	64.7		
		Filter 206, Quarter C.T. Orange	166	168	65.1	65.9		

Main Module Basic Control (continued)

		Filter 219, Fluorescent Green	169	171	66.3	67.1		
		Filter 247, Filter Minus Green	172	174	67.5	68.2		
		Filter 248, Half Minus Green	175	177	68.6	69.4		
		Filter 281, Three Quarter C.T. Blue	179	180	69.8	70.6		
		Filter 285, Three Quarter C.T. Orange	181	183	71.0	71.8		
		Filter 352, Glacier Blue	184	186	72.2	72.9		
		Filter 353, Lighter Blue	187	189	73.3	74.1		
		Filter 506, Madge	190	192	74.5	75.3		
		Filter 778, Millennium Gold	193	195	75.7	76.5		
		Filter 793, Vanity Fair	196	198	76.9	77.6		
		Filter 798, Chrysalis Pink	199	201	78.0	78.8		
		Rainbow, stop at first color (violet)	202	204	79.2	80.0		
		Rainbow, continuous slow→fast: *Violet→indigo→light blue →turquoise→green→yellow →orange→red→pink*	205	252	80.4	98.8		Fade
		Rainbow, stop at current color	253	255	99.2	100		Snap
21	**CTC (Color Temperature Control)**	Open, selected white point	0	9	0	3.5	0	Snap
		Fade through color temperatures of 1000 K to 2500 K stepless (interpolation)	11	11	4.3	45.9		Snap
			12	254	4.7	49.8		Fade
			255	255	100	53.7		Snap
22	**CQC (Color Quality Control) / Saturation**	HQ (high quality), saturated color	0	9	0	3.5	0	Snap
		Crossfade	10	117	3.9	45.9		Fade
		HQ (high quality), unsaturated color	118	127	46.3	49.8		Snap
		HO (high output), unsaturated color	128	137	50.2	53.7		
		Crossfade	138	245	54.1	96.1		Fade
		HO (high output), saturated color	246	255	96.5	100		Snap
23	**M/G shift**	Off (no correction)	0	9	0	3.5	0	Snap
		Full plus magenta +100%	10	10	3.9	3.9		
		Plus magenta +99% → +1%	11	124	4.3	48.6		Fade
		Neutral / no effect	125	140	49.0	54.9		Snap
		Plus green +1% → +99%	141	254	55.3	99.6		Fade
		Full plus green +100%	255	255	100	100		Snap
24	**Tungsten simulation**	Off (selected white point, no red shift or delay when dimming)	0	9	0	3.5	0	Snap
		Tungsten ACL 250W/28V	10	19	3.9	7.5		
		Tungsten Blinder 650W/120V	20	29	7.8	11.4		
		Tungsten 750W/80V	30	39	11.8	15.3		
		Tungsten 1000W/240V	40	49	15.7	19.2		
		Tungsten 1200W/240V	50	59	19.6	23.1		
		Tungsten 2000W/230V	60	69	23.5	27.1		
		Tungsten 2500W/230V	70	79	27.5	31.0		
		Tungsten 5000W/230V	80	89	31.4	34.9		
		No function (off)	90	120	35.3	47.1		
		Off (selected white point, no red shift or delay when dimming)	120	139	47.1	54.5		
		FX Tungsten ACL 250W/28V	140	149	54.9	58.4		
		FX Tungsten Blinder 650W/120V	150	159	58.8	62.4		
		FX Tungsten 750W/80V	160	169	62.7	66.3		
		FX Tungsten 1000W/240V	170	179	66.7	70.2		
		FX Tungsten 1200W/240V	180	189	70.6	74.1		
		FX Tungsten 2000W/230V	190	199	74.5	78.0		
		FX Tungsten 2500W/230V	200	209	78.4	82.0		
		FX Tungsten 5000W/230V	210	219	82.4	85.9		
		No function (off)	220	255	86.3	100		

DMX Mode 2: Normal (default)

35 DMX Channels

Channel	Command	DMX range		Percent %		Default DMX	Fade
Main Module Basic Control							
1 **Pan coarse** 2 **Pan fine**	Pan left → right	0	65535	0	100	32768	Fade
3 **Tilt coarse** 4 **Tilt fine**	Tilt back → front	0	65535	0	100	32768	Fade
5 **Intensity coarse** 6 **Intensity fine**	Intensity 0 → 100%	0	65535	0	100	0	Fade
7 **Shutter**	Closed	0	4	0	1.6	0	Snap
	Single flash if value changed within the range 005 → 009	5	9	2.0	3.5		Fade
	Pulse slow → fast	10	39	3.9	15.3		Fade
	Pulse opening slow → fast	40	69	15.7	27.1		Fade
	Pulse closing slow → fast	70	99	27.5	38.8		Fade
	Double flash slow → fast	100	129	39.2	50.6		Fade
	Strobe random pixel slow → fast	130	159	51.0	62.4		Fade
	Strobe random all slow → fast	160	199	62.7	78.0		Fade
	Strobe sync all pixel slow → fast	200	250	78.4	98.0		Fade
	Open	251	255	98.4	100		Snap
8 **Zoom**	Zoom narrow → wide	0	255	0	100	0	Snap
9 **Control/Settings**	See 'Control / Settings channel' on page 71						
10 **Accessory 1**	Effect parameter 1	0	255	0	100	0	Snap
11 **Accessory 2**	Effect parameter 2	0	255	0	100	0	Snap
12	[1] RGB - Red coarse [2] RGBL - Red coarse [3] x;y - x coarse	0	65535	0	100	65535	Fade
13	[1] RGB - Red fine [2] RGBL - Red fine [3] x;y - x fine						
14	[1] RGB - Green coarse [2] RGBL - Green coarse [3] x;y – y coarse	0	65535	0	100	65535	Fade
15 **RGB / RGBL / x,y color control** (see 'Key to conversion of x and y coordinates' on page 75)	[1] RGB - Green fine [2] RGBL - Green fine [3] x;y - y fine						
16	[1] RGB – Blue coarse [2] RGBL - Blue coarse [3] x;y – not used	0	65535	0	100	65535	Fade
17	[1] RGB - Blue fine [2] RGBL - Blue fine [3] x;y - not used						
18	[1] RGB - not used [2] RGBL - Lime coarse [3] x;y - not used	0	65535	0	100	65535	Fade
19	[1] RGB - not used [2] RGBL - Lime fine [3] x;y - not used						

Main Module Basic Control (continued)

		Open (Selected white point)	0	9	0	3.5		
		Filter 004, Medium Bastard Amber	10	12	3.9	4.7		
		Filter 019, Fire	13	15	5.1	5.9		
		Filter 025, Sunset Red	16	18	6.3	7.1		
		Filter 026, Bright Red	19	21	7.5	8.2		
		Filter 036, Medium Pink	22	24	8.6	9.4		
		Filter 049, Medium Purple	25	27	9.8	10.6		
		Filter 058, Lavender	28	30	11.0	11.8		
		Filter 068, Sky Blue	31	33	12.2	12.9		
		Filter 088, Lime Green	34	36	13.3	14.1		
		Filter 089, Moss Green	37	39	14.5	15.3		
		Filter 090, Dark Yellow Green	40	42	15.7	16.5		
		Filter 102, Light Amber	43	45	16.9	17.6		
		Filter 103, Straw	46	48	18.0	18.8		
		Filter 106, Primary Red	49	51	19.2	20.0		
		Filter 111, Dark Pink	52	54	20.4	21.2		
		Filter 115, Peacock Blue	55	57	21.6	22.4		
		Filter 117, Steel Blue	58	60	22.7	23.5		
		Filter 118, Light Blue	61	63	23.9	24.7		
		Filter 121, Filter Green	64	66	25.1	25.9		
		Filter 122, Fern Green	67	69	26.3	27.1		
		Filter 124, Dark Green	70	72	27.5	28.2		
		Filter 126, Mauve	73	75	28.6	29.4		
		Filter 128, Bright Pink	76	78	29.8	30.6		
	Color Wheel (for exact colors see 'Color wheel specifications' on page 76)	Filter 131, Marine Blue	79	81	31.0	31.8		
		Filter 132, Medium Blue	82	84	32.2	32.9		
20		Filter 134, Golden Amber	85	87	33.3	34.1	0	Snap
		Filter 135, Deep Golden Amber	88	90	34.5	35.3		
		Filter 136, Pale Lavender	91	93	35.7	36.5		
		Filter 137, Special Lavender	94	96	36.9	37.6		
		Filter 138, Pale Green	97	99	38.0	38.8		
		Filter 140, Summer Blue	100	102	39.2	40.0		
		Filter 141, Bright Blue	103	105	40.4	41.2		
		Filter 143, Pale Navy Blue	106	108	41.6	42.4		
		Filter 147, Apricot	109	111	42.7	43.5		
		Filter 148, Bright Rose	112	114	43.9	44.7		
		Filter 152, Pale Gold	115	117	45.1	45.9		
		Filter 154, Pale Rose	118	120	46.3	47.1		
		Filter 157, Pink	121	123	47.5	48.2		
		Filter 162, Bastard Amber	124	126	48.6	49.4		
		Filter 164, Flame Red	127	129	49.8	50.6		
		Filter 165, Daylight Blue	130	132	51.0	51.8		
		Filter 169, Lilac Tint	133	135	52.2	52.9		
		Filter 170, Deep Lavender	136	138	53.3	54.1		
		Filter 172, Lagoon Blue	139	141	54.5	55.3		
		Filter 180, Dark Lavender	142	144	55.7	56.5		
		Filter 182, Light Red	145	147	56.9	57.6		
		Filter 194, Surprise Pink	148	150	58.0	58.8		
		Filter 197, Alice Blue	151	153	59.2	60.0		
		Filter 201, Full C.T. Blue	154	156	60.4	61.2		
		Filter 202, Half C.T. Blue	157	159	61.6	62.4		
		Filter 203, Quarter C.T. Blue	160	162	62.7	63.5		
		Filter 204, Full C.T. Orange	163	165	63.9	64.7		

Main Module Basic Control (continued)

#	Function	Description						
		Filter 206, Quartet C.T. Orange	166	168	65.1	65.9		
		Filter 219, Fluorescent Green	169	171	66.3	67.1		
		Filter 247, Filter Minus Green	172	174	67.5	68.2		
		Filter 248, Half Minus Green	175	177	68.6	69.4		
		Filter 281, Three Quarter C.T. Blue	179	180	69.8	70.6		
		Filter 285, Three Quarter C.T. Orange	181	183	71.0	71.8		
		Filter 352, Glacier Blue	184	186	72.2	72.9		
		Filter 353, Lighter Blue	187	189	73.3	74.1		
		Filter 506, Madge	190	192	74.5	75.3		
		Filter 778, Millennium Gold	193	195	75.7	76.5		
		Filter 793, Vanity Fair	196	198	76.9	77.6		
		Filter 798, Chrysalis Pink	199	201	78.0	78.8		
		Rainbow, stop at first color (violet)	202	204	79.2	80.0		
		Rainbow, continuous slow→fast: *Violet→indigo→light blue →turquoise→green→yellow →orange→red→pink*	205	252	80.4	98.8		Fade
		Rainbow, stop at current color	253	255	99.2	100		Snap
21	CTC (Color Temperature Control)	Open, selected white point	0	9	0	3.5	0	Snap
		Fade through color temperatures of 1000 K to 2500 K stepless (interpolation)	11	11	4.3	45.9		
			12	254	4.7	49.8		Fade
			255	255	100	53.7		Snap
22	CQC (Color Quality Control) / Saturation	HQ (high quality), saturated color	0	9	0	3.5	0	Snap
		Crossfade	10	117	3.9	45.9		Fade
		HQ (high quality), unsaturated color	118	127	46.3	49.8		Snap
		HO (high output), unsaturated color	128	137	50.2	53.7		
		Crossfade	138	245	54.1	96.1		Fade
		HO (high output), saturated color	246	255	96.5	100		Snap
23	M/G shift	Off (no correction)	0	9	0	3.5	0	Snap
		Full plus magenta +100%	10	10	3.9	3.9		
		Plus magenta +99% → +1%	11	124	4.3	48.6		Fade
		Neutral / no effect	125	140	49.0	54.9		Snap
		Plus green +1% → +99%	141	254	55.3	99.6		Fade
		Full plus green +100%	255	255	100	100		Snap
24	Tungsten simulation	Off (selected white point, no red shift or delay when dimming)	0	9	0	3.5	0	Snap
		Tungsten ACL 250W/28V	10	19	3.9	7.5		
		Tungsten Blinder 650W/120V	20	29	7.8	11.4		
		Tungsten 750W/80V	30	39	11.8	15.3		
		Tungsten 1000W/240V	40	49	15.7	19.2		
		Tungsten 1200W/240V	50	59	19.6	23.1		
		Tungsten 2000W/230V	60	69	23.5	27.1		
		Tungsten 2500W/230V	70	79	27.5	31.0		
		Tungsten 5000W/230V	80	89	31.4	34.9		
		No function (off)	90	120	35.3	47.1		
		Off (selected white point, no red shift or delay when dimming)	120	139	47.1	54.5		
		FX Tungsten ACL 250W/28V	140	149	54.9	58.4		
		FX Tungsten Blinder 650W/120V	150	159	58.8	62.4		
		FX Tungsten 750W/80V	160	169	62.7	66.3		
		FX Tungsten 1000W/240V	170	179	66.7	70.2		
		FX Tungsten 1200W/240V	180	189	70.6	74.1		
		FX Tungsten 2000W/230V	190	199	74.5	78.0		
		FX Tungsten 2500W/230V	200	209	78.4	82.0		
		FX Tungsten 5000W/230V	210	219	82.4	85.9		
		No function (off)	220	255	86.3	100		

Main Module Basic Control (continued)

25	**Mix priority**	Main Module and Sub Module HTP (highest value takes priority)	0	9	0	3.5	0	Snap
		Main only (Main Module color takes priority)	10	19	3.9	7.5		
		Sub only (Sub Module color takes priority)	20	29	7.8	11.4		
		Main and Sub additive (Sub Module color value added to Main Module color value)	30	39	11.8	15.3		
		Main minus Sub Module subtractive (Sub Module color value subtracted from Main)	40	49	15.7	19.2		
		Sub Module minus main subtractive (Main Module color value subtracted from Sub Module)	50	59	19.6	23.1		
		TrueColor 1: Main over Sub – snap	60	69	23.5	27.1		
		TrueColor 2: Sub over Main – snap	70	79	27.5	31.0		
		TrueColor 3: Main over Sub – crossfade	80	89	31.4	34.9		Fade
		TrueColor 4: Sub over Main – crossfade	90	99	35.3	38.8		Fade
		No function	100	127	39.2	49.8		
		Main Module only	128	130	50.2	51.0		Snap
		Crossfading Main → HTP	131	190	51.4	74.5		Fade
		Main and Sub Modules (HTP)	191	192	74.9	75.3		Snap
		Crossfading HTP → Sub	193	252	75.7	98.8		Fade
		Sub Module only	253	255	99.2	100		Snap

Sub Module: Second Layer Control

26	**Intensity coarse**	Intensity 0 → 100%	0	65535	0	100	0	Fade
27	**Intensity fine**							
28	**Shutter**	Closed	0	4	0	1.6	0	Snap
		Single flash if value changed within the range 005 → 009	5	9	2.0	3.5		Fade
		Pulse slow → fast	10	39	3.9	15.3		Fade
		Pulse opening slow → fast	40	69	15.7	27.1		Fade
		Pulse closing slow → fast	70	99	27.5	38.8		Fade
		Double flash slow → fast	100	129	39.2	50.6		Fade
		Strobe random pixel slow → fast	130	159	51.0	62.4		Fade
		Strobe random all slow → fast	160	199	62.7	78.0		Fade
		Strobe sync all pixel slow → fast	200	250	78.4	98.0		Fade
		Open	251	255	98.4	100		Snap
29*	**Pattern selection**	Off (all pixels active)	0	9	0	3.5	0	Snap
		Static Pattern 01	10	11	3.9	4.3		
		Static Pattern 02	12	13	4.7	5.1		
		Static Pattern 03	14	15	5.5	5.9		
		Static Pattern 04	16	17	6.3	6.7		
		Static Pattern 05	18	19	7.1	7.5		
		Static Pattern 06	20	21	7.8	8.2		
		Static Pattern 07	22	23	8.6	9.0		
		Static Pattern 08	24	25	9.4	9.8		
		Static Pattern 09	26	27	10.2	10.6		
		Static Pattern 10	28	29	11.0	11.4		
		Static Pattern 11	30	31	11.8	12.2		

Sub Module: Second Layer Control (continued)

		Static Pattern 12	32	33	12.5	12.9	
		Static Pattern 13	34	35	13.3	13.7	
		Static Pattern 14	36	37	14.1	14.5	
		Static Pattern 15	38	39	14.9	15.3	
		Static Pattern 16	40	41	15.7	16.1	
		Static Pattern 17	52	43	20.4	16.9	
		Static Pattern 18	44	45	17.3	17.6	
		Static Pattern 19	46	47	18.0	18.4	
		Static Pattern 20	48	49	18.8	19.2	
		Static Pattern 21	50	51	19.6	20.0	
		Static Pattern 22	52	53	20.4	20.8	
		Static Pattern 23	54	55	21.2	21.6	
		Static Pattern 24	56	57	22.0	22.4	
		Static Pattern 25	58	59	22.7	23.1	
		Static Pattern 26	60	61	23.5	23.9	
		Static Pattern 27	62	63	24.3	24.7	
		Static Pattern 28	64	65	25.1	25.5	
		Static Pattern 29	66	67	25.9	26.3	
		Static Pattern 30	68	69	26.7	27.1	
		Static Pattern 31	70	71	27.5	27.8	
		Static Pattern 32	72	73	28.2	28.6	
		Static Pattern 33	74	75	29.0	29.4	
		Static Pattern 34	76	77	29.8	30.2	
		Static Pattern 35	78	79	30.6	31.0	
		Static Pattern 36	80	81	31.4	31.8	
		Static Pattern 37	82	83	32.2	32.5	
		Static Pattern 38	84	85	32.9	33.3	
		Static Pattern 39	86	87	33.7	34.1	
		Static Pattern 40	88	89	34.5	34.9	
		Static Pattern 41	90	91	35.3	35.7	
		Static Pattern 42	92	93	36.1	36.5	
		Static Pattern 43	94	95	36.9	37.3	
		Static Pattern 44	96	97	37.6	38.0	
		Static Pattern 45	98	99	38.4	38.8	
		Static Pattern 46	100	101	39.2	39.6	
		Static Pattern 47	102	103	40.0	40.4	
		Static Pattern 48	104	105	40.8	41.2	
		Static Pattern 49	106	107	41.6	42.0	
		Static Pattern 50	108	109	42.4	42.7	
		Static Pattern 51	110	111	43.1	43.5	
		Static Pattern 52	112	113	43.9	44.3	
		Static Pattern 53	114	115	44.7	45.1	
		Static Pattern 54	116	117	45.5	45.9	
		Static Pattern 55	118	119	46.3	46.7	
		Static Pattern 56	120	121	47.1	47.5	
		Static Pattern 57	122	123	47.8	48.2	
		Static Pattern 58	124	125	48.6	49.0	
		Static Pattern 59	126	127	49.4	49.8	
		Dynamic Pattern 01	128	129	50.2	50.6	
		Dynamic Pattern 02	130	131	51.0	51.4	
		Dynamic Pattern 03	132	133	51.8	52.2	
		Dynamic Pattern 04	134	135	52.5	52.9	
		Dynamic Pattern 05	136	137	53.3	53.7	
		Dynamic Pattern 06	138	139	54.1	54.5	

Sub Module: Second Layer Control (continued)

		Dynamic Pattern 07	140	141	54.9	55.3		
		Dynamic Pattern 08	142	143	55.7	56.1		
		Dynamic Pattern 09	144	145	56.5	56.9		
		Dynamic Pattern 10	146	147	57.3	57.6		
		Dynamic Pattern 11	148	149	58.0	58.4		
		Dynamic Pattern 12	150	151	58.8	59.2		
		Dynamic Pattern 13	152	153	59.6	60.0		
		Dynamic Pattern 14	154	155	60.4	60.8		
		Dynamic Pattern 15	156	157	61.2	61.6		
		Dynamic Pattern 16	158	159	62.0	62.4		
		Dynamic Pattern 17	160	161	62.7	63.1		
		Dynamic Pattern 18	162	163	63.5	63.9		
		Dynamic Pattern 19	164	165	64.3	64.7		
		Dynamic Pattern 20	166	167	65.1	65.5		
		Dynamic Pattern 21	168	169	65.9	66.3		
		Dynamic Pattern 22	170	171	66.7	67.1		
		Dynamic Pattern 23	172	173	67.5	67.8		
		Dynamic Pattern 24	174	175	68.2	68.6		
		Dynamic Pattern 25	176	177	69.0	69.4		
		Dynamic Pattern 26	178	179	69.8	70.2		
		Dynamic Pattern 27	180	181	70.6	71.0		
		Dynamic Pattern 28	182	183	71.4	71.8		
		Dynamic Pattern 29	184	185	72.2	72.5		
		Dynamic Pattern 30	186	187	72.9	73.3		
		Dynamic Pattern 31	188	189	73.7	74.1		
		Dynamic Pattern 32	190	191	74.5	74.9		
		Dynamic Pattern 33	192	193	75.3	75.7		
		Dynamic Pattern 34	194	195	76.1	76.5		
		Dynamic Pattern 35	196	197	76.9	77.3		
		Dynamic Pattern 36	198	199	77.6	78.0		
		Dynamic Pattern 37	200	201	78.4	78.8		
		Dynamic Pattern 38	202	203	79.2	79.6		
		Dynamic Pattern 39	204	205	80.0	80.4		
		Dynamic Pattern 40	206	207	80.8	81.2		
		Dynamic Pattern 41	208	209	81.6	82.0		
		Dynamic Pattern 42	210	211	82.4	82.7		
		Dynamic Pattern 43	212	213	83.1	83.5		
		Dynamic Pattern 44	214	215	83.9	84.3		
		Dynamic Pattern 45	216	217	84.7	85.1		
		Dynamic Pattern 46	218	219	85.5	85.9		
		Dynamic Pattern 47	220	221	86.3	86.7		
		Dynamic Pattern 48	222	223	87.1	87.5		
		Dynamic Pattern 49	224	225	87.8	88.2		
		Dynamic Pattern 50	226	227	88.6	89.0		
		Special Pattern 01	228	229	89.4	89.8		
		Special Pattern 02	230	231	90.2	90.6		
		Special Pattern 03	232	233	91.0	91.4		
		Special Pattern 04	234	235	91.8	92.2		
		Special Pattern 05	236	237	92.5	92.9		
		Special Pattern 06	238	239	93.3	93.7		
		Special Pattern 07	240	241	94.1	94.5		
		Special Pattern 08	242	243	94.9	95.3		
		Special Pattern 09	244	245	95.7	96.1		
		Special Pattern 10	246	247	96.5	96.9		
		Special Pattern 11	248	249	97.3	97.6		
		Random Pixel	250	255	98.0	100		

Sub Module: Second Layer Control (continued)

		Stop (first pattern step)	0	2	0.0	0.8		
		CW fast → slow (run pattern step 1 → n)	3	63	1.2	24.7		
		Stop at current position	64	66	25.1	25.9		
		CCW slow → fast (run pattern step n → 1)	67	127	26.3	49.8		
		Pattern Step 01	128	129	50.2	50.6		
		Pattern Step 02	130	131	51.0	51.4		
		Pattern Step 03	132	133	51.8	52.2		
		Pattern Step 04	134	135	52.5	52.9		
		Pattern Step 05	136	137	53.3	53.7		
		Pattern Step 06	138	139	54.1	54.5		
		Pattern Step 07	140	141	54.9	55.3		
		Pattern Step 08	142	143	55.7	56.1		
		Pattern Step 09	144	145	56.5	56.9		
		Pattern Step 10	146	147	57.3	57.6		
		Pattern Step 11	148	149	58.0	58.4		
		Pattern Step 12	150	151	58.8	59.2		
		Pattern Step 13	152	153	59.6	60.0		
		Pattern Step 14	154	155	60.4	60.8		
		Pattern Step 15	156	157	61.2	61.6		
		Pattern Step 16	158	159	62.0	62.4		
		Pattern Step 17	160	161	62.7	63.1		
		Pattern Step 18	162	163	63.5	63.9		
		Pattern Step 19	164	165	64.3	64.7		
		Pattern Step 20	166	167	65.1	65.5		
30	Pattern step / speed	Pattern Step 21	168	169	65.9	66.3	0	Snap
		Pattern Step 22	170	171	66.7	67.1		
		Pattern Step 23	172	173	67.5	67.8		
		Pattern Step 24	174	175	68.2	68.6		
		Pattern Step 25	176	177	69.0	69.4		
		Pattern Step 26	178	179	69.8	70.2		
		Pattern Step 27	180	181	70.6	71.0		
		Pattern Step 28	182	183	71.4	71.8		
		Pattern Step 29	184	185	72.2	72.5		
		Pattern Step 30	186	187	72.9	73.3		
		Pattern Step 31	188	189	73.7	74.1		
		Pattern Step 32	190	191	74.5	74.9		
		Pattern Step 33	192	193	75.3	75.7		
		Pattern Step 34	194	195	76.1	76.5		
		Pattern Step 35	196	197	76.9	77.3		
		Pattern Step 36	198	199	77.6	78.0		
		Pattern Step 37	200	201	78.4	78.8		
		Pattern Step 41	208	209	81.6	82.0		
		Pattern Step 42	210	211	82.4	82.7		
		Pattern Step 43	212	213	83.1	83.5		
		Pattern Step 41	208	209	81.6	82.0		
		Pattern Step 42	210	211	82.4	82.7		
		Pattern Step 43	212	213	83.1	83.5		
		Pattern Step 44	214	215	83.9	84.3		
		Pattern Step 45	216	217	84.7	85.1		
		Pattern Step 46	218	219	85.5	85.9		
		Pattern Step 47	220	221	86.3	86.7		

Sub Module: Second Layer Control (continued)

		Pattern Step 48	222	223	87.1	87.5		
		Pattern Step 49	224	225	87.8	88.2		
		Pattern Step 50	226	227	88.6	89.0		
		Pattern Step 51	228	229	89.4	89.8		
		Pattern Step 52	230	231	90.2	90.6		
		Pattern Step 53	232	233	91.0	91.4		
		Pattern Step 54	234	235	91.8	92.2		
		Pattern Step 55	236	237	92.5	92.9		
		Pattern Step 56	238	239	93.3	93.7		
		Pattern Step 57	240	241	94.1	94.5		
		Pattern Step 58	242	243	94.9	95.3		
		Pattern Step 59	244	245	95.7	96.1		
		Pattern Step 60	246	247	96.5	96.9		
		Pattern Step 61	248	249	97.3	97.6		
		Pattern Step 62	250	251	98.0	98.4		
		Pattern Step 63	252	253	98.8	99.2		
		Pattern Step 64	254	255	99.6	100.0		
31	**Pattern step crossfading (from one step to next)**	Off (no crossfading, Snap)	0	9	0	3.5		Snap
		Crossfading: Snap → min. Xfade → max. Xfade (fade in and fade out times are identical)	10	127	3.9	49.8		Fade
		Off (no crossfading, Snap)	128	137	50.2	53.7	0	Snap
		Crossfading with tail: Snap → min. Xfade with tail → max. Xfade with tail (fade in time is shorter than fade out time)	138	255	54.1	100		Fade
32	**Pattern transition (from one pattern to next)**	Off (snap from one pattern to next)	0	9	0	3.5		Snap
		Normal transition (snap → fade 5s)	10	63	3.9	24.7		Fade
		Off (snap from one pattern to next)	64	73	25.1	28.6		Snap
		FOB (Fade Over Blackout) transition (snap → fade 5s)	74	127	29.0	49.8		Fade
		Off (snap from one pattern to next)	128	137	50.2	53.7	0	Snap
		FOF (Fade Over Full) transition (snap → fade 5s)	138	191	54.1	74.9		Fade
		No function	192	201	75.3	78.8		
		No transition time - reserved for future use	202	255	79.2	100.0		
33	**Red intensity**	Intensity 0 → 100%, Pixels 1 – 19, Second Layer	0	255	0	100	0	Fade
34	**Green intensity**	Intensity 0 → 100%, Pixels 1 – 19, Second Layer	0	255	0	100	0	Fade
35	**Blue intensity**	Intensity 0 → 100%, Pixels 1 – 19, Second Layer	0	255	0	100	0	Fade

DMX Mode 3: Segments

41 DMX Channels

Channel		Command	DMX range		Percent %		Default DMX	Fade
Main Module Basic control								
1	**Pan coarse**	Pan left → right	0	65535	0	100	32768	Fade
2	**Pan fine**							
3	**Tilt coarse**	Tilt front → back	0	65535	0	100	32768	Fade
4	**Tilt fine**							
5	**Intensity coarse**	Intensity 0 → 100%	0	65535	0	100	0	Fade
6	**Intensity fine**							
7	**Shutter**	Closed	0	4	0	1.6	0	Snap
		Single flash if value changed within the range 005 → 009	5	9	2.0	3.5		Fade
		Pulse slow → fast	10	39	3.9	15.3		Fade
		Pulse opening slow → fast	40	69	15.7	27.1		Fade
		Pulse closing slow → fast	70	99	27.5	38.8		Fade
		Double flash slow → fast	100	129	39.2	50.6		Fade
		Strobe random pixel slow → fast	130	159	51.0	62.4		Fade
		Strobe random all slow → fast	160	199	62.7	78.0		Fade
		Strobe sync all pixel slow → fast	200	250	78.4	98.0		Fade
		Open	251	255	98.4	100		Snap
8	**Zoom**	Zoom narrow → wide	0	255	0	100	0	Snap
9	**Control/Settings**	See 'Control / Settings channel' *on page 71*						
10	**Accessory 1**	Effect parameter 1	0	255	0	100	0	Snap
11	**Accessory 2**	Effect parameter 2	0	255	0	100	0	Snap
12		[1] RGB - Red coarse [2] RGBL - Red coarse [3] x;y - x coarse	0	65535	0	100	65535	Fade
13		[1] RGB - Red fine [2] RGBL - Red fine [3] x;y - x fine						
14		[1] RGB - Green coarse [2] RGBL - Green coarse [3] x;y – y coarse	0	65535	0	100	65535	Fade
15	**RGB / RGBL / x,y color control** (see 'Key to conversion of x and y coordinates' on page 75)	[1] RGB - Green fine [2] RGBL - Green fine [3] x;y - y fine						
16		[1] RGB – Blue coarse [2] RGBL - Blue coarse [3] x;y – *not used*	0	65535	0	100	65535	Fade
17		[1] RGB - Blue fine [2] RGBL - Blue fine [3] x;y - *not used*						
18		[1] RGB - *not used* [2] RGBL - Lime coarse [3] x;y - *not used*	0	65535	0	100	65535	Fade
19		[1] RGB - *not used* [2] RGBL - Lime fine [3] x;y - *not used*						

Main Module Basic Control (continued)

20	**Color Wheel** (for exact colors see 'Color wheel specifications' on page 76)	Open (Selected white point)	0	9	0	3.5	0	Snap
		Filter 004, Medium Bastard Amber	10	12	3.9	4.7		
		Filter 019, Fire	13	15	5.1	5.9		
		Filter 025, Sunset Red	16	18	6.3	7.1		
		Filter 026, Bright Red	19	21	7.5	8.2		
		Filter 036, Medium Pink	22	24	8.6	9.4		
		Filter 049, Medium Purple	25	27	9.8	10.6		
		Filter 058, Lavender	28	30	11.0	11.8		
		Filter 068, Sky Blue	31	33	12.2	12.9		
		Filter 088, Lime Green	34	36	13.3	14.1		
		Filter 089, Moss Green	37	39	14.5	15.3		
		Filter 090, Dark Yellow Green	40	42	15.7	16.5		
		Filter 102, Light Amber	43	45	16.9	17.6		
		Filter 103, Straw	46	48	18.0	18.8		
		Filter 106, Primary Red	49	51	19.2	20.0		
		Filter 111, Dark Pink	52	54	20.4	21.2		
		Filter 115, Peacock Blue	55	57	21.6	22.4		
		Filter 117, Steel Blue	58	60	22.7	23.5		
		Filter 118, Light Blue	61	63	23.9	24.7		
		Filter 121, Filter Green	64	66	25.1	25.9		
		Filter 122, Fern Green	67	69	26.3	27.1		
		Filter 124, Dark Green	70	72	27.5	28.2		
		Filter 126, Mauve	73	75	28.6	29.4		
		Filter 128, Bright Pink	76	78	29.8	30.6		
		Filter 131, Marine Blue	79	81	31.0	31.8		
		Filter 132, Medium Blue	82	84	32.2	32.9		
		Filter 134, Golden Amber	85	87	33.3	34.1		
		Filter 135, Deep Golden Amber	88	90	34.5	35.3		
		Filter 136, Pale Lavender	91	93	35.7	36.5		
		Filter 137, Special Lavender	94	96	36.9	37.6		
		Filter 138, Pale Green	97	99	38.0	38.8		
		Filter 140, Summer Blue	100	102	39.2	40.0		
		Filter 141, Bright Blue	103	105	40.4	41.2		
		Filter 143, Pale Navy Blue	106	108	41.6	42.4		
		Filter 147, Apricot	109	111	42.7	43.5		
		Filter 148, Bright Rose	112	114	43.9	44.7		
		Filter 152, Pale Gold	115	117	45.1	45.9		
		Filter 154, Pale Rose	118	120	46.3	47.1		
		Filter 157, Pink	121	123	47.5	48.2		
		Filter 162, Bastard Amber	124	126	48.6	49.4		
		Filter 164, Flame Red	127	129	49.8	50.6		
		Filter 165, Daylight Blue	130	132	51.0	51.8		
		Filter 169, Lilac Tint	133	135	52.2	52.9		
		Filter 170, Deep Lavender	136	138	53.3	54.1		
		Filter 172, Lagoon Blue	139	141	54.5	55.3		
		Filter 180, Dark Lavender	142	144	55.7	56.5		
		Filter 182, Light Red	145	147	56.9	57.6		
		Filter 194, Surprise Pink	148	150	58.0	58.8		
		Filter 197, Alice Blue	151	153	59.2	60		
		Filter 201, Full C.T. Blue	154	156	60.4	61.2		
		Filter 202, Half C.T. Blue	157	159	61.6	62.4		
		Filter 203, Quarter C.T. Blue	160	162	62.7	63.5		
		Filter 204, Full C.T. Orange	163	165	63.9	64.7		

Main Module Basic Control (continued)

		Filter 206, Quartet C.T. Orange	166	168	65.1	65.9		
		Filter 219, Fluorescent Green	169	171	66.3	67.1		
		Filter 247, Filter Minus Green	172	174	67.5	68.2		
		Filter 248, Half Minus Green	175	177	68.6	69.4		
		Filter 281, Three Quarter C.T. Blue	179	180	69.8	70.6		
		Filter 285, Three Quarter C.T. Orange	181	183	71.0	71.8		
		Filter 352, Glacier Blue	184	186	72.2	72.9		
		Filter 353, Lighter Blue	187	189	73.3	74.1		
		Filter 506, Madge	190	192	74.5	75.3		
		Filter 778, Millennium Gold	193	195	75.7	76.5		
		Filter 793, Vanity Fair	196	198	76.9	77.6		
		Filter 798, Chrysalis Pink	199	201	78.0	78.8		
		Rainbow, stop at first color (violet)	202	204	79.2	80.0		
		Rainbow, continuous slow→fast: *Violet→indigo→light blue →turquoise→green→yellow →orange→red→pink*	205	252	80.4	98.8		Fade
		Rainbow, stop at current color	253	255	99.2	100		Snap
21	**CTC (Color Temperature Control)**	Open, selected white point	0	9	0	3.5	0	Snap
		Fade through color temperatures of 1000 K to 2500 K stepless (interpolation)	11	11	4.3	45.9		
			12	254	4.7	49.8		Fade
			255	255	100	53.7		Snap
22	**CQC (Color Quality Control) / Saturation**	HQ (high quality), saturated color	0	9	0	3.5	0	Snap
		Crossfade	10	117	3.9	45.9		Fade
		HQ (high quality), unsaturated color	118	127	46.3	49.8		Snap
		HO (high output), unsaturated color	128	137	50.2	53.7		
		Crossfade	138	245	54.1	96.1		Fade
		HO (high output), saturated color	246	255	96.5	100		Snap
23	**M/G shift**	Off (no correction)	0	9	0	3.5	0	Snap
		Full plus magenta +100%	10	10	3.9	3.9		
		Plus magenta +99% → +1%	11	124	4.3	48.6		Fade
		Neutral / no effect	125	140	49.0	54.9		Snap
		Plus green +1% → +99%	141	254	55.3	99.6		Fade
		Full plus green +100%	255	255	100	100		Snap
24	**Tungsten simulation**	Off (selected white point, no red shift or delay when dimming)	0	9	0	3.5	0	Snap
		Tungsten ACL 250W/28V	10	19	3.9	7.5		
		Tungsten Blinder 650W/120V	20	29	7.8	11.4		
		Tungsten 750W/80V	30	39	11.8	15.3		
		Tungsten 1000W/240V	40	49	15.7	19.2		
		Tungsten 1200W/240V	50	59	19.6	23.1		
		Tungsten 2000W/230V	60	69	23.5	27.1		
		Tungsten 2500W/230V	70	79	27.5	31.0		
		Tungsten 5000W/230V	80	89	31.4	34.9		
		No function (off)	90	120	35.3	47.1		
		Off (selected white point, no red shift or delay when dimming)	120	139	47.1	54.5		
		FX Tungsten ACL 250W/28V	140	149	54.9	58.4		
		FX Tungsten Blinder 650W/120V	150	159	58.8	62.4		
		FX Tungsten 750W/80V	160	169	62.7	66.3		
		FX Tungsten 1000W/240V	170	179	66.7	70.2		
		FX Tungsten 1200W/240V	180	189	70.6	74.1		
		FX Tungsten 2000W/230V	190	199	74.5	78.0		
		FX Tungsten 2500W/230V	200	209	78.4	82.0		
		FX Tungsten 5000W/230V	210	219	82.4	85.9		
		No function (off)	220	255	86.3	100		

Main Module Basic Control (continued)

25	**Mix priority**	Main Module and Sub Module HTP (highest value takes priority)	0	9	0	3.5	0	Snap
		Main only (Main Module color takes priority)	10	19	3.9	7.5		
		Sub only (Sub Module color takes priority)	20	29	7.8	11.4		
		Main and Sub additive (Sub Module color value added to Main Module color value)	30	39	11.8	15.3		
		Main minus Sub Module subtractive (Sub Module color value subtracted from Main)	40	49	15.7	19.2		
		Sub Module minus main subtractive (Main Module color value subtracted from Sub Module)	50	59	19.6	23.1		
		TrueColor 1: Main over Sub – snap	60	69	23.5	27.1		
		TrueColor 2: Sub over Main – snap	70	79	27.5	31.0		
		TrueColor 3: Main over Sub – crossfade	80	89	31.4	34.9		Fade
		TrueColor 4: Sub over Main – crossfade	90	99	35.3	38.8		Fade
		No function	100	127	39.2	49.8		
		Main Module only	128	130	50.2	51.0		Snap
		Crossfading Main → HTP	131	190	51.4	74.5		Fade
		Main and Sub Modules (HTP)	191	192	74.9	75.3		Snap
		Crossfading HTP → Sub	193	252	75.7	98.8		Fade
		Sub Module only	253	255	99.2	100		Snap

Sub Module: Second Layer Control

26	**Intensity coarse**	Intensity 0 → 100%	0	65535	0	100	0	Fade
27	**Intensity fine**							
28	**Shutter**	Closed	0	4	0	1.6	0	Snap
		Single flash if value changed within the range 005 → 009	5	9	2.0	3.5		Fade
		Pulse slow → fast	10	39	3.9	15.3		Fade
		Pulse opening slow → fast	40	69	15.7	27.1		Fade
		Pulse closing slow → fast	70	99	27.5	38.8		Fade
		Double flash slow → fast	100	129	39.2	50.6		Fade
		Strobe random pixel slow → fast	130	159	51.0	62.4		Fade
		Strobe random all slow → fast	160	199	62.7	78.0		Fade
		Strobe sync all pixel slow → fast	200	250	78.4	98.0		Fade
		Open	251	255	98.4	100		Snap
29*	**Pattern selection**	Off (all pixels active)	0	9	0	3.5	0	Snap
		Static Pattern 01	10	11	3.9	4.3		
		Static Pattern 02	12	13	4.7	5.1		
		Static Pattern 03	14	15	5.5	5.9		
		Static Pattern 04	16	17	6.3	6.7		
		Static Pattern 05	18	19	7.1	7.5		
		Static Pattern 06	20	21	7.8	8.2		
		Static Pattern 07	22	23	8.6	9.0		
		Static Pattern 08	24	25	9.4	9.8		
		Static Pattern 09	26	27	10.2	10.6		
		Static Pattern 10	28	29	11.0	11.4		
		Static Pattern 11	30	31	11.8	12.2		

Sub Module: Second Layer Control (continued)

		Static Pattern 12	32	33	12.5	12.9	
		Static Pattern 13	34	35	13.3	13.7	
		Static Pattern 14	36	37	14.1	14.5	
		Static Pattern 15	38	39	14.9	15.3	
		Static Pattern 16	40	41	15.7	16.1	
		Static Pattern 17	52	43	20.4	16.9	
		Static Pattern 18	44	45	17.3	17.6	
		Static Pattern 19	46	47	18.0	18.4	
		Static Pattern 20	48	49	18.8	19.2	
		Static Pattern 21	50	51	19.6	20.0	
		Static Pattern 22	52	53	20.4	20.8	
		Static Pattern 23	54	55	21.2	21.6	
		Static Pattern 24	56	57	22.0	22.4	
		Static Pattern 25	58	59	22.7	23.1	
		Static Pattern 26	60	61	23.5	23.9	
		Static Pattern 27	62	63	24.3	24.7	
		Static Pattern 28	64	65	25.1	25.5	
		Static Pattern 29	66	67	25.9	26.3	
		Static Pattern 30	68	69	26.7	27.1	
		Static Pattern 31	70	71	27.5	27.8	
		Static Pattern 32	72	73	28.2	28.6	
		Static Pattern 33	74	75	29.0	29.4	
		Static Pattern 34	76	77	29.8	30.2	
		Static Pattern 35	78	79	30.6	31.0	
		Static Pattern 36	80	81	31.4	31.8	
		Static Pattern 37	82	83	32.2	32.5	
		Static Pattern 38	84	85	32.9	33.3	
		Static Pattern 39	86	87	33.7	34.1	
		Static Pattern 40	88	89	34.5	34.9	
		Static Pattern 41	90	91	35.3	35.7	
		Static Pattern 42	92	93	36.1	36.5	
		Static Pattern 43	94	95	36.9	37.3	
		Static Pattern 44	96	97	37.6	38.0	
		Static Pattern 45	98	99	38.4	38.8	
		Static Pattern 46	100	101	39.2	39.6	
		Static Pattern 47	102	103	40.0	40.4	
		Static Pattern 48	104	105	40.8	41.2	
		Static Pattern 49	106	107	41.6	42.0	
		Static Pattern 50	108	109	42.4	42.7	
		Static Pattern 51	110	111	43.1	43.5	
		Static Pattern 52	112	113	43.9	44.3	
		Static Pattern 53	114	115	44.7	45.1	
		Static Pattern 54	116	117	45.5	45.9	
		Static Pattern 55	118	119	46.3	46.7	
		Static Pattern 56	120	121	47.1	47.5	
		Static Pattern 57	122	123	47.8	48.2	
		Static Pattern 58	124	125	48.6	49.0	
		Static Pattern 59	126	127	49.4	49.8	
		Dynamic Pattern 01	128	129	50.2	50.6	
		Dynamic Pattern 02	130	131	51.0	51.4	
		Dynamic Pattern 03	132	133	51.8	52.2	
		Dynamic Pattern 04	134	135	52.5	52.9	
		Dynamic Pattern 05	136	137	53.3	53.7	
		Dynamic Pattern 06	138	139	54.1	54.5	

Sub Module: Second Layer Control (continued)

		Dynamic Pattern 07	140	141	54.9	55.3	
		Dynamic Pattern 08	142	143	55.7	56.1	
		Dynamic Pattern 09	144	145	56.5	56.9	
		Dynamic Pattern 10	146	147	57.3	57.6	
		Dynamic Pattern 11	148	149	58.0	58.4	
		Dynamic Pattern 12	150	151	58.8	59.2	
		Dynamic Pattern 13	152	153	59.6	60.0	
		Dynamic Pattern 14	154	155	60.4	60.8	
		Dynamic Pattern 15	156	157	61.2	61.6	
		Dynamic Pattern 16	158	159	62.0	62.4	
		Dynamic Pattern 17	160	161	62.7	63.1	
		Dynamic Pattern 18	162	163	63.5	63.9	
		Dynamic Pattern 19	164	165	64.3	64.7	
		Dynamic Pattern 20	166	167	65.1	65.5	
		Dynamic Pattern 21	168	169	65.9	66.3	
		Dynamic Pattern 22	170	171	66.7	67.1	
		Dynamic Pattern 23	172	173	67.5	67.8	
		Dynamic Pattern 24	174	175	68.2	68.6	
		Dynamic Pattern 25	176	177	69.0	69.4	
		Dynamic Pattern 26	178	179	69.8	70.2	
		Dynamic Pattern 27	180	181	70.6	71.0	
		Dynamic Pattern 28	182	183	71.4	71.8	
		Dynamic Pattern 29	184	185	72.2	72.5	
		Dynamic Pattern 30	186	187	72.9	73.3	
		Dynamic Pattern 31	188	189	73.7	74.1	
		Dynamic Pattern 32	190	191	74.5	74.9	
		Dynamic Pattern 33	192	193	75.3	75.7	
		Dynamic Pattern 34	194	195	76.1	76.5	
		Dynamic Pattern 35	196	197	76.9	77.3	
		Dynamic Pattern 36	198	199	77.6	78.0	
		Dynamic Pattern 37	200	201	78.4	78.8	
		Dynamic Pattern 38	202	203	79.2	79.6	
		Dynamic Pattern 39	204	205	80.0	80.4	
		Dynamic Pattern 40	206	207	80.8	81.2	
		Dynamic Pattern 41	208	209	81.6	82.0	
		Dynamic Pattern 42	210	211	82.4	82.7	
		Dynamic Pattern 43	212	213	83.1	83.5	
		Dynamic Pattern 44	214	215	83.9	84.3	
		Dynamic Pattern 45	216	217	84.7	85.1	
		Dynamic Pattern 46	218	219	85.5	85.9	
		Dynamic Pattern 47	220	221	86.3	86.7	
		Dynamic Pattern 48	222	223	87.1	87.5	
		Dynamic Pattern 49	224	225	87.8	88.2	
		Dynamic Pattern 50	226	227	88.6	89.0	
		Special Pattern 01	228	229	89.4	89.8	
		Special Pattern 02	230	231	90.2	90.6	
		Special Pattern 03	232	233	91.0	91.4	
		Special Pattern 04	234	235	91.8	92.2	
		Special Pattern 05	236	237	92.5	92.9	
		Special Pattern 06	238	239	93.3	93.7	
		Special Pattern 07	240	241	94.1	94.5	
		Special Pattern 08	242	243	94.9	95.3	
		Special Pattern 09	244	245	95.7	96.1	
		Special Pattern 10	246	247	96.5	96.9	
		Special Pattern 11	248	249	97.3	97.6	
		Random Pixel	250	255	98.0	100	

Sub Module: Second Layer Control (continued)

		Stop (first pattern step)	0	2	0.0	0.8		
		CW fast → slow (run pattern step 1 → n)	3	63	1.2	24.7		
		Stop at current position	64	66	25.1	25.9		
		CCW slow → fast (run pattern step n → 1)	67	127	26.3	49.8		
		Pattern Step 01	128	129	50.2	50.6		
		Pattern Step 02	130	131	51.0	51.4		
		Pattern Step 03	132	133	51.8	52.2		
		Pattern Step 04	134	135	52.5	52.9		
		Pattern Step 05	136	137	53.3	53.7		
		Pattern Step 06	138	139	54.1	54.5		
		Pattern Step 07	140	141	54.9	55.3		
		Pattern Step 08	142	143	55.7	56.1		
		Pattern Step 09	144	145	56.5	56.9		
		Pattern Step 10	146	147	57.3	57.6		
		Pattern Step 11	148	149	58.0	58.4		
		Pattern Step 12	150	151	58.8	59.2		
		Pattern Step 13	152	153	59.6	60.0		
		Pattern Step 14	154	155	60.4	60.8		
		Pattern Step 15	156	157	61.2	61.6		
		Pattern Step 16	158	159	62.0	62.4		
		Pattern Step 17	160	161	62.7	63.1		
		Pattern Step 18	162	163	63.5	63.9		
		Pattern Step 19	164	165	64.3	64.7		
		Pattern Step 20	166	167	65.1	65.5		
30	Pattern step / speed	Pattern Step 21	168	169	65.9	66.3	0	Snap
		Pattern Step 22	170	171	66.7	67.1		
		Pattern Step 23	172	173	67.5	67.8		
		Pattern Step 24	174	175	68.2	68.6		
		Pattern Step 25	176	177	69.0	69.4		
		Pattern Step 26	178	179	69.8	70.2		
		Pattern Step 27	180	181	70.6	71.0		
		Pattern Step 28	182	183	71.4	71.8		
		Pattern Step 29	184	185	72.2	72.5		
		Pattern Step 30	186	187	72.9	73.3		
		Pattern Step 31	188	189	73.7	74.1		
		Pattern Step 32	190	191	74.5	74.9		
		Pattern Step 33	192	193	75.3	75.7		
		Pattern Step 34	194	195	76.1	76.5		
		Pattern Step 35	196	197	76.9	77.3		
		Pattern Step 36	198	199	77.6	78.0		
		Pattern Step 37	200	201	78.4	78.8		
		Pattern Step 41	208	209	81.6	82.0		
		Pattern Step 42	210	211	82.4	82.7		
		Pattern Step 43	212	213	83.1	83.5		
		Pattern Step 41	208	209	81.6	82.0		
		Pattern Step 42	210	211	82.4	82.7		
		Pattern Step 43	212	213	83.1	83.5		
		Pattern Step 44	214	215	83.9	84.3		
		Pattern Step 45	216	217	84.7	85.1		
		Pattern Step 46	218	219	85.5	85.9		
		Pattern Step 47	220	221	86.3	86.7		
		Pattern Step 48	222	223	87.1	87.5		

Sub Module: Second Layer Control (continued)

#	Function	Description						
		Pattern Step 49	224	225	87.8	88.2		
		Pattern Step 50	226	227	88.6	89.0		
		Pattern Step 51	228	229	89.4	89.8		
		Pattern Step 52	230	231	90.2	90.6		
		Pattern Step 53	232	233	91.0	91.4		
		Pattern Step 54	234	235	91.8	92.2		
		Pattern Step 55	236	237	92.5	92.9		
		Pattern Step 56	238	239	93.3	93.7		
		Pattern Step 57	240	241	94.1	94.5		
		Pattern Step 58	242	243	94.9	95.3		
		Pattern Step 59	244	245	95.7	96.1		
		Pattern Step 60	246	247	96.5	96.9		
		Pattern Step 61	248	249	97.3	97.6		
		Pattern Step 62	250	251	98.0	98.4		
		Pattern Step 63	252	253	98.8	99.2		
		Pattern Step 64	254	255	99.6	100.0		
31	**Pattern step crossfading (from one step to next)**	Off (no crossfading, Snap)	0	9	0	3.5		Snap
		Crossfading: Snap → min. Xfade → max. Xfade (fade in and fade out times are identical)	10	127	3.9	49.8		Fade
		Off (no crossfading, Snap)	128	137	50.2	53.7	0	Snap
		Crossfading with tail: Snap → min. Xfade with tail → max. Xfade with tail (fade in time is shorter than fade out time)	138	255	54.1	100		Fade
32	**Pattern transition (from one pattern to next)**	Off (snap from one pattern to next)	0	9	0	3.5		Snap
		Normal transition (snap → fade 5s)	10	63	3.9	24.7		Fade
		Off (snap from one pattern to next)	64	73	25.1	28.6		Snap
		FOB (Fade Over Blackout) transition (snap → fade 5s)	74	127	29.0	49.8		Fade
		Off (snap from one pattern to next)	128	137	50.2	53.7	0	Snap
		FOF (Fade Over Full) transition (snap → fade 5s)	138	191	54.1	74.9		Fade
		No function	192	201	75.3	78.8		
		No transition time - reserved for future use	202	255	79.2	100.0		
33	**Red, pixel 01**	Intensity 0 → 100%	0	255	0	100	0	Fade
34	**Green, pixel 01**	Intensity 0 → 100%	0	255	0	100	0	Fade
35	**Blue, pixel 01**	Intensity 0 → 100%	0	255	0	100	0	Fade
36	**Red, pixels 02 – 07**	Intensity 0 → 100%	0	255	0	100	0	Fade
37	**Green, pixels 02 – 07**	Intensity 0 → 100%	0	255	0	100	0	Fade
38	**Blue, pixels 02 – 07**	Intensity 0 → 100%	0	255	0	100	0	Fade
39	**Red, pixels 08 – 19**	Intensity 0 → 100%	0	255	0	100	0	Fade
40	**Green, pixels 08 – 19**	Intensity 0 → 100%	0	255	0	100	0	Fade
41	**Blue, pixels 08 - 19**	Intensity 0 → 100%	0	255	0	100	0	Fade

DMX Mode 4: Multipix advanced

89 DMX Channels

Channel		Command	DMX range		Percent %		Default DMX	Fade

Main Module Basic control

Channel		Command	DMX range		Percent %		Default DMX	Fade
1	**Pan coarse**	Pan left → right	0	65535	0	100	32768	Fade
2	**Pan fine**							
3	**Tilt coarse**	Tilt front → back	0	65535	0	100	32768	Fade
4	**Tilt fine**							
5	**Intensity coarse**	Intensity 0 → 100%	0	65535	0	100	0	Fade
6	**Intensity fine**							
7	**Shutter**	Closed	0	4	0	1.6	0	Snap
		Single flash if value changed within the range 005 → 009	5	9	2.0	3.5		Fade
		Pulse slow → fast	10	39	3.9	15.3		Fade
		Pulse opening slow → fast	40	69	15.7	27.1		Fade
		Pulse closing slow → fast	70	99	27.5	38.8		Fade
		Double flash slow → fast	100	129	39.2	50.6		Fade
		Strobe random pixel slow → fast	130	159	51.0	62.4		Fade
		Strobe random all slow → fast	160	199	62.7	78.0		Fade
		Strobe sync all pixel slow → fast	200	250	78.4	98.0		Fade
		Open	251	255	98.4	100		Snap
8	**Zoom**	Zoom narrow → wide	0	255	0	100	0	Snap
9	**Control/Settings**	*See 'Control / Settings channel' on page 71*						
10	**Accessory 1**	Effect parameter 1	0	255	0	100	0	Snap
11	**Accessory 2**	Effect parameter 2	0	255	0	100	0	Snap
12	**RGB / RGBL / x,y color control** (see 'Key to conversion of x and y coordinates' on page 75)	[1] RGB - Red coarse [2] RGBL - Red coarse [3] x;y - x coarse	0	65535	0	100	65535	Fade
13		[1] RGB - Red fine [2] RGBL - Red fine [3] x;y - x fine						
14		[1] RGB - Green coarse [2] RGBL - Green coarse [3] x;y – y coarse	0	65535	0	100	65535	Fade
15		[1] RGB - Green fine [2] RGBL - Green fine [3] x;y - y fine						
16		[1] RGB – Blue coarse [2] RGBL - Blue coarse [3] x;y – *not used*	0	65535	0	100	65535	Fade
17		[1] RGB - Blue fine [2] RGBL - Blue fine [3] x;y - *not used*						
18		[1] RGB - *not used* [2] RGBL - Lime coarse [3] x;y - *not used*	0	65535	0	100	65535	Fade
19		[1] RGB - *not used* [2] RGBL - Lime fine [3] x;y - *not used*						

Main Module Basic Control (continued)

		Open (Selected white point)	0	9	0	3.5		
		Filter 004, Medium Bastard Amber	10	12	3.9	4.7		
		Filter 019, Fire	13	15	5.1	5.9		
		Filter 025, Sunset Red	16	18	6.3	7.1		
		Filter 026, Bright Red	19	21	7.5	8.2		
		Filter 036, Medium Pink	22	24	8.6	9.4		
		Filter 049, Medium Purple	25	27	9.8	10.6		
		Filter 058, Lavender	28	30	11.0	11.8		
		Filter 068, Sky Blue	31	33	12.2	12.9		
		Filter 088, Lime Green	34	36	13.3	14.1		
		Filter 089, Moss Green	37	39	14.5	15.3		
		Filter 090, Dark Yellow Green	40	42	15.7	16.5		
		Filter 102, Light Amber	43	45	16.9	17.6		
		Filter 103, Straw	46	48	18.0	18.8		
		Filter 106, Primary Red	49	51	19.2	20.0		
		Filter 111, Dark Pink	52	54	20.4	21.2		
		Filter 115, Peacock Blue	55	57	21.6	22.4		
		Filter 117, Steel Blue	58	60	22.7	23.5		
		Filter 118, Light Blue	61	63	23.9	24.7		
		Filter 121, Filter Green	64	66	25.1	25.9		
		Filter 122, Fern Green	67	69	26.3	27.1		
		Filter 124, Dark Green	70	72	27.5	28.2		
		Filter 126, Mauve	73	75	28.6	29.4		
		Filter 128, Bright Pink	76	78	29.8	30.6		
		Filter 131, Marine Blue	79	81	31.0	31.8		
		Filter 132, Medium Blue	82	84	32.2	32.9		
20	**Color Wheel** (for exact colors see 'Color wheel specifications' on page 76)	Filter 134, Golden Amber	85	87	33.3	34.1	0	Snap
		Filter 135, Deep Golden Amber	88	90	34.5	35.3		
		Filter 136, Pale Lavender	91	93	35.7	36.5		
		Filter 137, Special Lavender	94	96	36.9	37.6		
		Filter 138, Pale Green	97	99	38.0	38.8		
		Filter 140, Summer Blue	100	102	39.2	40.0		
		Filter 141, Bright Blue	103	105	40.4	41.2		
		Filter 143, Pale Navy Blue	106	108	41.6	42.4		
		Filter 147, Apricot	109	111	42.7	43.5		
		Filter 148, Bright Rose	112	114	43.9	44.7		
		Filter 152, Pale Gold	115	117	45.1	45.9		
		Filter 154, Pale Rose	118	120	46.3	47.1		
		Filter 157, Pink	121	123	47.5	48.2		
		Filter 162, Bastard Amber	124	126	48.6	49.4		
		Filter 164, Flame Red	127	129	49.8	50.6		
		Filter 165, Daylight Blue	130	132	51.0	51.8		
		Filter 169, Lilac Tint	133	135	52.2	52.9		
		Filter 170, Deep Lavender	136	138	53.3	54.1		
		Filter 172, Lagoon Blue	139	141	54.5	55.3		
		Filter 180, Dark Lavender	142	144	55.7	56.5		
		Filter 182, Light Red	145	147	56.9	57.6		
		Filter 194, Surprise Pink	148	150	58.0	58.8		
		Filter 197, Alice Blue	151	153	59.2	60		
		Filter 201, Full C.T. Blue	154	156	60.4	61.2		
		Filter 202, Half C.T. Blue	157	159	61.6	62.4		
		Filter 203, Quarter C.T. Blue	160	162	62.7	63.5		
		Filter 204, Full C.T. Orange	163	165	63.9	64.7		
		Filter 206, Quartet C.T. Orange	166	168	65.1	65.9		
		Filter 219, Fluorescent Green	169	171	66.3	67.1		

Main Module Basic Control (continued)

#	Function	Description						
		Filter 247, Filter Minus Green	172	174	67.5	68.2		
		Filter 248, Half Minus Green	175	177	68.6	69.4		
		Filter 281, Three Quarter C.T. Blue	179	180	69.8	70.6		
		Filter 285, Three Quarter C.T. Orange	181	183	71.0	71.8		
		Filter 352, Glacier Blue	184	186	72.2	72.9		
		Filter 353, Lighter Blue	187	189	73.3	74.1		
		Filter 506, Madge	190	192	74.5	75.3		
		Filter 778, Millennium Gold	193	195	75.7	76.5		
		Filter 793, Vanity Fair	196	198	76.9	77.6		
		Filter 798, Chrysalis Pink	199	201	78.0	78.8		
		Rainbow, stop at first color (violet)	202	204	79.2	80.0		
		Rainbow, continuous slow→fast: *Violet→indigo→light blue →turquoise→green→yellow →orange→red→pink*	205	252	80.4	98.8		Fade
		Rainbow, stop at current color	253	255	99.2	100		Snap
21	**CTC (Color Temperature Control)**	Open, selected white point	0	9	0	3.5	0	Snap
		Fade through color temperatures of 1000 K to 2500 K stepless (interpolation)	11	11	4.3	45.9		
			12	254	4.7	49.8		Fade
			255	255	100	53.7		Snap
22	**CQC (Color Quality Control) / Saturation**	HQ (high quality), saturated color	0	9	0	3.5	0	Snap
		Crossfade	10	117	3.9	45.9		Fade
		HQ (high quality), unsaturated color	118	127	46.3	49.8		Snap
		HO (high output), unsaturated color	128	137	50.2	53.7		
		Crossfade	138	245	54.1	96.1		Fade
		HO (high output), saturated color	246	255	96.5	100		Snap
23	**M/G shift**	Off (no correction)	0	9	0	3.5	0	Snap
		Full plus magenta +100%	10	10	3.9	3.9		
		Plus magenta +99% → +1%	11	124	4.3	48.6		Fade
		Neutral / no effect	125	140	49.0	54.9		Snap
		Plus green +1% → +99%	141	254	55.3	99.6		Fade
		Full plus green +100%	255	255	100	100		Snap
24	**Tungsten simulation**	Off (selected white point, no red shift or delay when dimming)	0	9	0	3.5	0	Snap
		Tungsten ACL 250W/28V	10	19	3.9	7.5		
		Tungsten Blinder 650W/120V	20	29	7.8	11.4		
		Tungsten 750W/80V	30	39	11.8	15.3		
		Tungsten 1000W/240V	40	49	15.7	19.2		
		Tungsten 1200W/240V	50	59	19.6	23.1		
		Tungsten 2000W/230V	60	69	23.5	27.1		
		Tungsten 2500W/230V	70	79	27.5	31.0		
		Tungsten 5000W/230V	80	89	31.4	34.9		
		No function (off)	90	120	35.3	47.1		
		Off (selected white point, no red shift or delay when dimming)	120	139	47.1	54.5		
		FX Tungsten ACL 250W/28V	140	149	54.9	58.4		
		FX Tungsten Blinder 650W/120V	150	159	58.8	62.4		
		FX Tungsten 750W/80V	160	169	62.7	66.3		
		FX Tungsten 1000W/240V	170	179	66.7	70.2		
		FX Tungsten 1200W/240V	180	189	70.6	74.1		
		FX Tungsten 2000W/230V	190	199	74.5	78.0		
		FX Tungsten 2500W/230V	200	209	78.4	82.0		
		FX Tungsten 5000W/230V	210	219	82.4	85.9		
		No function (off)	220	255	86.3	100		

Main Module Basic Control (continued)

25	Mix priority	Main Module and Sub Module HTP (highest value takes priority)	0	9	0	3.5	0	Snap
		Main only (Main Module color takes priority)	10	19	3.9	7.5		
		Sub only (Sub Module color takes priority)	20	29	7.8	11.4		
		Main and Sub additive (Sub Module color value added to Main Module color value)	30	39	11.8	15.3		
		Main minus Sub Module subtractive (Sub Module color value subtracted from Main)	40	49	15.7	19.2		
		Sub Module minus main subtractive (Main Module color value subtracted from Sub Module)	50	59	19.6	23.1		
		TrueColor 1: Main over Sub – snap	60	69	23.5	27.1		
		TrueColor 2: Sub over Main – snap	70	79	27.5	31.0		
		TrueColor 3: Main over Sub – crossfade	80	89	31.4	34.9		Fade
		TrueColor 4: Sub over Main – crossfade	90	99	35.3	38.8		Fade
		No function	100	127	39.2	49.8		
		Main Module only	128	130	50.2	51.0		Snap
		Crossfading Main → HTP	131	190	51.4	74.5		Fade
		Main and Sub Modules (HTP)	191	192	74.9	75.3		Snap
		Crossfading HTP → Sub	193	252	75.7	98.8		Fade
		Sub Module only	253	255	99.2	100		Snap

Sub Module: Second Layer Control

26	Intensity coarse	Intensity 0 → 100%	0	65535	0	100	0	Fade
27	Intensity fine							
28	Shutter	Closed	0	4	0	1.6	0	Snap
		Single flash if value changed within the range 005 → 009	5	9	2.0	3.5		Fade
		Pulse slow → fast	10	39	3.9	15.3		Fade
		Pulse opening slow → fast	40	69	15.7	27.1		Fade
		Pulse closing slow → fast	70	99	27.5	38.8		Fade
		Double flash slow → fast	100	129	39.2	50.6		Fade
		Strobe random pixel slow → fast	130	159	51.0	62.4		Fade
		Strobe random all slow → fast	160	199	62.7	78.0		Fade
		Strobe sync all pixel slow → fast	200	250	78.4	98.0		Fade
		Open	251	255	98.4	100		Snap
29*	Pattern selection	Off (all pixels active)	0	9	0	3.5	0	Snap
		Static Pattern 01	10	11	3.9	4.3		
		Static Pattern 02	12	13	4.7	5.1		
		Static Pattern 03	14	15	5.5	5.9		
		Static Pattern 04	16	17	6.3	6.7		
		Static Pattern 05	18	19	7.1	7.5		
		Static Pattern 06	20	21	7.8	8.2		
		Static Pattern 07	22	23	8.6	9.0		
		Static Pattern 08	24	25	9.4	9.8		
		Static Pattern 09	26	27	10.2	10.6		
		Static Pattern 10	28	29	11.0	11.4		
		Static Pattern 11	30	31	11.8	12.2		

Sub Module: Second Layer Control (continued)

		Static Pattern 12	32	33	12.5	12.9		
		Static Pattern 13	34	35	13.3	13.7		
		Static Pattern 14	36	37	14.1	14.5		
		Static Pattern 15	38	39	14.9	15.3		
		Static Pattern 16	40	41	15.7	16.1		
		Static Pattern 17	52	43	20.4	16.9		
		Static Pattern 18	44	45	17.3	17.6		
		Static Pattern 19	46	47	18.0	18.4		
		Static Pattern 20	48	49	18.8	19.2		
		Static Pattern 21	50	51	19.6	20.0		
		Static Pattern 22	52	53	20.4	20.8		
		Static Pattern 23	54	55	21.2	21.6		
		Static Pattern 24	56	57	22.0	22.4		
		Static Pattern 25	58	59	22.7	23.1		
		Static Pattern 26	60	61	23.5	23.9		
		Static Pattern 27	62	63	24.3	24.7		
		Static Pattern 28	64	65	25.1	25.5		
		Static Pattern 29	66	67	25.9	26.3		
		Static Pattern 30	68	69	26.7	27.1		
		Static Pattern 31	70	71	27.5	27.8		
		Static Pattern 32	72	73	28.2	28.6		
		Static Pattern 33	74	75	29.0	29.4		
		Static Pattern 34	76	77	29.8	30.2		
		Static Pattern 35	78	79	30.6	31.0		
		Static Pattern 36	80	81	31.4	31.8		
		Static Pattern 37	82	83	32.2	32.5		
		Static Pattern 38	84	85	32.9	33.3		
		Static Pattern 39	86	87	33.7	34.1		
		Static Pattern 40	88	89	34.5	34.9		
		Static Pattern 41	90	91	35.3	35.7		
		Static Pattern 42	92	93	36.1	36.5		
		Static Pattern 43	94	95	36.9	37.3		
		Static Pattern 44	96	97	37.6	38.0		
		Static Pattern 45	98	99	38.4	38.8		
		Static Pattern 46	100	101	39.2	39.6		
		Static Pattern 47	102	103	40.0	40.4		
		Static Pattern 48	104	105	40.8	41.2		
		Static Pattern 49	106	107	41.6	42.0		
		Static Pattern 50	108	109	42.4	42.7		
		Static Pattern 51	110	111	43.1	43.5		
		Static Pattern 52	112	113	43.9	44.3		
		Static Pattern 53	114	115	44.7	45.1		
		Static Pattern 54	116	117	45.5	45.9		
		Static Pattern 55	118	119	46.3	46.7		
		Static Pattern 56	120	121	47.1	47.5		
		Static Pattern 57	122	123	47.8	48.2		
		Static Pattern 58	124	125	48.6	49.0		
		Static Pattern 59	126	127	49.4	49.8		
		Dynamic Pattern 01	128	129	50.2	50.6		
		Dynamic Pattern 02	130	131	51.0	51.4		
		Dynamic Pattern 03	132	133	51.8	52.2		
		Dynamic Pattern 04	134	135	52.5	52.9		
		Dynamic Pattern 05	136	137	53.3	53.7		
		Dynamic Pattern 06	138	139	54.1	54.5		

Sub Module: Second Layer Control (continued)

		Dynamic Pattern 07	140	141	54.9	55.3	
		Dynamic Pattern 08	142	143	55.7	56.1	
		Dynamic Pattern 09	144	145	56.5	56.9	
		Dynamic Pattern 10	146	147	57.3	57.6	
		Dynamic Pattern 11	148	149	58.0	58.4	
		Dynamic Pattern 12	150	151	58.8	59.2	
		Dynamic Pattern 13	152	153	59.6	60.0	
		Dynamic Pattern 14	154	155	60.4	60.8	
		Dynamic Pattern 15	156	157	61.2	61.6	
		Dynamic Pattern 16	158	159	62.0	62.4	
		Dynamic Pattern 17	160	161	62.7	63.1	
		Dynamic Pattern 18	162	163	63.5	63.9	
		Dynamic Pattern 19	164	165	64.3	64.7	
		Dynamic Pattern 20	166	167	65.1	65.5	
		Dynamic Pattern 21	168	169	65.9	66.3	
		Dynamic Pattern 22	170	171	66.7	67.1	
		Dynamic Pattern 23	172	173	67.5	67.8	
		Dynamic Pattern 24	174	175	68.2	68.6	
		Dynamic Pattern 25	176	177	69.0	69.4	
		Dynamic Pattern 26	178	179	69.8	70.2	
		Dynamic Pattern 27	180	181	70.6	71.0	
		Dynamic Pattern 28	182	183	71.4	71.8	
		Dynamic Pattern 29	184	185	72.2	72.5	
		Dynamic Pattern 30	186	187	72.9	73.3	
		Dynamic Pattern 31	188	189	73.7	74.1	
		Dynamic Pattern 32	190	191	74.5	74.9	
		Dynamic Pattern 33	192	193	75.3	75.7	
		Dynamic Pattern 34	194	195	76.1	76.5	
		Dynamic Pattern 35	196	197	76.9	77.3	
		Dynamic Pattern 36	198	199	77.6	78.0	
		Dynamic Pattern 37	200	201	78.4	78.8	
		Dynamic Pattern 38	202	203	79.2	79.6	
		Dynamic Pattern 39	204	205	80.0	80.4	
		Dynamic Pattern 40	206	207	80.8	81.2	
		Dynamic Pattern 41	208	209	81.6	82.0	
		Dynamic Pattern 42	210	211	82.4	82.7	
		Dynamic Pattern 43	212	213	83.1	83.5	
		Dynamic Pattern 44	214	215	83.9	84.3	
		Dynamic Pattern 45	216	217	84.7	85.1	
		Dynamic Pattern 46	218	219	85.5	85.9	
		Dynamic Pattern 47	220	221	86.3	86.7	
		Dynamic Pattern 48	222	223	87.1	87.5	
		Dynamic Pattern 49	224	225	87.8	88.2	
		Dynamic Pattern 50	226	227	88.6	89.0	
		Special Pattern 01	228	229	89.4	89.8	
		Special Pattern 02	230	231	90.2	90.6	
		Special Pattern 03	232	233	91.0	91.4	
		Special Pattern 04	234	235	91.8	92.2	
		Special Pattern 05	236	237	92.5	92.9	
		Special Pattern 06	238	239	93.3	93.7	
		Special Pattern 07	240	241	94.1	94.5	
		Special Pattern 08	242	243	94.9	95.3	
		Special Pattern 09	244	245	95.7	96.1	
		Special Pattern 10	246	247	96.5	96.9	
		Special Pattern 11	248	249	97.3	97.6	
		Random Pixel	250	255	98.0	100	

Sub Module: Second Layer Control (continued)

		Stop (first pattern step)	0	2	0.0	0.8		
		CW fast → slow (run pattern step 1 → n)	3	63	1.2	24.7		
		Stop at current position	64	66	25.1	25.9		
		CCW slow → fast (run pattern step n → 1)	67	127	26.3	49.8		
		Pattern Step 01	128	129	50.2	50.6		
		Pattern Step 02	130	131	51.0	51.4		
		Pattern Step 03	132	133	51.8	52.2		
		Pattern Step 04	134	135	52.5	52.9		
		Pattern Step 05	136	137	53.3	53.7		
		Pattern Step 06	138	139	54.1	54.5		
		Pattern Step 07	140	141	54.9	55.3		
		Pattern Step 08	142	143	55.7	56.1		
		Pattern Step 09	144	145	56.5	56.9		
		Pattern Step 10	146	147	57.3	57.6		
		Pattern Step 11	148	149	58.0	58.4		
		Pattern Step 12	150	151	58.8	59.2		
		Pattern Step 13	152	153	59.6	60.0		
		Pattern Step 14	154	155	60.4	60.8		
		Pattern Step 15	156	157	61.2	61.6		
		Pattern Step 16	158	159	62.0	62.4		
		Pattern Step 17	160	161	62.7	63.1		
		Pattern Step 18	162	163	63.5	63.9		
		Pattern Step 19	164	165	64.3	64.7		
		Pattern Step 20	166	167	65.1	65.5		
		Pattern Step 21	168	169	65.9	66.3		
30	**Pattern step / speed**	Pattern Step 22	170	171	66.7	67.1	0	Snap
		Pattern Step 23	172	173	67.5	67.8		
		Pattern Step 24	174	175	68.2	68.6		
		Pattern Step 25	176	177	69.0	69.4		
		Pattern Step 26	178	179	69.8	70.2		
		Pattern Step 27	180	181	70.6	71.0		
		Pattern Step 28	182	183	71.4	71.8		
		Pattern Step 29	184	185	72.2	72.5		
		Pattern Step 30	186	187	72.9	73.3		
		Pattern Step 31	188	189	73.7	74.1		
		Pattern Step 32	190	191	74.5	74.9		
		Pattern Step 33	192	193	75.3	75.7		
		Pattern Step 34	194	195	76.1	76.5		
		Pattern Step 35	196	197	76.9	77.3		
		Pattern Step 36	198	199	77.6	78.0		
		Pattern Step 37	200	201	78.4	78.8		
		Pattern Step 41	208	209	81.6	82.0		
		Pattern Step 42	210	211	82.4	82.7		
		Pattern Step 43	212	213	83.1	83.5		
		Pattern Step 41	208	209	81.6	82.0		
		Pattern Step 42	210	211	82.4	82.7		
		Pattern Step 43	212	213	83.1	83.5		
		Pattern Step 44	214	215	83.9	84.3		
		Pattern Step 45	216	217	84.7	85.1		
		Pattern Step 46	218	219	85.5	85.9		
		Pattern Step 47	220	221	86.3	86.7		
		Pattern Step 48	222	223	87.1	87.5		
		Pattern Step 49	224	225	87.8	88.2		

Sub Module: Second Layer Control (continued)

		Pattern Step 50	226	227	88.6	89.0		
		Pattern Step 51	228	229	89.4	89.8		
		Pattern Step 52	230	231	90.2	90.6		
		Pattern Step 53	232	233	91.0	91.4		
		Pattern Step 54	234	235	91.8	92.2		
		Pattern Step 55	236	237	92.5	92.9		
		Pattern Step 56	238	239	93.3	93.7		
		Pattern Step 57	240	241	94.1	94.5		
		Pattern Step 58	242	243	94.9	95.3		
		Pattern Step 59	244	245	95.7	96.1		
		Pattern Step 60	246	247	96.5	96.9		
		Pattern Step 61	248	249	97.3	97.6		
		Pattern Step 62	250	251	98.0	98.4		
		Pattern Step 63	252	253	98.8	99.2		
		Pattern Step 64	254	255	99.6	100.0		
31	**Pattern step crossfading (from one step to next)**	Off (no crossfading, Snap)	0	9	0	3.5	0	Snap
		Crossfading: Snap → min. Xfade → max. Xfade (fade in and fade out times are identical)	10	127	3.9	49.8		Fade
		Off (no crossfading, Snap)	128	137	50.2	53.7		Snap
		Crossfading with tail: Snap → min. Xfade with tail → max. Xfade with tail (fade in time is shorter than fade out time)	138	255	54.1	100		Fade
32	**Pattern transition (from one pattern to next)**	Off (snap from one pattern to next)	0	9	0	3.5	0	Snap
		Normal transition (snap → fade 5s)	10	63	3.9	24.7		Fade
		Off (snap from one pattern to next)	64	73	25.1	28.6		Snap
		FOB (Fade Over Blackout) transition (snap → fade 5s)	74	127	29.0	49.8		Fade
		Off (snap from one pattern to next)	128	137	50.2	53.7		Snap
		FOF (Fade Over Full) transition (snap → fade 5s)	138	191	54.1	74.9		Fade
		No function	192	201	75.3	78.8		
		No transition time - reserved for future use	202	255	79.2	100.0		
33	**Red, pixel 01**	Intensity 0 → 100%	0	255	0	100	0	Fade
34	**Green, pixel 01**	Intensity 0 → 100%	0	255	0	100	0	Fade
35	**Blue, pixel 01**	Intensity 0 → 100%	0	255	0	100	0	Fade
36	**Red, pixel 02**	Intensity 0 → 100%	0	255	0	100	0	Fade
37	**Green, pixel 02**	Intensity 0 → 100%	0	255	0	100	0	Fade
38	**Blue, pixel 02**	Intensity 0 → 100%	0	255	0	100	0	Fade
39	**Red, pixel 03**	Intensity 0 → 100%	0	255	0	100	0	Fade
40	**Green, pixel 03**	Intensity 0 → 100%	0	255	0	100	0	Fade
41	**Blue, pixel 03**	Intensity 0 → 100%	0	255	0	100	0	Fade
42	**Red, pixel 04**	Intensity 0 → 100%	0	255	0	100	0	Fade
43	**Green, pixel 04**	Intensity 0 → 100%	0	255	0	100	0	Fade
44	**Blue, pixel 04**	Intensity 0 → 100%	0	255	0	100	0	Fade
45	**Red, pixel 05**	Intensity 0 → 100%	0	255	0	100	0	Fade
46	**Green, pixel 05**	Intensity 0 → 100%	0	255	0	100	0	Fade
47	**Blue, pixel 05**	Intensity 0 → 100%	0	255	0	100	0	Fade
48	**Red, pixel 06**	Intensity 0 → 100%	0	255	0	100	0	Fade
49	**Green, pixel 06**	Intensity 0 → 100%	0	255	0	100	0	Fade
50	**Blue, pixel 06**	Intensity 0 → 100%	0	255	0	100	0	Fade

Sub Module: Second Layer Control (continued)

51	Red, pixel 07	Intensity 0 → 100%	0	255	0	100	0	Fade
52	Green, pixel 07	Intensity 0 → 100%	0	255	0	100	0	Fade
53	Blue, pixel 07	Intensity 0 → 100%	0	255	0	100	0	Fade
54	Red, pixel 08	Intensity 0 → 100%	0	255	0	100	0	Fade
55	Green, pixel 08	Intensity 0 → 100%	0	255	0	100	0	Fade
56	Blue, pixel 08	Intensity 0 → 100%	0	255	0	100	0	Fade
57	Red, pixel 09	Intensity 0 → 100%	0	255	0	100	0	Fade
58	Green, pixel 09	Intensity 0 → 100%	0	255	0	100	0	Fade
59	Blue, pixel 09	Intensity 0 → 100%	0	255	0	100	0	Fade
60	Red, pixel 10	Intensity 0 → 100%	0	255	0	100	0	Fade
61	Green, pixel 10	Intensity 0 → 100%	0	255	0	100	0	Fade
62	Blue, pixel 10	Intensity 0 → 100%	0	255	0	100	0	Fade
63	Red, pixel 11	Intensity 0 → 100%	0	255	0	100	0	Fade
64	Green, pixel 11	Intensity 0 → 100%	0	255	0	100	0	Fade
65	Blue, pixel 11	Intensity 0 → 100%	0	255	0	100	0	Fade
66	Red, pixel 12	Intensity 0 → 100%	0	255	0	100	0	Fade
67	Green, pixel 12	Intensity 0 → 100%	0	255	0	100	0	Fade
68	Blue, pixel 12	Intensity 0 → 100%	0	255	0	100	0	Fade
69	Red, pixel 13	Intensity 0 → 100%	0	255	0	100	0	Fade
70	Green, pixel 13	Intensity 0 → 100%	0	255	0	100	0	Fade
71	Blue, pixel 13	Intensity 0 → 100%	0	255	0	100	0	Fade
72	Red, pixel 14	Intensity 0 → 100%	0	255	0	100	0	Fade
73	Green, pixel 14	Intensity 0 → 100%	0	255	0	100	0	Fade
74	Blue, pixel 14	Intensity 0 → 100%	0	255	0	100	0	Fade
75	Red, pixel 15	Intensity 0 → 100%	0	255	0	100	0	Fade
76	Green, pixel 15	Intensity 0 → 100%	0	255	0	100	0	Fade
77	Blue, pixel 15	Intensity 0 → 100%	0	255	0	100	0	Fade
78	Red, pixel 16	Intensity 0 → 100%	0	255	0	100	0	Fade
79	Green, pixel 16	Intensity 0 → 100%	0	255	0	100	0	Fade
80	Blue, pixel 16	Intensity 0 → 100%	0	255	0	100	0	Fade
81	Red, pixel 17	Intensity 0 → 100%	0	255	0	100	0	Fade
82	Green, pixel 17	Intensity 0 → 100%	0	255	0	100	0	Fade
83	Blue, pixel 17	Intensity 0 → 100%	0	255	0	100	0	Fade
84	Red, pixel 18	Intensity 0 → 100%	0	255	0	100	0	Fade
85	Green, pixel 18	Intensity 0 → 100%	0	255	0	100	0	Fade
86	Blue, pixel 18	Intensity 0 → 100%	0	255	0	100	0	Fade
87	Red, pixel 19	Intensity 0 → 100%	0	255	0	100	0	Fade
88	Green, pixel 19	Intensity 0 → 100%	0	255	0	100	0	Fade
89	Blue, pixel 19	Intensity 0 → 100%	0	255	0	100	0	Fade

DMX Mode 5: Multipix compressed

71 DMX Channels

Channel		Command	DMX range		Percent %		Default DMX	Fade

Main Module Basic control

Channel		Command	DMX range		Percent %		Default DMX	Fade
1	**Pan coarse**	Pan left → right	0	65535	0	100	32768	Fade
2	**Pan fine**							
3	**Tilt coarse**	Tilt front → back	0	65535	0	100	32768	Fade
4	**Tilt fine**							
5	**Intensity coarse**	Intensity 0 → 100%	0	65535	0	100	0	Fade
6	**Intensity fine**							
7	**Shutter**	Closed	0	4	0	1.6	0	Snap
		Single flash if value changed within the range 005 → 009	5	9	2.0	3.5		Fade
		Pulse slow → fast	10	39	3.9	15.3		Fade
		Pulse opening slow → fast	40	69	15.7	27.1		Fade
		Pulse closing slow → fast	70	99	27.5	38.8		Fade
		Double flash slow → fast	100	129	39.2	50.6		Fade
		Strobe random pixel slow → fast	130	159	51.0	62.4		Fade
		Strobe random all slow → fast	160	199	62.7	78.0		Fade
		Strobe sync all pixel slow → fast	200	250	78.4	98.0		Fade
		Open	251	255	98.4	100		Snap
8	**Zoom**	Zoom narrow → wide	0	255	0	100	0	Snap
9	**Control/Settings**	See 'Control / Settings channel' *on page 71*						
10	**Accessory 1**	Effect parameter 1	0	255	0	100	0	Snap
11	**Accessory 2**	Effect parameter 2	0	255	0	100	0	Snap
12	**CTC (Color Temperature Control)**	Open, selected white point	0	9	0	3.5	0	Snap
		Fade through color temperatures of 1000 K to 2500 K stepless (interpolation)	11	11	4.3	45.9		
			12	254	4.7	49.8		Fade
			255	255	100	53.7		Snap
13	**CQC (Color Quality Control) / Saturation**	HQ (high quality), saturated color	0	9	0	3.5	0	Snap
		Crossfade	10	117	3.9	45.9		Fade
		HQ (high quality), unsaturated color	118	127	46.3	49.8		Snap
		HO (high output), unsaturated color	128	137	50.2	53.7		
		Crossfade	138	245	54.1	96.1		Fade
		HO (high output), saturated color	246	255	96.5	100		Snap
15	**Red, pixel 01**	Intensity 0 → 100%	0	255	0	100	0	Fade
16	**Green, pixel 01**	Intensity 0 → 100%	0	255	0	100	0	Fade
17	**Blue, pixel 01**	Intensity 0 → 100%	0	255	0	100	0	Fade
18	**Red, pixel 02**	Intensity 0 → 100%	0	255	0	100	0	Fade
19	**Green, pixel 02**	Intensity 0 → 100%	0	255	0	100	0	Fade
20	**Blue, pixel 02**	Intensity 0 → 100%	0	255	0	100	0	Fade
21	**Red, pixel 03**	Intensity 0 → 100%	0	255	0	100	0	Fade
22	**Green, pixel 03**	Intensity 0 → 100%	0	255	0	100	0	Fade
23	**Blue, pixel 03**	Intensity 0 → 100%	0	255	0	100	0	Fade
24	**Red, pixel 04**	Intensity 0 → 100%	0	255	0	100	0	Fade
25	**Green, pixel 04**	Intensity 0 → 100%	0	255	0	100	0	Fade
26	**Blue, pixel 04**	Intensity 0 → 100%	0	255	0	100	0	Fade
27	**Red, pixel 05**	Intensity 0 → 100%	0	255	0	100	0	Fade
28	**Green, pixel 05**	Intensity 0 → 100%	0	255	0	100	0	Fade
29	**Blue, pixel 05**	Intensity 0 → 100%	0	255	0	100	0	Fade

Main Module Basic Control (continued)

30	Red, pixel 06	Intensity 0 → 100%	0	255	0	100	0	Fade
31	Green, pixel 06	Intensity 0 → 100%	0	255	0	100	0	Fade
32	Blue, pixel 06	Intensity 0 → 100%	0	255	0	100	0	Fade
33	Red, pixel 07	Intensity 0 → 100%	0	255	0	100	0	Fade
34	Green, pixel 07	Intensity 0 → 100%	0	255	0	100	0	Fade
35	Blue, pixel 07	Intensity 0 → 100%	0	255	0	100	0	Fade
36	Red, pixel 08	Intensity 0 → 100%	0	255	0	100	0	Fade
37	Green, pixel 08	Intensity 0 → 100%	0	255	0	100	0	Fade
38	Blue, pixel 08	Intensity 0 → 100%	0	255	0	100	0	Fade
39	Red, pixel 09	Intensity 0 → 100%	0	255	0	100	0	Fade
40	Green, pixel 09	Intensity 0 → 100%	0	255	0	100	0	Fade
41	Blue, pixel 09	Intensity 0 → 100%	0	255	0	100	0	Fade
42	Red, pixel 10	Intensity 0 → 100%	0	255	0	100	0	Fade
43	Green, pixel 10	Intensity 0 → 100%	0	255	0	100	0	Fade
44	Blue, pixel 10	Intensity 0 → 100%	0	255	0	100	0	Fade
45	Red, pixel 11	Intensity 0 → 100%	0	255	0	100	0	Fade
46	Green, pixel 11	Intensity 0 → 100%	0	255	0	100	0	Fade
47	Blue, pixel 11	Intensity 0 → 100%	0	255	0	100	0	Fade
48	Red, pixel 12	Intensity 0 → 100%	0	255	0	100	0	Fade
49	Green, pixel 12	Intensity 0 → 100%	0	255	0	100	0	Fade
50	Blue, pixel 12	Intensity 0 → 100%	0	255	0	100	0	Fade
51	Red, pixel 13	Intensity 0 → 100%	0	255	0	100	0	Fade
52	Green, pixel 13	Intensity 0 → 100%	0	255	0	100	0	Fade
53	Blue, pixel 13	Intensity 0 → 100%	0	255	0	100	0	Fade
54	Red, pixel 14	Intensity 0 → 100%	0	255	0	100	0	Fade
55	Green, pixel 14	Intensity 0 → 100%	0	255	0	100	0	Fade
56	Blue, pixel 14	Intensity 0 → 100%	0	255	0	100	0	Fade
57	Red, pixel 15	Intensity 0 → 100%	0	255	0	100	0	Fade
58	Green, pixel 15	Intensity 0 → 100%	0	255	0	100	0	Fade
59	Blue, pixel 15	Intensity 0 → 100%	0	255	0	100	0	Fade
60	Red, pixel 16	Intensity 0 → 100%	0	255	0	100	0	Fade
61	Green, pixel 16	Intensity 0 → 100%	0	255	0	100	0	Fade
62	Blue, pixel 16	Intensity 0 → 100%	0	255	0	100	0	Fade
63	Red, pixel 17	Intensity 0 → 100%	0	255	0	100	0	Fade
64	Green, pixel 17	Intensity 0 → 100%	0	255	0	100	0	Fade
65	Blue, pixel 17	Intensity 0 → 100%	0	255	0	100	0	Fade
66	Red, pixel 18	Intensity 0 → 100%	0	255	0	100	0	Fade
67	Green, pixel 18	Intensity 0 → 100%	0	255	0	100	0	Fade
68	Blue, pixel 18	Intensity 0 → 100%	0	255	0	100	0	Fade
69	Red, pixel 19	Intensity 0 → 100%	0	255	0	100	0	Fade
70	Green, pixel 19	Intensity 0 → 100%	0	255	0	100	0	Fade
71	Blue, pixel 19	Intensity 0 → 100%	0	255	0	100	0	Fade

Control / Settings channel

The Control / Settings commands listed below are available on Channel 9 in every DMX mode.

Channel		Command	DMX range		Percent %		Default DMX	Fade
		Idle	0	9	0.0	3.5		
		No function	10	11	3.9	4.3		
		IQ.Service connect	12	13	4.7	5.1		
		No function	14	19	5.5	7.5		
		Dimming curve Soft / Square, (3 sec.)	20	21	7.8	8.2		
		Dimming curve Linear, 3 sec.	22	23	8.6	9.0		
		Dimming curve S-curve, 3 sec.	24	25	9.4	9.8		
		No function	26	29	10.2	11.4		
		Display mode: Off (3 sec.)	30	31	11.8	12.2		
		Display mode: Auto (3 sec.)	32	33	12.5	12.9		
		Display mode: On (3 sec.)	34	35	13.3	13.7		
		No function	36	37	14.1	14.5		
		Display orientation: Auto (3 sec.)	38	39	14.9	15.3		
		Display orientation: Normal (3 sec.)	40	41	15.7	16.1		
		Display orientation: Inverted (3 sec.)	42	43	16.5	16.9		
		No function	44	45	17.3	17.6		
		No signal: Blackout (3 sec.)	46	47	18.0	18.4		
		No signal: Hold (3 sec.)	48	49	18.8	19.2		
		No signal: Play captured scene (3 sec.)	50	51	19.6	20.0		
		No signal: Capture current scene (3 sec.)	52	53	20.4	20.8		
		No function	54	55	21.2	21.6		
		Fan mode: Off (3 sec.)	56	57	22.0	22.4		
9	**Control / Settings**	**Fan mode: Regulated (3 sec.)**	58	59	22.7	23.1	0	Snap
		Fan mode: High (3 sec.)	60	61	23.5	23.9		
		Fan mode: Medium (3 sec.)	62	63	24.3	24.7		
		Fan mode: Low (3 sec.)	64	65	25.1	25.5		
		No function	66	69	25.9	27.1		
		Pixel mirror: Off (3 sec.)	70	71	27.5	27.8		
		Pixel mirror: x-mirror (3 sec.)	72	73	28.2	28.6		
		Pixel mirror: y-mirror (3 sec.)	74	75	29.0	29.4		
		Pixel mirror: x-y-mirror (3 sec.)	76	77	29.8	30.2		
		Pixel rotation: off (3 sec.)	78	79	30.6	31.0		
		Pixel rotation: 60° (3 sec.)	80	81	31.4	31.8		
		Pixel rotation 120° (3 sec.)	82	83	32.2	32.5		
		Pixel rotation 180° (3 sec.)	84	85	32.9	33.3		
		Pixel rotation 240° (3 sec.)	86	87	33.7	34.1		
		Pixel rotation 300° (3 sec.)	88	89	34.5	34.9		
		No function	90	91	35.3	35.7		
		Position feedback: Off (3 sec.)	92	93	36.1	36.5		
		Position feedback: On (3 sec.)	94	95	36.9	37.3		
		No function	96	97	37.6	38.0		
		Tilt invert Off (3 sec.)	98	99	38.4	38.8		
		Tilt invert On (3 sec.)	100	101	39.2	39.6		
		Pan invert Off (3 sec.)	102	103	40.0	40.4		
		Pan invert On (3 sec.)	104	105	40.8	41.2		
		No function	106	129	41.6	50.6		
		Performance: Fast (3 sec.)	130	131	51.0	51.4		
		Performance: Normal (3 sec.)	132	133	51.8	52.2		
		Performance: Smooth (3 sec.)	134	135	52.5	52.9		
		No function	136	137	53.3	53.7		

		White Point: 8000K (3 sec.)	138	139	54.1	54.5	
		White Point: 6500K (3 sec.)	140	141	54.9	55.3	
		White Point: 5600K (3 sec.)	142	143	55.7	56.1	
		White Point: 4200K (3 sec.)	144	145	56.5	56.9	
		White Point: 3200K (3 sec.)	146	147	57.3	57.6	
		No function	148	149	58.0	58.4	
		Sub Module mode Normal (3 sec.)	150	151	58.8	59.2	
		Sub Module mode Independent (3 sec.)	152	153	59.6	60.0	
		No function	154	165	60.4	64.7	
		Color Mode: RGB [1] (3 sec.)	166	167	65.1	65.5	
		Color Mode: RGBL [2] (3 sec.)	168	169	65.9	66.3	
		Color Mode: x;y [3] (3 sec.)	170	171	66.7	67.1	
		No function	172	181	67.5	71.0	
		iQ. Gamut: FULL (3 sec.)	182	183	71.4	71.8	
		iQ. Gamut: Rec. 2020 (3 sec.)	184	185	72.2	72.5	
		iQ. Gamut: Rec. 706 (3 sec.)	186	187	72.9	73.3	
		No function	188	191	73.7	74.9	
		Hibernation Off (3 sec., fixture will reset)	192	192	75.3	75.3	
		Hibernation On (3 sec.)	193	193	75.7	75.7	
		No function	194	195	76.1	76.5	
		Pan range: Normal (3 sec.)	196	197	76.9	77.3	
		Pan range : Extended (3 sec.)	198	199	77.6	78.0	
		No function	200	201	78.4	78.8	
		Accessory: None	202	203	79.2	79.6	
		Accessory: Egg crate	204	205	80.0	80.4	
		Accessory: Snoot	206	207	80.8	81.2	
		No function	208	215	81.6	84.3	
		PWM Optimal (3 sec.)	216	217	84.7	85.1	
		PWM High 1 (3 sec.)	218	219	85.5	85.9	
		PWM High 2 (3 sec.)	220	221	86.3	86.7	
		PWM Max. (3 sec.)	222	223	87.1	87.5	
		No function	224	229	87.8	89.8	
		Save as User Settings Preset 1 (3 sec.)	230	231	90.2	90.6	
		Save as User Settings Preset 2 (3 sec.)	232	233	91.0	91.4	
		Save as User Settings Preset 3 (3 sec.)	234	235	91.8	92.2	
		No function	236	237	92.5	92.9	
		Load User Settings Preset 1 (3 sec.)	238	239	93.3	93.7	
		Load User Settings Preset 2 (3 sec.)	240	241	94.1	94.5	
		Load User Settings Preset 3 (3 sec.)	242	243	94.9	95.3	
		Load Settings Default	244	245	95.7	96.1	
		No function	246	249	96.5	97.6	
		Reset pan/tilt (3 sec.)	250	251	98.0	98.4	
		Reset head (3 sec.)	252	253	98.8	99.2	
		Reset ALL (3 sec.)	254	255	99.6	100	

To reduce the risk of accidentally changing settings, the commands on the Control / Settings channel must be held for a certain time before they are executed. The above table indicates the number of seconds that you must hold a command.

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10. Key to conversion of x and y coordinates

The following formulas are used when converting DMX values to x/y coordinates on the RGB and RGBL color mixing channels:

8-bit

$$\text{DMX}\,x = \frac{x\text{ co-ordinate} \times 255}{0.8}$$

$$\text{DMX}\,y = \frac{y\text{ co-ordinate} \times 255}{0.8}$$

16-bit

$$\text{DMX}\,x = \frac{x\text{ co-ordinate} \times 65535}{0.8}$$

$$\text{DMX}\,y = \frac{y\text{ co-ordinate} \times 65535}{0.8}$$

11. Color wheel specifications

The following table gives the color gamut co-ordinates of the color presets available on the color wheel effect.

Filter 004, Medium Bastard Amber	0.37;0.335
Filter 019, Fire	0.664;0.31
Filter 025, Sunset Red	0.566;0.359
Filter 026, Bright Red	0.712;0.281
Filter 036, Medium Pink	0.36;0.268
Filter 049, Medium Purple	0.283;0.101
Filter 058, Lavender	0.212;0.099
Filter 068, Sky Blue	0.151;0.128
Filter 088, Lime Green	0.356;0.511
Filter 089, Moss Green	0.259;0.547
Filter 090, Dark Yellow Green	0.184;0.641
Filter 102, Light Amber	0.434;0.44
Filter 103, Straw	0.336;0.359
Filter 106, Primary Red	0.699;0.285
Filter 111, Dark Pink	0.389;0.215
Filter 115, Peacock Blue	0.134;0.296
Filter 117, Steel Blue	0.223;0.278
Filter 118, Light Blue	0.149;0.113
Filter 121, Filter Green	0.302;0.534
Filter 122, Fern Green	0.234;0.543
Filter 124, Dark Green	0.123;0.586
Filter 126, Mauve	0.287;0.082
Filter 128, Bright Pink	0.401;0.151
Filter 131, Marine Blue	0.199;0.305
Filter 132, Medium Blue	0.137;0.11
Filter 134, Golden Amber	0.501;0.371
Filter 135, Deep Golden Amber	0.667;0.326
Filter 136, Pale Lavender	0.288;0.254
Filter 137, Special Lavender	0.231;0.175
Filter 138, Pale Green	0.331;0.433
Filter 140, Summer Blue	0.201;0.245
Filter 141, Bright Blue	0.129;0.159
Filter 143, Pale Navy Blue	0.17;0.205
Filter 147, Apricot	0.446;0.381
Filter 148, Bright Rose	0.482;0.238
Filter 152, Pale Gold	0.37;0.332
Filter 154, Pale Rose	0.35;0.318
Filter 157, Pink	0.457;0.272
Filter 162, Bastard Amber	0.348;0.328

Filter 164, Flame Red	0.659;0.302
Filter 165, Daylight Blue	0.159;0.158
Filter 169, Lilac Tint	0.294;0.281
Filter 170, Deep Lavender	0.278;0.211
Filter 172, Lagoon Blue	0.141;0.22
Filter 180, Dark Lavender	0.191;0.072
Filter 182, Light Red	0.67;0.313
Filter 194, Surprise Pink	0.24;0.183
Filter 197, Alice Blue	0.164;0.118
Filter 201, Full C.T. Blue	0.228;0.233
Filter 202, Half C.T. Blue	0.261;0.273
Filter 203, Quarter C.T. Blue	0.285;0.294
Filter 204, Full C.T. Orange	0.437;0.392
Filter 206, Quartet C.T. Orange	0.346;0.34
Filter 219, Fluorescent Green	0.219;0.334
Filter 247, Filter Minus Green	0.325;0.279
Filter 248, Half Minus Green	0.317;0.297
Filter 281, Three Quarter C.T. Blue	0.239;0.258
Filter 285, Three Quarter C.T. Orange	0.4;0.387
Filter 352, Glacier Blue	0.171;0.19
Filter 353, Lighter Blue	0.193;0.246
Filter 506, Madge	0.662;0.337
Filter 778, Millennium Gold	0.606;0.382
Filter 793, Vanity Fair	0.419;0.17
Filter 798, Chrysalis Pink	0.191;0.061

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