FUSION by GLP

# Exo Hybrid 40

User Manual

Document revision: 20241028-02

Fixture software version 0.2.2

## Document revisions

| Revision number | Notes | Date released |
|---|---|---|
| 20241028-02 | First release of the User Manual for the Fusion Exo Hybrid 40.<br>Covers firmware v. 0.2.2 | October 2024 |

GLP® Fusion Exo Hybrid 40 User Manual



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# 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. |
|  | **Important Information** for correct use of the product | | |


**Warning! Read the Fusion Exo Hybrid 40 Quick Start and Safety Manual supplied with the 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 Fusion Exo Hybrid 40 fixtures. If you fail to read that information you may create a safety hazard with a risk of serious or lethal injury or damage.**

If you have any doubts or questions about how to use the GLP® Fusion Exo Hybrid 40 lighting fixture safely, contact your GLP supplier for assistance. Your GLP supplier will be happy to help.

The user documentation for Fusion Exo Hybrid 40 fixtures consists of three documents:

- The **Fusion Exo Hybrid 40 Quick Start and Safety Manual**, supplied with 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 dimensions drawings and technical specifications for the fixture.
- The **Fusion Exo Hybrid 40 User Manual**, (this document). The User Manual explains features and control of Fusion Exo Hybrid 40 fixtures.
- The **Fusion Exo Hybrid 40 DMX Channel Index**, available for download from www.glp.de. The Channel Index is a separate document containing the DMX control channel layout and DMX commands available in the fixture.

The Fusion Exo Hybrid 40 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 fixture's user documentation and on the fixture. Read the fixture's Quick Start and Safety Manual and familiarize yourself with the safety precautions that it contains. 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 fixture's Quick Start and Safety Manual and this user manual.
- 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 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 user 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 fixture. Save both documents for future reference.
- If you have any questions about the safe operation of the fixture, please contact an authorized GLP distributor (see list of distributors at www.glp.de).

## *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 1955
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- 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. Fusion Exo Hybrid 40 overview


***Figure 1. Fusion Exo Hybrid 40 overview***

**A - Head**
**B – Tilt Lock**
**C - Pan Lock**
**D - Control panel with backlit display and NFC sensor**
**E - AC mains power IN (powerCON TRUE1 TOP)**
**F - DMX IN (5-pin XLR)**
**G - etherCON port A ethernet connection, fail-safe**
**H - AC mains power THRU (powerCON TRUE1 TOP)**
**I - DMX THRU/OUT (5-pin XLR)**
**J - etherCON port B ethernet connection, fail-safe**

# 3. Features

The FUSION Exo Hybrid 40 is an LED beam/spot fixture characterised by its high light output. Based on a 380 W white light LED, excellent optics with a 135 mm front lens and a zoom range of 3.8° to 46°, it offers plenty of light output for small to medium-sized stages as well as for outdoor applications and festivals.

A comprehensive feature package for spot, beam or wash applications makes the FUSION Exo Hybrid 40 a versatile choice. This includes a CMY colour mixing system plus separate CTO, 12 fixed colours and additional 4 colour correction filter, two gobo wheels, an animation wheel, a frost system and two combinable prisms.

The IP65-rated construction enables a full range of indoor and temporary outdoor applications. Neither wind nor rain, dust, dirt, fog generator fluid residue or confetti particles are an issue to worry about.

In addition to the powerCON True 1 In/Out and DMX 5pin In/Out, two fail-safe ethernet ports, a LumenRadio CRMX module and the proven GLP iQ.Mesh system are already integrated for particularly flexible and universal use. With this range of features and a weight of just 25 kg, the FUSION Exo Hybrid is extremely compact and easy to set up in busy working environments.

## *Control options*

The Fusion Exo Hybrid 40 is compatible with DMX 512, RDM, Art-Net, sACN, iQ.Mesh and CRMX control protocols.

When receiving Art-Net or sACN the fixture can output the received data to the DMX XLR port for use by other fixtures (**Protocol Setup → Node** option).

When no control data is being received you can set the fixture to Blackout, Hold the last data or go to a stored stand alone scene (**Fixture Settings → No Signal** option).

The fixture also features GLP iQ.Mesh and a LumenRadio CRMX module supplied installed in the fixture as standard. The GLP iQ.Mesh Module allows easy configuration, control, service and maintenance via the GLP iQ.Service App. Other FPO modules can be supplied on request – GLP Service can give details.

## *User setting presets*

You can store the current fixture option settings in one of 3 presets, this allows you to recall the fixture options into a known state (**Fixture Settings → Load Settings** and **Service → Advanced → Save Settings**).

## *Pan and Tilt*

The Fusion Exo Hybrid 40 has motorized pan and tilt movement with coarse and fine (16 bit) control channels.

### Direction of movement

With the fixture standing on the ground:

- Increasing Pan moves yoke clockwise from home position.
- increasing Tilt moves head to the front from home position.

Pan/Tilt direction can be reversed using the **Fixture Settings → Invert** settings or via DMX on the Special/Control channel. This can be useful when setting up symmetrical movement in multiple fixtures.

### Position feedback and self-correction

The fixture has a position feedback and self-correction system that brings the head back to its correct position if it was unintentionally moved.

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.

Motor drive and position feedback are automatically disabled for a short time if you press one of the control panel buttons so you can move the head manually to access the display panel. Pan/Tilt remains 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** option.

## *Fixture performance (speed) options*

You can adjust the speed (and noise level) of fixture movements and its internal function motors by selecting from 4 different performance options in **Fixture Settings → Performance.**

## *Intensity / Dimmer*

The electronic dimming effect provides smooth 16-bit dimming of the fixture output. Three dimming curves with different dimming characteristics are available.

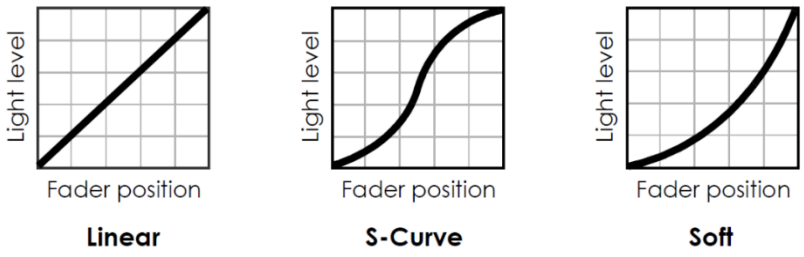



***Figure 2. Dimming curves***

The PWM frequency of the LED dimming can be adjusted if you have problems with camera flicker using the **Fixture Settings → PWM Frequency** option. The PWM Frequency is shown on the top line of the screen. Higher PWM frequencies will reduce the dimming performance / resolution.

## *Shutter*

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

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 random** strobes the fixture at random intervals, allowing a random strobe between multiple fixtures. Speed can be adjusted from slow to fast.
- **Strobe** strobes the fixture at a regular speed 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.

## *Control / Special channel*

The Special/Control DMX channel lets you change fixture settings and perform a fixture reset from the control desk (which can be very useful during a show). To apply a command on the Special/Control channel, you must hold the command for the time indicated in the DMX channel index (usually 3 seconds).

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 stops the fixture getting into an unwanted Reset loop if it is patched wrongly.

*Note: Most of the fixture settings available in the fixture's control menus or on the Special/Control DMX channel are also available via RDM.*

## *Zoom*

The Fusion Exo Hybrid 40 has motorized zoom control that lets you vary the beam angle from narrow to wide as the DMX value increases.

The "Performance" Setting allows you to limit the Zoom speed to control the noise made by the zoom movement.

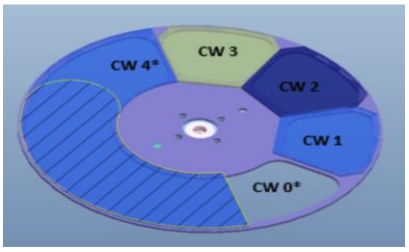
## *Focus*

The Focus Channel let you adjust the sharpness of the projection.

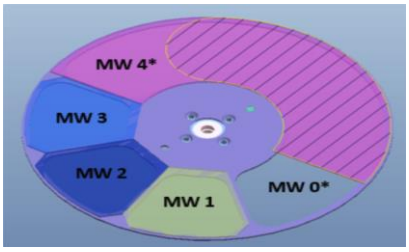
## *Color Mix / Color Wheel / CTC*

The Color and CTC functions of the fixture are based on four color wheels which have a combination of variable and fixed colors for Cyan, Magenta, Yellow and Color Temperature Correction.

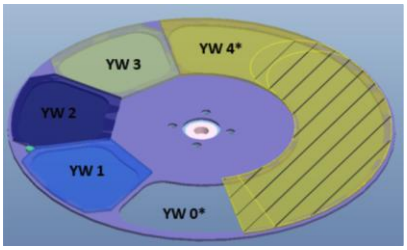
Cyan color wheel



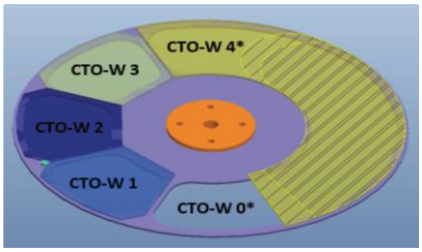

Magenta color wheel




Yellow color wheel

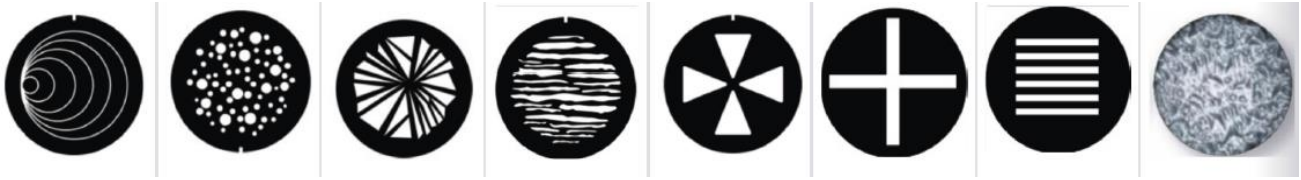



CTC wheel




## *Gobo Wheel 1 (rotating gobos)*

Gobo Wheel 1 has eight rotatable gobos. Each gobo can be selected for index position, rotation or swing. It is possible to rotate the full gobo wheel through all gobos.



0: open (not shown)

1: Round stairs

2: Little dots

3: Shattered

4: Zebra

5: Center Mark

6: Crossed lines

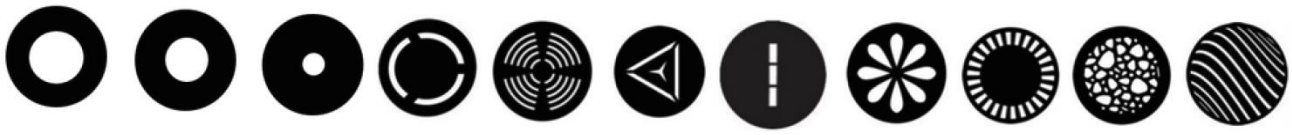
7: Block of lines

8: Ornament

Gobos are interchangeable.

## *Gobo Wheel 2 (static)*

Gobo Wheel 2 is a fixed wheel with 11 positions. A gobo shake effect may be added and it is possible to continuously rotate the wheel through all gobos.



0: open (not shown)

1: large dot

2: medium dot

3: small dot

4: Three thirds circle

5: Sonic

6: Star in triangle

7: Three thirds line

8: Daisy flower

9: Lines in circle

10: Gravel

11: Wave lines

## *Effect / Animation wheel*

The fixture has an effect/animation wheel which can be rotated at variable speed in either direction to give a ripple or movement effect (adjust focus to give desired effect).

## *Frost*

The variable frost allows you to soften the edges of the projected light beam.

## *Prism 1 / 2*

The fixture has two different prism effects (linear and circular) which can be used individually or in combination. The prisms can be indexed in a fixed position from 0..360 degrees or can be continuously rotated in either direction.

# 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, tilt is automatically disabled for a few seconds if you press any button on the control panel. Tilt remains 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 tilt correction applied.

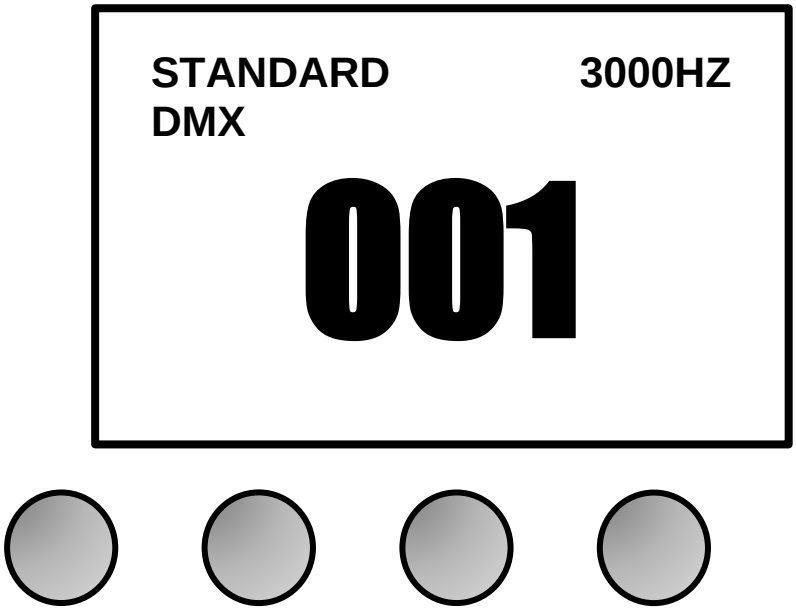



***Figure 3. Default information screen***

## *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 3. The top line of the default information screen shows:

- DMX Mode
- LED Dimming PWM (top right)
- Input control source

The center of the screen shows the fixture's current DMX address in large characters. If the fixture's self-diagnosis system detects an error, the fixture will flash an error message alternately with the DMX address. This lets you see the DMX address and error message at a distance from the fixture.

- If the fixture detects a valid, active network at one of the fixture's etherCON ports, the ethernet lights to the left of the screen will light up.
- If the fixture detects a valid wireless DMX signal the wireless light will light up.

## *Using the control panel*

The four control panel buttons below the display have the following functions

*In the main screen:*

- MODE/ESC: Activates the Quick Menu
- UP/DOWN: Press three times to open the live diagnostic tool
- ENTER: Activates the control panel if it is in sleep mode, then opens the main menu

*When navigating through the menus:*

- MODE/ESC: Goes back one level towards the top of the menu
- UP: Scrolls up or increases a number
- DOWN: Scrolls down or decreases a number
- ENTER: Confirms a setting or implements a command

*At any time:*

- UP and DOWN together: Temporarily rotates the display 180°

## *Control button shortcuts*

### Battery Eco Mode (available in Battery Mode only)

When the fixture is running on battery power, 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.*

## *Error Messages*

If the fixture detects an error, it displays an error message in the display. The Error is 'sticky' and will continue to be shown in the display until the next power cycle or reset. To get details of the error message, follow the information in the display. These details are important if you talk to GLP service.

- Pressing ESC ignores the error message and exits the error display.
- Pressing ENTER shows information about the error.

*Note: Make a note of any error message displayed. You may need these details for error diagnosis. Please be ready to give them to GLP Service if necessary.*

Certain critical error messages are permanently stored in the display. In this case, please contact your GLP service agent.

When restarting the fixture or sending a RESET command, the fixture performs an initialization process to test all functions and sensors. The fixture also continuously checks itself for correct operation.

## *Loss of DMX signal*

The display flashes if the DMX signal is lost (the fixture will then behave according to its No Signal setting.

## *Service and maintenance*

See the separate *Fusion Exo Hybrid 40 Quick Start and Safety Manual* supplied with the fixture and available for download from www.glp.de for information on service and maintenance.

# 5. Control menu structure

## *Quick menu*

The control panel's Quick Menu gives you quick access to the most frequently used commands. To open the Quick Menu, press MODE/ESC 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 Preset 1 | >>>Confirm<<< | *Loads custom user settings* |
| | User Setting Preset 2 | >>>Confirm<<< | |
| | User Setting Preset 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*<br><br>>>>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 Fusion Exo Hybrid 40 control panel. Options may also be set by RDM. Some options can be changed while operating using the Control/Settings channel.

| **Menus** | | | ***Notes*** |
|---|---|---|---|
| DMX Address | | | |
| **001**-512 | | | *Set fixture's DMX start address. Highest possible address depends on control mode.* |
| Protocol Setup | | | |
| Data In | **DMX** | | *Control via DMX protocol* |
| | CRMX | | *Control via CRMX* |
| | Art-Net | | *Control via Art-Net* |
| | sACN | | *Control via sACN* |
| Ethernet Config | Addressing Mode | **Auto 2.x.x.x** | |
| | | Auto 10.x.x.x | |
| | | DHCP | |
| | | Custom IP | |
| | Custom IP Address | 0.0.0.0 | |
| | Custom IP Subnet | 0.0.0.0 | |
| | ArtNet Port | 0..32768 | |
| | sACN Universe | 1..63999 | |
| Node | **Disabled** | | *Received data (ArtNet, sACN) to be sent out of DMX XLR port* |
| | Enabled | | |
| Linking Options | CRMX Unlink | | *Unlink from existing CRMX network* |
| Fixture Settings | | | |
| Dimmer Curve | **Soft** | | *Soft (square law) dimming curve* |
| | Linear | | *Linear 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* |
| | Minimum | | *All fans off or at minimum speed* |
| Performance | Fast | | *Set Mechanical effects speed to control fixture noise level.* |
| | **Normal** | | |
| | Smooth | | |
| | Low Temperature | | |
| PWM Frequency | 600Hz | | *Set PWM dimming frequency of light source to prevent flicker. Higher frequencies have less dimming resolution.* |
| | 2200Hz | | |
| | **3000Hz** | | |
| | 4800Hz | | |

| **Menus** | | | ***Notes*** |
|---|---|---|---|
| | 9600Hz | | |
| | 25000Hz | | |
| 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 pan movement* |
| | On | | |
| Tilt Invert | **Off** | | *Reverse tilt movement* |
| | On | | |
| Pan Disable | **Off** | | *Disable pan motors* |
| | On | | |
| Tilt Disable | **Off** | | *Disable tilt motors* |
| | On | | |
| Position feedback | Off | | *Enable/disable /tilt position correction* |
| | **On** | | |
| Zoom Invert | **Off** | | *Invert zoom so 0=wide, 255=narrow* |
| | On | | |
| 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 3 sec.<<< | *Apply a user preset to fixture settings* |
| | User Settings 2 | >>> Confirm 3 sec.<<< | |
| | User Settings 3 | >>> Confirm 3 sec.<<< | |
| | Setting Defaults | >>> Confirm 3 sec.<<< | *Return fixture to default settings (not including DMX address, protocol type, Ethernet / CRMX configuration, user offsets,* |

| **Menus** | | | ***Notes*** |
|---|---|---|---|
| | | | *user presets and counters)* |
| Information | | | |
| Live diagnostic | | | *Shows overview of fixture information* |
| Show errorlist | | | *Shows any stored errors* |
| Show Serial Number | | | |
| Show SW Version | | | |
| Show Product Version | | | |
| Show Device Info | | | |
| Show Fixture Counter | | | *Shows lamp and operation timers and counters* |
| Manual Control | | | |
| Reset All | | | *Reset all effects* |
| Reset P/T | | | *Reset pan and tilt* |
| Reset Head | | | *Reset all effects except tilt* |
| Manual DMX<br><br>***Warning! Fixture will start moving***<br><br>Press **Enter** | Pan | 000-255 | *Manually control all effects* |
| | Tilt | 000-255 | |
| | ...<br>*Scroll through all effects*<br>... | | |
| | Reset Manual Values | *Confirm for 3 seconds (press Enter)* | *Reset all manually entered DMX values to zero* |
| Service | | | |
| Test All | | | *Run test sequence of all effects.. Stop with ESC.* |
| Test P/T | | | *Run test sequence of pan/tilt.* |
| Test LED | | | *Run test sequence of LED.* |
| Test Zoom | | | *Run test sequence of zoom.* |
| Test Fans (Auto) | | | *Automatic fan test* |
| Test Fans (Manual) | | | *Manually test fans one by one* |
| Test Encoders | | | *Test movement position sensors* |
| Advanced<br>*(Press and hold for 3 secs.)* | Service Mode | **OFF** | *Normal operation* |
| | | ON | *Disable tilt and display timeouts (exit by cycling power off and on.)* |
| | Job offsets | Pan<br>Tilt<br>Zoom<br>... | *Create custom job offsets in home positions of all effects. Default offset = **0***<br>*Note: This function is not fixture calibration!* |
| | Reset counters | Lamp Hours | *Press Enter for 3 seconds to confirm* |
| | | Power Cycles | |
| | | LED Hours | |
| | | Max Temperature | |
| | | Service Timer | |

| **Menus** | | | | ***Notes*** |
|---|---|---|---|---|
| | 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 | |
| Load factory defaults | | | | |
| >>>Confirm by pressing Enter<<< | | | | *Reloads all factory default settings and default fixture configuration settings.* ***Important! Controller may lose connection to fixture!*** |

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


GLP