

# **MAC Encore Performance**

## **CLD and WRM**

### **User Guide**



**Martin**<sup>®</sup>  
by HARMAN

### **User Documentation update information**

Any important changes in the MAC Encore Performance User Guide are listed below.

#### **Revision C**

Released March 2023. Improved information on channels 9 and 12 in DMX Protocol section. Added short explanation of PWM Slider and Stepper Motor FX. Covers firmware v. 1.6.1

#### **Revision B**

Released January 2018. Added information on light output intensity in different cooling modes. Covers firmware version 1.1.0.

#### **Revision A**

First version released. Covers MAC Encore Performance firmware version 1.0.0.

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**MAC Encore Performance User Guide, P/N 5089616-00, Rev. C**

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# Introduction



***Warning! Before using the MAC Encore Performance, read the latest version of the product's Safety and Installation Manual, paying particular attention to the Safety Precautions section. The Safety and Installation Manual is available for download from the MAC Encore Performance Support and Downloads page on the Martin website at [www.martin.com](http://www.martin.com).***

This User Guide is a supplement to the Installation and Safety Manual that is supplied with the MAC Encore Performance. Both these documents are available for download from the MAC Encore Performance product pages on the Martin® website at [www.martin.com](http://www.martin.com). This User Guide contains information that is mainly of interest for lighting designers and operators, whereas the Safety and Installation Manual contains important information for all users, especially installers and technicians.

We recommend that you check the Martin® website regularly for updated documentation, because we publish revised versions each time we can improve the quality of the information we provide and each time we release new firmware with changes or new features. Each time we revise this guide, we list any important changes on page 2 so that you can keep track of updates.

You can also see the full product specifications and a range of useful documents such as 2D and 3D drawings by visiting the MAC Encore Performance product pages at [www.martin.com](http://www.martin.com).

# Effects

This section gives details of the effects that can be controlled via DMX. See the DMX protocol table on page 22 for details of the channels used to control them.

Where fine control is available, the main control channel sets the first 8 bits (the most significant byte or MSB), and the fine channels set the second 8 bits (the least significant byte or LSB) of the 16-bit control byte. In other words, the fine channel works within the position set by the coarse channel.

## Shutter and strobe effects

The MAC Encore Performance's dimmer/shutter provides instant blackout and snap open as well as regular or random strobe effects with variable speed from approx. 1 Hz to 25 Hz.

## Dimming

The dimmer effect provides smooth, high-resolution fading from 100% to zero.

Fine 16-bit dimming control is available on DMX channels 2 and 3.

## Cyan, Magenta, Yellow and CTC

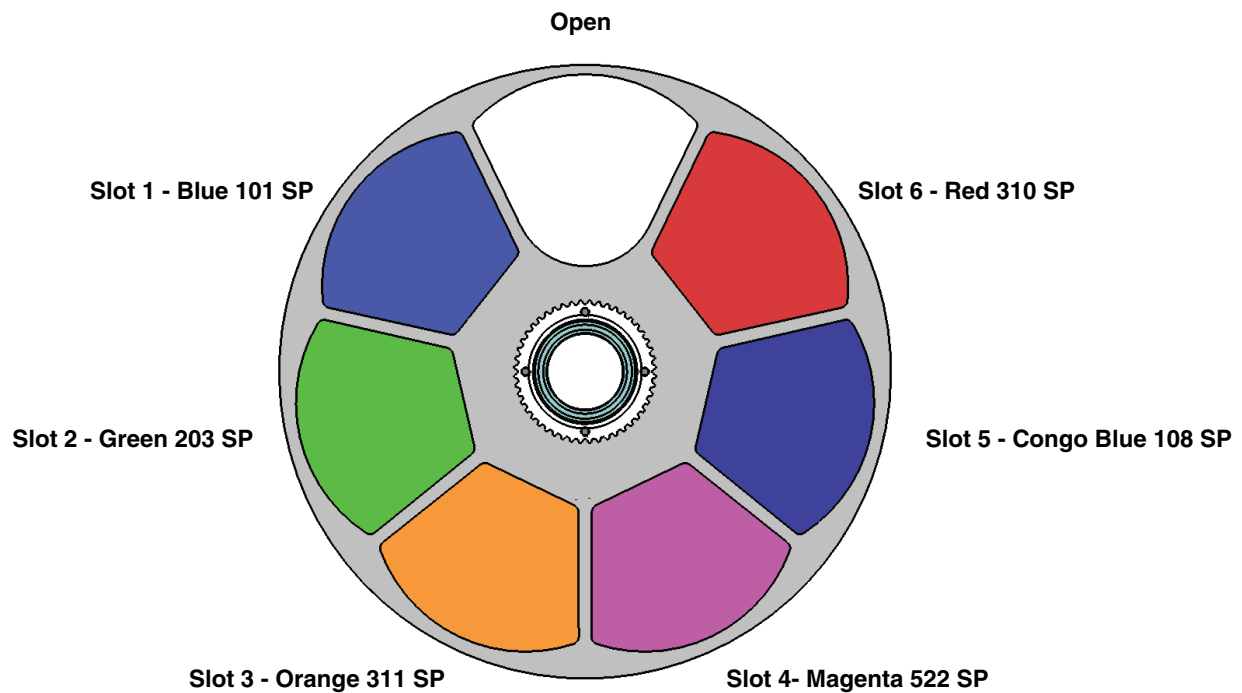
The amount of cyan, magenta, yellow applied to the MAC Encore Performance's light output can be varied from zero to 100%.

The amount of CTC (color temperature control) applied can also be varied from zero to 100%. The CTC flags installed as standard vary between CLD and WRM models:

- The CTC flags installed in CLD models let you apply a variable amount of warm color temperature.
- The CTC flags installed in WRM models let you apply a variable amount of cold color temperature.

# Color wheel

The color wheel has six color filters that can be applied as split colors or in full-color steps. The color wheel can also be scrolled continuously, applying the color filters in sequence with control of color wheel speed and direction. Color filters can also be applied in random order at fast, medium or slow speed.



*Color wheel seen from lamp side*

**Figure 1: Color wheel**

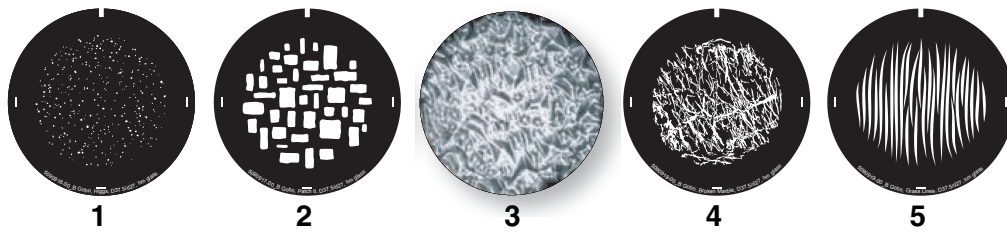
As standard, the MAC Encore Performance is supplied with the following color filters installed:

- Slot 1 - Blue 101 - P/N 5076512
- Slot 2 - Green 203 SP - P/N 5076513
- Slot 3 - Orange 311 SP - P/N 5076514
- Slot 4 - Magenta 522 SP - P/N 5076515
- Slot 5 - Congo Blue 108 SP - P/N 5076516
- Slot 6 - Red 310 SP - P/N 5076517
- Slot 7 - Open

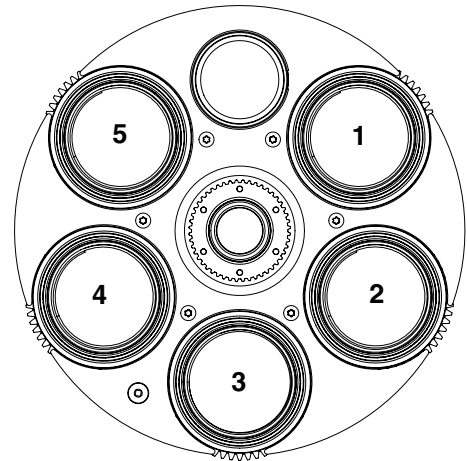
# Rotating gobos

The rotating gobo wheel in the MAC Encore Performance has five rotating gobos that can be selected, indexed (positioned at an angle), rotated continuously, and shaken (bounced). The wheel can also be scrolled continuously or shaken. Gobo indexing, continuous gobo rotation, gobo shake and continuous wheel scrolling are selected on channel 9. Depending on what is selected on this channel, the gobo indexed angle or gobo rotation speed are set on channels 10 and 11, where fine 16-bit control is available.

The standard gobos are shown in the correct order in Figure 2. All gobos are interchangeable, but replacement gobos must match the dimensions, construction and quality of the gobos supplied as standard. The gobos are E-27 size (standard E-size 37.5 mm external diameter, 27 mm image area diameter). Limbo/Crystal is a custom gobo glued permanently into its holder. If you replace Limbo/Crystal, you will therefore need to order an additional goboholder.



Slot - Gobo	Part number
1. Higgs .....	P/N 5090916
2. Patch It .....	P/N 5090917
3. Limbo/Crystal in holder.....	P/N 62325152
4. Broken Marble .....	P/N 5090918
5. Grass Lines .....	P/N 5090919



*Gobo wheel seen from lamp side*

**Figure 2: Rotating gobos installed as standard**

# Animation wheel

The MAC Encore Performance is supplied with the “Radial Breakup” animation wheel (P/N 5069571) installed. The wheel can be used to add animation effects to gobo projections.

Animation position and rotation are selected on channel 12 and adjusted on channel 13.

When using gobo animation, adjust the fixture’s focus to obtain the most realistic results.

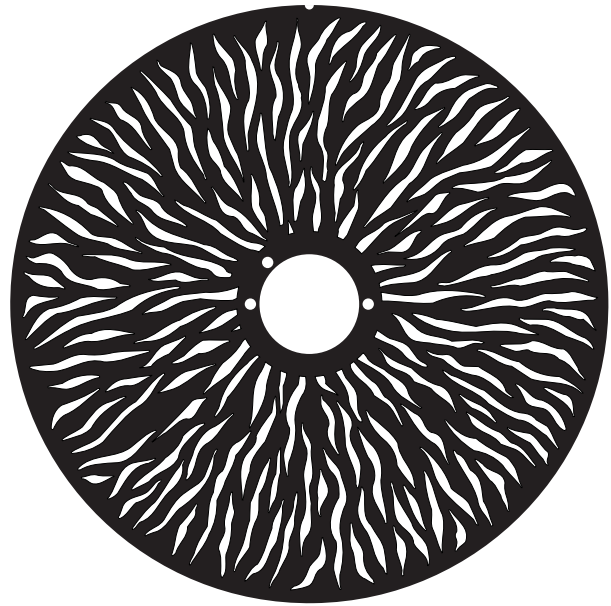


Figure 3: ‘Radial Breakup’ animation wheel

## Frost

The amount of frost filter inserted in the beam is variable 0 - 100%.

The MAC Encore Performance is supplied with a light (low diffusion) frost filter installed as standard. A heavy (medium-to-high diffusion) frost filter assembly, P/N 91001002HU, is available as an accessory from your Martin supplier.

## Iris

The iris lets you change the diameter of the beam and projections. You can adjust the iris from fully open to closed.

## Zoom and focus

The focus system allows sharp or soft projections. Focus range varies with zoom angle. At the narrowest zoom angle, nearest focus is approximately 6 meters (20 feet). As the zoom angle is widened, the nearest focus distance is reduced, down to approximately 2 meters (6.8 ft.), and far focus can be set to approximately infinity.

The internal zoom system varies the focused beam angle from 12° to 48°.

### Zoom/focus linking

Focus can be linked to zoom so that it automatically adjusts to match changes in zoom angle. Focus on rotating gobos matches zoom closely, while focus on the gobo animation wheel matches zoom best in the center of the zoom range and slightly less precisely at the two extremes of the zoom range.

Linked zoom/focus works within 3 distance ranges (figures are approximate):

- Near (7 meters / 25 ft.)
- Medium (15 meters / 50 ft.)
- Far (30 meters / 100 ft. - infinity)



To link zoom and focus, select a distance range using the Fixture Control/Settings DMX channel or **FOCUS TRACKING** in the control panel **PERSONALITY** menu. Then adjust focus to obtain the required degree of sharpness. Linking is now enabled and focus will auto-adjust.

## Framing

The 4-blade framing module in the MAC Encore Performance can be rotated to an indexed position within a range of 110°. Independent control of angle and amount of insertion is available for each blade. You can insert one or more blades into the beam projection and also form the beam into any shape with three or four flat sides.

## Pan and tilt

16-bit pan and tilt control are available.

## Pre-programmed FX

The MAC Encore Performance offers a range of pre-programmed effect macros that we simply call FX. These macros give instant access to complex dynamic effects with no need for time-consuming programming at the controller. See “FX: pre-programmed effects” on page 27 for a full list of the FX available.

Most of the FX are easy to understand based on their names, but two of them deserve a short explanation:

- The **PWM Slider** FX adjusts the LED PWM refresh rate. Once you have selected **PWM Slider** on the FX Selection channel, you can use the next channel to adjust the PWM refresh rate from 2000 Hz to 3000 Hz as follows:

DMX value	Function
0 - 126	PWM frequency 3000 Hz
127 - 255	PWM frequency reduces from 3000 to 2000 Hz (NB: reduction is not precisely linear)

- The **Stepper Motor** FX applies ‘steppy’ tracking to the color wheel, iris, rotating gobo wheel rotation, gobo rotation, fixed gobo wheel rotation and prism rotation. When **Stepper Motor** is selected, control input is down-sampled and these effects move in hard steps. If you select **Stepper Motor** on the FX Selection channel, the next channel (FX Speed) adjust the size of the steps and adjusts their frequency from approx. 20 ms - 600 ms.

# Control panel operations

You can configure individual fixture settings (such as the MAC Encore Performance's DMX address), read out data, execute service operations and view error messages using the fixture's backlit graphic display and control panel.

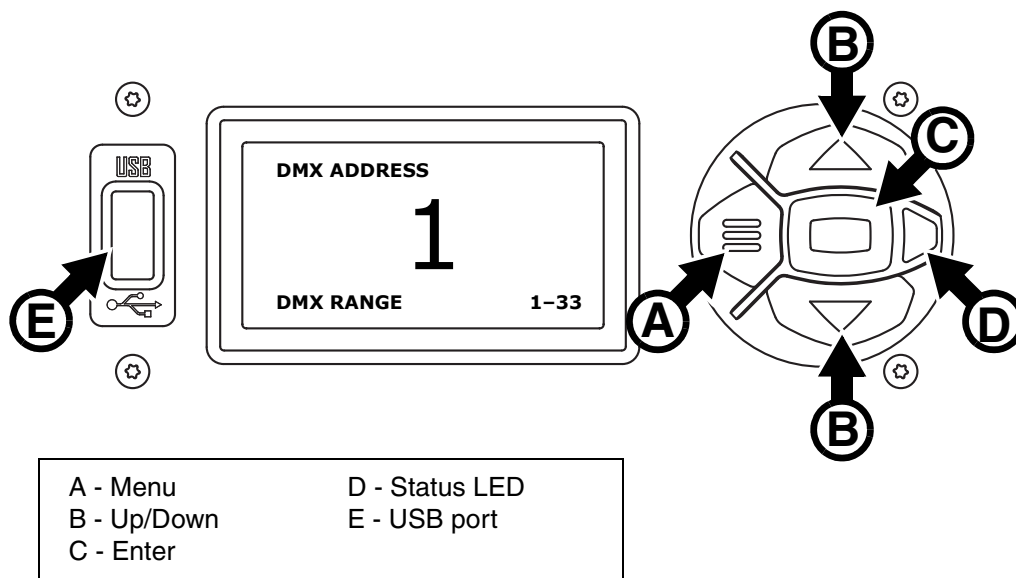


Figure 4: Display and control panel

When the MAC Encore Performance is powered on, it first boots and resets, then it displays its DMX address (or its fixture ID number, if one has been set) and any status messages (see page 32) in the display **A**.

The display can be set to automatically rotate to match standing or hanging fixture orientation in the **PERSONALITY** → **DISPLAY** menu or the Shortcuts menu (see "Shortcuts" on page 11).

## Using the control panel

- Press the Menu button **A** or Enter button **C** to access the menus.
- Use the Up and Down buttons **B** to scroll up and down menus.
- Press the Enter button **C** to enter a menu or make a selection.
- The currently selected item in a menu is indicated by a star ✱.
- Press the Menu button **A** to step backwards through the menus.

## Status LED

The LED **D** next to the control buttons indicates fixture status depending on the color displayed and DMX status depending on whether the LED flashes or lights constantly:

- **GREEN**: All parameters normal.
- **AMBER**: Warning (service interval exceeded, for example).  
If **ERROR MODE** is set to **Normal**, the warning message will be shown in the display. If **ERROR MODE** is set to **Silent**, the display must be activated by pressing the Enter button C to display the warning message.
- **RED**: Error detected.  
If **ERROR MODE** is set to **Normal**, the error message will be shown in the display. If **ERROR MODE** is set to **Silent**, display the error message BY GOING TO NORMAL OR SERVICE - ERROR LIST.
- **FLASHING**: No DMX signal detected.
- **CONSTANT**: Valid DMX signal detected.

## Battery power

The MAC Encore Performance's onboard battery gives access to the most important functions in the control panel when the fixture is not connected to AC power. The following functions are available on battery power:

- DMX address
- Fixture ID
- All personality settings (pan/tilt, cooling, fan clean mode, dimming curve, DMX reset, parameter shortcuts, all display settings, error mode)
- Default settings
- Information (Power On Hours and Power Cycles counters, Software version)
- Error list

To activate the display when the fixture is not connected to power, press the Menu button **A**. Press again to enter the menus. The display extinguishes after 10 seconds with no user input and the control panel is de-activated after 1 minute with no user input. Press the Menu button **A** again to re-activate.

## Shortcuts

If you hold the Menu button **A** pressed in for 2 - 3 seconds, a shortcut menu with the most important commands appears. Select a command with the Up and Down buttons **B** and press the Enter button **C** to activate, or press the Menu button again to cancel.

- **RESET ALL** resets the whole fixture
- **ROTATE DISPLAY** rotates the MAC Encore Performance display 180°.
- **FOLLOW SPOT TOGGLE** enables and disables followspot mode.

## Settings stored permanently

The following settings are stored permanently in the fixture memory and are not affected by powering the MAC Encore Performance off and on or by updating the fixture software:

- DMX address
- Fixture ID
- All personality settings (pan/tilt, cooling, fan clean mode, dimming curve, all display settings, error mode, etc.)
- Resettable counters
- Service settings (calibration, firmware)

These settings can be returned to factory defaults using the control menus or via DMX.

## Service mode

Holding the Menu and Enter buttons **A** and **C** both pressed in while powering the fixture on puts the fixture into service mode, in which pan and tilt are disabled and a **SERV** warning appears in the display. Service mode removes the risk of unexpected head movement during lamp adjustment. Cycling power and allowing the fixture to start normally takes it out of service mode.

# DMX address

The DMX address, also known as the start channel, is the first channel used to receive instructions from the controller. For independent control, each fixture must be assigned its own control channels. If you give two MAC Encore Performance fixtures the same address, they will behave identically. Address sharing can be useful for diagnostic purposes and symmetrical control, particularly when combined with the inverse pan and tilt options.

DMX addressing is limited to make it impossible to set the DMX address so high that you are left without enough control channels for the fixture.

To set the fixture's DMX address:

1. Press Enter to open the main menu.
2. Press Enter to enter the **DMX ADDRESS** menu, then scroll to the desired address and press Enter to save.
3. Press Menu to exit.

# Fixture ID

The MAC Encore Performance lets you set a four-digit ID number to ease identification of the fixtures in an installation. When a fixture is powered on for the first time, it displays its DMX address by default. As soon as you set an ID number other than **0** in **FIXTURE ID**, the MAC Encore Performance will display this ID number by default, and indicate **FIXTURE ID** in the display.

# Personality

The MAC Encore Performance provides several options that let you optimize the fixture for different applications in the **PERSONALITY** menu:

- The **PAN/TILT** menu lets you swap and/or invert pan and tilt.
- This menu lets you put the fixture into **FOLLOWSPOT MODE**. In this mode, control of pan and tilt via DMX or the control panel is disabled and pan and tilt movement are unlocked. This allows the head of the fixture to be aimed by hand using user-supplied handles mounted on the back of the head. The pan and tilt motors are energized so that they act as a gentle brake. This feature gives a damped feel and smooth control for followspot operators and also prevents the head from moving when operators remove their hands from the fixture.  
The fixture remembers its followspot mode setting if you cycle fixture power off and on.
- The **LIMIT PAN/TILT** feature lets you set minimum and maximum limits for pan and tilt. This can be useful in a number of situations. It lets you ensure that the fixture only lights a specific zone on a stage, for example, and can also be used to prevent the head from colliding with other fixtures or objects.
- The **SPEED** menu lets you set **PAN/TILT** to **NORMAL**, **FAST** (optimized for speed) or **SLOW** (optimized for smooth movement – useful for slow movements in long-throw applications). Likewise, you can select an overall speed for all the effects by setting **EFFECT** speed to **NORMAL**, **FAST** or **SLOW**. You can also set effect speed to **FOLLOW P/T**, in which effects will always use whatever speed is set for pan and tilt.
- **DIMMER CURVE** provides four dimming options (see Figure 5):

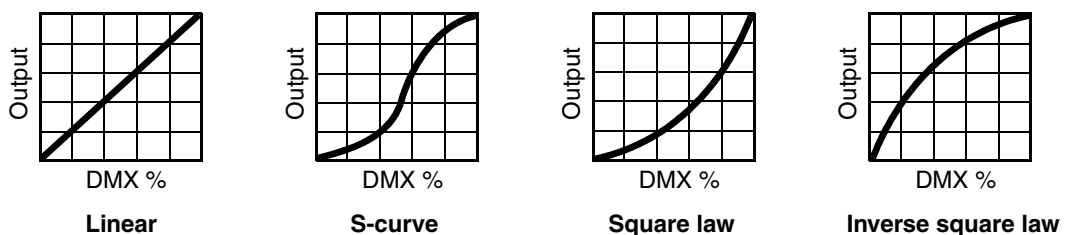


Figure 5: Dimming curve options

- **LINEAR** – (optically linear) the increase in light intensity appears to be linear as DMX value is increased.
- **S-CURVE** – light intensity control is finer at low levels and high levels and coarser at medium levels. This curve emulates the RMS voltage dimming characteristics of an incandescent lamp such as the tungsten halogen lamp of the Martin® MAC TW1.
- **SQUARE LAW** – light intensity control is finer at low levels and coarser at high levels.
- **INV SQUARE LAW** – light intensity control is coarser at low levels and finer at high levels.
- **TUNGSTEN EMULATOR** is an option that gives the look and feel of a tungsten lamp. The default color temperature of the MAC Encore Performance CLD variant is shifted to match the WRM variant, and a gradually increasing red shift is introduced as both variants are dimmed down. A slight lag is also added to dimmer and shutter response to simulate the warm-up and cool-down behavior of an incandescent source.
- **ALTERNATE COLOR TEMP** deploys the CTC flags to shift the fixture's default color temperature. This setting can be used to match CLD and WRM variants visually in color temperature and color mixing behavior.
- **FOCUS TRACKING** sets focus to automatically self-adjust, giving sharper focus when you use the zoom effect.
- **VIDEO TRACKING** optimizes performance if the MAC Encore Performance is used with a video source.

In normal use, the fixture processes the DMX signal it receives, tracking (or smoothing out) changes in values in order to ensure smooth fading between colors and/or intensities. This signal processing takes fractions of a second and is normally invisible, but if the fixture is used to display video (using Martin P3™ video system components to convert video to DMX, for example) the processing can interfere with video response times. If you enable video tracking, the fixture does not ‘smooth out’ DMX input but instead snaps instantly when a DMX value changes.

For best results, we recommend that you enable video tracking during video display and disable it (the default setting) during normal DMX control.

- **DMX RESET** defines whether the fixture or individual effects can be reset by sending a DMX command on the fixture settings channel. Setting it to OFF can help you avoid accidentally sending a Reset command during a show, for example.
- **EFFECT SHORTCUT** determines whether the effects take the shortest path between two positions (shortcuts enabled) or not (shortcuts disabled).
- **COOLING MODE** lets you select between various cooling fan options depending on whether your priority is maximum possible light output or quietest possible cooling fan operation:
  - **REGULATE FANS** optimizes cooling fan operation for maximum light output. It controls fixture temperature by varying cooling fan speed up to maximum level and does not limit light intensity. Maximum fan speed in regulated operation is normally enough to keep the fixture within its operating temperature range up to the maximum permitted ambient temperature of 40° C (104° F) without limiting light intensity. A fixture that reduces its light intensity when set to regulated fans operation may be a sign that the ambient temperature is higher than the permitted maximum or that the fixture requires cleaning.
  - **CONSTANT SPEED** lets you set a constant cooling fan speed. This lets you choose the balance between cooling fan noise and light intensity that is right for your application. You can set the cooling fan speed to high, medium, low or ultra-low level.

If the fixture gets close to its maximum recommended temperature when its cooling fans are running at the speed you have selected, it will begin to limit light intensity. The fixture will then continue to regulate light intensity if necessary to keep the fixture within its recommended operating temperature range.

Table 1 below shows the constant light output intensity that will normally be available after 30 minutes of operation at different ambient temperatures using the different cooling fan settings. Intensity is shown as a percentage of the fixture’s maximum intensity.

If you set the fixture to **Constant medium** fan speed when the ambient temperature is 32° C (90° F), for example, 95% of the fixture’s maximum output intensity will be available after 30 minutes of operation at constant full intensity.

	Ambient temperature		
	23° C (73° F)	32° C (90° F)	40° C (104° F)
Regulated fans	<b>100%</b>	<b>100%</b>	<b>100%</b>
Constant high	<b>100%</b>	<b>100%</b>	<b>90%</b>
Constant medium	<b>100%</b>	<b>95%</b>	<b>74%</b>
Constant low	<b>85%</b>	<b>75%</b>	<b>61%</b>
Constant ultra-low	<b>68%</b>	<b>62%</b>	<b>50%</b>

**Table 1: Constant light output intensity available (as % of maximum) after 30 mins.**

- **DISPLAY** offers the following options for the LCD display:
  - **DISPLAY SLEEP** determines whether the display remains on permanently, or goes into sleep mode 2, 5 or 10 minutes after the last time a control panel button is pressed.
  - **DISPLAY INTENSITY** lets you define the brightness of the display backlighting. Select **Auto** for automatic adjustment to match the ambient light level, or manually set the intensity to a level from 0% to 100%.
  - **DISPLAY ROTATION** lets you rotate the display manually through 180° so that it can be read easily no matter how the fixture is oriented. If set to **Auto**, the MAC Encore Performance senses its orientation and rotates the display automatically.
  - **DISPLAY CONTRAST** lets you define the contrast of the backlit graphic display. Select **Auto** for automatic adjustment to match display intensity, or manually set the contrast to a level from 0% to 100%.

- **ERROR MODE** enables or disables error warnings. If set to **NORMAL**, the display is activated and lights up if the fixture needs to report an error. If set to **SILENT**, the fixture does not light the display with error warnings but error messages can still be read when the display is activated manually. In both **NORMAL** and **SILENT** modes, the status LED lights amber to indicate a warning and red to indicate an error.
- **HIBERNATION MODE** sets light output intensity to zero and disables effect deployment and pan/tilt movement. The main purpose of the mode is to protect the fixture from the intake of airborne material such as dust and confetti and to provide an option for situations where noise is critical. The small reduction in power consumption obtained in Hibernation Mode is a by-product.  
When you bring the fixture out of hibernation mode, it performs a full reset.

## Factory defaults

**FACTORY DEFAULT** lets you reload the fixture's factory default settings. Effect calibration settings are not affected, so any changes you have made to zoom, pan and tilt offsets will be kept.

## Custom settings

The custom configuration function CUSTOM 1 - CUSTOM 3 allows you to save and recall up to three sets of fixture settings that override the factory default settings. The custom settings comprise:

- all the settings in the PERSONALITY menu, and
- the fixture's DMX address

## Fixture information readouts

The following fixture information can be called up in the display:

- **POWER ON TIME** provides two counters:
  - The **TOTAL** counter is not user-resettable and displays total hours powered on since manufacture.
  - The **RESETTABLE** counter is user-resettable and displays the number of hours the fixture has been powered on since the counter was last reset.
- **POWER ON CYCLES** also provides two counters:
  - The **TOTAL** counter is not user-resettable and displays the total number of power on/off cycles since manufacture.
  - The **RESETTABLE** counter is user-resettable and displays the number of power on/off cycles since the counter was last reset.
- **SW VERSION** displays the currently installed firmware (fixture software) version.
- **RDM UID** displays the fixture's factory-set unique ID for identification in RDM systems.
- **LED TYPE** displays the fixture variant's LED type, CLD or WRM, for identification purposes. Note that you can change the fixture's base color temperature by applying an ALTERNATE COLOR TEMP command in the PERSONALITY menu, but the fixture's LED TYPE will not be affected.
- **FAN SPEEDS** provides separate status readouts from the fixture's cooling fans.
- **TEMPERATURES** provides separate PCB temperature readouts.

## DMX signal monitoring

The MAC Encore Performance provides data on the DMX signal it is receiving in the **DMX LIVE** menu. This information can be useful for troubleshooting control problems.

**RATE** displays the DMX refresh rate in packets per second. Values lower than 10 or higher than 44 may result in erratic performance, especially when using tracking control.

**QUALITY** displays the quality of the received DMX data as a percentage of packets received. Values much below 100 indicate interference, poor connections, or other problems with the serial data link that are the most common cause of control problems.

**START CODE** displays the DMX start code. Packets with a start code other than 0 may cause irregular performance.

The remaining options under **DMX LIVE** scroll through the fixture's DMX channels. Press Enter to display the DMX values in a range from 0 - 255 that are being received on each channel.

## Test sequences

**TEST** activates effects in sequence, allowing you to test all effects, LEDs only, pan and tilt movement only, or effects only (i.e. without pan and tilt movement) without a DMX controller:

- Select a test type and press Enter to start the test.
- Press Menu to stop the test.

## Manual control

The **MANUAL CONTROL** menu lets you reset the MAC Encore Performance and operate the fixture without a DMX controller. To execute commands in the **MANUAL CONTROL** menu, select a menu item for the effect that you want to control, then enter a value from 0 to 255 to apply a command. The menu items and values correspond to the commands listed in the DMX protocol on page 22.

# Adjusting settings via DMX

Certain fixture settings and parameters can be adjusted from the DMX controller on the fixture control/settings channel, DMX channel 33.

Commands sent on this channel override any settings previously entered in the fixture's onboard control menus.

To help you avoid accidentally applying a setting that may disrupt a light show, for example, most of the commands must be held for a certain time before they are applied. For example, the command that turns off the display illumination must be held for one second to activate it. The command that resets the fixture must be held for five seconds to activate it. The times required to apply DMX commands on the Fixture control/settings channel are listed for each command on page 25 in the DMX protocol.

## Resetting

Either the entire fixture or individual effects can be reset to their initial positions. Resetting individual effects can allow on-the-fly recovery if an effect loses its correct position, for example, without having to reset the entire fixture.

## Settings

A range of fixture personality and behavior settings can be adjusted via DMX, overriding any settings previously entered in the onboard control menus. See DMX channel 33 in the DMX Protocol on page 22 for a full list of the settings available for adjustment via DMX.

### Illuminating the display

Among the useful features on the fixture control/settings channel is the fixture display setting. The fixture's display panel can be brought out of sleep mode with a DMX command. This makes it possible to read the fixture's DMX address while the fixture is installed in the rig.

After being illuminated in this way, the display will return to sleep mode according to the setting entered in the onboard control menus.

## Changing calibration offsets using DMX

The Fixture control/settings DMX channel allows pan, tilt and zoom to be calibrated by changing their factory default offsets in percent values from the DMX controller.

To set an effect offset:

1. Set the effect you want to calibrate to a specific value via DMX (for example, set all the fixtures in a group to DMX value 200 on the zoom channel).
2. Select 'Enable calibration' on the Fixture control/settings channel and hold for 5 seconds to activate.
3. The DMX control channels for pan, tilt and zoom now adjust the calibration offsets for those effects. Adjust each offset until the effect is in the required position (for example, adjust the zoom offset on each fixture in the group until the beam angle on all fixtures is identical – this is the position you will obtain when you send DMX value 200).
4. Send a 'Store ...' command for the effect on the Fixture control/settings channel and hold for 5 seconds to activate. Calibration offsets are now stored in memory and normal DMX control is restored.

Calibration offsets that are stored in memory are not affected by powering the fixture off and on or by updating the fixture software.

You can reset all calibration offsets to their default values by sending a DMX value on the Fixture control/settings channel. You must hold the value for 5 seconds. The fixture will return to factory default calibration values. If you have overwritten the factory default values by applying a CALIBRATION → SAVE DEFAULTS command in the SERVICE menu, the fixture will return to the last default calibration values that were saved).



# RDM

The MAC Encore Performance can communicate using RDM (Remote Device Management) in accordance with ESTA's *American National Standard E1.20-2006: Entertainment Technology RDM Remote Device Management Over DMX512 Networks*.

RDM is a bi-directional communications protocol for use in DMX512 control systems, it is the open standard for DMX512 device configuration and status monitoring.

The RDM protocol allows data packets to be inserted into a DMX512 data stream without affecting existing non-RDM equipment. It allows a console or dedicated RDM controller to send commands to and receive messages from specific fixtures.

## RDM UID

Each MAC Encore Performance has a factory-set RDM UID (unique identification number) that makes it addressable and identifiable in RDM systems. The number can be found in the control panel **INFORMATION** menu under **RDM UID**.

## RDM communication

The MAC Encore Performance supports the standard RDM PIDs (Parameter IDs) required by ESTA plus a range of manufacturer-specific PIDs. Sending **SUPPORTED\_PARAMETERS** and **PARAMETER\_DESCRIPTION** commands from an RDM controller will call up a list of the PIDs supported in the firmware version installed in the fixture.

The PIDs in the following tables are supported in software v.1.0.0. Additional PIDs will be supported in later firmware versions.

### Standard RDM Parameter IDs

GET allowed	SET allowed	RDM parameter ID's (slot 21-22)	Notes
		Network Management	
		DISC_UNIQUE_BRANCH	
		DISC_MUTE	
		DISC_UN_MUTE	
		Status Collection	
✓		QUEUED_MESSAGE	
✓		STATUS_MESSAGES	
✓		STATUS_ID_DESCRIPTION	
	✓	CLEAR_STATUS_ID	
		RDM Information	
✓		SUPPORTED_PARAMETERS	
✓		PARAMETER_DESCRIPTION	

		Product information	
✓		DEVICE_INFO	
✓		DEVICE_MODEL_DESCRIPTION	
✓		MANUFACTURER_LABEL	
✓	✓	DEVICE_LABEL	
✓	✓	FACTORY_DEFAULTS	
✓		SOFTWARE_VERSION_LABEL	
		DMX Setup	
✓	✓	DMX_PERSONALITY	
✓		DMX_PERSONALITY_DESCRIPTION	
✓	✓	DMX_START_ADDRESS	
✓		SLOT_DESCRIPTION	
		Sensors	
✓		SENSOR_DEFINITION	
✓	✓	SENSOR_VALUE	
		Usage information	
✓	✓	DEVICE_HOURS	
✓	✓	DEVICE_POWER_CYCLES	
		Onboard LCD display	
✓	✓	DISPLAY_INVERT	
✓	✓	DISPLAY_LEVEL	
		Configuration	
✓	✓	PAN_INVERT	
✓	✓	TILT_INVERT	
		Control	
✓	✓	IDENTIFY_DEVICE	
	✓	RESET_DEVICE	
✓	✓	PERFORM_SELFTEST	
✓	✓	SELF_TEST_DESCRIPTION	

### Manufacturer-specific RDM Parameter IDs

GET allowed	SET allowed	RDM parameter ID's (slot 21-22)	Notes
		DMX protocol	
✓	✓	DMX_RESET	
		Fixture behavior	
✓	✓	EFFECT_SPEED	
✓	✓	DISPLAY_ERRORS_ENABLE	
✓	✓	DIMMER_CURVE	
✓	✓	FOCUS_TRACKING	
✓	✓	DISPLAY_AUTO_OFF	
✓	✓	HIBERNATION_MODE	

✓	✓	TUNGSTEN MODE	
✓	✓	ALTERNATIVE LIGHT SOURCE	Deploy CTC flags: - Apply warm CTC to CLD fixture - Apply cold CTC to WRM fixture
		Pan/tilt	
✓	✓	PAN_TILT_SPEED	
✓	✓	PAN_TILT_ENABLE	
✓	✓	PAN_LIMIT_MIN	
✓	✓	PAN_LIMIT_MAX	
✓	✓	TILT_LIMIT_MIN	
✓	✓	TILT_LIMIT_MAX	
	✓	PAN_TILT_LIMIT_RESET	
		Fixture cooling	
✓	✓	FAN_CLEAN	

# Software service functions

## Service utilities

The control panel **SERVICE** menu provides utilities for technicians rigging or servicing the fixture:

- **ERROR LIST** displays any error messages that are stored in internal memory.
- **FAN CLEAN** lets you set all cooling fans to run at maximum speed for short periods for cleaning purposes.
- **PT FEEDBACK** lets you disable feedback to the fixture software from the pan, tilt and effects positioning systems. If feedback is set to **ON** and a pan, tilt or effect position error is detected, the shutter closes and the effect resets. This feature can be disabled by setting feedback to **OFF**.  
The **OFF** setting is not saved when the fixture is powered off, and the system will be re-enabled the next time the fixture starts. If a pan/tilt position error occurs and the system cannot correct pan/tilt position within 10 seconds, feedback is automatically disabled.
- **ADJUST** is for use by Martin® Service and its authorized agents only.
- **CALIBRATION** lets you set new default positions for calibration purposes, set effects to their factory default positions or overwrite the factory default positions with new values. See "Calibration" below.
- **USB** lets you update the firmware (fixture software) using a USB memory device. For a detailed guide to updating the firmware, see "Installing firmware using a USB memory device" later in this chapter.

## Calibration

Martin® fixtures are adjusted and calibrated at the factory, and further calibration will normally only be necessary if fixtures have been subjected to abnormal shocks during transport, if normal wear and tear has affected alignment after an extended period of use. You can also use calibration to fine-tune fixtures for a particular location or application.

The **CALIBRATION** menu lets you define offsets in the fixture software to adjust the positions of pan, tilt and zoom relative to the DMX values the fixture receives. This allows you to fine-tune fixtures and achieve uniform behavior in different fixtures.

Calibration can be carried out using the fixture's onboard control panel and via DMX (see "Illuminating the display" on page 16).

A recommended procedure is to set pan, tilt and zoom to the same DMX values in multiple fixtures and then calibrate each fixture using its onboard control panel while comparing its light output with a reference fixture. The calibration range available for each effect varies. Calibration values are expressed as percentages. After selecting a value, press Enter to set the effect to that value.

### Loading and storing default calibration offsets

In the **SERVICE** → **CALIBRATION** menu, **LOAD DEFAULTS** lets you erase the calibration offsets that you have defined and reload the default calibration offsets that are stored in memory.

**SERVICE** → **CALIBRATION** → **SAVE DEFAULTS** lets you overwrite the factory default calibration offsets that are stored in memory with any new offsets that you have defined. Overwriting is permanent, so once you have saved new default offsets, **LOAD DEFAULTS** will load the new defaults, not the original factory defaults.

## Firmware installation

The currently installed firmware (fixture software) version can be viewed in the control panel **INFORMATION** menu. Firmware updates are available from the Martin® website and can be installed using a USB memory stick or a Windows PC running the Uploader application in the Martin® DMX Tools suite (available for download free of charge from [www.martin.com](http://www.martin.com)) and a Martin® M-DMX compact USB-DMX interface.

Calibration data is stored in the relevant modules wherever possible so that a module will stay calibrated if it is removed from the fixture or installed in another fixture.

Do not switch the fixture off during a firmware update, or firmware will be corrupted.

## Installing firmware using a USB memory device

**Important!** *Do not remove a USB memory device while the fixture is updating files.*

The following are required in order to install firmware using a USB memory device:

- The MAC Encore Performance '.BANK' firmware update file, available for download from the Martin website at <http://www.martin.com>.
- A USB memory stick or other USB memory device with the update file copied from a PC into the USB stick's root directory.

To install the MAC Encore Performance firmware:

1. Download the '.BANK' firmware file from the MAC Encore Performance Product Support page at [www.martin.com](http://www.martin.com), read the firmware release notes carefully to check for any instructions or warnings, and copy the firmware file to the root directory of a USB stick.
2. Disconnect the data link from the MAC Encore Performance.
3. Insert the USB stick in the MAC Encore Performance's USB host socket. The fixture should recognize the USB stick and illuminate the display. If the fixture does not recognize the USB stick, navigate to **SERVICE** → **USB** in the control panel.
4. **AVAILABLE FIRMWARE** will appear in the display. You can now scroll through the firmware versions available.
5. To install a firmware version, select it and press Enter. The MAC Encore Performance asks you to confirm installation of the new firmware. Press Enter to confirm and press Menu to exit without confirming.
6. Allow the fixture to install the firmware and reboot.
7. Remove the USB stick. The newly-installed firmware version will now be displayed in the **INFORMATION** menu.
8. Reconnect the data link.
9. If you have installed a new firmware version, check the Martin® website to see whether an updated User Guide is available for this firmware.

Fixture information and settings, are not affected when new software is uploaded.

## Installing using a PC and hardware interface

The following are required in order to install firmware using a PC:

- The MAC Encore Performance firmware '.MU3' update file, available for download from the Product Support area of the Martin website at <http://www.martin.com>.
- A Windows PC running the latest version of the Uploader application in the Martin® DMX Tools suite (available for download free of charge from [www.martin.com](http://www.martin.com)) and loaded with the firmware update file.
- A USB-DMX hardware interface device such as the Martin® M-DMX.

To install the MAC Encore Performance firmware:

1. Download the firmware '.MU3' file from the MAC Encore Performance support page on the Martin website to the PC.
2. Read the firmware release notes carefully to check for any instructions or warnings.
3. Follow the instructions for an auto upload/upload via DMX in the Martin Uploader application help files and supplied with the hardware interface.

# DMX protocol

For fixtures running MAC Encore Performance firmware version 1.6.1.

Channel	DMX Value	Function	Fade type	Default value
1	0 - 19	<b>Strobe/shutter effect</b> Shutter closed	Snap	30
	20 - 49	Shutter open		
	50 - 200	Strobe, slow → fast		
	201 - 210	Shutter open		
	211 - 255	Random strobe, slow → fast		
2	0 - 65535	<b>Dimmer fade (MSB)</b> Closed → open	Fade	0
3		<b>Dimmer fade, fine (LSB)</b>	Fade	0
4	0 - 255	<b>Cyan</b> 0 → 100%	Fade	0
5	0 - 255	<b>Magenta</b> 0 → 100%	Fade	0
6	0 - 255	<b>Yellow</b> 0 → 100%	Fade	0
7	0 - 255	<b>CTC</b> 0 → 100%	Fade	0
8		<b>Color wheel Indexing</b> <i>Continuous scrolling</i> 0 Open 1 - 13 Open → Blue 14 Blue 15 - 27 Blue → Green 28 Green 29 - 41 Green → Orange 42 Orange 43 - 55 Orange → Magenta 56 Magenta 57 - 69 Magenta → Congo 70 Congo 71 - 83 Congo → Red 84 Red 85 - 97 Red → Open 98 - 160 Open	Snap	0
		<i>Stepped scrolling</i> 161 - 163 Blue 164 - 166 Green 167 - 169 Orange 170 - 172 Magenta 173 - 175 Congo 176 - 178 Red 179 - 192 Open		
		<b>Continuous rotation</b> 193 - 214 CW fast → slow 215 - 221 Stop (wheel stops at current position) 222 - 243 CCW slow → fast		
		<b>Random colors</b> 244 - 247 Fast 248 - 251 Medium 252 - 255 Slow		

Table 2: DMX Protocol

Channel	DMX Value	Function	Fade type	Default value
9	0 - 9 10 - 14 15 - 19 20 - 24 25 - 29 30 - 34	<b>Rotating gobo wheel: gobo selection, indexing, shake, rotation</b> <i>Indexed gobo: set indexed angle on channels 10/11</i> Open Gobo 1 indexing Gobo 2 indexing Gobo 3 indexing Gobo 4 indexing Gobo 5 indexing	Fade	0
	35 - 39 40 - 44 45 - 49 50 - 54 55 - 59	<i>Continuous gobo rotation: set gobo rotation speed on channels 10/11</i> Gobo 1 rotation Gobo 2 rotation Gobo 3 rotation Gobo 4 rotation Gobo 5 rotation		
10	60 - 89 90 - 119 120 - 149 150 - 179 180 - 209	<i>Gobo shake centered on indexed angle. Set indexed angle on channels 10/11</i> Shake angle increments in following steps: 10°, 15°, 30°, 45°, 60°, 90°, 135°, 180°, 270° and 360° Gobo 1 shake, 360° slow → 10° fast Gobo 2 shake, 360° slow → 10° fast Gobo 3 shake, 360° slow → 10° fast Gobo 4 shake, 360° slow → 10° fast Gobo 5 shake, 360° slow → 10° fast	Fade	0
	210 - 232 233 - 255	<i>Gobo wheel rotation, indexed gobos (set gobo indexed angle on channels 10 and 11)</i> Gobo wheel rotation CW fast → slow Gobo wheel rotation CCW slow → fast		
11	0 - 65535	<b>Rotating gobo wheel: indexed angle, rotation direction and speed</b> <i>Indexed position (if gobo wheel set to indexed gobo on channel 9):</i> Indexed position (0° at 32768) <i>Rotation (if wheel set to continuous gobo rotation on channel 9):</i> No rotation, gobo indexed at 0° CW rotation fast → slow No rotation, gobo stops at current position CCW rotation slow → fast No rotation, gobo indexed at 90°	Fade	32768
12	0 - 5 6 - 10 11 - 15 16 - 20 21 - 25	<b>Animation wheel indexing /rotation</b> Open Horizontal position indexed Horizontal position rotation Vertical position rotation Vertical position indexed	Snap	0
	26 27 - 59 60 61 - 109 110	<i>Angled rotation (set direction and speed on Channel 13)</i> Angled rotation - Wheel outside gate Angled rotation - Wheel moving into gate Angled rotation - Wheel in horizontal position Angled rotation - Wheel in angled position Angled rotation - Wheel in vertical position		
13	111 112 - 198 199 200 - 254 255	<i>Angled indexing (set indexing angle on Channel 13)</i> Angled indexing - Wheel in vertical position Angled indexing - Wheel in angled position Angled indexing - Wheel in horizontal position Angled indexing - Wheel moving out of gate Angled indexing - Wheel outside gate	Snap	127
	0 - 255	<b>Animation wheel indexed angle, rotation speed and direction</b> <i>If indexing is selected on channel 12:</i> Indexed angle min. → max. <i>If rotation is selected on channel 12:</i> Stop, indexed at 0° CW rotation, fast → slow Stop, wheel stops at its current position CCW rotation, fast → slow Stop, indexed at 90°		
14	0 - 255	<b>Frost</b> No frost → Full frost	Fade	0

Table 2: DMX Protocol

Channel	DMX Value	Function	Fade type	Default value
15	0 - 255	<b>Iris</b> Open → Closed	Snap	0
16	0 - 65535	<b>Zoom, 16-bit (MSB and LSB)</b> Flood → spot	Fade	32768
17				
18	0 - 65535	<b>Focus, 16-bit (MSB and LSB)</b> Infinity → near	Fade	32768
19				
20	0 - 255	<b>Framing blade 1, position</b> Out → in	Fade	0
21	0 -126 127 - 128 129 - 255	<b>Framing blade 1, angle</b> Angle – Parallel Angle +	Fade	127
22	0 - 255	<b>Framing blade 2, position</b> Out → in	Snap	0
23	0 -126 127 - 128 129 - 255	<b>Framing blade 2, angle</b> Angle – Parallel Angle +	Fade	127
24	0 - 255	<b>Framing blade 3, position</b> Out → in	Fade	0
25	0 -126 127 - 128 129 - 255	<b>Framing blade 3, angle</b> Angle – Parallel Angle +	Fade	127
26	0 - 255	<b>Framing blade 4, position</b> Out → in	Fade	0
27	0 -126 127 - 128 129 - 255	<b>Framing blade 4, angle</b> Angle – Parallel Angle +	Fade	127
28	0 -126 127 - 128 129 - 255	<b>Frame indexing angle</b> Minimum Parallel Maximum	Fade	127
29	0 - 65535	<b>Pan, 16-bit (MSB and LSB)</b> Left → right (32768 = neutral)	Fade	32768
30				
31	0 - 65535	<b>Tilt, 16-bit (MSB and LSB)</b> Up → down (32768 = neutral)	Fade	32768
32				

Table 2: DMX Protocol



Channel	DMX Value	Function	Fade type	Default value
33		<b>Fixture control/settings</b> <i>(hold for number of seconds indicated to activate)</i>	Snap	0
	0 - 9	<i>No function (disables calibration) – 5 sec.</i>		
	10 - 14	Reset entire fixture – 5 sec.		
	15	<i>No function</i>		
	16	Reset color only – 5 sec.		
	17	Reset beam only – 5 sec.		
	18	Reset pan and tilt only – 5 sec.		
	19 - 22	<i>No function</i>		
	23	Linear dimming curve – 1 sec. <i>(menu override, setting unaffected by power off/on)</i>		
	24	Square law dimming curve – 1 sec. <i>(menu override, factory default setting, setting unaffected by power off/on)</i>		
	25	Inverse square law dimming curve – 1 sec. <i>(menu override, setting unaffected by power off/on)</i>		
	26	S-curve dimming curve – 1 sec. <i>(menu override, setting unaffected by power off/on)</i>		
	27	<i>No function</i>		
	28	Fast pan and tilt speed – 1 sec. <i>(default setting, menu override - setting returns to MENU setting after power on/off)</i>		
	29	Smooth pan and tilt speed – 1 sec. <i>(menu override - setting returns to MENU setting after power on/off)</i>		
	30	Parameter shortcuts = ON		
	31	Parameter shortcuts = OFF		
	32	Focus tracking = OFF		
	33	Enable focus tracking at close range – 1sec.		
	34	Enable focus tracking at medium range – 1sec.		
	35	Enable focus tracking at long range – 1sec.		
	36	Video tracking = ON – 1sec.		
	37	Video tracking = OFF – 1sec.		
	38-40	<i>No function</i>		
	41	Beam smoothing = ON – 1sec.		
	42	Beam smoothing = OFF – 1sec.		
	43-51	<i>No function</i>		
	52	Turn on control panel display – 1 sec.		
	53	Turn off control panel display – 1 sec.		
	54	Regulated fan speed, fixed light output intensity – 1sec.		
	55	Full fan speed, regulated light output intensity – 1sec.		
	56	Medium fan speed, regulated light output intensity – 1sec.		
	57	Low fan speed, regulated light output intensity – 1sec.		
	58	Ultra-low fan speed, regulated light output intensity – 1sec.		
	59-60	<i>No function</i>		
	61	Hibernation mode = ON – 5 sec.		
	62	Hibernation mode = OFF – 5 sec.		
	63-64	<i>No function</i>		
	65	Pan and tilt limits = ON – 5 sec.		
	66	Pan and tilt limits = OFF – 5 sec.		
	67	Store current pan position as lower pan limit – 5 sec.		
68	Store current pan position as upper pan limit – 5 sec.			
69	Store current tilt position as lower tilt limit – 5 sec.			
70	Store current tilt position as upper tilt limit – 5 sec.			
71	Reset pan and tilt limits and disable pan/tilt limit functionality – 1sec.			
72	Tungsten Emulation = ON – 1sec.			
73	Tungsten Emulation = OFF – 1sec.			
74	Alternative light source (color temperature shift) = ON – 1sec.			
75	Alternative light source (color temperature shift) = OFF – 1sec.			
76-99	<i>No function</i>			
100	Enable calibration – 5 sec.			
101	Store pan and tilt calibration – 5 sec.			
102	Store dimmer calibration – 5 sec.			
103	Store cyan calibration – 5 sec.			
104	Store magenta calibration – 5 sec.			
105	Store yellow calibration – 5 sec.			
106	<i>No function</i>			

Table 2: DMX Protocol

Channel	DMX Value	Function	Fade type	Default value
<b>33 contd.</b>	107	Store all CMY calibration – 5 sec.	Snap	0
	108	Store rotating gobo 1 current slot index calibration – 5 sec.		
	109-110	<i>No function</i>		
	111	Store framing calibration – 5 sec.		
	112	Store iris calibration – 5 sec.		
	113	Store focus calibration – 5 sec.		
	114	Store zoom calibration – 5 sec.		
	115	Store color wheel calibration – 5 sec.		
	116	Store animation wheel calibration – 5 sec.		
	117 - 198	<i>No function</i>		
199	Reset all calibrations to factory default – 5 sec.			
200 - 255	<i>No function</i>			
<b>34</b>	0 - 255	<b>FX1 selection (see Table 3 on page 27)</b> Effect selection (adjust on DMX channel 15)	Snap	0
<b>35</b>	0 - 126 127 - 128 129-255	<b>FX1 speed</b> Effect reversed fast → slow Effect stops Effect forward slow → fast	Fade	128
<b>36</b>	0 - 255	<b>FX2 selection (see Table 3 on page 27)</b> Effect selection (adjust on DMX channel 17)	Snap	0
<b>37</b>	0 - 126 127 - 128 129-255	<b>FX2 speed</b> Effect reversed fast → slow Effect stops Effect forward slow → fast	Fade	128
<b>38</b>	0	<b>FX synchronization</b> No sync	Snap	0
	1	Offset shift 10°		
	2	Offset shift 20°		
	3	Offset shift 30°		
	4	Offset shift 40°		
	5	Offset shift 50°		
	6	Offset shift 60°		
	7	Offset shift 70°		
	8	Offset shift 80°		
	9	Offset shift 90°		
	10	Offset shift 100°		
	11	Offset shift 110°		
	12	Offset shift 120°		
	13	Offset shift 130°		
	14	Offset shift 140°		
	15	Offset shift 150°		
	16	Offset shift 160°		
	17	Offset shift 170°		
	18	Offset shift 180°		
	19	Offset shift 190°		
	20	Offset shift 200°		
	21	Offset shift 210°		
	22	Offset shift 220°		
	23	Offset shift 230°		
	24	Offset shift 240°		
	25	Offset shift 250°		
	26	Offset shift 260°		
	27	Offset shift 270°		
	28	Offset shift 280°		
	29	Offset shift 290°		
	30	Offset shift 300°		
	31	Offset shift 310°		
	32	Offset shift 320°		
	33	Offset shift 330°		
	34	Offset shift 340°		
	35	Offset shift 350°		
36	Synchronized: all fixtures start FX cycles at same time			
37 - 100	<i>No function</i>			
101 - 120	Random start (FX 1 adjust controls overall speed)			
121 - 140	Random duration			
141 - 255	<i>No function</i>			

**Table 2: DMX Protocol**

# FX: pre-programmed effects

The table below lists the pre-programmed dynamic FX (effect macros) that can be controlled using DMX channels 34-38.

Select FX on channels 34 and 36 by sending the values listed in the table. Adjust effect parameters such as speed and/or amount of effect applied on channels 35 and 37, and adjust synchronization of effects across different fixtures on channel 38.

**Applicable when running MAC Encore Performance firmware version 1.6.1.**

DMX value	Effect	DMX value	Effect	DMX value	Effect
0	NO FX	42-49	NO FX	84	ZOOM STEP
1	GOBO X-FADE	50	RAINBOW WAVE	85	ZOOM RAMP
2	STEPPER MOTOR	51	RAINBOW STEP	86	RANDOM SIZE WAVE
3-5	NO FX	52	RAINBOW PULSE	87	RANDOM SIZE STEP
6	PWM SLIDER	53	RGB WAVE	88-89	NO FX
7	NO FX	54	RGB STEP	90	PIN TO FLOOD
8	TICK TICK TICK	55	RGB PULSE	91	POUNCE
9	TICK TOCK	56	CMY WAVE	92	SPLASH
10	INTENSITY SINE WAVE	57	CMY STEP	93-109	NO FX
11	INTENSITY STEP	58	CMY PULSE	110-122	NO FX
12	INTENSITY PULSE	59	MIX TO WHITE WAVE	123	MILLING AROUND
13	DOUBLE STROBE	60	MIX TO WHITE STEP	124-159	NO FX
14	TRIPLE STROBE	61	MIX TO WHITE PULSE	160	FIRE GOBO
15	UP FLASH	62	RANDOM BOLD	161	NO FX
16	UP FLASH DOWN FLASH	63	RANDOM MIX STEP	162	WATER GOBO
17	RANDOM LEVEL	64	RANDOM MIX PULSE	163-180	NO FX
18-20	NO FX	65	RANDOM SUBTLE	181	SELECT FIXED GOBO 1
21	ELECTRIC ARC	66	RED WHITE BLUE WAVE	182	SELECT FIXED GOBO 2
22	THUNDERSTORM ATOMIC	67	RED WHITE BLUE STEP	183	SELECT FIXED GOBO 3
23	THUNDERSTORM	68-69	NO FX	184	SELECT FIXED GOBO 4
24	WELDING	70	COLOR WHEEL FULL STEP	185	SELECT FIXED GOBO 5
25-29	NO FX	71	COLOR WHEEL ALL STEP	186	SELECT FIXED GOBO 6
30	ANIMATION	72	COLOR WHEEL SPLIT STEP	187	SELECT FIXED GOBO 7
31	MOVIE FLICKER	73	COLOR WHEEL RANDOM SPLIT STEP	188-209	NO FX
32	CROSS CHASE	74	COLOR WHEEL SHAKER	210	ZOOM FADES
33	RANDOM DIMMERS	75	FIRE	211	FADE SPIN GOBO ZOOM
34	SHAKEY DIMMERS	76	WATER	212	GOBO TWIST
35	CENTER OUT CHASE	77	ICE	213	EXPAND TWIST
36	NEGATIVE PULSE	78	HOT AND COLD	214	EXPAND TWIST FADE
37	POSITIVE PULSE	79	WARM AND FUZZY	215-255	NO FX
38	RINGS IN OUT	80	IRIS RAMP		
39	NO FX	81	IRIS STEP		
40	RANDOM COLOR WAVE	82	IRISH PULSE		
41	RANDOM COLOR STEP	83	ZOOM WAVE		

**Table 3: FX in the MAC Encore Performance**

# Control panel menus

MAC Encore Performance firmware version 1.6.1.

Menu level 1	Menu level 2	Menu level 3	Menu level 4	Notes (Default settings in bold print)	
DMX ADDRESS	1 – XXX			DMX address (default address = 1). The DMX address range is limited so that the fixture will always have enough DMX channels within the 512 available.	
FIXTURE ID	0 – 9999	User-settable fixture ID number		<b>0</b>	
PERSONALITY	PAN/TILT	PAN INVERT	ON/OFF	Inverse DMX pan control: right → left	
		TILT INVERT	ON/OFF	Inverse DMX tilt control: down → up	
		FOLLOWSPOT MODE	ON/OFF	Enable followspot mode	
		LIMIT PAN/TILT	LIMIT ENABLE -> ON/OFF		Enable pan and tilt limits
			PAN MIN -> degrees		Set minimum limit for pan angle
			PAN MAX -> degrees		Set maximum limit for pan angle
			TILT MIN -> degrees		Set minimum limit for tilt angle
	TILT MAX -> degrees			Set maximum limit for tilt angle	
	SPEED	PAN/TILT	<b>FAST</b>	<b>Optimize pan/tilt movement for speed</b>	
			SMOOTH	Optimize pan/tilt movement for smoothness	
		EFFECT	<b>FOLLOW P/T</b>	<b>Effects speed follows the speed setting applied to pan and tilt via DMX or in control menu</b>	
			FAST	Optimize effects movement for speed	
			SLOW	Optimize effects movement for smoothness	
	DIMMER CURVE	LINEAR		Optically linear dimming curve	
		<b>SQUARE LAW</b>		<b>Square law dimming curve</b>	
		INV SQ LAW		Inverse square law dimming curve	
		S-CURVE		S-curve (fixture emulates incandescent lamp voltage linear RMS dimming curve)	
	TUNGSTEN EMULATOR	ON/OFF		Enable tungsten lamp emulation	
	ALTERNATE COLOR TEMP	ON/OFF		Applies alternative color temperature: sets CLD fixture to warm white and WRM fixture to cold white by deploying CTC flags	
	FOCUS TRACKING	ENABLED		Focus self-adjusts depending on zoom angle	
		<b>DISABLED</b>		<b>Focus remains at distance set via DMX</b>	
	VIDEO TRACKING	ENABLED		Color fading optimized for speed of color changes	
		<b>DISABLED</b>		<b>Color fading optimized for smoothness</b>	
DMX RESET	ON		<b>Fixture can be reset via DMX</b>		
	OFF		Fixture cannot be reset via DMX (can be overridden: see DMX protocol)		

Table 4: Control menus

Menu level 1	Menu level 2	Menu level 3	Menu level 4	Notes (Default settings in bold print)	
PERSONALITY (continued)	EFFECT SHORTCUT	ON		<b>Effects take shortest route during changes, crossing open positions if necessary</b>	
		OFF		Effects avoid open positions during effects changes	
	COOLING MODE	REGULATED FANS		<b>Fans optimized for light intensity (temperature controlled by regulating fan speed, light output unaffected)</b>	
		FULL		Fans set to full/medium/low/ultra-low constant speed, fixture temperature controlled by regulating light output.	
		MEDIUM			
		LOW			
	ULTRA-LOW				
	DISPLAY	DISPLAY SLEEP	ON		Display remains permanently on
			2 MINUTES		<b>Display goes into sleep mode 2 minutes after last key press</b>
			5 MINUTES		Display goes into sleep mode 5 minutes after last key press
			10 MINUTES		Display goes into sleep mode 10 minutes after last key press
		DISPLAY INTENSITY	10 ... <b>100</b>		Set display intensity in % (default = <b>100</b> )
		DISPLAY ROTATION	<b>NORMAL</b> / ROTATE 180		Display orientation <b>normal</b> or rotated 180°
		DISPLAY CONTRAST	1 ...100		Adjust display contrast (default = <b>41</b> )
	ERROR MODE	NORMAL		<b>Enable error messages and warnings in display</b>	
SILENT		Disable error messages and warnings in display (status LED will still light to indicate fixture status if error has been detected or fixture has a warning)			
HIBERNATION MODE	OFF		<b>Disable hibernation mode</b>		
	ON		Enable hibernation mode (light output and motor operation set to zero)		
DEFAULT SETTINGS	FACTORY DEFAULT	LOAD	ARE YOU SURE? YES/NO	Return all settings (except calibrations) to factory defaults	
	CUSTOM 1	LOAD	ARE YOU SURE? YES/NO	Load Custom Settings 1	
		SAVE	ARE YOU SURE? YES/NO	Save fixture's current settings as Custom Settings 1	
	CUSTOM 2	LOAD	ARE YOU SURE? YES/NO	Load Custom Settings 2	
		SAVE	ARE YOU SURE? YES/NO	Save fixture's current settings as Custom Settings 2	
	CUSTOM 3	LOAD	ARE YOU SURE? YES/NO	Load Custom Settings 3	
		SAVE	ARE YOU SURE? YES/NO	Save fixture's current settings as Custom Settings 3	

Table 4: Control menus

Menu level 1	Menu level 2	Menu level 3	Menu level 4	Notes (Default settings in bold print)
INFORMATION	POWER ON TIME	TOTAL	0 ... XXX HR	Display hours fixture has been powered on since manufacture (not user-resettable)
		RESETTABLE	CLEAR COUNTER? YES/NO	Display hours fixture has been powered on since last counter reset (user-resettable)
	POWER ON CYCLES	TOTAL	0 ... XXX HR	Display number of times fixture has been powered on since manufacture (not user-resettable)
		RESETTABLE	CLEAR COUNTER? YES/NO	Display number of times fixture has been powered on since last counter reset (user-resettable)
	SW VERSION*	XX.XX.XX		Displays currently active software version
	RDM UID*	4D50.XXXXXXXXX		Displays fixture's unique RDM ID
	LED TYPE*	COLD/WARM		Displays fixture's LED color temperature type
	FAN SPEEDS*	HEAD FAN 1... BASE FAN 3	0 - XXX RPM	Displays current speed of all cooling fans (head and base)
	TEMPERATURES*	CMY EFFECT ... DC/DC	X C	Displays temperature in °C of all PCBs
DMX LIVE*	RATE	0 - 44 HZ		DMX transmission speed in packets per second
	QUALITY	0 - 100%		Percent of packets received
	START CODE	0 - 255		Value of the DMX start code
	STROBE ... CONTROL	...		Scroll to see values being received on each DMX channel
TEST*	TEST ALL			Run test sequence of all functions To test a specific function, use Up/Down buttons to scroll through functions and pause. Press Enter to restart test sequence. Press Menu button to exit test.
	TEST LEDS			Run test sequence of LEDs only. To test a specific LED group, use Up/Down buttons to scroll through groups and pause. Press Enter to restart test sequence. Press Menu button to exit test.
	TEST EFFECTS			Run test sequence of effects. To test a specific effect, use Up/Down buttons to scroll through effects and pause. Press Enter to restart test sequence. Press Menu button to exit test.
	TEST PAN/TILT	PAN		Run test sequence of pan functions. Press Menu button to stop test
		TILT		Run test sequence of tilt functions. Press Menu button to stop test
MANUAL CONTROL*	RESET	RESET		Reset fixture
	STROBE ... CONTROL	0 - 255		Scroll through effects, then enter a DMX value to manually control an effect

Table 4: Control menus

Menu level 1	Menu level 2	Menu level 3	Menu level 4	Notes (Default settings in bold print)
SERVICE	ERROR LIST	Empty or up to 20 errors		Display any errors in memory
	FAN CLEAN	ON/OFF		Activate fan cleaning
	PT FEEDBACK	<b>ON</b>		<b>Enable pan/tilt position feedback systems</b>
		OFF		Disable pan/tilt position feedback
	ADJUST	PAN/TILT AT END STOP	STEP 1	To adjust, move head to P/T adjustment position, then press Enter
			STEP 2	To adjust, move head to P/T adjustment position again, then press Enter
	CALIBRATION	DIMMER ... FRAMING ROT	0.00 ...+/- xx%	Scroll through effects. Define home position for each effect
		PAN	0.00 ...+/- xx%	Define pan home position
		TILT	0.00 ...+/- xx%	Define tilt home position
		LOAD DEFAULTS	LOAD	Load factory default calibration settings
		SAVE DEFAULTS	SAVE	Replace factory default calibration settings with current calibration settings
	USB	NO DEVICE		No USB device present or no firmware on USB device
		UPDATING FILES		Fixture updating internal memory from USB device
		AVAILABLE FIRMWARE	XX.XX.XX ... XX.XX.XX	Select firmware from versions stored in internal memory. Scroll to select version, then press Enter and confirm your choice to update

**Table 4: Control menus**

*\* Menus marked \* are available only when the fixture is connected to mains power. All other menus are available in mains- and battery-powered operation.*

# Service and display messages

The MAC Encore Performance gives service and maintenance information by displaying a large 3- or 4-character short code and a smaller full-text message in the fixture's display. The short code is visible at a distance, allowing easier reading with the fixture still in the rig, for example, while the full-text message gives more detailed information.

## Warning messages

Warning messages indicate that either:

- problems might appear in the future if no action is taken, or
- the user needs to pay special attention to a function or procedure when working with the fixture.

The MAC Encore Performance communicates warnings as follows:

- Warning codes are shown continuously in the display and disappear when the user reacts to the warning.
- If more than one warning is detected, all warnings are displayed in sequence.
- If the display is inactive, the fixture's status LED (see Figure 4 on page 10) flashes orange to indicate that there is a warning. Activating the display will show the warning.

The possible warning messages are listed in Table 5 below:

Short code	Long message and explanation
<b>BANK</b>	BANK NO ACCESS Error unpacking firmware bank during/after software upload. Fixture will continue to operate on existing firmware. Warning message is cleared by a successful software upload or at the next power off/on cycle.
<b>BETW</b>	BEAM TEMP HIGH Beam temperature sensor detects abnormally high operating temperature.*
<b>CMTW</b>	CMY TEMP HIGH CMY module temperature sensor detects abnormally high operating temperature.*
<b>DCTW</b>	DC TEMP HIGH DC PCB sensor detects abnormally high operating temperature.*
<b>EFTW</b>	EFF TMP HIGH Effects module temperature sensor detects abnormally high operating temperature.*
<b>FRTW</b>	FRAMING TMP HIGH Framing module temperature sensor detects abnormally high operating temperature.*
<b>G11M</b>	GOBO 1-1 MISSING Gobo 1 not detected on rotating gobo wheel.
<b>G12M</b>	GOBO 1-2 MISSING Gobo 2 not detected on rotating gobo wheel.
<b>G13M</b>	GOBO 1-3 MISSING Gobo 3 not detected on rotating gobo wheel.
<b>G14M</b>	GOBO 1-4 MISSING Gobo 4 not detected on rotating gobo wheel.
<b>G15M</b>	GOBO 1-5 MISSING Gobo 5 not detected on rotating gobo wheel.
<b>LDTW</b>	LED DRV TMP HIGH LED driver temperature sensor detects abnormally high operating temperature.*
<b>PFTW</b>	PFC TEMP HIGH PFC unit temperature sensor detects abnormally high operating temperature.*
<b>PTTW</b>	PT TEMP HIGH Pan/tilt PCB sensor detects abnormally high operating temperature.*

Table 5: Warning messages



Short code	Long message and explanation
SERV	SERVICE MODE Fixture in service mode.
SLW	SAFETY LOOP A safety loop error occurred but is no longer active. Warning message is cleared at the next power off/on cycle.
UITW	UI TEMP HIGH User interface (LCD display and control panel) PCB sensor detects abnormally high operating temperature.*
ZFTW	ZF TEMP HIGH Zoom PCB sensor detects abnormally high operating temperature.*

**Table 5: Warning messages**

*\*High temperature warnings are canceled as soon as temperature returns to normal. If temperature reaches cutoff level, the warning is replaced by a cutoff error message.*

## Error messages

Error messages indicate that a problem is present. The MAC Encore Performance communicates errors as follows:

- Error messages flash in the display.
- If more than one error is detected, the fixture flashes all errors three times each.
- Errors are shown in the display regardless of display status: they override an inactive display and any other information that the display might be showing.
- If an error is present, the status LED flashes red.

The possible error messages are listed in Table 6 below:

Short code	Long message and explanation
APER	AW POS ERROR Animation wheel position error.
ARER	AW ROT ERROR Animation wheel rotation error.
BEER	BEAM SHAPER POS Beam shaper position error.
BETC	BEAM TMP CUT OFF Beam temperature cutoff activated.
BETE	BEAM TMP SEN ERR Beam temperature sensor error.
C1ER	COLOR WHEEL 1 ERR Color wheel position error.
CECM	COMM ERR CMY CMY flags position system communication error.
CEEF	COMM ERR EFFECT Effects position system communication error.
CELD	COM ERR LED DRV LED driver communication error.
CEPT	COM ERR P/T Pan/tilt driver communication error.
CEZF	COM ERR Z/F Zoom/focus driver communication error.
CMTC	CMY TEMP CUT OFF CMY module temperature cutoff activated.
CMTE	CMY TEMP SEN ERR CMY module temperature sensor error.

**Table 6: Error messages**

<b>Short code</b>	<b>Long message and explanation</b>
<b>COLD</b>	FIXTURE COLD Fixture too cold. Physical movement of effects is disabled until fixture has warmed up.
<b>CTER</b>	CTC ERROR CTC flags position error.
<b>CYER</b>	CYAN ERROR Cyan flags position error.
<b>DCTC</b>	DC TEMP CUT OFF DC PCB temperature cutoff.
<b>DCTE</b>	DC TEMP SEN ERR DC PCB temperature sensor error.
<b>EFTC</b>	EFF TEMP CUT OFF Effects module temperature cutoff activated.
<b>EFTE</b>	EFF TEMP SEN ERR Effects module temperature sensor error.
<b>FAN</b>	HEAD FAN 1 ERR
<b>FAN</b>	HEAD FAN 2 ERR
<b>FAN</b>	HEAD FAN 3 ERR
<b>FAN</b>	HEAD FAN 4 ERR
<b>FAN</b>	BASE 1 FAN ERR
<b>FAN</b>	BASE 2 FAN ERR
<b>FAN</b>	BASE 3 FAN ERR
<b>FAN</b>	HEAD FAN 5 ERR
<b>FAN</b>	HEAD FAN 6 ERR
<b>FAN</b>	HEAD FAN 7 ERR
<b>FAN</b>	HEAD FAN 8 ERR
<b>FAN</b>	HEAD FAN 9 ERR
<b>FAN</b>	HEAD FAN 10 ERR
<b>FAN</b>	HEAD FAN 11 ERR
<b>FBEP</b>	PAN FBACK ERR Pan position magnetic indexing system timeout. Fixture is unable to correct pan position (but pan movement will often still be possible).
<b>FBET</b>	TILT FBACK ERR Tilt position magnetic indexing system timeout. Fixture is unable to correct tilt position (but tilt movement will often still be possible).
<b>FOER</b>	FOCUS ERROR Focus position error. Fixture is unable to control focus.
<b>FRTC</b>	FR TEMP CUT OFF Framing module temperature cutoff activated.
<b>FRTE</b>	FR TEMP SEN ERR Framing module temperature sensor error.
<b>FSER</b>	FRAMING1 INS ERR Framing blade 1 insertion position error.
<b>FSER</b>	FRAMING1 ANG ERR Framing blade 1 angle position error.
<b>FSER</b>	FRAMING2 INS ERR Framing blade 2 insertion position error.
<b>FSER</b>	FRAMING2 ANG ERR Framing blade 2 angle position error.
<b>FSER</b>	FRAMING3 INS ERR Framing blade 3 insertion position error.
<b>FSER</b>	FRAMING3 ANG ERR Framing blade 3 angle position error.

**Table 6: Error messages**

<b>Short code</b>	<b>Long message and explanation</b>
<b>FSER</b>	FRAMING4 INS ERR Framing blade 4 insertion position error.
<b>FSER</b>	FRAMING4 ANG ERR Framing blade 4 angle position error.
<b>FTER</b>	FROST ERROR Frost effect position error.
<b>G1ER</b>	GOBO W 1 ERR Rotating gobo wheel position error.
<b>IRER</b>	IRIS ERROR Iris effect position error.
<b>LDTC</b>	LED TEMP CUT OFF LED board temperature cutoff activated.
<b>LDTE</b>	LED TEMP SEN ERR LED board temperature sensor error.
<b>MAER</b>	MAGENTA ERROR Magenta flag position error.
<b>MMER</b>	MISSING MODULE ERR Impossible to communicate with a module that should be present. Module missing or not correctly connected.
<b>NLCI</b>	NO LED COLOR INFO Fixture unable to retrieve LED color/type information.
<b>PAER</b>	PAN ERROR Pan position electrical indexing system timeout.
<b>PFTC</b>	PFC TEMP CUT OFF Power factor correction system temperature cutoff.
<b>PFTE</b>	PFC TEMP SEN ERR Power factor correction system temperature sensor error.
<b>PSER</b>	PAN SENSOR ERROR Fixture unable to retrieve reliable data from pan position sensor.
<b>PTCM</b>	PT SENSOR ADJUST Pan/tilt sensors are incorrectly adjusted.
<b>PTTC</b>	PT TEMP CUT OFF Pan/tilt temperature cutoff activated.
<b>PTTE</b>	P/T SENSOR ERROR Pan/tilt sensors are incorrectly adjusted.
<b>PUTC</b>	PSU TEMP CUT OFF PSU temperature cutoff activated.
<b>PUTE</b>	PSU TEMP SEN ERR PSU temperature sensor error.
<b>R1ER</b>	GOBO W 1 ROT ERR Rotating gobo wheel indexing position error.
<b>RFER</b>	FRAM ROT ERROR Framing module indexing position error.
<b>SLER</b>	SAFETY LOOP Safety loop circuit activated. A temperature circuit breaker has shut down LEDs. Circuit breaker resets automatically after temperature has returned to normal operating range.
<b>TIER</b>	TILT ERROR Tilt position electrical indexing circuit timeout.
<b>TSER</b>	TILT SENSOR ERR Fixture unable to retrieve reliable data from tilt position sensor.
<b>UECM</b>	UPL ERR CMY Could not upload new CMY effect system firmware during a firmware upload. Error cleared when new firmware is uploaded successfully or power is cycled off and on.
<b>UEEF</b>	UPL ERR EFFECT Could not upload new effects systems firmware during a firmware upload. Error cleared when new firmware is uploaded successfully or power is cycled off and on.
<b>UELD</b>	UPL ERR LED DRV Could not upload new LED driver firmware during a firmware upload. Error cleared when new firmware is uploaded successfully or power is cycled off and on.

**Table 6: Error messages**

<b>Short code</b>	<b>Long message and explanation</b>
<b>UEPT</b>	UPL ERR PAN/TILT Could not upload new pan/tilt system firmware during a firmware upload. Error cleared when new firmware is uploaded successfully or power is cycled off and on.
<b>UEZF</b>	UPL ERR Z/F Could not upload new zoom/focus system firmware during a firmware upload. Error cleared when new firmware is uploaded successfully or power is cycled off and on.
<b>UITC</b>	UI TEMP CUT OFF User interface (LCD display and control panel) PCB temperature cutoff activated.
<b>UITE</b>	UI TEMP SEN ERR User interface (LCD display and control panel) PCB temperature sensor error.
<b>VOLO</b>	VOLT AT NODE LOW Low voltage detected in node PCBA.
<b>YEER</b>	TELOW ERROR Yellow flag position error.
<b>ZFTC</b>	ZF TEMP CUT OFF Zoom/focus effect temperature cutoff activated.
<b>ZFTE</b>	ZF TEMP SEN ERR Zoom/focus effect temperature sensor error.
<b>ZOER</b>	ZOOM ERROR Zoom position electrical indexing system timeout.

**Table 6: Error messages**

The fixture reports a calibration error if valid calibration data is not detected in EEPROM. The fixture may be unable to read/write calibration data to EEPROM.

