

MAC Aura™ PXL

User Guide



Martin[®]
by HARMAN

User Documentation update information

Any important changes in the MAC Aura PXL User Guide are listed below.

Revision B

Covers MAC Aura PXL firmware version 1.2.0.

Adds Low-noise LED mode. Adds 12 new colors to virtual color wheel effect. Corrects various minor errors in RDM PIDs table. Firmware download now from within Martin Companion suite only.

Revision A

First version released. Covers MAC Aura PXL firmware version 1.0.0.

Also includes FX. These are available from firmware version 1.1.0 which is due for release in the fall/autumn of 2020.

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Introduction



Warning! Before installing, operating or servicing the MAC Aura PXL, 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 supplied with the fixture. The latest version is also available for download from the MAC Aura PXL area of the Martin website at www.martin.com.

This User Guide is a supplement to the Installation and Safety Manual that is supplied with the MAC Aura PXL. Both these documents are available for download from the MAC Aura PXL area of the Martin® website at 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.

Operating the fixture

Before applying power to or operating the MAC Aura PXL:

- Read the 'Safety Information' section of the fixture's Safety and Installation Manual.
- Check that the installation is safe and secure.
- Check that the base is fastened securely so that the torque reaction when the head moves will not cause the base to move.
- Check that the head tilt lock is released.
- Be prepared for the fixture to light up suddenly. Check that no-one is looking at the fixture from close range.
- Be prepared for the head to move suddenly. Check that there will be no risk of collision with persons or objects.

The MAC Aura PXL does not have an On/Off switch. To apply power to the fixture, apply power to the power input cable.

Effects

This section gives details of the effects available in the MAC Aura PXL lighting fixture. See the DMX protocol tables starting on page 25 for details of the channels and commands used to control the effects via DMX.

Effects control

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.

When the MAC Aura PXL is included in a Martin P3™ system, the fixture's 19 Beam pixels and 141 Aura pixels can be mapped to a video source (such as a media server) that is connected to the P3 system controller.

P3

The MAC Aura PXL is compliant with the Martin P3™ system controller family. If you add the fixture to a P3-driven installation, the P3 system controller will map the fixture's 19 Beam pixels and 141 Aura pixels individually regardless of which DMX mode the fixture is set to. This means that, even if the fixture is set to Compact or Basic DMX Modes, the video fed into the P3 system controller will be mapped onto every individual pixel in the fixture.

P3 control lets you match the color and intensity of MAC Aura PXL fixtures precisely and instantly with other P3-compatible lighting fixtures, creative LED elements or LED video panels in an installation.

Control protocol priority

The MAC Aura PXL auto-senses and responds correctly to whichever control protocol it is receiving: DMX and/or RDM via standard DMX cable, DMX and/or RDM via Art-Net or streaming ACN over Ethernet cable, or P3.

If the fixture is receiving both P3 data and DMX data, which can be either:

- via a combination of DMX cable for DMX and Ethernet cable for P3, or
- from a P3 system controller that is merging DMX and P3 data and sending it via Ethernet cable,

the P3 mix channels for the Beam (channel 18) and Aura (channel 32) let you determine which signal should take priority. You can also crossfade, which means that you can superimpose DMX data with variable opacity from 0% to 100% onto the P3 video output that is being displayed on the fixture's pixels.

Merging global and pixel-level color control

In Extended and Ludicrous mode, the color of the 19 beam pixels can be controlled by both the Beam global RGB control (channels 4 - 9) and the Beam pixel RGB controls (channel 33 - 89).

In Ludicrous mode, the color of the 141 Aura pixels can be controlled by both the Aura global RGB control (channels 27 - 29) and the Aura pixel RGB controls (channels 90 - 512).

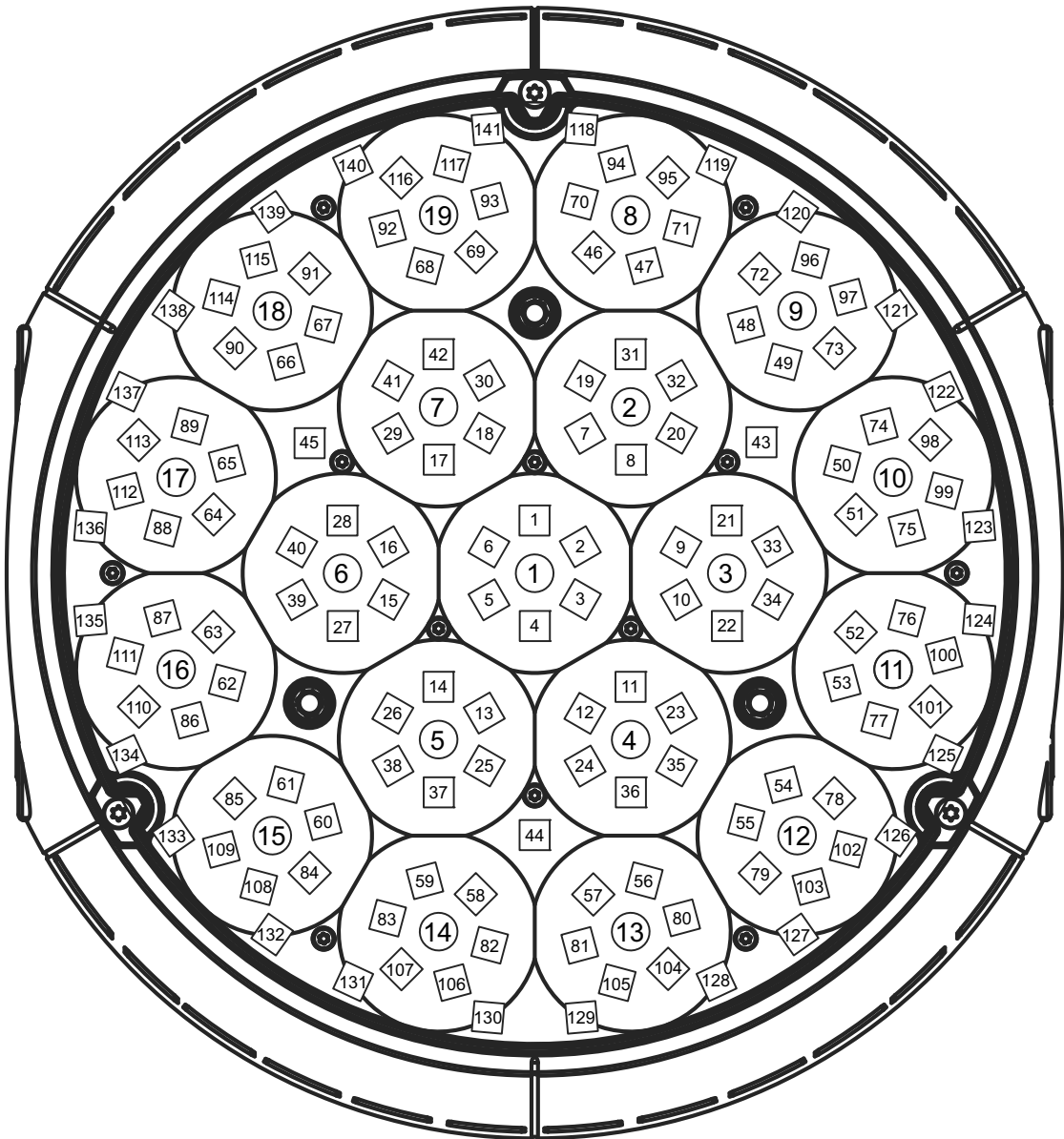
Global color control is combined with pixel-level color control using HTP (highest takes precedence) logic. So, to control color on a global level, keep the pixel RGB channels at zero. And to control color pixel-by-pixel, keep the global RGB channels at zero. For more advanced looks it is also possible to use a mix of both control methods (for example: set background color with global RGB control and overlay pixel effects with pixel RGB controls).

Pixel mapping

See Figure 1. The MAC Aura PXL's 19 Beam pixels and 141 Aura pixels are numbered as shown.

Individual RGB control of each of the fixture's Beam pixels is available on channels 33 - 89 in Extended and Ludicrous DMX modes. Individual RGB control of each of the fixture's Aura pixels is available on channels 90 - 512 in Ludicrous DMX mode.

The 19 Beam pixels and 141 Aura pixels are always treated as individual pixels in a P3 system.



Fixture in hanging orientation, pan at 50%, and with display and connectors at back of fixture

Figure 1: Pixel layout

Effects overview

Shutter and strobe effects

The MAC Aura PXL's electronic shutter effect provides instant blackout and snap open as well as regular or random strobe effects with variable speed from approx. 1 Hz to approx. 20 Hz.

In Compact DMX Mode, the strobe/shutter channel 1 is global – it controls both Beam and Aura. In Basic, Extended and Ludicrous DMX Modes, the strobe/shutter channel 1 controls the Beam only. A separate strobe/shutter effect for the Aura is available on channel 24.

Dimming

The fixture features smooth 0-100% global (Aura and Beam) dimming with 16-bit control resolution.

Four dimming curve options are available (see under "Personality" on page 14).

In Compact DMX Mode, the 16-bit dimmer channels 2 and 3 are global – they control both Beam and Aura. In Basic, Extended and Ludicrous DMX Modes, channels 2 and 3 control the Beam only. Separate 16-bit dimming control of the Aura is available on channels 25 and 26.

Color mixing

The MAC Aura PXL offers 16-bit RGB color mixing. White intensity in the Beam's RGBW LEDs is adjusted automatically to match RGB control input.

In Compact DMX Mode, the 16-bit RGB color mixing channels 4 - 9 are global – they control both Beam and Aura. In Basic, Extended and Ludicrous DMX Modes, channels 4 - 9 control the Beam only. Separate 8-bit RGB color mixing for the Aura is available on channels 27 - 29.

Color temperature control

Color temperature control is available on a dedicated CTC channel. You can adjust the fixture's color temperature from 2000 K to 10 000 K in 50 K steps.

In Compact DMX Mode, the CTC channel 10 is global – it controls both Beam and Aura. In Basic, Extended and Ludicrous DMX Modes, channel 10 controls the Beam only. Separate CTC control of the Aura is available on channel 30.

Virtual color wheel

The MAC Aura PXL features a virtual color wheel effect that lets you select from 48 color presets. Most of the color presets are LEE-referenced, but the virtual color wheel also offers fully saturated colors which are very suitable for use as background colors for the fixture's pre-programmed FX. Colors are applied in full-color steps. Virtual color wheel scrolling lets you apply color presets sequentially with control of speed and color wheel direction. Color presets can also be applied in random order at fast, medium or slow speed.

In Compact DMX Mode, the virtual color wheel channel 11 is global – it controls both Beam and Aura. In Basic, Extended and Ludicrous DMX Modes, channel 11 controls the Beam only. A separate virtual color wheel for the Aura is available on channel 31.

The color wheel effect always takes priority over color mixing. If you want to use RGB color mixing, set the color wheel channel(s) to zero.

An exception to color wheel priority appears when Internal FX are being used. Some of the FX use both the color created by RGB color mixing and the color set by the virtual color wheel to create 2-color effects (RGB color mixing sets foreground color and the virtual color wheel sets background color).

Zoom

The MAC Aura PXL features a zoom lens system with a range of 1:8. This lets you vary the beam angle (half-peak) of the fixture from 6° - 40°. The field angle (one-tenth peak) varies from 7° to 59°.

Tungsten emulation

The tungsten lamp emulation option available on the Fixture Control / Settings channel gives the warm appearance and warm shift dimming characteristics of a tungsten lamp fixture.

Pan and tilt

16-bit pan and tilt control is available in all DMX modes.

Pre-programmed FX

The MAC Aura PXL offers two separately controllable effects engines. See “FX: pre-programmed effects” on page 34 for details of the effects available.

The built-in FX give instant access to complex dynamic effects with no need for programming at the controller.

Depending on how you set up DMX/P3 crossfading on the P3 channels (i.e. channels 18 for the Beam and 32 for the Aura), you can also superimpose FX over any P3 video that the fixture is displaying.

Note that firmware updates can add new FX to those that are available in the fixture. If new FX are added, the change will be indicated in the firmware release notes and a new revision of this User Guide will be made available for download in the MAC Aura PXL area of the Martin website at www.martin.com

Control panel

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

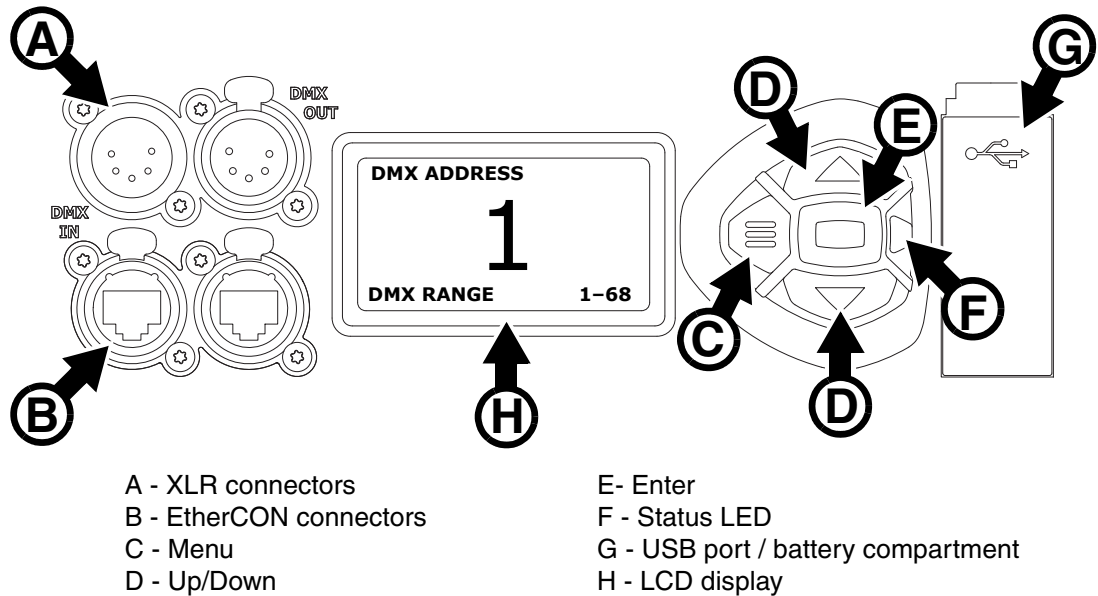


Figure 2: Display and control panel

When the MAC Aura PXL 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 43) in the display **H**.

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 10).

Using the control panel

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

Status LED

The LED **F** next to the control buttons indicates fixture status by showing a color and DMX status by flashing or lighting 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.

The status LED is only active when the display is active. If the display enters sleep mode, the LED will also sleep.

Battery power

The MAC Aura PXL'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
- DMX control mode (Compact/Basic/Extended/Ludicrous)
- 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 **C**. 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 **C** again to re-activate.

Shortcuts

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

- **RESET ALL** resets the whole fixture
- **ROTATE DISPLAY** rotates the MAC Aura PXL display 180°.

Settings stored permanently

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

- DMX address
- DMX control mode (Compact/Basic/Extended/Ludicrous)
- Fixture ID
- All personality settings (pan/tilt, cooling, dimming curve, DMX reset, parameter shortcuts, all display settings, error mode, etc.)
- Resettable counters
- Service settings (adjustment, calibration)

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

Service mode

Holding the Menu and Enter buttons **C** and **E** 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 service adjustments.

Cycling power and allowing the fixture to start normally takes it out of service mode.

Control options

You can control the MAC Aura PXL using DMX and/or Martin P3 protocol. The fixture auto-senses the type of data that it is receiving and will respond correctly with no need for manual protocol selection.

The following options are available:

- DMX control over standard DMX cable connected to the fixture's 5-pin XLR connectors.
- DMX control using Art-Net over Ethernet cable connected to the fixture's etherCON connectors.
- DMX control using streaming ACN over Ethernet cable connected to the fixture's etherCON connectors.
- DMX control over DMX cable and P3 video data over Ethernet cable.
- P3 video data with embedded DMX commands over Ethernet cable. If you connect DMX / Art-Net / sACN to the P3 system controller, the controller can merge the DMX commands into the P3 signal and send them to the fixture over Ethernet.

You can decide how the fixture should behave if it receives both DMX data and P3 video data. The default setting is for DMX data to take priority, but you can set the fixture to give priority to P3 pixels and you can crossfade between DMX colors and P3 pixels.

Fail-safe connection

The MAC Aura PXL has a fail-safe network connection. If the fixture loses power or if you shut it down, it will continue to relay an Ethernet signal, and the Art-Net / sACN / P3 signal to the other networked fixtures in the daisy chain will not be interrupted.

Data rate

Any Ethernet switch used to relay Art-Net, streaming ACN or P3 data to the MAC Aura PXL must be capable of running at 10/100 Mbps speed, as the fixture does not support Gigabit Ethernet data rates.

DMX

The MAC Aura PXL accepts a DMX-512A data signal.

DMX setup

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 Aura PXL 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.

DMX modes

The **CONTROL MODE** menu lets you set the MAC Aura PXL to one of the fixture's four DMX operating modes:

- **Compact Mode** controls all the fixture's pixels, Beam and Aura, together as one unit. It offers a strobe/shutter, 16-bit dimming control, 16-bit RGB control, CTC adjustment, a virtual color wheel, zoom

and 16-bit control of pan and tilt. It also includes a Fixture Control / Settings channel that lets you configure fixture settings over the DMX link.

- **Basic Mode** includes all the functionality of Compact Mode but it but it also offers a P3 Mix channel that allows you drive colors by DMX, P3 video pixels or a mix of both. It also gives you two separately controllable FX engines. FX can be synchronized across fixtures for identical behavior, or you can configure them with offsets in 10° steps which lets you run FX chases. Basic Mode also lets you control the Aura separately from the Beam, with a shutter/strobe, 16-bit dimming, RGB color mixing, CTC control, a virtual color wheel and P3 Mix.
- **Extended Mode** includes all the functionality of the previous modes but adds individual RGB control of each of the fixture's 19 Beam pixels. Figure 1 on page 6 shows how the Beam pixels are numbered. Extended Mode lets you patch virtual dimmers to individual Beam pixels.
- **Ludicrous Mode** includes all the functionality of the previous modes but adds individual RGB control of each of the fixture's 141 Aura pixels. Figure 1 on page 6 shows how the Aura pixels are numbered. Ludicrous Mode lets you patch virtual dimmers to individual Aura pixels.

To set the fixture's DMX mode:

1. Press Enter to enter the main menu.
2. Scroll to **CONTROL MODE**, then press Enter. Scroll to select either **COMPACT**, **BASIC**, **EXTENDED** or **LUDICROUS**, then press Enter to confirm.
3. Press Menu to exit.

Note that a P3 controller connected to the MAC Aura PXL will always treat the fixture as 160 individual pixels even if the fixture is in Basic or Extended DMX mode.

Art-Net and streaming ACN setup

The MAC Aura PXL automatically assigns itself an IP address when connected to Art-Net and sACN, as provided for in the Art-Net and sACN standards. Manually assigning IP addresses is not necessary but you can do this using the control panel if needed for a specific network configuration.

In the **DMX SETUP** menu in the control panel, you can allocate the fixture to a DMX universe for DMX control via Art-Net or sACN.

Using the **ETHERNET SETUP** menu in the control panel, you can display the fixture's current IP address and subnet mask or assign new ones by entering them manually. You can also display the fixture's MAC address.

RDM

The MAC Aura PXL can communicate over standard DMX cable and over Art-Net and sACN Ethernet links using RDM (Remote Device Management) in accordance with ESTA's *American National Standard E1.20-2006*.

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 ID

Each MAC Aura PXL 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 Aura PXL 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 by the fixture.

Note that a firmware update can sometimes expand a fixture's RDM functionality. If this happens, the firmware release notes will give details.

P3

The MAC Aura PXL accepts video pixel control using Martin's proprietary P3 protocol that has been a well-established standard in the industry for over 10 years. It lets you send a video signal from a media server or other video source to P3-compliant video display devices and LED lighting fixtures over Ethernet cable using Martin's reliable P3 data protocol.

The intuitive graphic user interface in Martin P3 controllers lets you visualize and set up a custom installation that can contain a huge number of display devices in any kind of physical arrangement within a few minutes. Device identification is automatic. You can arrange devices on the monitor using drag-and-drop. System latency is often zero and typically < 1 ms. If you use P3 you do not need to worry about IP addresses, as P3 does not use IP addresses or communication.

The MAC Aura PXL's 19 Beam and 141 Aura pixels will always be treated as individual pixels in by a P3 video system controller, regardless of which DMX mode the fixture is set to.

If both video from a media server (or other source) and DMX, Art-Net or sACN data from a lighting console are sent into the P3 System Controller, the P3 System Controller will merge these together and send them to the fixtures over one single network, avoiding the need to run two data cables.

If you use a P3 System Controller, it is also no longer necessary to use the control panels on fixtures, as the P3 System Controller will configure all DMX modes, start addresses, universes and other settings remotely. This feature lets you address tens or hundreds of fixtures in a matter of seconds without needing to access the control panel of each fixture.

A P3 System Controller will also monitor all fixtures for warnings and errors, letting you manage the installation remotely from one central location.

Fixture setup

The onboard control panel (see “Control panel” on page 9) and the Control / settings DMX channel let you configure the fixture via a range of fixture settings.

Fixture ID

The MAC Aura PXL 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 Aura PXL will display this ID number by default, and indicate **FIXTURE ID** in the display.

Personality

The MAC Aura PXL 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. It also lets you set minimum and maximum limits for pan and tilt.
- The **SPEED** menu lets you set **PAN/TILT** to **FAST** (optimized for speed) or **SMOOTH** (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 **FAST** or **SMOOTH**. 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 3):

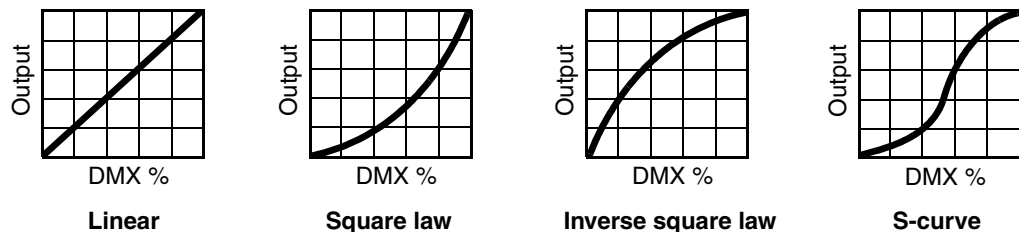


Figure 3: Dimming curve options

- **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** lets you choose to have the look and feel of a tungsten lamp. Color temperature and dimming characteristics emulate tungsten lamp behavior, with a shift towards warmer white when you dim the fixture down.
- **COLOR MODE** offers two options that affect color saturation and evenness between fixtures:
 - **Extended Color** mode optimizes LED deployment for color saturation and gets the deepest color saturation possible from the LEDs. The white color point is calibrated and even across different fixtures, but as the fixture approaches full color saturation there can be very small differences in color rendition between different fixtures.
 - **Calibrated Color** mode optimizes LED deployment for even color rendition between fixtures. All fixtures display identical color from white point to full color saturation, and maximum color saturation levels are limited slightly to ensure this.

- **VIDEO TRACKING** optimizes performance if the MAC Aura PXL is used with a video source. In normal use, the fixture processes the 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 the processing can interfere with video response times. If you enable video tracking, the fixture does not 'smooth out' input but instead snaps instantly when a value changes.
For best results, we recommend that you enable video tracking during P3 video display and disable it (the default setting) during 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). If shortcuts are enabled, the virtual color wheel effect can go through a virtual open position during changes from one color to another just as a mechanical color wheel would.
- **COOLING MODE** lets you select between five cooling fan options depending on whether your priority is highest light output or quietest cooling fan operation:
 - **CONSTANT FAN FULL, CONSTANT FAN MEDIUM, CONSTANT FAN LOW** and **CONSTANT FAN ULOW** set fans to run at constant full, medium, low or ultra-low speed. If you select one of these settings, the fixture will reduce light output intensity to control temperature if it exceeds its normal operating temperature range. These settings give you choices depending on your priorities: If your main priority is quieter operation, select a lower fan speed. If your main priority is higher light intensity, select a higher fan speed.
 - **REGULATE FANS**, the default setting, gives the optimum balance between lowest cooling fan noise and highest light output intensity. It controls fixture temperature by varying cooling fan speed up to the maximum speed available and does not limit light intensity unless full fan speed is not enough to keep fixture temperature within its normal range.
- **LOW NOISE LED MODE** offers two options to balance dimming smoothness and the possibility of high frequency noise:
 - With **LOW NOISE LED MODE** disabled (default) the fixture will offer the best dimming performance, particularly at very low intensity levels. However, in a silent or very quiet environment some minor high frequency noise may be heard from the electronics of the fixture.
 - With **LOW NOISE LED MODE** enabled this high frequency noise will be removed entirely, but the fixture will offer slightly reduced dimming smoothness. Any loss of smoothness will typically only be visible at very low intensity levels.

You can enable or disable **LOW NOISE LED MODE** using the fixture's integrated control panel, via the Control and Settings DMX channel, via RDM or via a P3 System Controller.
- **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 Aura PXL 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. The savable settings comprise:

- all the settings in the PERSONALITY menu,
- the fixture's DMX address, and
- the fixture's DMX control mode: Compact, Basic, Extended or Ludicrous.

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.
- **FAN SPEEDS** provides separate status readouts from the fixture's cooling fans.
- **TEMPERATURES** provides separate PCB temperature readouts. You can choose to see the current readout or the minimum and maximum temperature levels since the fixture was last powered on.

DMX signal monitoring

The MAC Aura PXL 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 usable packets from the data 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** display the DMX values in a range from 0 - 255 that are being received on each channel. The DMX channels displayed depend on whether the fixture is in Compact, Basic, Extended or Ludicrous DMX mode.

Test sequences

The **TEST** menu lets you test all the fixture's effects, test LED effects only, test mechanical effects only or test pan and tilt only. If you are going to run a test, be prepared for the head to move without warning and be prepared for the fixture to light up suddenly.

To run a test:

- In the TEST menu, scroll to TEST ALL, TEST LEDS, TEST EFFECTS or TEST PAN/TILT and press Enter.
- Scroll to the item you want to test and press Enter to start a test sequence for that item.
- Press Menu to stop the test sequence.

Manual control

The **MANUAL CONTROL** menu lets you reset the MAC Aura PXL 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 25.

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** lets you set the pan and tilt home positions in the unlikely event that the fixture loses pan and tilt adjustment. Adjustment may also be required by some firmware updates. If so, this will be mentioned in the firmware release notes.
- **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 using a USB memory device" later in this chapter.

Calibration

Martin fixtures are adjusted and calibrated at the factory, and further calibration should only be necessary if fixtures have been subjected to abnormal shocks during transport or 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 effects 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 "Changing calibration offsets using DMX" on page 20).

A recommended procedure is to set pan, tilt and effects 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.

Installing firmware

You can check the currently installed firmware (fixture software) version in the **INFORMATION** menu in the MAC Aura PXL's control panel.

Firmware updates are available from the Martin website and can be downloaded automatically from within the Martin Companion software suite on a PC connected to the Internet. You can install firmware updates using one of the following methods:

- A USB memory device inserted into the USB port beside the control panel.
- A Windows PC running the Martin Companion application with a Martin Companion Cable USB/DMX hardware interface connected to the DMX link.
- A Martin P3 system controller connected to the fixture via the Ethernet cable.

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.

Important! Do not switch the fixture off or disconnect the source of the firmware during an update, or the firmware will be corrupted.

Installing using a USB memory device

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

- The MAC Aura PXL '.BANK' firmware update file, available for automatic download from within the Martin Companion software suite running on a PC connected to the Internet.
- 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 Aura PXL firmware:

1. Download the '.BANK' firmware file from within the Martin Companion Application and press **Download USB Stick Firmware...**
2. 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.
3. Disconnect the data link from the MAC Aura PXL.
4. Insert the USB stick into the MAC Aura PXL'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.
5. **AVAILABLE FIRMWARE** will appear in the display. You can now scroll through the firmware versions available.
6. To install a firmware version, select it and press Enter. The MAC Aura PXL asks you to confirm installation of the new firmware. Press Enter to confirm and press Menu to exit without confirming.
7. Allow the fixture to install the firmware and reboot. Do not remove the USB stick until the fixture has successfully rebooted.
8. Remove the USB stick. The newly-installed firmware version will now be displayed in the **INFORMATION** menu.
9. Reconnect the data link.
10. If you have installed a new firmware version, check the MAC Aura PXL area of www.martin.com to see whether an updated version of this User Guide is available for the new firmware.

Fixture information and settings are not affected when you upload new firmware to the fixture.

Installing using a PC running Martin Companion

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

- A Windows PC running the latest version of the Martin Companion software suite (available for download free of charge from the Martin website at www.martin.com).

- The MAC Aura PXL firmware file, which the Martin Companion application will download automatically when you run Martin Companion on a PC with an Internet connection.
- The Martin Companion Cable USB-DMX hardware interface, available from your Martin supplier by ordering P/N 91616091.

To install the MAC Aura PXL firmware:

1. Connect your PC to the Internet and launch the Martin Companion application. The application will automatically download the latest Martin fixture firmware from the Martin cloud.
2. Read the firmware release notes carefully to check for any instructions or warnings.
3. Connect the Martin Companion Cable hardware interface to your PC and to the DMX link. Any fixtures on the DMX link that are powered on will automatically recognize that Martin Companion has been connected.
4. Carry out a firmware upload from within the Martin Companion application (see the application's help files if necessary). Do not disconnect the Martin Companion cable until the upload is complete.

Installing from a P3 controller

To install firmware in the MAC Aura PXL from a Martin P3 controller, you must first download the latest MAC Aura PXL firmware file automatically from the Martin cloud using the Martin Companion application running on a PC connected to the Internet. You must then import the firmware into the P3 controller. Once imported, you can use the P3 controller to upload the firmware to all the fixtures on the network that are powered on.

When you import new firmware into a P3 controller, it will automatically recognize old firmware in fixtures and suggest a firmware update.

When carrying out firmware updates, the P3 controller must be connected to fixtures via Ethernet cable as normal. Updating the firmware is a fairly intuitive process using the commands available in the controller interface. Any fixtures that are powered on will recognize that the P3 controller is offering a firmware update and prepare to receive the firmware.

Adjusting settings via DMX

Certain fixture settings and parameters can be adjusted from the DMX controller on the Fixture Control / Settings channel.

Commands sent on this channel override any settings 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 26 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.

Illuminating the display

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.

Control menu setting overrides

The following fixture settings can be adjusted via DMX, overriding the settings entered in the onboard control menus. See under "Control panel menus" on page 39 for details of these settings.

- Dimming curve
- Pan and tilt speed
- Parameter shortcuts
- Video tracking
- Color mode
- Fan speed
- Low-noise LED mode
- Pan/tilt and zoom calibration offsets

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 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 Aura PXL 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 Aura PXL 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 Aura PXL 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.1.2.0. Other PIDs may be added in later firmware versions. In this case, firmware release notes will give details.

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	

GET	SET	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	
		IP configuration	
✓		LIST_INTERFACES	
✓		INTERFACE_LABEL	
✓		INTERFACE_HARDWARE_ADDRESS_TYPE1	
✓		IPV4_DHCP_MODE	
✓		IPV4_CURRENT_ADDRESS	
✓	✓	IPV4_STATIC_ADDRESS	
	✓	INTERFACE_APPLY_CONFIGURATION	
		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_ENABLE	
		Fixture behavior	
✓	✓	EFFECT_SPEED	
✓	✓	DISPLAY_ERRORS_ENABLE	
✓	✓	DIMMER_CURVE	
✓	✓	COLOR_MODE	
✓	✓	VIDEO_TRACKING	
✓	✓	DISPLAY_AUTO_OFF	
✓	✓	HIBERNATION_MODE	
✓	✓	TUNGSTEN_MODE	
		Pan/tilt	
✓	✓	PAN_TILT_SPEED	
✓	✓	PAN_TILT_LIMITATION_ENABLE	
✓	✓	PAN_LIMIT_MIN	
✓	✓	PAN_LIMIT_MAX	
✓	✓	TILT_LIMIT_MIN	
✓	✓	TILT_LIMIT_MAX	
	✓	PAN_TILT_LIMIT_RESET	
		Fixture cooling	
✓	✓	FAN_MODE	
✓	✓	FAN_CLEAN	
		Fixture information	
✓	✓	FIXTURE_ID	
✓		SERIAL_NUMBER	

DMX protocol

MAC Aura PXL firmware version 1.2.0.

Compact DMX Mode

Channel	DMX Value	Function	Fade type	Default value
Strobe / Intensity				
1	0 - 19	Strobe/shutter effect 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	Dimmer (16-bit)	Fade	0
3		Overall intensity 0 → 100%		
Color: all 19 Beam pixels and all Aura pixels controlled as one single pixel				
4	0 - 65535	Red, 16-bit	Fade	65535
5		Intensity 0 → 100%		
6	0 - 65535	Green, 16-bit	Fade	65535
7		Intensity 0 → 100%		
8	0 - 65535	Blue, 16-bit	Fade	65535
9		Intensity 0 → 100%		
10	0 - 10	CTC Disabled	Fade	0
	11 - 171	Color temperature 2000 K to 10 000 K in 50 K steps		
	172 - 255	10 000 K		
11	0 -10	Virtual color wheel Indexing, solid colors Open	Snap	0
	11	Moroccan pink (Lee 790)		
	13	Pink (Lee 157)		
	15	Special rose pink (Lee 332)		
	17	Follies pink (Lee 328)		
	19	Fuchsia pink (Lee 345)		
	21	Surprise pink (Lee 194)		
	23	Congo blue (Lee 181)		
	25	Tokyo blue (Lee 071)		
	27	Deep blue (Lee 120)		
	29	Just blue (Lee 079)		
	31	Medium blue (Lee 132)		
	33	Double CT blue (Lee 200)		
	35	Slate blue (Lee 161)		
	37	Full CT blue (Lee 201)		
	39	Half CT blue (Lee 202)		
	41	Steel blue (Lee 117)		
	43	Lighter blue (Lee 353)		
	45	Light blue (Lee 118)		
	47	Medium blue green (Lee 116)		
49	Dark green (Lee 124)			
51	Primary green (Lee 139)			
53	Moss green (Lee 089)			
55	Fern green (Lee 122)			
57	Jas green (Lee 738)			
59	Lime green (Lee 088)			

Table 1: Compact DMX Mode

Channel	DMX Value	Function	Fade type	Default value
11 cont.	61	Spring yellow (Lee 100)	Snap	0
	63	Deep amber (Lee 104)		
	65	Chrome orange (Lee 179)		
	67	Orange (Lee 105)		
	69	Gold amber (Lee 021)		
	71	Millennium gold (Lee 778)		
	73	Deep golden amber (Lee 135)		
	75	Flame red (Lee 164)		
	77	Red magenta		
	79	Medium lavender		
	81	Pure white		
	83	Pure red		
	85	Pure yellow		
	87	Pure green		
	89	Pure cyan		
	91	Pure blue		
	93	Pure magenta		
	95	Peacock blue (LEE 115)		
	97	Dark lavender (LEE 180)		
	99	Double CT orange (LEE 287)		
	101	Full CT orange (LEE 204)		
	103	Half CT orange (LEE 205)		
	105	Deep Straw (LEE 015)		
107- 190	<i>No function</i>			
	Continuous rotation			
191 - 214	CW, fast → slow			
215 - 219	Stop (wheel stops at current color)			
220 - 243	CCW slow → fast			
	Random colors			
244 - 247	Fast			
248 - 251	Medium			
252 - 255	Slow			
Beam angle				
12	0 - 255	Zoom Narrow → wide	Fade	128
Movement				
13	0 - 65535	Pan, 16-bit Left → right (32768 = neutral)	Fade	32768
14				
15	0 - 65535	Tilt, 16-bit Forward → backward (32768 = neutral)	Fade	32768
16				
Control / Settings				
17		Fixture control/settings (hold for number of seconds indicated to activate)		
	0 - 9	<i>No function (disables calibration) – 5 sec.</i>		
	10 - 14	Reset entire fixture – 5 sec.		
	15 - 16	<i>No function</i>		
	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. (menu override, setting unaffected by power off/on)		
	24	Square law dimming curve – 1 sec. (menu override, default setting, setting unaffected by power off/on)		
	25	Inverse square law dimming curve – 1 sec. (menu override, setting unaffected by power off/on)		
	26	S-curve dimming curve– 1 sec. (menu override, setting unaffected by power off/on)		
	27	<i>No function</i>		
	28	Fast pan and tilt speed– 1 sec. (default setting, menu override - setting returns to MENU setting after power on/off)		
	29	Smooth pan and tilt speed– 1 sec. (menu override - setting returns to MENU setting after power on/off)		
	30 - 35	<i>No function</i>		
	36	Video tracking = ON – 1 sec.		
	37	Video tracking = OFF (default) – 1 sec.		
	38	Extended color mode (default) – 1 sec.		
39	Calibrated color mode – 1 sec.			
40 - 51	<i>No function</i>			

Table 1: Compact DMX Mode

Channel	DMX Value	Function	Fade type	Default value
17 cont.	52	Control panel display = ON (default) – 1 sec.	Snap	0
	53	Control panel display = OFF – 1 sec.		
	54	Regulated fan speed, fixed light output intensity (default) – 1 sec.		
	55	Full fan speed, regulated light output intensity – 1 sec.		
	56	Medium fan speed, regulated light output intensity – 1 sec.		
	57	Low fan speed, regulated light output intensity – 1 sec.		
	58	Ultra-low fan speed, regulated light output intensity – 1 sec.		
	59 - 60	<i>No function</i>		
	61	Hibernation mode = ON – 5 sec.		
	62	Hibernation mode = OFF (default) – 5 sec.		
	63 - 64	<i>No function</i>		
	65	Pan and tilt limits = ON – 5 sec.		
	66	Pan and tilt limits = OFF (default) – 5 sec.		
	67	Store lower pan limit – 5 sec.		
	68	Store upper pan limit – 5 sec.		
	69	Store lower tilt limit – 5 sec.		
	70	Store upper tilt limit – 5 sec.		
	71	Reset pan and tilt limits – 5 sec.		
	72	Tungsten emulation = ON – 1 sec.		
	73	Tungsten emulation = OFF (default) – 1 sec.		
	74 - 84	<i>No function</i>		
	85	Low-noise LED mode = ON – 1 sec.		
	86	Low-noise LED mode = OFF (default) – 1 sec.		
	87 - 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 - 113	<i>No function</i>		
	114	Store zoom calibration – 5 sec.		
	115 - 198	<i>No function</i>		
199	Reset all calibration values to factory default – 5 sec.			
200 - 255	<i>No function</i>			

Table 1: Compact DMX Mode

Basic DMX Mode

Channels 1- 17 in Basic Mode are identical to Compact Mode apart from channels 1 - 11. In Compact Mode, channels 1 - 11 control the whole fixture (Beam and Aura) as one unit. In Basic Mode, channels 1 - 11 control the Beam only, and channels 24 - 32 control the Aura.

Channel	DMX Value	Function	Fade type	Default value
Beam P3 Mix				
18	0 - 26	Beam P3 Mix <i>DMX Mode</i> Beam output fully controlled by DMX (P3 pixel data ignored)	Snap	0
	27	<i>Mixed Mode</i> Beam output fully controlled by DMX (P3 pixel data ignored)		
	27 - 227	Progressive crossfade from DMX to P3 control		
	228	Beam output fully controlled by P3 (DMX data ignored)		
229 - 255	<i>Video Mode</i> P3 pixel control with DMX superimposed (DMX channels 'color' the P3 pixel data)			
Macro FX				
19	0 - 255	FX1 selection (see Table 5 on page 35) Effect selection (adjust speed and direction on DMX channel 20)	Snap	0
20	0 - 126	FX1 speed Effect reversed fast → slow	Fade	128
	127 - 129	Effect stops		
	130 - 255	Effect forward slow → fast		
21	0 - 255	FX2 selection (see Table 5 on page 35) Effect selection (adjust speed and direction on DMX channel 22)	Snap	0
22	0 - 126	FX2 speed Effect reversed fast → slow	Fade	128
	127 - 129	Effect stops		
	130 - 255	Effect forward slow → fast		
23	0	FX synchronization No sync	Snap	36
	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°		

Table 2: Basic DMX Mode

Channel	DMX Value	Function	Fade type	Default value
23 cont.	29	Offset shift 290°	Snap	36
	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 (Channel 20 controls overall speed)		
121 - 140	Random duration			
141 - 255	<i>No function</i>			
Aura control				
24	0 - 19	Aura strobe shutter Shutter closed	Snap	30
	20 - 49	Shutter open		
	50 - 200	Strobe slow → fast		
	201 - 210	Shutter open		
	211 - 255	Random strobe slow → fast		
25	0 - 65535	Aura dimmer (16-bit) Intensity 0 - 100%	Fade	0
26				
27	0 - 255	Aura Red 0 - 100%	Fade	255
28	0 - 255	Aura Green 0 - 100%	Fade	255
29	0 - 255	Aura Blue 0 - 100%	Fade	255
30	0 - 10	Aura CTC Disabled	Fade	0
	11 - 171	Color temperature 2000 K to 10 000 K in 50 K steps		
	172 - 255	10 000 K		
31	0 - 10	Aura virtual color wheel Indexing, solid colors Open	Snap	0
	11	Moroccan pink (Lee 790)		
	13	Pink (Lee 157)		
	15	Special rose pink (Lee 332)		
	17	Follies pink (Lee 328)		
	19	Fuchsia pink (Lee 345)		
	21	Surprise pink (Lee 194)		
	23	Congo blue (Lee 181)		
	25	Tokyo blue (Lee 071)		
	27	Deep blue (Lee 120)		
	29	Just blue (Lee 079)		
	31	Medium blue (Lee 132)		
	33	Double CT blue (Lee 200)		
	35	Slate blue (Lee 161)		
	37	Full CT blue (Lee 201)		
	39	Half CT blue (Lee 202)		
	41	Steel blue (Lee 117)		
	43	Lighter blue (Lee 353)		
	45	Light blue (Lee 118)		
	47	Medium blue green (Lee 116)		
	49	Dark green (Lee 124)		
	51	Primary green (Lee 139)		
	53	Moss green (Lee 089)		
	55	Fern green (Lee 122)		
	57	Jas green (Lee 738)		
	59	Lime green (Lee 088)		
	61	Spring yellow (Lee 100)		
63	Deep amber (Lee 104)			

Table 2: Basic DMX Mode

Channel	DMX Value	Function	Fade type	Default value
31 cont.	65	Chrome orange (Lee 179)	Snap	0
	67	Orange (Lee 105)		
	69	Gold amber (Lee 021)		
	71	Millennium gold (Lee 778)		
	73	Deep golden amber (Lee 135)		
	75	Flame red (Lee 164)		
	77	Red magenta		
	79	Medium lavender		
	81	Pure white		
	83	Pure red		
	85	Pure yellow		
	87	Pure green		
	89	Pure cyan		
	91	Pure blue		
	93	Pure magenta		
	95	Peacock blue (LEE 115)		
	97	Dark lavender (LEE 180)		
	99	Double CT orange (LEE 287)		
	101	Full CT orange (LEE 204)		
	103	Half CT orange (LEE 205)		
	105	Deep Straw (LEE 015)		
	107 - 190	<i>No function</i>		
	Continuous rotation			
191 - 214	CW, fast → slow			
215 - 219	Stop (wheel stops at current color)			
220 - 243	CCW slow → fast			
	Random colors			
244 - 247	Fast			
248 - 251	Medium			
252 - 255	Slow			
32	0 - 26	Aura P3 Mix <i>DMX Mode</i> Output fully controlled by DMX (P3 pixel data ignored)	Snap	0
	27	<i>Mixed Mode</i> Output fully controlled by DMX (P3 pixel data ignored)		
	27 - 227	Progressive crossfade from DMX to P3 control		
	228	Output fully controlled by P3 (DMX data ignored)		
	229 - 255	<i>Video Mode</i> P3 pixel control with DMX superimposed (DMX channels 'color' the P3 pixel data)		

Table 2: Basic DMX Mode

Extended DMX Mode

DMX channels 1 - 32 in Extended Mode are identical to Basic Mode. Note that, as in Basic Mode, channels 1 - 11 control the Beam only, and channels 24 - 32 control the Aura.

Channel	DMX Value	Function	Fade type	Default value
<i>Beam pixel color (pixel color control of 19 x Beam LEDs, global Beam RGB channels are added using HTP)</i>				
33	0 - 255	Beam pixel 1 Red 0 - 100%	Fade	0
34	0 - 255	Beam pixel 1 Green 0 - 100%	Fade	0
35	0 - 255	Beam pixel 1 Blue 0 - 100%	Fade	0
36	0 - 255	Beam pixel 2 Red 0 - 100%	Fade	0
37	0 - 255	Beam pixel 2 Green 0 - 100%	Fade	0
38	0 - 255	Beam pixel 2 Blue 0 - 100%	Fade	0
39	0 - 255	Beam pixel 3 Red 0 - 100%	Fade	0
40	0 - 255	Beam pixel 3 Green 0 - 100%	Fade	0
41	0 - 255	Beam pixel 3 Blue 0 - 100%	Fade	0
42	0 - 255	Beam pixel 4 Red 0 - 100%	Fade	0
43	0 - 255	Beam pixel 4 Green 0 - 100%	Fade	0
44	0 - 255	Beam pixel 4 Blue 0 - 100%	Fade	0
45	0 - 255	Beam pixel 5 Red 0 - 100%	Fade	0
46	0 - 255	Beam pixel 5 Green 0 - 100%	Fade	0
47	0 - 255	Beam pixel 5 Blue 0 - 100%	Fade	0
48	0 - 255	Beam pixel 6 Red 0 - 100%	Fade	0
49	0 - 255	Beam pixel 6 Green 0 - 100%	Fade	0
50	0 - 255	Beam pixel 6 Blue 0 - 100%	Fade	0
51	0 - 255	Beam pixel 7 Red 0 - 100%	Fade	0
52	0 - 255	Beam pixel 7 Green 0 - 100%	Fade	0
53	0 - 255	Beam pixel 7 Blue 0 - 100%	Fade	0
54	0 - 255	Beam pixel 8 Red 0 - 100%	Fade	0
55	0 - 255	Beam pixel 8 Green 0 - 100%	Fade	0
56	0 - 255	Beam pixel 8 Blue 0 - 100%	Fade	0
57	0 - 255	Beam pixel 9 Red 0 - 100%	Fade	0
58	0 - 255	Beam pixel 9 Green 0 - 100%	Fade	0
59	0 - 255	Beam pixel 9 Blue 0 - 100%	Fade	0

Table 3: Extended DMX Mode

Channel	DMX Value	Function	Fade type	Default value
60	0 - 255	Beam pixel 10 Red 0 - 100%	Fade	0
61	0 - 255	Beam pixel 10 Green 0 - 100%	Fade	0
62	0 - 255	Beam pixel 10 Blue 0 - 100%	Fade	0
63	0 - 255	Beam pixel 11 Red 0 - 100%	Fade	0
64	0 - 255	Beam pixel 11 Green 0 - 100%	Fade	0
65	0 - 255	Beam pixel 11 Blue 0 - 100%	Fade	0
66	0 - 255	Beam pixel 12 Red 0 - 100%	Fade	0
67	0 - 255	Beam pixel 12 Green 0 - 100%	Fade	0
68	0 - 255	Beam pixel 12 Blue 0 - 100%	Fade	0
69	0 - 255	Beam pixel 13 Red 0 - 100%	Fade	0
70	0 - 255	Beam pixel 13 Green 0 - 100%	Fade	0
71	0 - 255	Beam pixel 13 Blue 0 - 100%	Fade	0
72	0 - 255	Beam pixel 14 Red 0 - 100%	Fade	0
73	0 - 255	Beam pixel 14 Green 0 - 100%	Fade	0
74	0 - 255	Beam pixel 14 Blue 0 - 100%	Fade	0
75	0 - 255	Beam pixel 15 Red 0 - 100%	Fade	0
76	0 - 255	Beam pixel 15 Green 0 - 100%	Fade	0
77	0 - 255	Beam pixel 15 Blue 0 - 100%	Fade	0
78	0 - 255	Beam pixel 16 Red 0 - 100%	Fade	0
79	0 - 255	Beam pixel 16 Green 0 - 100%	Fade	0
80	0 - 255	Beam pixel 16 Blue 0 - 100%	Fade	0
81	0 - 255	Beam pixel 17 Red 0 - 100%	Fade	0
82	0 - 255	Beam pixel 17 Green 0 - 100%	Fade	0
83	0 - 255	Beam pixel 17 Blue 0 - 100%	Fade	0
84	0 - 255	Beam pixel 18 Red 0 - 100%	Fade	0
85	0 - 255	Beam pixel 18 Green 0 - 100%	Fade	0
86	0 - 255	Beam pixel 18 Blue 0 - 100%	Fade	0
87	0 - 255	Beam pixel 19 Red 0 - 100%	Fade	0
88	0 - 255	Beam pixel 19 Green 0 → 100%	Fade	0
89	0 - 255	Beam pixel 19 Blue 0 → 100%	Fade	0

Table 3: Extended DMX Mode

Ludicrous DMX Mode

DMX channels 1 - 89 in Ludicrous Mode are identical to Extended Mode and Basic Mode. Note that, as in Basic and Extended Modes, channels 1 - 11 control the Beam only, and channels 24 - 32 control the Aura

Channel	DMX Value	Function	Fade type	Default value
Aura pixel color (pixel color control of 141 x Aura LEDs, global Aura RGB channels are added using HTP)				
90	0 - 255	Aura pixel 1 Red 0 - 100%	Fade	0
91	0 - 255	Aura pixel 1 Green 0 - 100%	Fade	0
92	0 - 255	Aura pixel 1 Blue 0 - 100%	Fade	0
...
510	0 - 255	Aura pixel 141 Red 0 - 100%	Fade	0
511	0 - 255	Aura pixel 141 Green 0 - 100%	Fade	0
512	0 - 255	Aura pixel 141 Blue 0 - 100%	Fade	0

Table 4: Ludicrous DMX Mode

FX: pre-programmed effects

Important: FX are implemented in the MAC Aura PXL from firmware version 1.1.0 onward. You can quickly check which firmware version a fixture is running using INFORMATION → FW in the fixture's control menus. For information on updating firmware, see "Installing firmware" on page 18.

The table on the following pages lists the pre-programmed dynamic FX (effect macros) available in Basic, Extended and Ludicrous DMX modes in the MAC Aura PXL from **firmware version 1.1.0 onward**. You select an FX on DMX channels 19 and 21 by sending the values listed in the table. Adjust effect speed on channels 20 and 22, and adjust synchronization of effects across different fixtures on channel 23.

Effects types

Beam intensity effects (1-63)

These effects modulate the intensity of the Beam LEDs while maintaining the color(s) set by the RGB channels, RGB pixel channels and P3 pixels.

When the Beam virtual color wheel (DMX channel 11) is set to 0 (open), the intensity modulation uses black/off as reference. So (for example) the Beam Wave effect will sweep between full intensity and off.

When the Beam virtual color wheel (DMX channel 11) is set to any other color, the intensity modulation will use that selected color as reference. So (for example) the Beam Wave effect will sweep between the 'normal' color(s) and the color selected on the virtual color wheel.

Beam color effects (64-95)

These effects override the color(s) set by the RGB channels, RGB pixel channels, virtual color wheel and P3 pixels.

Aura intensity effects (96-191)

These effects modulate the intensity of the Aura LEDs while maintaining the color(s) set by the RGB channels, RGB pixel channels and P3 pixels.

When the Aura virtual color wheel (DMX channel 31) is set to 0 (open), the intensity modulation uses black/off as reference. So (for example) the Aura Wave effect will sweep between full intensity and off.

When the Aura virtual color wheel (DMX channel 31) is set to any other color, the intensity modulation will use that selected color as reference. So (for example) the Aura Wave effect will sweep between the 'normal' color(s) and the color selected on the virtual color wheel.

Aura color effects (192-223)

These effects override the color(s) set by the RGB channels, RGB pixel channels, virtual color wheel and P3 pixels.

Beam & Aura combined effects (224-239)

These effects apply to both the Beam and Aura LEDs and provide a complete effect.

Full fixture effects (240-255)

These effects also control the zoom of the fixture.

Effects types

Available from MAC Aura PXL firmware version 1.1.0. onward

DMX value	Effect
0	No FX
Beam intensity FX	
1	Beam Wave (sine wave)
2	Beam Step (50/50 on/off)
3	Beam Pulse
4	Beam Blackout Strobe
5	Beam 2x Strobe
6	Beam 3x Strobe
7	Beam 4x Strobe
8	Beam Up, Down, Flash
9	Beam Up, Flash, Down, Flash
10	Beam Random Levels
11	Beam Sparkle Stars
12	Beam Starfield
13	Beam Fiber Optic
14	Beam Pixel Killer
15	Beam Build Up/Down (pixel after pixel turned on at random then off at random)
16	Beam In-Out Wave (crossfade between 3 rings)
17	Beam In-Out Step (step between 3 rings)
18	Beam In-Out Pulse (pulse 3 rings)
19	Beam Waterdrop (intensity from inner to outer gradually increasing / moving)
20	Beam Radar Spinning
21	Beam Cross (X) Spinning
22	Beam Cross (X) Circle (O) Wave
23	Beam Circling Snake
24	Beam Pie Slice Chase
25	Beam Random Chase 1 pixel Wave
26	Beam Random Chase 1 pixel Step
27	Beam Random Chase 1 pixel Pulse
28	Beam Random Chase 3 pixel Wave
29	Beam Random Chase 3 pixel Step
30	Beam Random Chase 3 pixel Pulse
31	Beam Random Chase 6 pixel Wave
32	Beam Random Chase 6 pixel Step
33	Beam Random Chase 6 pixel Pulse
34	Beam Vertical Wave
35	Beam Horizontal Wave
36	Beam Vertical Bouncing Line
37	Beam Horizontal Bouncing Line
38	Beam Vertical + Horizontal Bouncing Line
39	Beam Noise
40	Beam Movie Flicker
41	Beam Atomic Lighting
42	Beam Thunderstorm
43 - 63	No function

Table 5: FX in the MAC Aura PXL

Beam color FX	
64	Beam Rainbow Wave
65	Beam Rainbow Step
66	Beam Rainbow Pulse
67	Beam RGB Wave
68	Beam RGB Step
69	Beam RGB Pulse
70	Beam CMY Wave
71	Beam CMY Step
72	Beam CMY Pulse
73	Beam Random Mix Wave
74	Beam Random Mix Step
75	Beam Random Mix Pulse
76	Beam Spectrum Shifter
77	Beam Red White Blue Fade
78	Beam Red White Blue Snaps
79	Beam Fire
80	Beam Water
81	Beam Swimming Pool
82	Beam Ice
83	Beam Hot and Cold
84	Beam Warm and Fuzzy
85	Beam Silver and Gold
86	Beam Gold and Silver
87	Beam Electric Arc
88	Beam Plasma
89 -95	<i>No function</i>
Aura intensity FX	
96	Aura Wave (sine wave)
97	Aura Step (50/50 on/off)
98	Aura Pulse
99	Aura Blackout Strobe
100	Aura 2x Strobe
101	Aura 3x Strobe
102	Aura 4x Strobe
103	Aura Up, Down, Flash
104	Aura Up, Flash, Down, Flash
105	Aura Random Levels
106	Aura Sparkle Stars
107	Aura Starfield
108	Aura Fiber Optic
109	Aura Pixel Killer
110	Aura Build Up/Down (pixel after pixel turned on at random then off at random)
111	Aura In-Out Wave (crossfade between 3 rings)
112	Aura In-Out Step (step between 3 rings)
113	Aura In-Out Pulse (pulse 3 rings)
114	Aura Waterdrop (intensity inner to outer gradually increasing)
115	Aura Radar Spinning
116	Aura Cross (X) Spinning
117	Aura Cross (X) Circle (O) Wave
118	Aura Circling Snake
119	Aura Pie Slice Chase
120	Aura Random Chase 1 pixel Wave

Table 5: FX in the MAC Aura PXL

121	Aura Random Chase 1 pixel Step
122	Aura Random Chase 1 pixel Pulse
123	Aura Random Chase 3 pixel Wave
124	Aura Random Chase 3 pixel Step
125	Aura Random Chase 3 pixel Pulse
126	Aura Random Chase 6 pixel Wave
127	Aura Random Chase 6 pixel Step
128	Aura Random Chase 6 pixel Pulse
129	Aura Vertical Wave
130	Aura Horizontal Wave
131	Aura Vertical Bouncing Line
132	Aura Horizontal Bouncing Line
133	Aura Vertical + Horizontal Bouncing Line
134	Aura Noise
135	Aura Movie Flicker
136	Aura Atomic Lightning
137	Aura Thunderstorm
138	Aura A Wave
139	Aura B Wave
140	Aura C Wave
141	Aura D Wave
142	Aura E Wave
143	Aura F Wave
144	Aura G Wave
145	Aura H Wave
146	Aura I Wave
147	Aura J Wave
148	Aura K Wave
149	Aura L Wave
150	Aura M Wave
151	Aura N Wave
152	Aura O Wave
153	Aura P Wave
154	Aura Q Wave
155	Aura R Wave
156	Aura S Wave
157	Aura T Wave
158	Aura U Wave
159	Aura V Wave
160	Aura W Wave
161	Aura X Wave
162	Aura Y Wave
163	Aura Z Wave
164	Aura 0 Wave
165	Aura 1 Wave
166	Aura 2 Wave
167	Aura 3 Wave
168	Aura 4 Wave
169	Aura 5 Wave
170	Aura 6 Wave
171	Aura 7 Wave
172	Aura 8 Wave
173	Aura 9 Wave
174 - 191	No function

Table 5: FX in the MAC Aura PXL

FX: pre-programmed effects

Aura color FX	
192	Aura Rainbow Wave
193	Aura Rainbow Step
194	Aura Rainbow Pulse
195	Aura RGB Wave
196	Aura RGB Step
197	Aura RGB Pulse
198	Aura CMY Wave
199	Aura CMY Step
200	Aura CMY Pulse
201	Aura Random Mix Wave
202	Aura Random Mix Step
203	Aura Random Mix Pulse
204	Aura Spectrum Shifter
205	Aura Red White Blue Fade
206	Aura Red White Blue Snaps
207	Aura Fire
208	Aura Water
209	Aura Swimming Pool
210	Aura Ice
211	Aura Hot and Cold
212	Aura Warm and Fuzzy
213	Aura Silver and Gold
214	Aura Gold and Silver
215	Aura Electric Arc
216	Aura Plasma
217 - 223	<i>No function</i>
Beam / Aura combined FX	
224	Full Thunderstorm
225	Full Welding
226	Full 3-Step Strobe
227	Full Tick Tock
228	Aura Ramp, Beam Flash
229	Beam Ramp, Aura Flash
230	Beam-Aura Wave (sine wave)
231	Beam-Aura Step (50/50 on/off)
232	Beam-Aura Pulse (sine wave)
233 - 239	<i>No function</i>
Full fixture FX	
240	Beam Splash
241	Beam Splash Invert
242	Aura Splash
243	Aura Splash Invert
244	Beam Zoom Out Towards Aura
245	Beam Zoom In Towards Aura
246 - 255	<i>No function</i>

Table 5: FX in the MAC Aura PXL

Control panel menus

Available when running MAC Aura PXL firmware version 1.2.0.

The table below gives details of the menus available in the fixture's control panel.

Menu level 1	Menu level 2	Menu level 3	Menu level 4	Notes (Default settings in bold print)	
DMX SETUP	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. Note that Ludicrous Mode uses 512 channels so in this mode the address can only be 001.	
	DMX CONTROL MODE	COMPACT		Set DMX control mode	
		BASIC			
		EXTENDED			
LUDICROUS					
DMX UNIVERSE	1 - 64000		Set DMX universe		
ETHERNET SETUP	IP ADDRESS	XXX.XXX.XXX.XXX		Display fixture's static IP address	
		PART 1 MSB	0 - 255	Set far left block (most significant byte) of IP address	
		PART 2	0 - 255	Set middle left block of IP address	
		PART 3	0 - 255	Set middle right block of IP address	
		PART 4 LSB	0 - 255	Set far right block (least significant byte) of IP address	
	SUBNET MASK	XXX.XXX.XXX.XXX		Display fixture's subnet mask	
		EDIT SUBNET MASK	XXX.XXX.XXX.XXX	Display fixture's subnet mask	
			XXX.XXX.XXX.XXX	Set subnet mask with 1 bit increments from the left	
MAC ADDRESS	XX:XX:XX:XX:XX:XX		Display fixture's MAC address		
RESET IP SETUP	RESET	ARE YOU SURE? YES/NO	Reset static IP address and subnet mask to default values		
FIXTURE ID	0 – 9999	User-settable fixture ID number		0	
PERSONALITY	PAN/TILT	PAN INVERT	ON/OFF	Inverse DMX pan control: right → left	
		TILT INVERT	ON/OFF	Inverse DMX tilt control: down → up	
		LIMIT PAN/TILT	LIMIT ENABLE ON/OFF		Enable limits for pan and tilt
			PAN MIN → -32767 degrees		Set minimum pan angle
			PAN MAX → 32768 degrees		Set maximum pan angle
			TILT MIN → -32767 degrees		Set minimum tilt angle
	TILT MAX → 32768 degrees			Set maximum tilt angle	
	SPEED	PAN/TILT	FAST		Optimize pan/tilt movement for speed
			SMOOTH		Optimize pan/tilt movement for smoothness
		EFFECT	FOLLOW P/T		Effects speed follows the speed setting applied to pan and tilt via DMX or in control menu
			FAST		Optimize effects movement for speed
SMOOTH			Optimize effects movement for smoothness		

Table 6: Control menus

Menu level 1	Menu level 2	Menu level 3	Menu level 4	Notes (Default settings in bold print)
PERSONALITY (continued)	DIMMER CURVE	LINEAR		Optically linear dimming curve
		SQUARE LAW		Square law dimming curve
		INV SQ LAW		Inverse square law dimming curve
		S-CURVE		S-curve (fixture emulates incandescent lamp voltage linear RMS dimming curve)
	TUNGSTEN EMULATOR	ON		Color temperature and dimming characteristics emulate tungsten lamp behavior
		OFF		
	COLOR MODE	EXTENDED COLOR		Color mixing optimized for saturation
		CALIBRATED		Color mixing optimized for even color rendition across fixtures
	VIDEO TRACKING	ENABLED		Color fading optimized for speed of color changes
		DISABLED		Color fading optimized for smoothness
	DMX RESET	ON		Fixture can be reset via DMX
		OFF		Fixture cannot be reset via DMX (note that this menu item can be overridden: see DMX protocol)
	EFFECT SHORTCUT	ON		Effects take shortest route during changes, crossing open positions if necessary
		OFF		Effects avoid open positions during effects changes
	COOLING MODE	CONSTANT FAN FULL		Fans optimized for maximum light intensity, fans run at full speed, light intensity reduced if necessary to keep fixture within temperature limits
		CONSTANT FAN MEDIUM		Fans run at medium speed, light intensity reduced if necessary to keep fixture within temperature limits
		CONSTANT FAN LOW		Fans run at low speed, light intensity reduced if necessary to keep fixture within temperature limits
		CONSTANT FAN ULOW		Fans optimized for lowest noise, fans run at ultra-low speed, light intensity reduced if necessary to keep fixture within temperature limits
		REGULATE FANS		Compromise between light intensity and quietness, fan speed temperature-regulated, light intensity only reduced if fans reach full speed and further action necessary to keep fixture within temperature limits
	LOW NOISE LED MODE	ON		Reduce high frequency noise coming from electronics with slightly less smooth low level dimming performance
		OFF		Optimized low level dimming performance, but with minor high frequency noise coming from electronics (not noticeable in majority of applications)

Table 6: Control menus

Menu level 1	Menu level 2	Menu level 3	Menu level 4	Notes (Default settings in bold print)
PERSONALITY (continued)	DISPLAY	DISPLAY SLEEP	10 MINUTES	Display goes into sleep mode 10 minutes after last key press
			5 MINUTES	Display goes into sleep mode five minutes after last key press
			2 MINUTES	Display goes into sleep mode two minutes after last key press
			ON	Display permanently on
		DISPLAY INTENSITY	10 ... 100 %	Set display intensity in % (default = 100)
		DISPLAY ROTATION	NORMAL / ROTATE 180	Display orientation normal or rotated 180°
		DISPLAY CONTRAST	1 ...100	Adjust contrast of display (default = 41)
	ERROR MODE	NORMAL	Enable error messages and warnings in display	
		SILENT	Disable error messages and warnings in display (the status LED will still light to indicate fixture status if an error has been detected or the fixture has a warning)	
	HIBERNATION MODE	ON	Enable Hibernation Mode (light output set to zero, all effect movement disabled)	
OFF		Disable Hibernation Mode		
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
	INFORMATION	POWER ON TIME	TOTAL	0 ... XXX HR
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)
FW VERSION		XX.XX.XX		Displays currently active firmware version
RDM UID**		4D50.XXXXXXXX		Displays fixture's unique RDM ID
FAN SPEEDS**		HEAD FAN 1 ... 4, BASE FAN 1 - 2	0 - XXX RPM	Scroll to display current speed of each cooling fan (head and base)
TEMPERATURES**		UI ... AURA PIXEL	CURRENT / MIN / MAX X C	Scroll through PCB temperature sensors, then display current, minimum* and maximum* temperature in °C of all PCBs *Since fixture was last powered on
DMX LIVE**		RATE	0 - 44 HZ	
	QUALITY	0 - 100%		Percent of packets received
	START CODE	0 - 255		Value of the DMX start code
	STROBE/ SHUTTER ... AURA P3 MIX	XXX		Scroll to see values received on each DMX channel

Table 6: Control menus

Menu level 1	Menu level 2	Menu level 3	Menu level 4	Notes (Default settings in bold print)	
TEST**	TEST ALL	BEAM DIMMER ... TILT		Run test sequence of all functions To test a specific function, use Up/Down buttons to scroll through functions. Press Enter to pause and press again to restart test sequence. Press Menu button to exit test	
	TEST LEDS	BEAM DIMMER ... AURA V COLOR WHEEL		Run test sequence of LEDs only. To test a specific LED group, use Up/Down buttons to scroll through groups. Press Enter to pause and press again to restart test sequence. Press Menu button to exit test	
TEST (continued)**	TEST EFFECTS	BEAM DIMMER ... AURA V COLOR WHEEL		Run test sequence of effects. To test a specific effect, use Up/Down buttons to scroll through groups. Press Enter to pause and press again to restart test sequence. Press Menu button to exit test	
	TEST PAN/TILT	PAN		Run test sequence of pan functions. Press Menu button to exit test	
		TILT		Run test sequence of tilt functions. Press Menu button to exit test	
MANUAL CONTROL**	RESET			Reset fixture	
	STROBE/SHUTTER ... AURA P3 MIX			Scroll through effects, then manually control an effect	
SERVICE	ERROR LIST	Empty or up to 20 errors		Display any errors in memory	
	FAN CLEAN**	ON/OFF		Start/stop fan cleaning	
	PT FEEDBACK**	ON		Enable pan/tilt position feedback systems	
		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	-30.00 ... 0.00%		Set max. dimmer intensity level
		RED	-30.00 ... 0.00%		Set max. red intensity level
		GREEN	-30.00 ... 0.00%		Set max. green intensity level
		BLUE	-30.00 ... 0.00%		Set max. blue intensity level
		ZOOM	-5.00 ... 5.00%		Set zoom home position
		PAN	-2.00 ... 2.00%		Set pan home position
		TILT	-2.00 ... 2.00%		Set tilt home position
		AURA DIMMER	-30.00 ... 0.00%		Set max. Aura dimmer intensity level
		AURA RED	-30.00 ... 0.00%		Set max. Aura red intensity level
		AURA GREEN	-30.00 ... 0.00%		Set max. Aura green intensity level
		AURA BLUE	-30.00 ... 0.00%		Set max. Aura blue intensity level
		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 6: Control menus

**Menus or menu items 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 Aura PXL 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 Aura PXL 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 2 on page 9) flashes orange to indicate that there is a warning. Activating the display will show the warning.

The possible warning messages are listed in Table 7 below:

Short code	Long message and explanation
BANK	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.
DCTW	DC TEMP HIGH DC PCB sensor detects abnormally high operating temperature.*
LDTW	LED DRV TMP HIGH LED driver temperature sensor detects abnormally high operating temperature.*
PFTW	PFC TEMP HIGH PFC unit temperature sensor detects abnormally high operating temperature.*
PTTW	PT TEMP HIGH Pan/tilt PCB sensor detects abnormally high operating temperature.*
SERV	SERVICE MODE Fixture in service mode.
SL W	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 7: 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 Aura PXL 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 8 below:

Short code	Long message and explanation
CELD	COM ERR LED DRV LED driver communication error.
COLD	FIXTURE COLD Fixture too cold. Physical movement of effects is disabled until fixture has warmed up.
FAN	BASE FAN 1 ERR
FAN	BASE FAN 2 ERR
FAN	BASE FAN 3 ERR
FAN	HEAD FAN 1 ERR
FAN	HEAD FAN 2 ERR
FAN	HEAD FAN 3 ERR
FAN	HEAD FAN 4 ERR
FBEP	PAN FBACK ERR Pan position magnetic indexing system timeout. Fixture is unable to correct pan position (but pan movement will often still be possible).
FBET	TILT FBACK ERR Tilt position magnetic indexing system timeout. Fixture is unable to correct tilt position (but tilt movement will often still be possible).
FBEZ	ZOOM FBACK ERR Zoom position indexing system timeout. Fixture is unable to correct zoom position.
LDTC	LED TEMP SEN ERR LED board temperature sensor error.
LDTE	LED TEMP SEN ERR LED board temperature sensor error.
MMER	MISSING MODULE ERR Impossible to communicate with a module that should be present. Module missing or not correctly connected.
PAER	PAN ERROR Pan position electrical indexing system timeout.
PFTC	PFC TEMP CUT OFF Power factor correction system temperature cutoff.
PFTE	PFC TEMP SEN ERR Power factor correction system temperature sensor error.
PSER	PAN SENSOR ERROR Fixture unable to retrieve reliable data from pan position sensor.
PTCM	P/T SENSOR ADJUST Pan/tilt sensors are incorrectly adjusted.
SLER	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.
TIER	TILT ERROR Tilt position electrical indexing circuit timeout.
TSER	TILT SENSOR ERR Fixture unable to retrieve reliable data from tilt position sensor.

Table 8: Error messages

Short code	Long message and explanation
UELD	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.
UITC	UI TEMP CUTOFF User interface (LCD display and control panel) temperature cutoff activated.
ZSER	ZOOM SENSOR ERR Zoom position electrical indexing system timeout.

Table 8: 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.



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