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LOW-NOISE MULTI-SPECTRAL RGBAL LED FIXTURE

Clay Paky Rhapsodya





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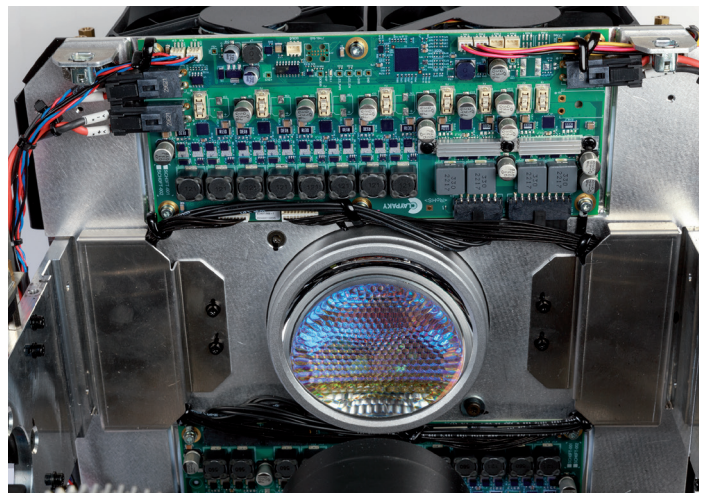
Faster, higher, further - a Rhapsodya in black. From a user and technician's point of view, there is a lot to discover in the new flagship model from Clay Paky.

By Herbert Bernstädt | Images: Clay Paky (1), Herbert Bernstädt |
Graphics and measurements: Herbert Bernstädt

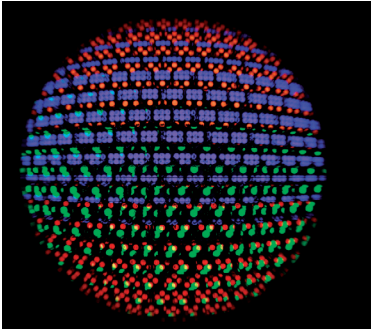
Rhapsody: this originally meant „recited poem“ - today it is a „piece of music without categorical classification“. In terms of language, however, the Clay Paky Rhapsodya is rather the opposite: various disciplines such as the latest control algorithms, maximum performance and lowest volume combine to create a workhorse that could clearly be assigned to a musical category like „fusion“.

RGBAL – for a whiter white

The white light of the Rhapsodya is mixed by a powerful 1,200 W multi-color LED module made up of the colors red, green, blue, amber, and lime. The individual colors can be controlled in four sectors each. The LED engine is cooled by heat pipes that distribute the heat over a large area onto fine metal fins that can be forced-cooled by opposing pairs



LED module in the middle Above the module is one of the two driver boards that separately drive the colors red, green, blue, amber and lime in four zones

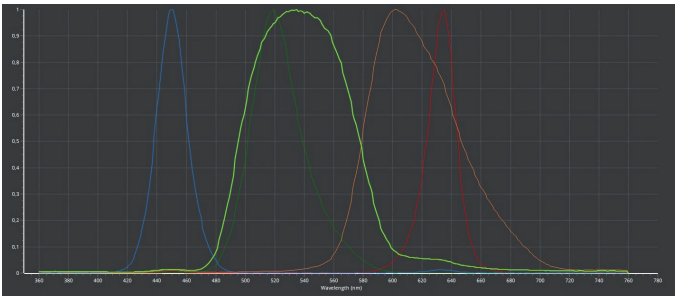


LED engine

Its four zones were each controlled in a different color (red, green, blue and amber)

Centered pulling up with a rope

allows the center opening. Furthermore, there's four omega adapter positions, wide rubber feet and spacious carrying handles



Spectra of the RGBAL color chips The wide spectra of the phosphor-converted LEDs of lime and amber, which ensure high color rendering, are clearly visible



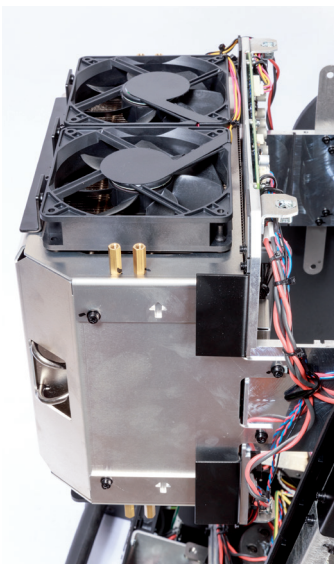
The device weight of 48 kg

requires a Saveking with 6 mm quick connection link or 8 mm without damping link with at least 1 m safety rope length (8 mm Kettbinner or 10 mm chain end link do not fit)

of fans. Directional arrows on the housing of the cooling system (which shows the direction of air flow with milled arrows) are very easy to service.

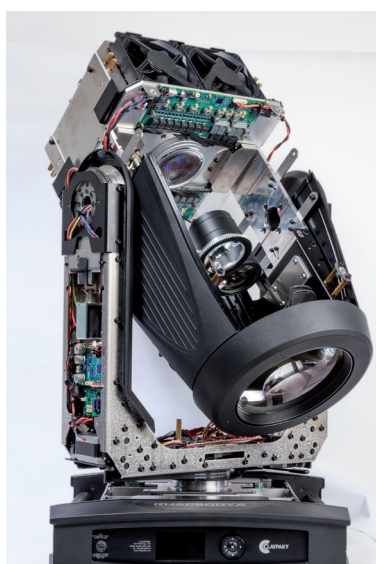
Basically, the Rhapsodya structure is impressive thanks to its D-Sub connectors for two removable modules, labeled cables and a structure ranging from very solid to massive. These are the ingredients of a moving light designed for longevity.

It is a pleasure to reattach the covers to the head of the fixture, using quick-release fasteners. Firstly, because the safety rope for the cover hoods is also equipped with a quick connection system, which you simply must push in to attach; a simple quarter turn is enough to unlock. On the other hand, the hoods fit exactly into place without having to bend the frame to fit or loosen the front lens to clamp the hood underneath, as is the case with many other mod-



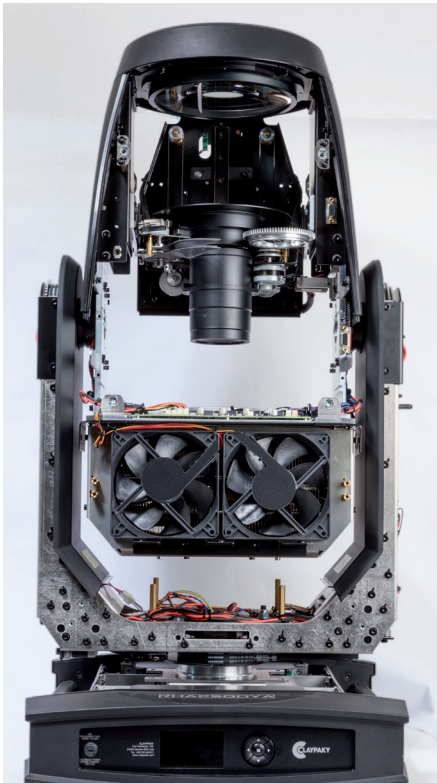
Cooling fins encapsulated in sheet metal

can be forced-cooled with pairs of fans attached at the bottom and top; in the middle are the direction arrows for the direction of air flow

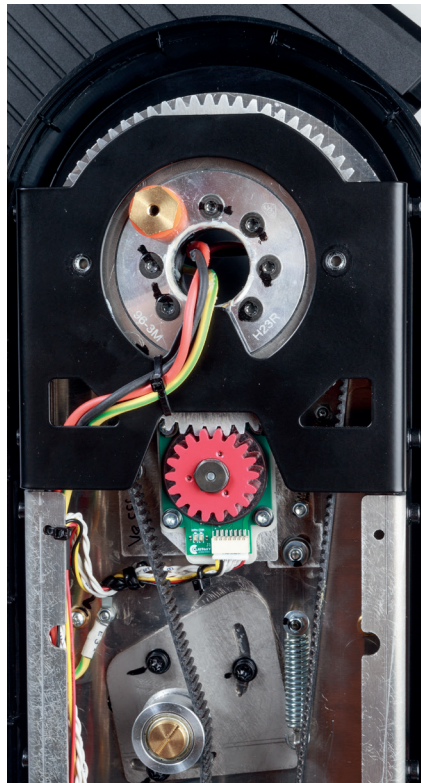


Only one torx screw size

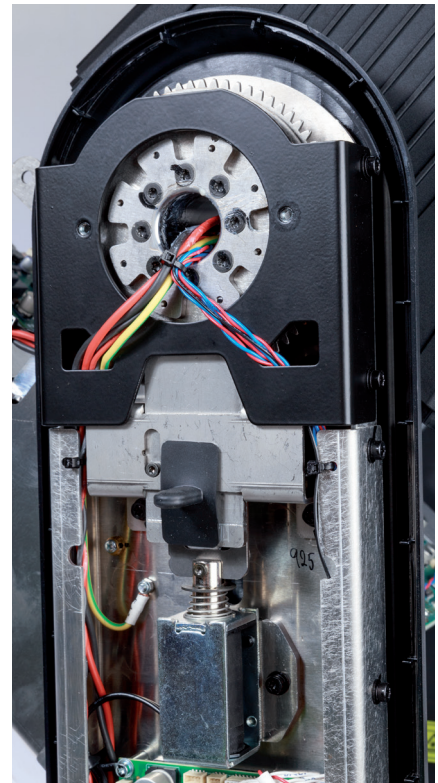
Easy cover removal



The space required by the cooling system and zoom optics is revealed in the „cleared out“ state



Behind the red pinion Electronics for position evaluation



Pull magnet for opening the tilt lock

els. This makes changing a gobo a pleasure. In turn, the robust construction comes at the cost of a weight of 48 kg. Here I'm missing handles at the top of the tilt bracket. In contrast, the carrying handles on the base are almost the entire width and allow even goalkeepers' hands to grip it comfortably.

27 dB-mode

A large part of the head is taken up by the cooling system. Despite the heat generated from the 1200 W LED engine, the Rhapsodya is hardly audible. Especially when you compare this with a 1200 W discharge lamp, these worlds are no longer comparable. The fan control leaves nothing to be desired. The fan mode is set exclusively via DMX. The control channel can be used to switch between the fan modes 27 dB, 30 dB, 35 dB and the fan control channel. If the fan control channel is activated, a DMX control circuit provides continuous fan control up to fan standstill. It is very commendable that the fans in the base are also included. This means that the volume can be influenced immediately in relation to a current scene. This makes the Rhapsodya the first

choice for noise-sensitive applications such as spoken theatre or TV studios. Of course, the fan activity also affects the brightness, which immediately adjusts when the mode is changed. If you let the spotlight run at maximum fan speed, the brightness drops to 92% when switching to 35 dB mode; in fan mode 30 dB to 80%, in 27 dB to 75%. If the fan is switched off, the brightness drops down to 17% of the maximum possible brightness.

By the way: To protect the system, Clay Paky recommends setting the dimmer to 0 a few minutes before switching off the spotlight. This brings back memories of the discharge lamp era.

Extensive control options for pan/tilt

Although the reset is easy after switching on, the usual movements of the bracket and head are missing: the reason for this is the absolute position sensor and extensive control options for the pan/tilt functions. This allows many requirements to be met, such as in confined spaces (set installations in TV shows or beneath the gallery in the theater), where the range of movement is limited. Control circuits

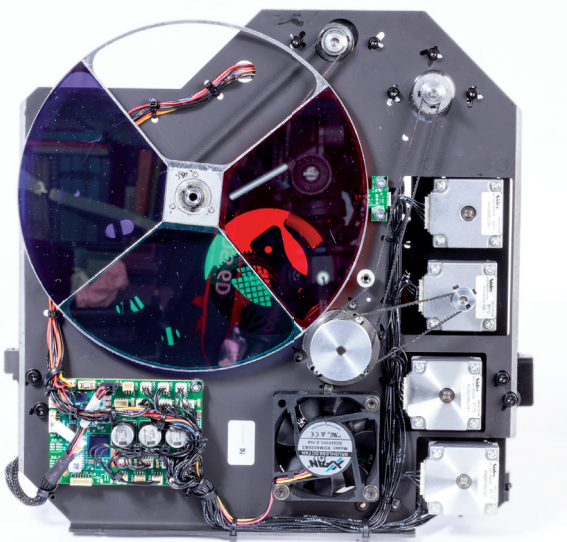


Proper lubrication makes for enjoyable riding - here's the cable routing for the pan

for creating a working area have already been prepared in the DMX menu but have not been implemented yet.

You can also set the absolute encoder to a new 0 position, so that the „home position“ may deviate from the usual 127dec/127dec. You can also completely deactivate the pan/tilt drive to use the Rhapsodya as a follower (although the tilt is very difficult to move even when the power is off).

You can also find a tie rod on the tilt axis lock. This is a very practical function if the lock is automatically removed when the Rhapsodya is switched on. However, there seems to be a little improvement necessary; on our test device the system did not unlock after switching on. Perhaps the grease was missing in the right place, which was generously applied to the cable feedthroughs in the pan and tilt joint.

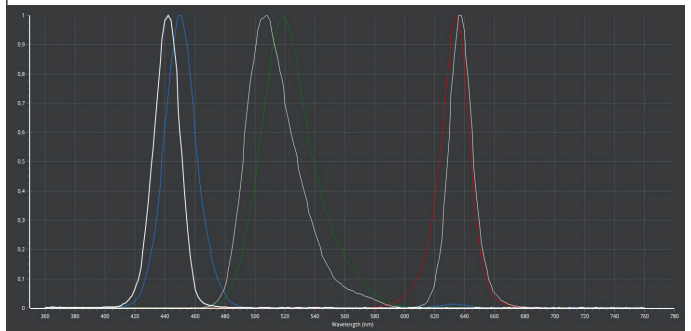


A large color wheel is attached to the back of the gobo module

Color and more color

If you use a multi-color LED array instead of a white-ish LED array, you usually add amber and lime to the basic colors red, green and blue to achieve high color reproduction - as is the case with the Rhapsodya. This is already a very good position here. Nevertheless, a color wheel has been added.

This reminds you of the days of the VL-5, which could slightly change the color location of the basic color by rotating the dichroic filters. However, with the Rhapsodya, when the color wheel is retracted with a color, only the LEDs of the corresponding color are activated - e.g. the green LED and green dichroic filter. You can see the difference immediately. Even the color location shifts a little, as can be clearly seen in the spectrum. Due to the large exit area of the LED module, the color filters are also very large. This means that only the primary colors red, green and blue can be found, corresponding to the primary LED colors.

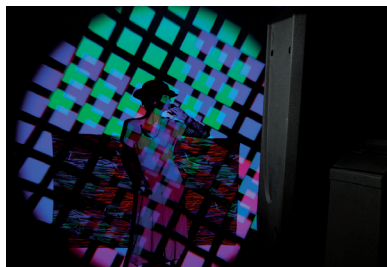


White shows the characteristic curves with the color wheel

Colored curves = LED by itself: When you insert the color filters you lose brightness, but the dominant wavelength also jumps to the left



Pixel control controlled per sector in the colors red, green, blue and amber



The effect of pixel control when used with prism and gobo

Spot with pixel control?

Since there's already a color wheel in use, one may wonder why you can't let the color filters move halfway or continuously into the beam path to create multi-colored projections, especially with a gobo and prism. Here, too, a different approach has been taken: The sparkling effect is known from the powerful white light arrays, in which individual segments of the array are controlled separately.

This is also possible here with the five-color LED array. There are four segments available, each segment of which can be mixed with the colors. The individual segments are controlled by patching a second lamp and selecting the pixel mode there. The pixel mode is activated for the lamp in the menu or via DMX. This mode also receives its own DMX or Ethernet address, so that this pixel control can be carried out by a media server, for example. The pixel mode control can be carried out as RGB, RGBA, RGBL or RGBAL color mixing.

Extreme control of colors

With the RGBAL color mixing unit, it makes sense to carry out a corresponding calibration to display the best possible



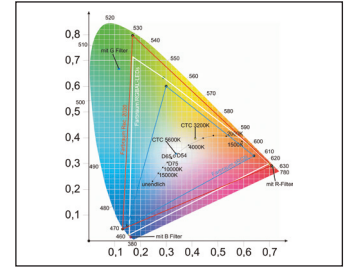
Amber as another LED color



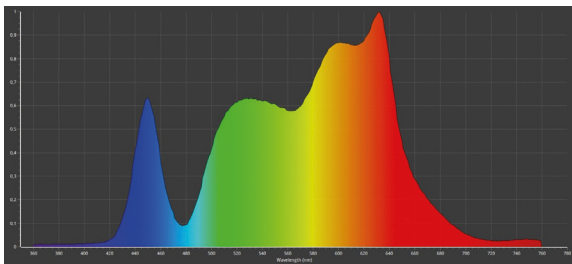
Lime as another LED color



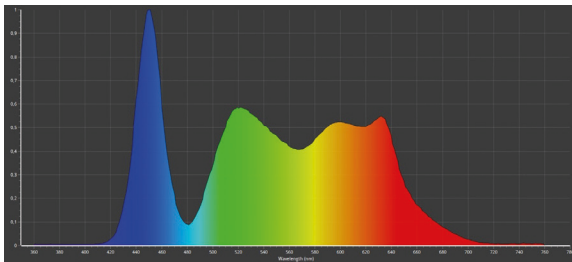
RAW all LED colors at 100% (camera: 6500K)



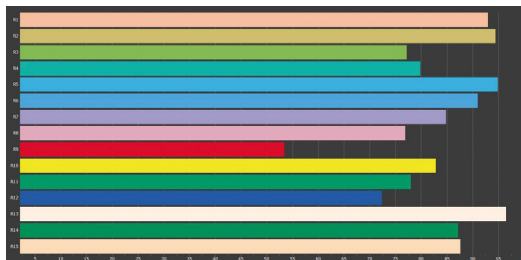
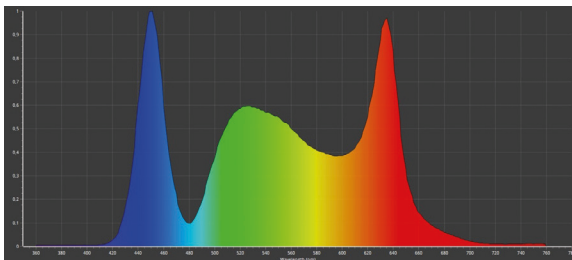
Color locations of the LEDs as native color space (white triangle), the color spaces for Rec. 2020 and sRGB as well as color locations of the RGB LEDs with dichroic filter



Calibrated 3200K with the best possible CRI

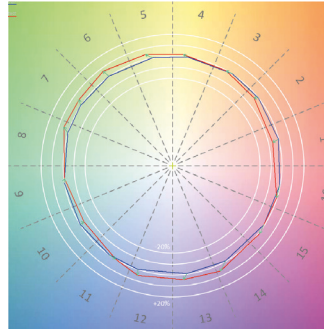


Calibrated 5600K with the best possible CRI

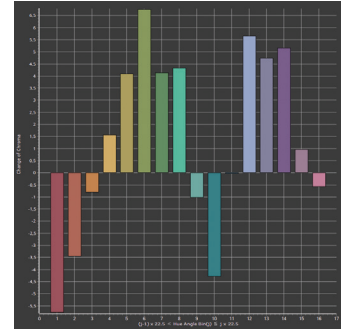


Calibrated 5600K with the highest brightness

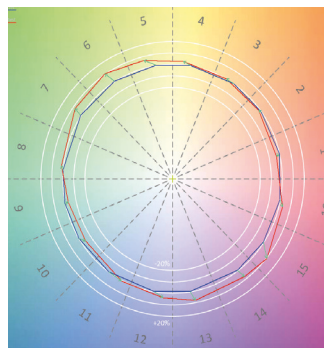
Type	Rhapsodya
Manufacturer	Clay Paky
LED power class	1,200 W
LED pwm	650 Hz – 16,700 Hz
LED color, color mix	RGBAL
CCT	2,500 – 10,000K
CRI	95 (manufacturer's data)
Color calibration	yes
Beam angle	6,6° – 61,8° (manufacturer's data)
Luminous flux	15.651 lm at CTC 6,500K with narrow zoom
Luminous intensity (lux in 10 m)	14.490 lx at CTC 6,500K with narrow zoom
Front lens	180 mm
Color wheel (virtual)	Color presets, CTO, tint
Gobos	2 × 6 rotating + open
Prism	4 facets
Iris	Yes
Frost	Easily interchangeable, strong
Animation wheel	Yes + angle
Aperature slider	2 levels, Module 120° rotatable
Dimmer control	24-bit
Pan / tilt	540° / 270°
Protocol	DMX-512, RDM, ArtNet, sACN, CRMX (optional, W-DMX)
Control circuits	62, 54, 47
Stand-alone	Control of all DMX circuits via menu
IP	20
Ta	-20° C to 40° C · (-4° F to 104° F)
Lüfter	Selectable: 27 dB(A)/ 30 dB(A)/ 35 dB(A), fan off with less light output
Voltage range	100-120 / 200 – 240V 50/60 Hz
Power consumption	1,600 W
Connections	PowerConTrue1 in, DMX XLR 5-pin in/out, RJ45 in
Dimensions	393 × 416 × 860 mm
Weight	48,1 kg
Manual	Englisch, PDF
Risk class	3, IEC TR 62778: GR2, distance to reach RG1: 15,3 m, IEC 62471: RG3
Special features	CloudIO, built-in web server



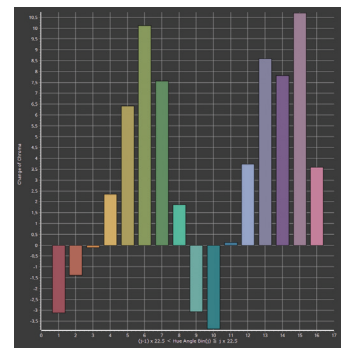
TM30 Vector 3200K in highest CRI mode



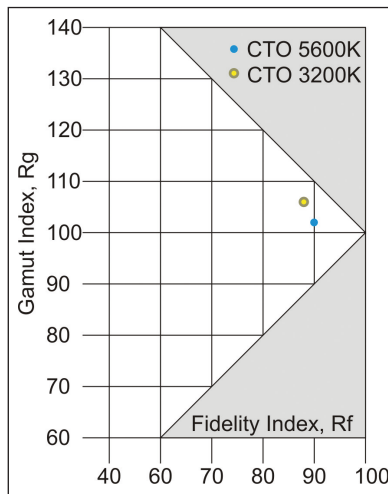
TM30 ChromaShift 3200K in highest CRI mode



TM30 Vector 5600K in highest CRI mode

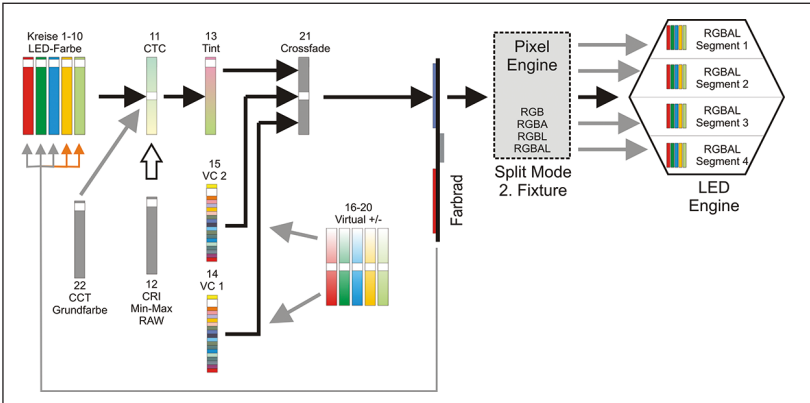


TM30 ChromaShift 5600K in highest CRI mode



TM30 Gamut and Fidelity for 3200K and 5600K in highest CRI mode

white light. Here, too, Clay Paky shows a remarkable solution with the Rhapsodya: With a control circuit, you can continuously tune from cool white to warm white color temperature. With a second control circuit, you can determine the type of calibration optimization. This allows the white light color temperature to be continuously trimmed between the greatest possible brightness and the greatest possible color rendering index - unless you set this control circuit to RAW.



Dependencies of the color control The circle value refer to the standard mode

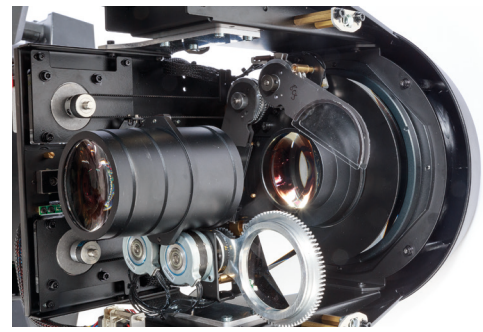
In this case, all colors are controlled with maximum brightness. With another control circuit, you can also directly call up defined color temperatures such as 3200K or 5600K, which then serve as the center position for the tunable CTC channel. In addition, you can also save or call up colors or white points that you have defined yourself. While setting the white point always takes five seconds to switch, the tunable CTC channel reacts immediately.

The setting options, which are initially unfamiliar, are quickly internalized and allow the lamp to be changed immediately, even during scene changes, without having to decide on anything in the menu at the beginning. This means the Rhapsodya can be optimally controlled at any time, especially when the requirements change fundamentally within an act.

Adding virtual color wheels

The control circuits for the individual colors - CTC, Tint, CRI mode - also include a control circuit for calling up the usual Lee color filters, the „virtual color wheel“. These almost 70 colors are joined by 12 user-definable colors. And that’s not all. Another identical control circuit allows you to set a second virtual color. With another control circuit, you can now fade from the normal color mix to the first or second virtual color wheel. Nothing is left to be desired here.

The whole thing is topped off with another five correction circuits with which you can influence the virtual colors by proportionally increasing or decreasing the individual LED color.

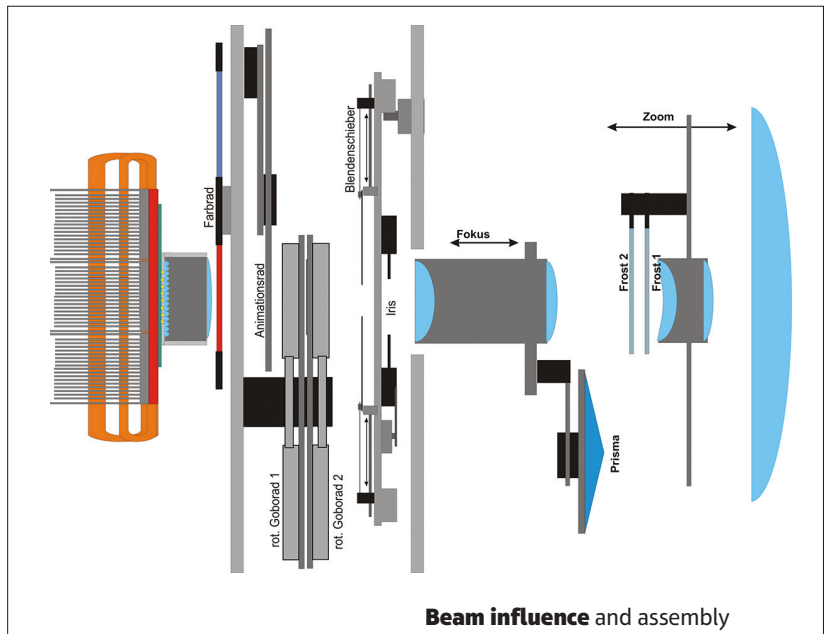


Zoom and focus unit with attached prism and frost functions. A light shield around the zoom lens covers the large exit lens in this picture and ensures that no stray light gets through the sides

With the activatable „optimized color point“ function, differences in brightness are reduced when changing colors. If you then activate the split mode, you can influence each individual segment at a higher level. This means you are independent of the color treatment tools of a lighting console - helpful if you come across different console philosophies with your spotlight set or your show.

Clean light beam

The Rhapsodya offers a rock-solid equipment for influencing the beam. The zoom covers a very large range from 6.6° to 61.8°. Although the light is generated by many multi-colored LED chips, no color shadows or „pizza optics“ can be seen; a homogeneous color mix in every focus or zoom position as



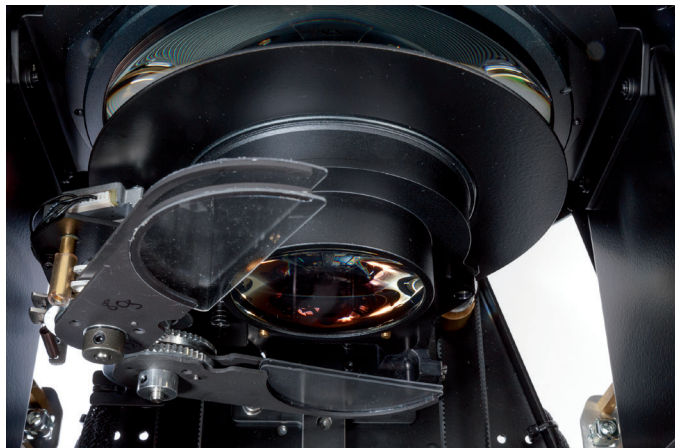
Beam influence and assembly



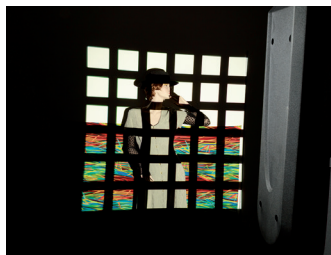
Frost 1 halfway retracted
zoom to 200 dec., focused on gobo



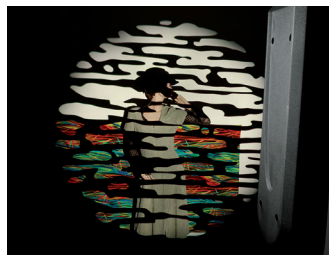
Frost 1 fully retracted zoom to 200 dec., focused on gobo



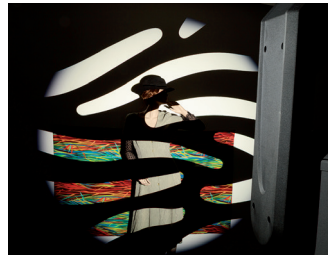
Double frost in front of the zoom lens, it is carried along



Gobo wheel 2 with right-angled gobo design and slight barrel curvature in the projection



Gobo wheels 1 and 2 with real morphing, here focus at 184 dec.



Animation wheel

well as any shading beam effect such as a shutter. Here the Rhapsodya is beyond any doubt. Only with a sharply drawn light circle can slight shadows be seen at the edge area.

If the focus is set to a decimal value of 255 (lens group is in the direction of the light exit of the headlight), you can move the zoom from 255 dec. to 45 dec., i.e. from the front lens to the LED engine. Then the zoom lens group stops, although you continue to move the control circuit towards 0, because the lens groups have reached a minimum distance from each other. If you then move the focus towards 0, the zoom lens follows at the same distance. Conversely, the focus lens „pushes the zoom unit in front of itself“ until they leave the minimum distance from each other again.

The frost system consists of two frost filters of different in-

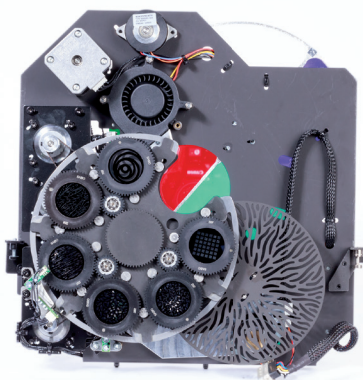
tensities that can be moved into the beam path independently of each other. This is very easy to work with and optimally „softens“ the projection.

The Rhapsodya offers two rotating gobo wheels, a rotating 4-way prism and an animation wheel that can be rotated from horizontal to vertical. This allows horizontal flow effects as well as ramping fire effects to be created. The projections are very good in all disciplines. Only at a high zoom does a slight barrel distortion become apparent.

The rotation speeds, especially on the animation wheel, can be set extremely slowly without jerking. This allows very beautiful, wafting backgrounds to be generated. Only when you focus on a gobo in gobo wheel 1 and move a shutter slider in, can you see the multiple edges of the shutter slid-

er. If this bothers you, you can also put the gobo on gobo wheel 2, which is closer to the shutter slider system. The effect is no longer visible there.

Module carrier color wheel, two rotating gobo wheels on one axis, animation wheel (which takes up a lot of space for horizontal to vertical alignment). Each of the interchangeable gobos has a magnet for zero-point detection, which makes it ideal for use with gobos across multiple devices



It's all about the shifting

The improved aperture slider system from Clay Paky impresses with its image quality. The sharp image of all blades with the limitation to the light cone is particularly impres-



Aperture slide module with a deep opening for retracting the focus lens system, the pinion for rotating the aperture slide arrangement can be clearly seen on the right



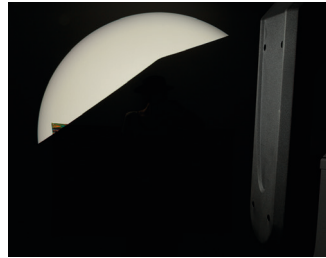
Four aperture slides slightly retracted and focused, showing the focus distance to the unaffected light cone



Depending on the mode, 50% or 100% control for an aperture slide half retracted into the beam path



Perfect image of a light strip with aperture slides opposite each other

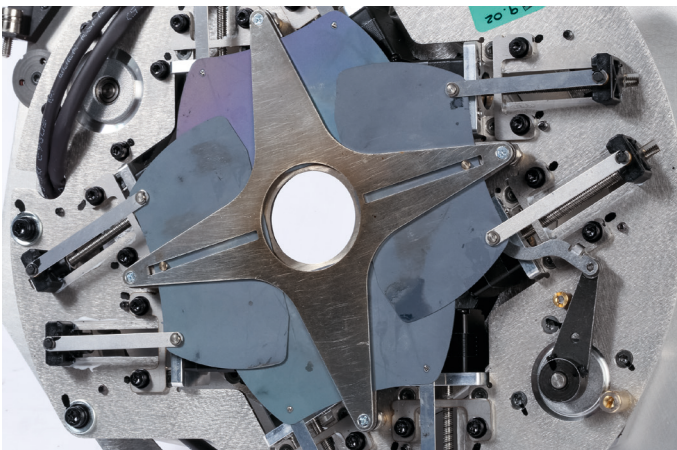


An angle appears when the slider is retracted and tilted

sive. The simultaneous focusing of the opposite sliders is achieved by having them on the same image plane. The Rhapsodya only has two slider planes. Unfortunately, this means you can't shift a triangle.

But hand on heart: When do you have to shift triangles? In most cases, it is the edges of the stage or decorations that must be shifted. More creative tasks include framing

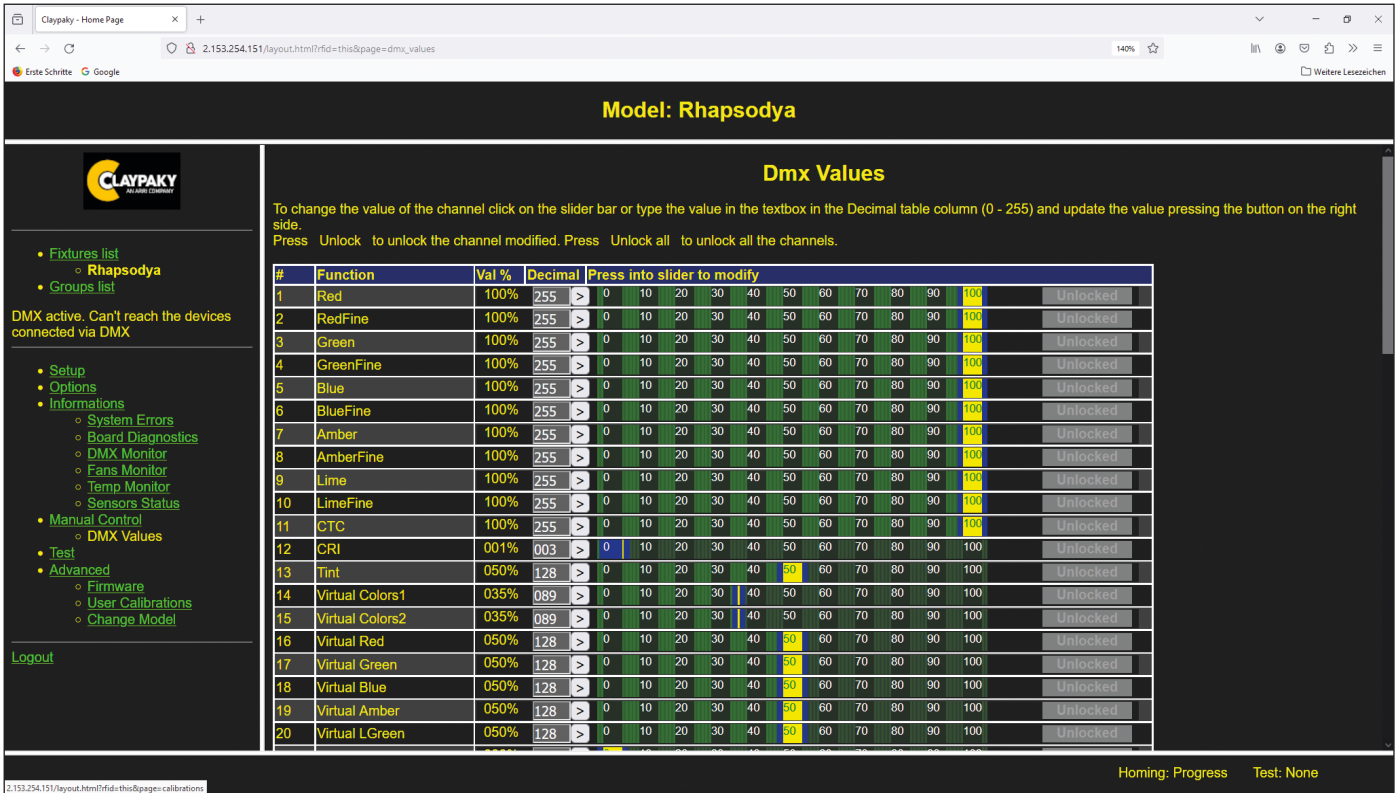
pictures, logos or checkerboard patterns - i.e. squares. Then, of course, the image sharpness scores points. In the setting, you can switch between standard and extended blade mode, which means that you can only move the blade halfway into the beam path with 100% control, while extended allows you to shift the beam path completely with just one slider. This allows you to create beautiful, dynamic shutter slider move-



V-shaped arrangement of the spindle drives for exact reproducibility while simultaneously allowing a complete blackout with just one slide



Aperture slider angled at the edge so that the opposite sliders on the same level can be angled more towards each other



Integrated web interfaces allow in-depth exchange between Rhapsodya and the user

ments, where a light bar moves from one side to the other. With the right head movement, this can create a wow effect.

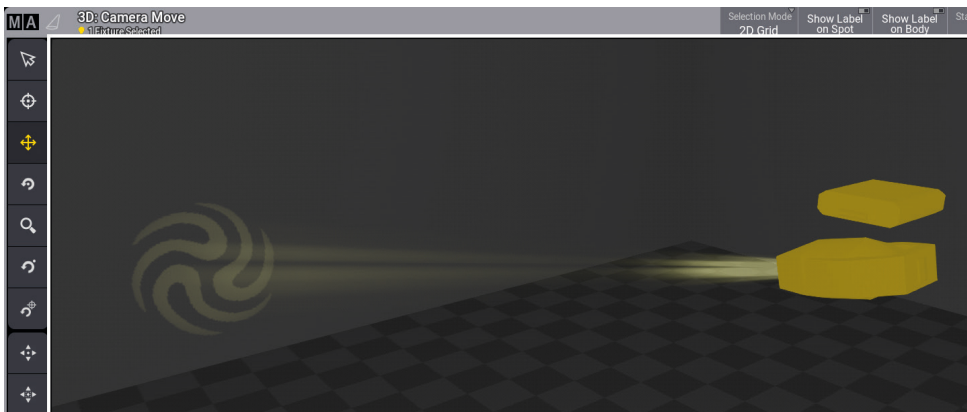
The exact slider control is no coincidence: they are positioned here using spindle drives that are arranged similarly to a V-8 cylinder to allow alignment in one or the other inclined position. To ensure that this can work on two levels, the sliders are angled at the edge so that the opposite sides have more freedom in their deflection.

From light to darkness

The overall picture continues when dimming - four dimmer curves are standard, 16-bit resolution anyway. The selection of five different halogen simulations is also interesting. Specifically named „1 kW“ or „5 kW“, but you don't always have to try them all out first.

Every dimming is based on a PWM (pulse width modulation), defined via the control channel or in the menu. The highest PWM base frequency is 16700 Hz, starting at 650

Hz. A separate control circuit can be used to retune this basis to a certain extent, so that the adjustable frequencies range from 520 Hz to 20 kHz. There are two driver groups, each with a clock generator: one for the LED colors red, amber and green, blue and lime via the second clock generator. The result is a slight oscillation between the two clocks, in which the PWM shifts in position relative to each other. In practice, this will probably have no visible effect.



GMA3 3D and GDTF file Of course, not everything is perfect on the first try. But since the basic functions work perfectly, you can easily overlook the „jammed“ yoke

Even if you dim or mix the colors via the LED colors, „Smooth Color Dimmer“ ensures that the value jumps in the console color circles do not become color jumps for the eye but are gently faded. The selection of one of three gamma curves for the color control (like the dimmer curves) then affects the color circles.

Looking for a connection

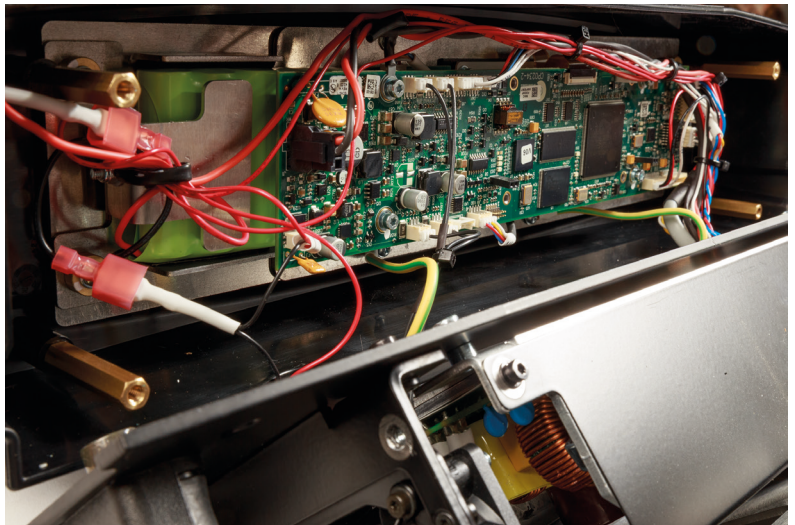
A lot of engineering has already been spent on tasks such as controlling the colors. This care also extends to other topics such as control. Of course, the Rhapsodya can be controlled via DMX, Artnet or sACN or optionally via Lumen radio. The Ethernet connections in/out are also switched through using relays when the Rhapsodya is without power.

The connectivity becomes interesting when you look at the whole picture. Not only does it support RDM, but you can also set the Rhapsodya as an RMD master. It then takes on the position of a lighting control desk - as an RDM control instance. The Rhapsodya can recognize all other devices connected via Ethernet via RDM, query data and forward it to the CloudIO. You can also save 16 colors (called „digital filters“) via CloudIO and retrieve them from the cloud from wherever you are. We have already reported on the advantages of CloudIO (see www.production-partner.de).

The Rhapsodya has an integrated web interface. This allows you to communicate with the lamp via a browser (with the group of spotlights if the RDM master is active) by addressing the IP address of the lamp. In addition to the setup and RDM functions, firmware updates, calibration, manual control, monitoring and error and diagnostics can also be accessed via the web interface. The implementation is excellent, intuitive and leaves nothing to be desired. Ideal for service and spare parts procurement, all information is available with image files via <https://e-assist.tech/>, so that you can order exactly the right spare parts. The QR code shown on the boot screen of the headlight reveals its UID.

Conclusion

The Rhapsodya combines many virtues: It can be silent, it can be bright, it can be rich in color - and it can also stand still when reset. With its design equipment, consisting of



The battery is on the left in front of the control board builds that supplies the menu with power when the Rhapsodya is not yet connected to the power grid



Accessories included To ensure that the EMC limits are complied with under all circumstances, the supply line requires a ferrite ring, which is included in the cable (without a Schuko connector)

two rotating gobo wheels, aperture slider, iris, two frosts, prism and animation wheel, which can be rotated continuously in the orientation, it is up to all standard requirements and underlines the claim of an all-rounder or workhorse. Adding a color wheel to a five-color addition mix is already extraordinary. In addition, there is a sophisticated color mixing control that is second to none. The color reproduction, the homogeneous light field and projection properties are beyond reproach for an additive color mixing system. The two-level aperture sliders stand out.

Combined with the variety of communication and information transfer via web browser or CloudIO, Clay Paky is simply top notch with the Rhapsodya. Control options and optical performance make the Rhapsodya ideal for all tasks on stage, in the studio or at an event. It is understandable that this is also reflected in the price and weight. ■