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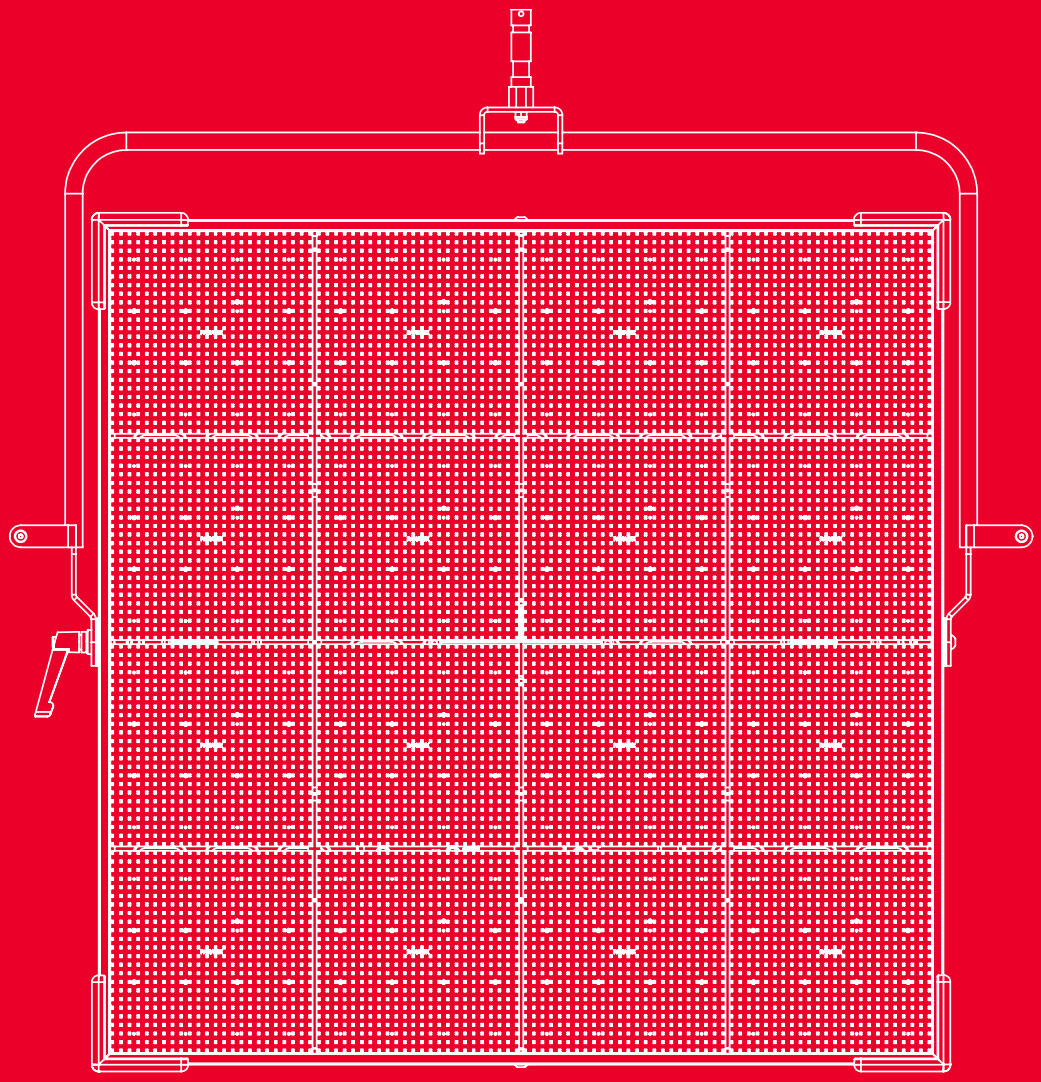

PANALUX SONARA 4:4

The next-generation, enhanced variable white LED soft light.

User manual of SONARA™

LATEST VERSION AS OF JULY 2021

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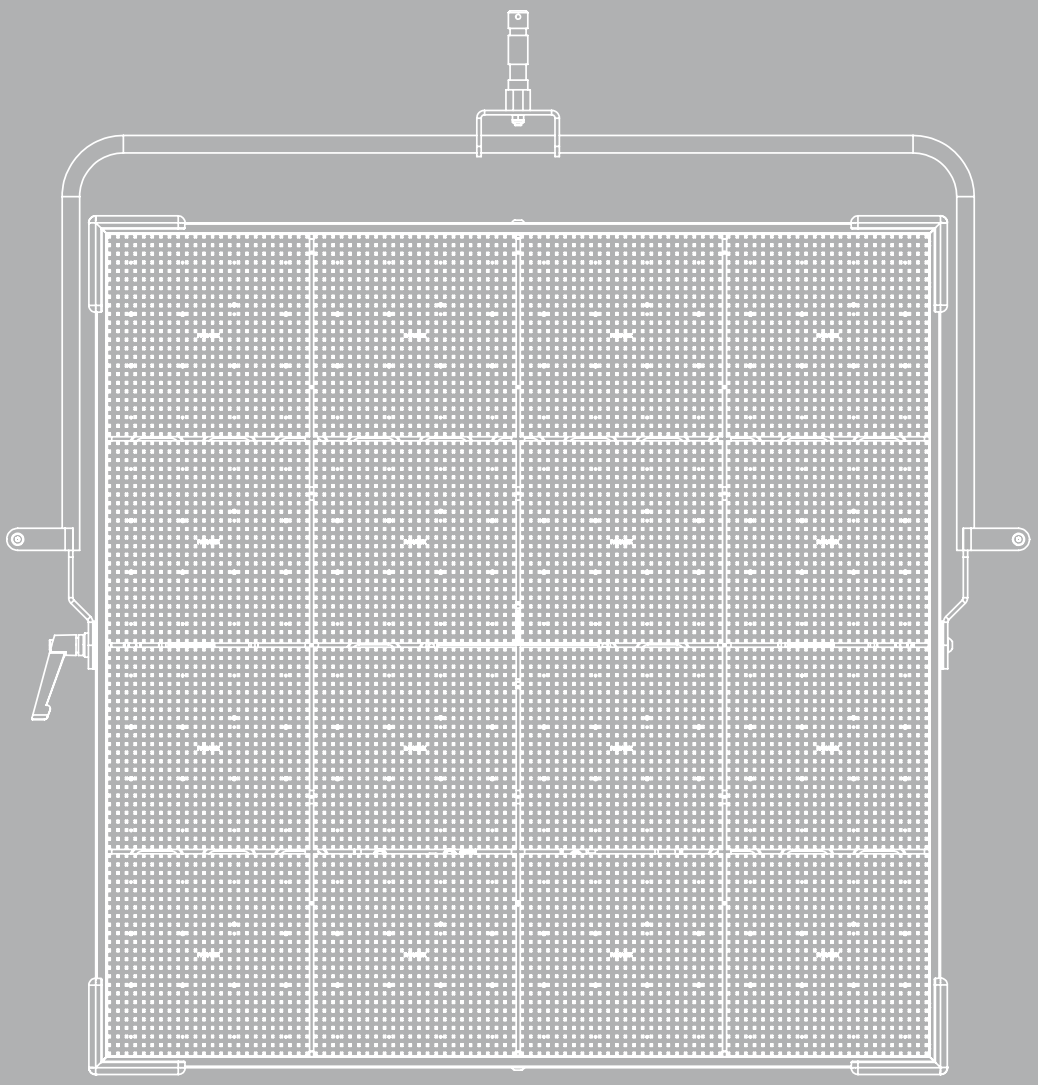

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01

IMPORTANT INFORMATION & WARNINGS

IMPORTANT INFORMATION

Safety Information

The symbols below are used throughout this manual to identify important safety information.

Heed all warnings and safety information.

This product is not user servicable.

	**Warning, Danger, or Caution** Risk or injury to yourself, third party, or the product
	**Risk of electric shock** Risk of severe electric shock

Changes

Panalux provides this manual 'as is' without warranty of any kind, either expressed or implied, including but not limited to the implied warranties or merchantability and fitness for a particular purpose. Panalux may make improvements and/or changes to the product(s) and/or the program(s) described in this publication at any time without notice. This publication could contain technical inaccuracies or typographical errors. Changes are periodically made to the information in this publication; these changes are incorporated in new editions of this publication.

Measuring Correlated Colour Temperature (CCT), Colour x y

The SONARA utilises an LED source that is optimized for the film, TV, and image capture industries. Older colour meters cannot be used to accurately read the Correlated Colour Temperature (CCT) of SONARA and other discontinuous spectrum light sources. Older colour meters are designed for a full spectrum source such as incandescent lights. These meters possess only 3 sensors to measure the light output: red, green, and blue. As such, a narrow band or discontinuous spectrum light source may not read correctly. Colour meters such as the Sekonic C800 Spectromaster or UPR Tech MK 350 will provide excellent measurements and include TLCI and SSI metrics as standard.

Panalux have taken great care in ensuring that the CCT and colour spectrum of gel emulations of the light emanating from SONARA closely matches traditional tungsten and discharge light sources. This allows you to easily place SONARA alongside your traditional lighting fixtures. If in any doubt, it is the user's responsibility, as is customary, to shoot image capture tests when combining sources employing different core technology—such as HMI, fluorescent, tungsten, or simple RGB and bi-colour LED fixtures—to ensure compatibility. Shoot tests using the camera setup to be used for the project (capture gamut, LUTs, etc.). The spectral power density curve, chip profiles, and coordinates will be different from other fixtures. Matching x y coordinates will only guarantee proximity to the x y coordinates. It will not guarantee a colour match to eye or to camera with another light source.

Flicker-Free Filming

The only way to guarantee flicker-free filming at any frame rate and shutter angle is by using pure DC power, carbon arc sources, or daylight. There is a chance of flicker in every other scenario with artificial light, even with tungsten mains-powered fixtures.

Visible flicker is also affected by postproduction. Where the contrast is increased, the flicker becomes more visible.

SONARA has been validated flicker-free at any dim position up to 10,000 fps. SONARA has been tested across a range of dim settings, CCTs, and colours with the high-speed Vision Research Phantom camera as well as Arri Alexa Mini, with the cameras at multiple shutter angles. Not all manufacturers are as thorough. Test whenever in doubt, particularly when shooting high speed.

Flicker factor, the relationship between the maximum and minimum illuminance exhibited in the flicker, can be measured with a flicker meter. 100% means the light goes totally dark at minimum. HMI electronic ballasts tend to have a flicker factor around 1–3%, tungsten lights 0–10%.

With multi-colour LED fixtures, in particular older Stage and Architectural LED fixtures where compatibility with film and digital cameras wasn't a consideration in their design, individual colour channels can be out of sync, causing different colour mixes on different frames, which can cause issues with high-speed filming, stop-frame animation, and still photography.

If in doubt, test and review. Check the footage after running a test, and be aware that some digital cameras do not replay raw footage, so it is advisable to download files first and then check.

Gel/Filter Emulations and Source Matching

SONARA comes pre-loaded with a range of LEE Filter gel emulations. Since the base spectrum of the SONARA at 3200K and 5600K is not identical to a tungsten or daylight source, the gel presets are merely emulations. Due to the inherent technology, no LED bi-colour or multi-chip source can perfectly match the spectrum of a subtractive filter laid over a tungsten or daylight source. Even if the x y coordinates appear to be a good match, the spectrum will be different, and the camera will read subtle differences.

If in doubt, test before shooting.

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02

INTRODUCTION

INTRODUCTION

About This User Manual

This manual provides installation, operation, and maintenance instructions for SONARA. This manual applies to the following software versions:

v1.02

Additional Documentation

For more information regarding DMX512 systems, refer to the DMX512/1990 & AMX 192 Standards publication available from United States Institute for Theatre Technology, Inc. (USITT). Contact by post at USITT, 6443 Ridings Road, Syracuse, NY, 13206-1111, USA; by phone on 1-800-93USITT; or online at www.usitt.org.

Art-Net is used for transmitting DMX lighting control protocol and RDM over the User Datagram Protocol (UDP) of the Internet Protocol suite. It is based on the TCP/IP protocol suite and used to communicate between nodes/lighting fixtures and a lighting desk, typically on a private local network such as Ethernet. Art-Net can address over 30,000 universes.

Art-Net™ designed by and copyright Artistic Licence Holdings Ltd.

Technical Support

For technical support, contact Panalux on +44 20 8233 7000 or at info@panalux.biz.

Disclaimer

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03

USER INSTRUCTIONS

USER INSTRUCTIONS

General Notes

1. Please read through this manual carefully before operating SONARA. Keep this manual for future reference.
2. There are numerous safety instructions and warnings that must be adhered to for your own safety.
3. SONARA is not intended for residential use. It is only intended for use in a professional studio.
4. SONARA must only be serviced by a qualified individual.
5. SONARA is rated as IP20, for indoor use and in a dry environment.
6. SONARA is not certified for use in hazardous locations.
7. SONARA's operating temperature is within the range of 0 to 40°C (32 to 104°F).
8. Do not connect to a variable power supply such as a dimmer rack or variac.
9. Use only approved spare parts and accessories. (Refer to Spare Parts/Accessories list on page 37.)

Fixture Setup

1. Read these safety instructions carefully to ensure SONARA and its accessories are used safely.
2. Ensure the 28mm spigot is correctly mounted onto the yoke before rigging.
3. For an alternative method of hanging SONARA, threads are present on the fixture for attaching an M12 eye bolt in each corner. Ensure the M12 eye bolts are correctly attached to SONARA before rigging.
4. 6 threads are available for mounting quick triggers, 4 in each corner and 2 on the outer edge of the back, roughly aligned with the centre line and yoke mounting position.
5. SONARA weighs 44kg excluding accessories and 38kg excluding yoke assembly. The combined weight should be considered when choosing suitable safety cable(s). The safety cable assembly should be rated at 10x the combined weight of the fixture and accessories present.
6. The safety cable(s) must be securely attached to the designated slot on SONARA, or through fitted M12 eyebolts (detailed on page 11).
7. When hanging SONARA, always use secondary safety cables of suitable length (as short as possible) attached to the safety eye or fitted eyebolts. **Do not use the yoke to secure safety cables.**
8. For safety purposes, ensure that the yoke locking handle is correctly tightened when manipulating SONARA in the required orientation. NOTE: If the locking handle is not tightened correctly, the fixture may swing.
9. Lifting handles are provided on the yoke. Ensure the yoke locking handle is tightened before lifting.
10. If SONARA is to be used with the yoke detached, accessory handles are available in the kit.
11. Ensure the connection cables and any other cables are routed carefully to avoid snagging and pulling.
12. Ensure SONARA is stored within the range of -20 to +60°C (-4 to +140°F).

Attachment of Safety Bonds

Safety Bond Mounting Point

Fitted Safety Bond (Safety Eye)

Fitted Safety Bond (Eyebolt)

Ventilation

1. Do not cover air ventilation slots on SONARA, or the fixture may overheat.
2. Do not use SONARA outdoors or in a wet environment without approved accessories. (See the table on p. 37 for outdoor accessories.)
3. Keep SONARA a minimal distance of 0.1m away from flammable materials/objects.

Additional Safety Considerations

1. Do not open SONARA when the fixture is powered.
2. Allow SONARA to cool before servicing, as internal parts may be hot.
3. Do not alter the design of SONARA or tamper with any of the safety features.
4. Do not look directly into SONARA's bare light source as it may be harmful to the eyes.
5. SONARA reaches a maximum surface temperature of 85°C. Please ensure contact on the surface by persons or materials is avoided when the fixture is operating.
6. Do not operate SONARA if there are any signs of physical damage. If damage is visible or suspected, contact Panalux Engineering Dept.
7. Before using SONARA, check for any of the defects listed in the adjacent table.

Part	Possible Defect
Power cable	**Physical damage, cut, burnt**
Locking handle	**Physical damage, loose**
Spigot	**Physical damage, loose**
Lifting eye	**Physical damage, loose**
Venting ports	**Physical damage, bent, covered**
Yoke	**Physical damage, loose**
Casing	**Physical damage**
Corner protectors	**Physical damage, loose**

Power Supply

1. Ensure the power cable is disconnected before servicing.
2. SONARA only uses a mains connection. Do not connect to a variable supply such as a dimmer rack, variac, or inverter.
3. The power cable should be plugged into SONARA before switching the mains power supply ON. The mains power supply should be switched OFF before removing the power cable.
4. SONARA is shipped with a 7A fuse in the casket. For use in 110V locations, this should be changed to a 15A version (15A fuse not included).

Safety Cables

1. A minimum of one safety cable MUST be used when hanging SONARA from its yoke or eye bolts or using quick triggers. The length should be as short as possible to reduce travel distance if the primary hanging fails.
2. The safety cable slot (as shown on page 11) MUST be used to attach a safety cable.
3. Ensure safety cables are capable of supporting the combined load of the SONARA and accessories.

	Approvals
EU	EN 55015:2013 EN 61547:2009 EN 61000-3-2:2014 EN 61000-3-3:2013 EN 61000-4-2:2009 EN61000-4-3:2006+A1:2008+A2:2010 EN 61000-4-4:2012 EN 61000-4-5:2006 EN 61000-4-6:2009 EN 61000-4-8:2010 EN 61000-4-11:2004
FCC	47 CFR of part 15
CSA and UL	CSA C22.2 No. 250.4-14 CAN/CSA C22.2 No. 250.13-14 UL Standard No. 153 UL Standard No. 8750

	Certifications
ROHS	EPA3050B:1996 EN1122B:2011 EPA3052:1996 EPA7196A:1992 APE3540C:1996 EPA8270D:2007
Europe	EN / IEC 62471

Note

SONARA has been built to conform to international regulatory standards relating to professional lighting equipment. Any modification made to SONARA will void the manufacturers' warranty.

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04

FIXTURE OVERVIEW

FIXTURE OVERVIEW

SONARA Components & Controls

SONARA is a powerful light fixture that incorporates 16 of Panalux's high-quality proprietary LED arrays. This LED source provides the user with a large volume of high-quality white light at a stable and repeatable CCT, emulating traditional sources and a vast array of tints. SONARA can be controlled via the local controller attached to the back of the fixture, or via an external DMX512 signal that can communicate with the fixture through 5-pin DMX connector or via wireless DMX.

Sonara Rear View

Controller

Comms Panel

The SONARA user interface and wired remote have been designed to provide a clear and simple display of essential information.

The controller features 1 rotary push encoder, 4 selector buttons (bottom), and 4 memory buttons (top).

The 4 selector buttons are identified with 'soft' labels on the display depending on selected mode.

In white mode (shown), the display will always show:

- **Dim position** (percentage)
- **CCT**
- **Green/Magenta bias**
- **DMX base address**
- **DMX personality**
- **DMX control source** (wired, wireless, Art-Net)

Controller

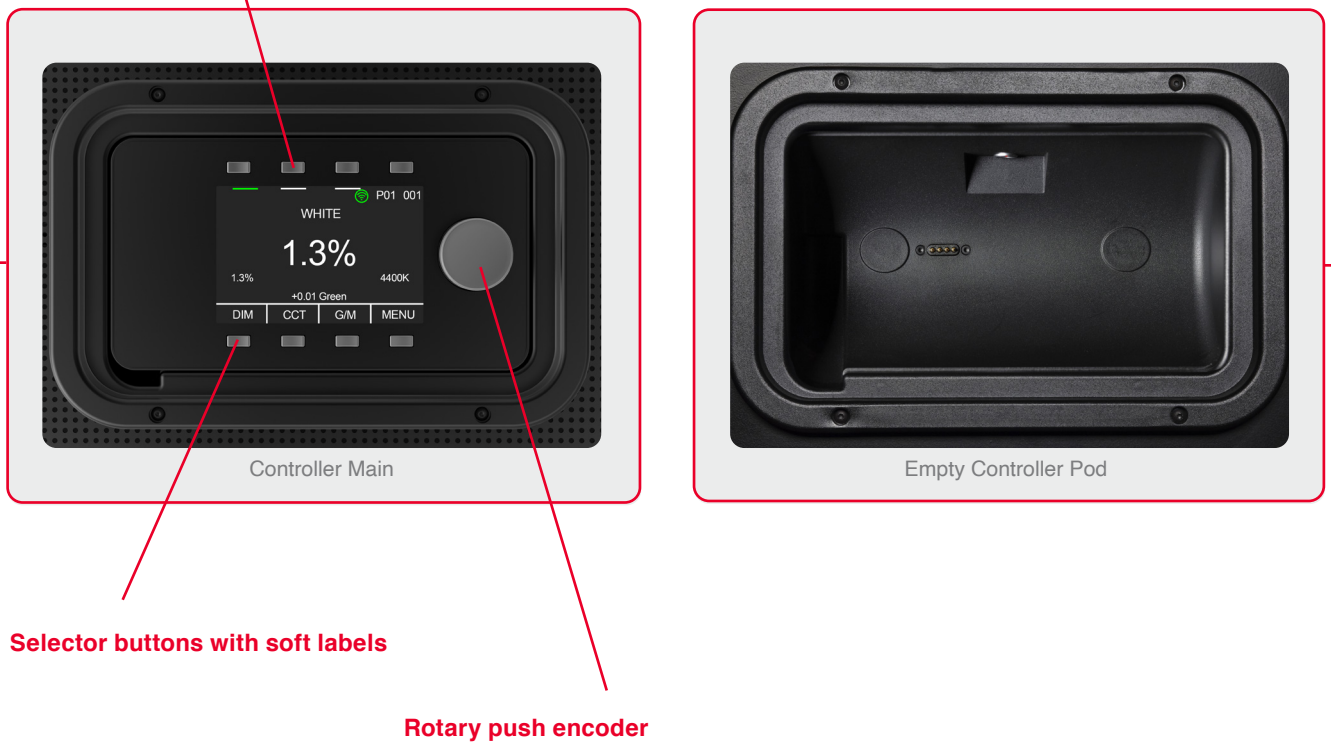
The controller until can be detached from the fixture and linked with a 4m accessory cable, enabling wired remote control when the fixture is out of reach.

The cable connects to 2 Lemo connectors. One Lemo connector is on the back of the controller and the other Lemo connector is inside the controller holding trough.

The controller features magnets and a lanyard to hang on a stand lock-off.

There is a safety for the controller on the back plate for situations when SONARA is rigged at height.

User memory buttons



Controller Main

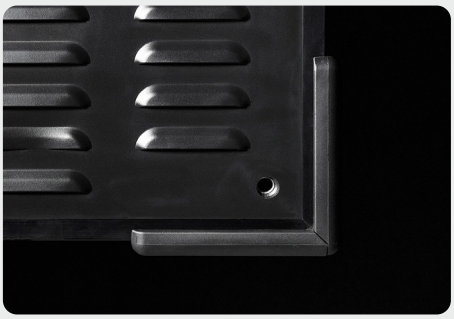
Empty Controller Pod

Selector buttons with soft labels

Rotary push encoder

SONARA Mounting Components

Centre M12 Mounting Points



Corner M12 Mounting Points

Mounting Point Fitted With M12 Eyebolt

Locking Handle

Spigot

Powering Options

Sonara is fitted with a Neutrik powerCON TRUE1 NAC3MPX-TOP type connector. Use only Neutrik connectors for power cords. It is the user's responsibility to ensure the power cord is maintained in good condition and any physical damage is addressed.

Comms Panel

Comms Panel

The comms panel features a power on/off switch as well as the following connectors: power in, DMX in and thru, Art-Net in, wireless antenna, USB power, ext. port, and upgrade port.

SONARA uses industry standard 5-pin XLR male and female connectors to receive and output DMX signals. The DMX wiring is as follows:

Pin 1: Ground
Pin 2: Data +
Pin 3: Data –
Pin 4: Spare
Pin 5: Spare

Please note: SONARA is self-terminating and does not require external DMX termination when used in a chain.

Accessories

SONARA has a range of accessory options.

A remote extension cord allows the controller to be used away from the fixture. The controller features magnets and a lanyard to mount on a stand or hang from a lock-off.

Along with a soft box and eggcrate, available diffusion textiles include:

Quarter Grid Cloth
Half Grid Cloth
Full Grid Cloth
Magic Cloth

Available weather kit includes:

Plastic front cover (to be used with soft box)
Rear breathable cover

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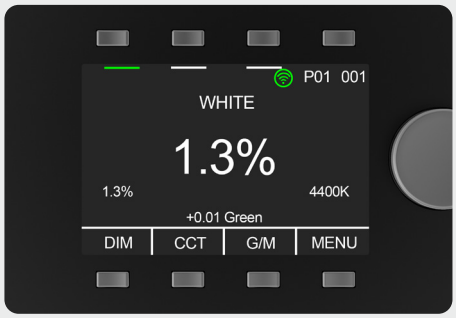
05

OPERATION

OPERATION

User Interface

SONARA provides control over the intensity, colour temperature, green/magenta bias, hue and saturation, x y coordinates, amber/lime/blue, and a range of other parameters for precision control. All are accessible from the local user interface. Control is via the user control (mounted to the fixture or hard-wired for remote operation), wireless, or Art-Net connection.



User Interface

In all modes, the **top bar** will always show the current state of:

- **DMX Base Address**
- **DMX Personality**
- **DMX Control Source** (wired, wireless, Art-Net)
- **'LOCKED'** (when local control is locked)
- **'DEMO'** (when fixture is cycling through a demo)

In white mode (shown above), the display will always show:

- **Dim Position** (percentage)
- **CCT**
- **Green/Magenta Bias**

Factory Reset

Factory reset and clearing all memory presets is achieved by holding down the bottom left and bottom right buttons together while cycling the power.

Lock Mode

The local controls can be locked and unlocked by holding down the bottom left button for 2 seconds. 'LOCKED' will be shown top centre of the display when local control is disabled.

To release LOCKED status and DEMO status, hold down bottom left button.

Rotary Encoder

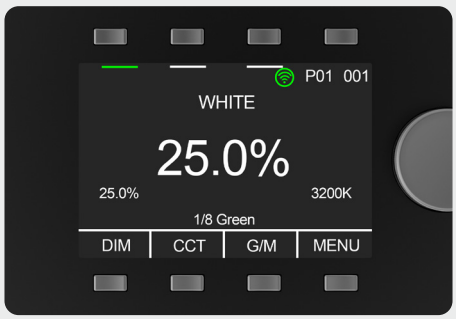
The encoder enables scrolling forwards or backwards through the ‘live’ highlighted item or, by pushing the encoder, jumping through presets. It is also used to navigate menus and ‘push’ to confirm selection.

See rotary encoder presets below:

Value	Presets											
Dim	25%	50%	75%	100%								
CCT	1600K	2700K	2900K	3200K	3600K	4300K	5000K	5600K	6500K	7500K	10000K	20000K
G/M	1/8 -G	1/4 -G	1/2 -G	3/4 -G	1 -G	N/C	1/8 +G	1/4 +G	1/2 +G	3/4 +G	1 +G	

After 30 seconds, the encoder always defaults to dimmer in any mode.

The encoder features a ballistic algorithm. The slower it is rotated, the higher the resolution; the faster it is turned, the quicker it scrolls through the CCT range or gel list, for example. When controlling the dimming, for instance, this allows ultra-fine control down to 0.1% steps.



Rotary Encoder Functions

Selector Buttons

3 selector buttons allow the user to assign the encoder to alter key attributes: dim, CCT, and green/magenta bias in WHITE MODE.

The fourth selector button (bottom right) is dedicated to MENU selection or BACK functions.

Memory Buttons

The 4 memory buttons above the screen are reserved for user scene memory.

Push and hold any button to store a scene. All scene settings will be saved. For example, in WHITE MODE, dim percentage, CCT, and green/magenta bias will be saved.

Once a scene is saved, the white bar turns green. One light button touch will display the saved settings, and the bar will turn red without changing the light output. A second touch will change the output.

The scene memory can be overwritten.

Restoring to factory default will erase all user-memory settings.

Backlight

The controller screen's backlight activates on user interaction, local or from DMX, and deactivates with a slow fade after 30 seconds of inactivity to its very dim setting.

Controller

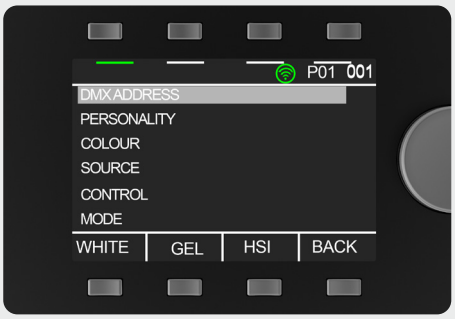
Modes

SONARA features five basic modes:

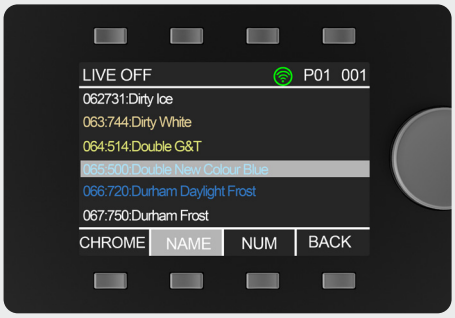
WHITE
GEL
HSI
ALB
x y

One push of the menu button (bottom right) enables the menu and shortcuts to:

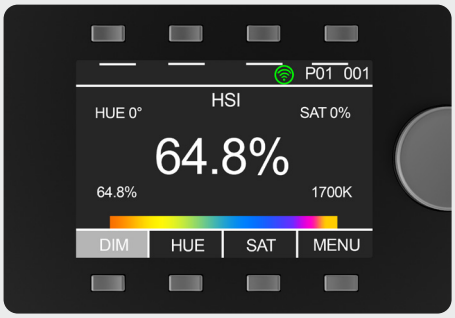
WHITE, GEL, HSI and **BACK**



Menu Screen



Gel Live On/Off



HSI Mode

WHITE allows white point control along the Black Body Locus (BBL) from 1600K – 20,000K and green/magenta bias above and below the Planckian Locus.

GEL mode accesses a range of LEE filter emulations sortable by chroma, name, and number.

Full gel list in the Appendix (pp. 39-41).

In this screen, the live highlighted bottom button (NAME in the top-left example image) allows toggling of LIVE ON and LIVE OFF. In LIVE OFF mode, you can scroll through a range of colours without changing the output until selected. In LIVE ON mode, the output will change actively whilst scrolling through the gel list.

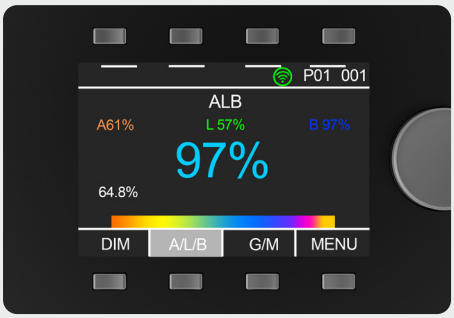
HSI mode allows the user to control the hue angle and saturation against the set white point.

Modes (cont.)

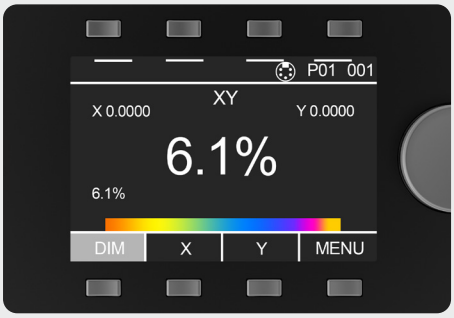
ALB (Amber, Lime, Blue) mode is an incomplete colour wheel, since this version of SONARA doesn't have a saturated green or red chip. (The primary goal with SONARA is to produce high-quality broad-spectrum whites in an extremely extended range.)

x y mode allows the user to select an x y coordinate on the CIE 1935 chromaticity chart. If the chosen colour point is out of gamut, SONARA won't produce any output until the coordinates are adjusted to bring it within the achievable gamut. The light will switch off during adjustment as soon as the requested coordinate is unachievable. If the coordinates selected go out of achievable gamut, the coordinate font will turn red.

To allow fine tuning of gels, x y mode will pick its start coordinates from the most recently selected gel.



ALB Mode



x y Mode

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06

CONTROL FEATURES & OPTIONS

CONTROL FEATURES & OPTIONS

Source Select

SONARA can receive external control via wired DMX, wireless DMX with a built-in LumenRadio receiver, and Art-Net via the RJ45 connector. In PRIMARY/CLONE mode, the first SONARA in the DMX chain behaves as primary, with all subsequent SONARAs in the chain mimicking its settings. (All SONARAs in the chain must be set to the same DMX personality.)

Art-Net is used for transmitting DMX lighting control protocol and RDM over the User Datagram Protocol (UDP) of the Internet Protocol suite. It is used to communicate between nodes/lighting fixtures and a lighting desk, typically on a private local network such as Ethernet.

Control / Dimming Curves

SONARA has 4 built-in dimming curves:

Curve	Characteristics
Linear (Default)	In linear mode, 50% equates to half the output, or **1 stop down**. 25% is quarter output, or **2 stops down**.
Square Law	A square law curve increases the dimming effect at lower control levels.
S Curve	S Curve provides a finer control at lower and higher levels while offering coarse control (lower resolution) at medium levels. This dimming curve best emulates a typical incandescent lamp's dimming abilities.
Tungsten Emulate	Tungsten emulate mode combines square law with greater resolution at lower levels and a warming of the CCT as the fixture dims. This operates on any CCT start point between 2700K and 3600K (correlating to an underrun and overrun tungsten bulb). At CCTs outside this range, standard square law is in play.

Tungsten Emulate Mode

Tungsten Emulate reference values are as below:

Dim	CCT
100%	**3200K**
85%	3000K
71%	2800K
58%	2600K
48%	2400K
38%	2200K
31%	2000K

Dim	CCT
100%	**3600K**
86%	3400K
74%	3200K
63%	3000K
52%	2800K
35%	2600K
28%	2400K

Dim	CCT
100%	**2700K**
80%	2480K
60%	2220K
40%	1920K
30%	1760K
25%	1695K
10%	1600K

Important Note on Dimming Curves

It is important for consistency that all SONARAs in a DMX rig are set to the same dimming curve. If set to different dimming curves, fixtures on the same address output won't track with a global dim command.

Control Output

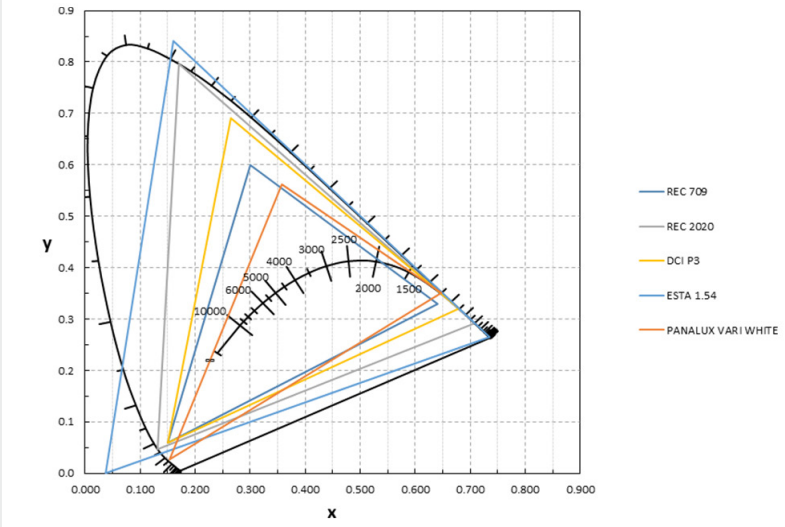
SONARA has two power output modes, **BOOST** (defult) and **FLAT**. Due to the inherent efficacy difference between warm white and cold white chips, the photometric output changes at different CCTs. In a studio environment where multiple changes are made to CCT, it is often advantageous that the photometric output remains constant. This is achieved in FLAT mode and is active only in WHITE MODE and only between 2700K and 7000K.

In BOOST mode, maximum output is available, which may be advantageous when working in environments with ambient daylight.

Control Gamut

SONARA output gamut can be either full gamut or restricted to match REC 709 or REC 2020. Due to the different overlaps of the gamuts, selecting REC 709 or REC 2020 will restrict some of SONARA's output in certain zones. For example, as can be seen in the illustration below, SONARA is capable of producing a range of colours in the yellow and deep amber zone that wouldn't be captured in REC 709. In x y mode with REC 709 as the selected gamut, SONARA would not output a colour at those x y coordinates, which would be shown in a red font on the display.

In CCT, HSI, ALB, or GEL mode, if the colour is unachievable due to the chosen gamut, the colour produced will be desaturated into the selected white point.



Chromaticity Diagram showing gamut comparison between Sonara 4:4 Vari-White and other common colour spaces.

Control Camera LUTs

Camera LUTs change both the x y coordinate and spectral mix of whites to match the colour science of various cameras. An image photographed under the same light source will look different on different cameras. The camera LUTs are intended to bring alignment to the same subject shot with different cameras.

Control Priority

SONARA can be controlled by local user interface or by external control (wired or wireless).

3 control priority modes are available, detailed below:

Mode	Characteristics
LTP (Default)	Last Takes Precedence. In LTP mode, SONARA will listen to DMX (wired or wireless), Art-Net, and the local User Interface, and will take instructions from any. This allows a DOP or gaffer to 'ride' the dimmer when the talent is moving to a cue, or during setup to make changes whilst talking to the board operator, who may be backstage.
External	Ignores local control and locks the User Interface. To exit this mode, hold down the bottom left button for 5 seconds and the display will go to Control Priority Menu.
Local	Ignores any external input even if wired to DMX.

DMX Personalities

DMX personalities determine how SONARA behaves in relation to DMX control and the number of channels one fixture will occupy. The selected personality is always shown on the top status bar. SONARA has 14 available DMX personalities:

Personality	Type	Channels
P1	White 8 bit	3
P2	White 16 bit	5
P3	HSI 8 bit	4
P4	HSI 16 bit	8
P5	Gel 24 bit BCD	6
P6	Gel 16 bit	5
P7	Gel Hue 24 bit BCD	8

Personality	Type	Channels
P8	Gel Hue 16 bit	11
P9	ALB 8 bit	4
P10	ALB 16 bit	8
P11	x y 16 bit	8
P12	x y 24 bit BCD	10
P13	Ultra	7
P14	Extreme	10

DMX Personalities - Channel Assignments

The parameters controlled in each of the DMX personalities are listed below:

DMX Personality Select

		1	2	3	4	5	6	7	8	9	10	11
P1	**White 8 bit**	DIM	CCT	+/- Gn								
P2	**White 16 bit**	DIM	DIM	CCT	CCT	+/- Gn						
P3	**HSI 8 bit**	DIM	CCT	HUE	SAT							
P4	**HSI 16 bit**	DIM	DIM	CCT	CCT	HUE	HUE	SAT	SAT			
P5	**Gel 24 bit BCD**	DIM	CCT	+/- Gn	GEL 000	GEL 00	GEL 0					
P6	**Gel 16 bit**	DIM	DIM	+/- Gn	GEL	GEL						
P7	**Gel Hue 24 bit BCD**	DIM	CCT	+/- Gn	GEL 000	GEL 00	GEL 0	+/- HUE	SAT			
P8	**Gel Hue 16 bit**	DIM	DIM	CCT	CCT	+/- Gn	GEL	GEL	HUE	HUE	SAT	SAT
P9	**ALB 8 bit**	DIM	AMBER	LIME	BLUE							
P10	**ALB 16 bit**	DIM	DIM	AMBER	AMBER	LIME	LIME	BLUE	BLUE			
P11	**x y 16 bit**	DIM	DIM	x	x	y	y	Spectral Breadth	WW to CW			
P12	**x y 24 bit BCD**	DIM	DIM	x .0	x .00	x .000	y .0	y .00	y .000	Spectral Breadth	WW to CW	
P13	**Ultra**	DIM	DIM	AMBER	LIME	BLUE	WW	CW				
P14	**Extreme**	DIM	DIM	AMBER 1	AMBER 2	LIME	BLUE	WW 1	WW 2	CW 1	CW 2	

RDM

SONARA is RDM Enabled

RDM functionality gives the ability to remotely identify the fixture, set its DMX address and DMX personality, and other options. This feature also enables information about SONARA to be read remotely, such as the temperature of the LED arrays. See the full list of RDM functions and monitoring options below:

	Function	Type
1	UID (Unique Identifier) to allow recognition of individual fixtures	Monitoring
2	RDM Protocol Version	Monitoring
3	Device Model Description	Fixed
4	Manufacturer Label	Fixed
5	Software Version	Fixed
6	Serial Number	Fixed
7	DMX Footprint	Monitoring
8	DMX Personality Description	Monitoring
9	DMX Start Address	User Editable
10	DMX Personality	User Editable
11	Dimming Curve	User Editable
12	Output Mode	User Editable
13	Colour Gamut	User Editable
14	Camera LUT	User Editable
15	Device Hours	Monitoring
16	Lamp Hours	Monitoring
17	Power Output	Monitoring
18	Reset device to factory defaults and wipe saved scenes	User Editable

SONARA RDM Sensors

See the full list of remote sensor monitoring options below:

Sensor	Type	Reading
1	Temperature	Array temperature in degrees Celsius
2	Temperature	Array temperature in degrees Celsius
3	Temperature	Array temperature in degrees Celsius
4	Temperature	Array temperature in degrees Celsius
5	Temperature	Array temperature in degrees Celsius
6	Temperature	Array temperature in degrees Celsius
7	Temperature	Array temperature in degrees Celsius
8	Temperature	Array temperature in degrees Celsius
9	Temperature	Array temperature in degrees Celsius
10	Temperature	Array temperature in degrees Celsius
11	Temperature	Array temperature in degrees Celsius
12	Temperature	Array temperature in degrees Celsius
13	Temperature	Array temperature in degrees Celsius
14	Temperature	Array temperature in degrees Celsius
15	Temperature	Array temperature in degrees Celsius
16	Temperature	Array temperature in degrees Celsius
17	Temperature	Master driver processor temperature in degrees Celsius

SONARA Menu Tree

DMX ADDRESS	▶ 1 - 512	
PERSONALITY	▶ 1 - 14	
COLOUR	▶ WHITE	
	▶ GEL	
	▶ HSI	
	▶ RGB	
	▶ X Y	
SOURCE	▶ WIRED	
	▶ WIRELESS	
	▶ ARTNET	
	▶ PRIMARY/CLONE	
CONTROL	CURVES	▶ LINEAR
		▶ SQUARE LAW
		▶ S CURVE
		▶ TUNGSTEN EMULATE
	OUTPUT	▶ BOOST
		▶ FLAT
	GAMUT	▶ PX VARI WHITE
		▶ REC 2020
		▶ REC 709
		▶ DCI P3
		▶ ESTA 1.54
	CAMERA LUTS**	
	CONTROL PRIORITY	▶ LTP
		▶ EXTERNAL
		▶ LOCAL
MODE	▶ STANDARD	
	▶ PIXILATION**	
	▶ SFX**	
	▶ ATTRACT	

**future feature

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GENERAL

Power Characteristics

Characteristic	Value
AC power / nominal input voltage	110-240V (AC) 50-60Hz
Max input current	14A (110V) / 7A (230V)
Max power input	1500W

Physical Characteristics

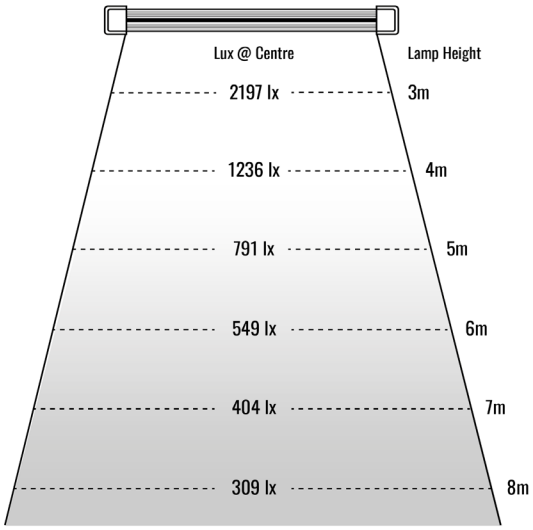
Characteristic	Value
Dimensions (excluding yoke)	1248 x 1248 x 134 (mm) 49 x 49 x 5.25 (inches)
Dimensions (including yoke)	1486 x 1546 x 163 (mm) 58.5 x 61 x 6.5 (inches)
Weight (excluding accessories)	44kg
Weight (excluding yoke)	38kg

Fault Finding Tips

Issue	Possible Solution
No power seen and rocker switch not lit	**Fuse in casket blown. Try replacement.**
No response from controller on power up or splash screen	**Confirm that the controller is located firmly and squarely in the trough and held by the magnets. Check to see if the lanyard is hindering the controller's positioning.**
No response from controller in remote mode	**Confirm that both ends of the cable are fitted correctly into the housings on the head and the controller and that the keyway aligns.**
Two or more fixtures on the same address are behaving differently on dimming or CCT	**Ensure that all fixtures are set in the same option for personality, dimming curve, and FLAT/BOOST.**
One or more fixtures on a DMX Universe are flashing or behaving oddly	**Confirm that none of the fixtures are in PRIMARY/CLONE mode.**

Optical Characteristics

The waterfall diagram shows a typical spread of light when SONARA is suspended at various heights. Measurements were taken with a temperature stabilised SONARA set at 3200K at maximum intensity.



Sonara Luminous Intensity

Lux Variation With Height and Spread

Further detailed measurements listed below were taken with a SONARA at 3200K as above.

Height (m)	Lux (lx) at Spread (m)										
	Centre	1.2	2.4	3.7	4.9	6.1	7.3	8.5	9.8	11.0	12.2
3	2197	1859	1639	1420	1082	845	625	473	355	287	220
4	1236	1046	922	799	608	475	352	266	200	162	124
5	791	669	590	511	389	304	225	170	128	103	79
6	549	465	410	355	270	211	156	118	89	72	55
7	404	341	301	261	199	155	115	87	65	53	40
8	309	261	231	200	152	119	88	67	50	40	31

Warnings & Cautions

SYMBOL	MEANING
	**Risk of electric shock / risk of fire** Do not open. To reduce the risk of electric shock, do not remove cover (or back). No user serviceable parts inside. Refer servicing to qualified service personnel.
	**Burning Injuries** Be aware of high case temperatures of 60-85°C during and after use of Sonara. Don't touch the metal cases, frames, or LEDs to avoid burning injuries.
	**Flammable Materials** Keep flammable materials away from the installation. The installation should be such that the amount of air flow required for safe operation of the equipment is not compromised. Proper ventilation must be provided.
	**ESD and LEDs** LED components used in Sonara are sensitive to electro-static discharge (ESD). To prevent the possibility of destroying LED components do not touch during operation or when SONARA is switched off.
	**Light output** Due to high light-output intensity do not look directly into the bare LED array. Use diffusers when exposing the light to human eyes.
	**Disconnect Device** When the appliance inlets of any individual SONARAs are not accessible, the socket outlets supplying the rack shall be installed near the equipment and be easily accessible, or a readily accessible general disconnect device shall be incorporated in the fixed wiring. Disconnect device should state 3mm separation in both poles and should include reference to national wiring rules.
	**This equipment MUST be earthed** In order to protect against risk of electric shock, the installation should be properly grounded. Defeating the purpose of the grounding type plug will expose you to the risk of electric shock.
	**Mains cords** Use only a Neutrik PowerCon TrueOne NAC3FX-W-TOP Connector. The user is responsible for ensuring power cables are of adequate condition for each application. If the power cords are damaged, replace them only with new ones. Never try to repair a power cord.
	**Environmental: Disposal of old electrical & electronic equipment** This symbol on the product or on its packaging indicates that this product shall not be treated as household waste.

Spare Parts & Accessories

PART NO	DESCRIPTION
HIN98AR	Lamp head
JINKBAR	Yoke
GN.15633	Locking handle
JINKOAR	Eye bolt
JIN9LAR	Controller
CIN9MAR	Controller extension cable
YINBOAR	Controller extension cable pouch
124-8684	Aerial
VIKLIA7	Power cord
YJNBQAJ	Soft box
YIN9PAR	Soft box bag
JIN9RAR	Full Grid Cloth
JIN9SAR	Half Grid Cloth
JIN9TAR	Quarter Grid Cloth
JIN9QAR	Magic Cloth
GJNBPAJ	Egg crate
YJNBQAJ	Egg crate bag
JINR8AR	Rain cover – front
JINR9AR	Rain cover – rear (flat)
JINRAAR	Rain cover – rear (domed)

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APPENDIX

Gel Library

	Gel Name
2	Rose Pink
3	Lavender Tint
4	Medium Bastard Amber
7	Pale Yellow
8	Dark Salmon
9	Pale Amber Gold
10	Medium Yellow
13	Straw Tint
15	Deep Straw
17	Surprise Peach
19	Fire
20	Medium Amber
21	Gold Amber
22	Dark Amber
24	Scarlet
25	Sunset Red
26	Bright Red
27	Medium Red
29	Plasa Red
35	Light Pink
36	Medium Pink
46	Dark Magenta
48	Rose Purple
49	Medium Purple
52	Light Lavender
53	Paler Lavender
58	Lavender
61	Mist Blue
63	Pale Blue
68	Sky Blue
71	Tokyo Blue
75	Evening Blue
79	Just Blue
85	Deeper Blue
88	Lime Green
89	Moss Green
90	Dark Yellow Green
101	Yellow
102	Light Amber
103	Straw
104	Deep Amber
105	Orange
106	Primary Red
107	Light Rose
108	English Rose
109	Light Salmon
110	Middle Rose
111	Dark Pink
113	Magenta
115	Peacock Blue
116	Medium Blue-Green
117	Steel Blue
118	Light Blue
119	Dark Blue
120	Deep Blue
121	Lee Green
122	Fern Green
124	Dark Green
126	Mauve
127	Smokey Pink
128	Bright Pink
131	Marine Blue
132	Medium Blue
134	Golden Amber
135	Deep Golden Amber
136	Pale Lavender
137	Special Lavender
138	Pale Green
139	Primary Green
140	Summer Blue
141	Bright Blue
142	Pale Violet
143	Pale Navy Blue
144	No Colour Blue
147	Apricot
148	Bright Rose
151	Gold Tint

Gel Library (cont.)

152	Pale Gold
153	Pale Salmon
124	Pale Rose
156	Chocolate
157	Pink
158	Deep Orange
159	No Colour Straw
161	Slate Blue
162	Bastard Amber
164	Flame Red
165	Daylight Blue
169	Lilac Tint
170	Deep Lavender
172	Lagoon Blue
174	Dark Steel Blue
176	Loving Amber
179	Chrome Orange
180	Dark Lavender
181	Congo Blue
182	Light Red
183	Moonlight Blue
184	Cosmetic Peach
186	Cosmetic Silver Rose
187	Cosmetic Rouge
188	Cosmetic Highlight
189	Cosmetic Silver Moss

191	Cosmetic Aqua Blue
192	Flesh Pink
194	Surprise Pink
195	Zenith Blue
196	True Blue
197	Alice Blue
198	Palace Blue
199	Regal Blue
212	L.C.T.Yellow
213	White Flame Green
219	Fluorescent Green
230	Super Corr.L.C.T.Yellow
232	S.Cor WF.Grn to Tungsten
236	H.M.I. (to Tungsten)
237	C.I.D. (to Tungsten)
238	C.S.I. (to Tungsten)
241	Lee Fluorescent 5700K
242	Lee Fluorescent 4300K
243	Lee Fluorescent 3600K
322	Soft Green
323	Jade
327	Forest Green
328	Follies Pink
332	Special Rose Pink
343	Special Medium Lavender

345	Fuchsia Pink
352	Glacier Blue
353	Lighter Blue
354	Special Steel Blue
361	Surprise Blue (BBC)
363	Special Medium Blue
366	Cornflower
441	Full C.T. Straw
442	Half C.T. Straw
443	Quarter C.T. Straw
444	Eighth C.T. Straw
500	Double New Colour Blue
501	New Col Robertson Blue
502	Half New Colour Blue
503	Quarter New Colour Blue
504	Waterfront Green
505	Sally Green
506	Marlene
507	Madge
508	Midnight Maya
511	Bacon Brown
512	Amber Delight
513	Ice And A Slice
514	Double G and T
525	Argent Blue
550	ALD Gold

Gel Library (cont.)

604	Full C.T. Eight Five
642	1/2 Mustard Yellow
643	1/4 Mustard Yellow
650	Industry Sodium
651	Hi Sodium
652	Urban Sodium
700	Perfect Lavender
701	Provence
702	Special Pale Lavender
703	Cold Lavender
704	Lily
705	Lily Frost
706	King Fals Lavender
707	Ultimate Violet
708	Cool Lavender
709	Electric Lilac
710	Spir Special Blue
711	Cold Blue
712	Bedford Blue
713	J. Winter Blue
714	Elysian Blue
715	Cabana Blue
716	Mikkel Blue
719	Colour Wash Blue
721	Berry Blue
722	Bray Blue

723	Virgin Blue
724	Ocean Blue
725	Old Steel Blue
727	QFD Blue
728	Steel Green
729	Scuba Blue
730	Liberty Green
731	Dirty Ice
733	Damp Squib
735	Velvet Green
736	Twickenham Green
738	JAS Green
740	Aurora Borealis Green
741	Mustard Yellow
742	Bram Brown
744	Dirty White
746	Brown
747	Easy White
748	Seedy Pink
763	Wheat
764	Sun Colour Straw
765	Lee Yellow
767	Oklahoma Yellow
768	Egg Yolk Yellow
770	Burnt Yellow
773	Cardbox Amber

774	Soft Amber Key 1
775	Soft Amber Key 2
776	Nectarine
777	Rust
778	Millennium Gold
779	Bastard Pink
780	AS Golden Amber
781	Terry Red
787	Marius Red
789	Blood Red
790	Moroccan Pink
791	Moroccan Frost
793	Vanity Fair
795	Magical Magenta
797	Deep Purple
798	Chrysalis Pink
799	Special K H Lav

Source Emulation List

900	Candle flame	**913**	
901		**914**	
902		**915**	
903		**916**	
904	Carbon arc	**917**	
905	Low pressure sodium	**918**	
906	Sodium vapour	**919**	
907	Mercury vapour	**920**	Fluorescent Warm White
908	Xenon	**921**	Fluorescent Neutral White
909	Arena lighting	**922**	Fluorescent Cold White
910	Frosty night	**923**	Fluorescent Old and green
911		**924**	
912		**925**	

Overall Dimensions & Rigging Centres