PROFILE LIGHT ENGINE

TUNABLE COOL WHITE

TUNABLE WARM WHITE

USER MANUAL

INTRODUCTION

OUR GOAL

We are committed to providing you the highest quality in customer service. Our comprehensive resources are available to help your business succeed and ensure you get the full benefit of being a Vari-Lite customer.

TECHNICAL SUPPORT

Our Service and Support team is tasked with online and field support, repair, demo, commissioning, maintenance contracts, and technical training for fixtures and systems. In addition, this team plays a large role in a Systems sales, responsible for administering final commissioning, record-keeping, and organizing services. Refer to the back cover of this User Manual for contacts in your region or visit **www.vari-lite.com/support**

CUSTOMER SERVICE

Customer Service is responsible for boxed goods and spare parts quotations, order entry and fulfilment, project delivery, lead times, and general account management. They also manage all after sales warranty fulfilment, RGA, and repairs invoicing in tandem with our After Sales Service & Support team. Visit our website to find a customer service agent in your region.

ADDITIONAL DOCUMENTATION

Additional product documentation, including DMX maps, software, and photometric reports, are available for download on our website.

For more information on installing DMX512 control systems, the following publication is available for purchase from the United States Institute for Theatre Technology (USITT), "Recommended Practice for DMX512: A Guide for Users and Installers, 2nd edition" (ISBN: 9780955703522).

USITT Contact Information:

> USITT
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> 315 South Crouse Avenue, Suite 200
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> Syracuse, New York 13210-1844 USA
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> Fax: 866-398-7488 or +1-315-463-6525
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> Website: www.usitt.org

ABOUT THIS DOCUMENT

Read all instructions before installing or using this product. Retain this User Manual for future reference.

Additional product information and descriptions may be found on the product data sheet(s) which can be downloaded from the website at **www.vari-lite.com**.

This User Manual provides necessary information regarding safety, installation, operation and routine maintenance for Profile Light Engine TCW/TWW. Familiarizing yourself with this information will help you to get the most out of your product.

WARNING: It is important to read ALL accompanying safety and installation instructions to avoid damage to the product and potential injury to yourself or others.

SAFETY WARNINGS AND NOTICES

Read this user manual in full before attempting to install, operate or maintain the fixture to which it relates. This user manual is intended to provide general guidance to such suitably qualified personnel. Installation and operation of the fixture are to be performed by qualified personnel only.

When using electrical equipment, basic safety precautions should always be followed including the following:

READ AND FOLLOW ALL SAFETY INSTRUCTIONS.

- For indoor, dry location use only. Do not use outdoors unless fixture is suitably IP rated.
- Use safety tether when mounting.
- Equipment should be mounted in locations and at heights where it will not be readily subjected to tampering by unauthorized personnel.
- Not for residential use. Do not use this equipment for other than intended use.
- Note distance requirement(s) from combustible materials or illuminated objects. Do not mount near gas or electric heaters.
- Install only in locations with adequate ventilation. Ensure sure that ventilation slots are not blocked.
- Ensure that the voltage and frequency of the power supply match the power requirements of the fixture.
- The fixture must be earthed/grounded to the appropriate conductor.
- Do not operate fixture outside the specified ambient temperature range.
- Do not connect the fixture to any dimmer pack.
- The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition and void warranty.
- Refer service to qualified personnel. This fixture contains no user serviceable parts.
- Prior to first use, carefully inspect fixture to ensure no damage has occurred during shipping.
- Materials used in the manufacturing process can cause strong odors when the product is new. These odors dissipate over time.
- Prior to each use, carefully inspect power cables and replace any damaged cables.
- Exterior surfaces of the luminaire will be hot during operation. Take appropriate precautions.
- Continuous use of the fixture may shorten the lifespan. Power down the fixture when not in use.
- Do not cycle power on and off repeatedly. Disconnect mains power if the fixture is not used for an extended period.
- Clean fixtures regularly, particularly when working in a dusty environment.
- Never touch power cables or wires while the fixture is powered on.
- Avoid entangling power wires with other cables.
- In the event of a serious operating problem, immediately discontinue using the fixture.
- It is hazardous to operate luminaires without lens or shield. Shields, lenses, or ultraviolet screens shall be changed if they have become visibly damaged to such an extent that their effectiveness is impaired, for example, by cracks or deep scratches.
- Original packing materials can be reused for transporting the fixture.
- Do not look directly at the LED light beam while the fixture is on.
- This is a Class A product. In a domestic environment this product may cause radio interference, in which case, the user may be required to take adequate measures.
- The light source contained in this luminaire shall only be replaced by the manufacturer or service agent or similarly qualified person.

SAVE THESE INSTRUCTIONS.

WARNING: Refer to National Electrical Code® and local codes for cable specifications. Failure to use proper cable can result in damage to equipment or danger to personnel. Caution Against Direct Sunlight Through Front Lens Assembly

CAUTION AGAINST DIRECT SUNLIGHT THROUGH FRONT LENS ASSEMBLY

The design and nature of the front lens assembly in Vari-Lite LLC luminaires is to efficiently focus the light energy from the luminaire's lamp for maximum light output.

- When the front lens assembly is exposed to direct sunlight or intense light from neighboring fixtures, the lens will collect and intensify this light and focus it back into the fixture. Intense sunlight or beams from other fixtures can cause damage to internal assemblies contained within the fixture.
- When fixture is not in use and direct sunlight or other intense light is present, position luminaires so their front lens assembly it not directly exposed to the light source.

CAUTION AGAINST POWERING LUMINAIRES FROM DIMMER CIRCUITS

It is not recommended to power any Vari-Lite LLC luminaire from a dimmer - even in 'NONDIM' mode. Dimmer and non-dim modules are not suitable sources of power because their output modifies the AC wave form. This may work for a short time, but eventually results in power problems, luminaire mis-operation and/or failure.

- When using a power distribution rack, do not use dimmer or non-dim modules to power any Vari-Lite LLC luminaire. Damage to the luminaire can occur.
- Using a dimmer or non-dim module to power your Vari-Lite LLC luminaire will void your luminaire's warranty.

CAUTION AGAINST THE USE OF THIRD PARTY PARTS OR ACCESSORIES

- Heat and heat distribution are important factors when operating Vari-Lite LLC luminaires. Vari-Lite LLC luminaires are designed to dissipate heat efficiently and safely. Any blockages or obstructions, such as aftermarket baffles, covers, enclosures, etc. can interrupt the luminaire's ability to dissipate heat properly and can damage the luminaire.
- Vari-Lite LLC cannot be responsible for issues arising from non-approved parts and accessories installed on or used with any Vari-Lite LLC product. Customers of such products should contact the manufacturer directly for assistance and support.

TRANSPORTING LUMINAIRES

When shipping or transporting luminaires, Vari-Lite LLC recommends that the luminaire(s) be sufficiently protected against any (including, but not limited to) shock, vibration, drops, jarring, exposure to the environment, etc.

Failure to sufficiently protect any Vari-Lite LLC luminaire during shipping or transportation will result in damage and void the luminaire's warranty. Vari-Lite LLC will not be responsible for any shipping damage or breakage of any product under any circumstances. Vari-Lite LLC will not be responsible for any third party case manufacturer's cases.

NOTE: As with all automated luminaires, proper handling and suitable protective shipping cases should be used when transporting fixtures to reduce the risk of damage.

TRANSPORTATION AND SHIPPING CASE REQUIREMENTS

Cases to transport Vari-Lite LLC luminaires should meet the following loading requirements:

- Luminaire head, yoke, and enclosure sub-assemblies shall be equally supported and constrained where no one sub-assembly (head, yoke, or enclosure) fully supports the entire mass of the luminaire.
- The interior of the case shall be of high quality and uniform density foam. The foam shall be of the same type and density throughout as to equally and uniformly support loading at every contact surface.
- The case shall, when laid on any of its six (6) surfaces, maintain the loading requirements outlined above.
- All cases not meeting the aforementioned loading requirements, with wheels, shall have markings on the exterior of the case that the unit is to be transported on it wheels only (e.g. "Case must be transported and remain [at all times] on its wheels").

COMPLIANCE NOTICE

FCC DECLARATION OF CONFORMITY

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with Vari-Lite system, service, and safety guide-lines, may cause harmful interference to radio communications.

As tested under this standard:

FCC 47CFR 15B clA*CEI

Issued:2009/10/01 Title 47 CFR Part 15 Subpart B Unintentional Radiators Class A

Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her own expense.

EU DECLARATION OF CONFORMITY

We, Vari-Lite LLC., 10911 Petal Street, Dallas, Texas 75238, declare under our responsibility for the products contained herein are in conformity with the essential requirements of the following European Directives and harmonized standards:

Low Voltage Director (LVD), 2006/95/EC

EN 60589-2-17:1984+A1:1987+A2:1990 used in conjunction with 60598-1:2008/A11:2009

Electromagnetic Compatibility Directive (EMC), 2004//108/EC

EN 55022:2010, EN55024:2010

HOW TO OBTAIN WARRANTY SERVICE

A copy of the Limited Warranty card was included in the shipping package for this product.

To obtain warranty service, please contact customer service at 1-214-647-7880, or **entertainment.service@ signify.com** and request a Return Material Authorization (RMA) for warranty service. You will need to provide the model and serial number of the item being returned, a description of the problem or failure and the name of the registered user or organization. If available, you should have your sales invoice to establish the date of sale as the beginning of the warranty period. Once you obtain the RMA, pack the unit in a secure shipping container or in its original packing box. Be sure to clearly indicate the RMA number on all packing lists, correspondence, and ship-ping labels. If available, please include a copy of your invoice (as proof of purchase) in the shipping container.

With the RMA number written legibly on or near the shipping address label, return the unit, freight prepaid, to:

> Vari-Lite LLC
> Attention: Warranty Service (RMA# _____)
> 10911 Petal Street
> Dallas, Texas 75238
> USA

As stated in the warranty, it is required that the shipment be insured and FOB our service center.

IMPORTANT! When returning products to Vari-Lite for repairs (warranty or out-of-warranty) from a country other than the USA, "Vari-Lite LLC", must appear in the address block as the Importer of Record (IOR) on all ship-ping documentation, Commercial Invoices, etc. This must be done in order to clear customs in a timely manner and prevent returns.

1 DESCRIPTION

FEATURES

• High output midsized LED theatrical luminaires - modern fixtures with quality you can trust.

• Tunable white with >94 CRI - adjust color temperature without compromising output or quality of light.

• Quiet operation with variable fan control - perfect for use in quiet environments.

• Adjustable frequency to exceed camera frame rates - camera-friendly fixtures for IMAG, event recordings, or TV and film applications.

For detailed product information, please refer to the Product Guide at https://www.vari-lite.com/global/products/leko-led-profile-tcw

COMPONENTS

The document provides installation and operation instructions for the following products:

• Profile Light Engine TCW or Profile Light Engine TWW

Read all instructions before installing or using this product. Retain this manual for future reference. Additional product information and descriptions may be found on the product specification sheet.

INCLUDED ITEMS

Each Profile Light Engine TCW or TWW luminaire includes the following items:

• Profile Light Engine TCW or Profile Light Engine TWW
• TrueOne compatible power connector
• Quick Start Guide

INCLUDED ITEMS

Profile Light Engine
TCW or TWW

QUICK START GUIDE

POWER CONNECTOR

WARRANTY CARD
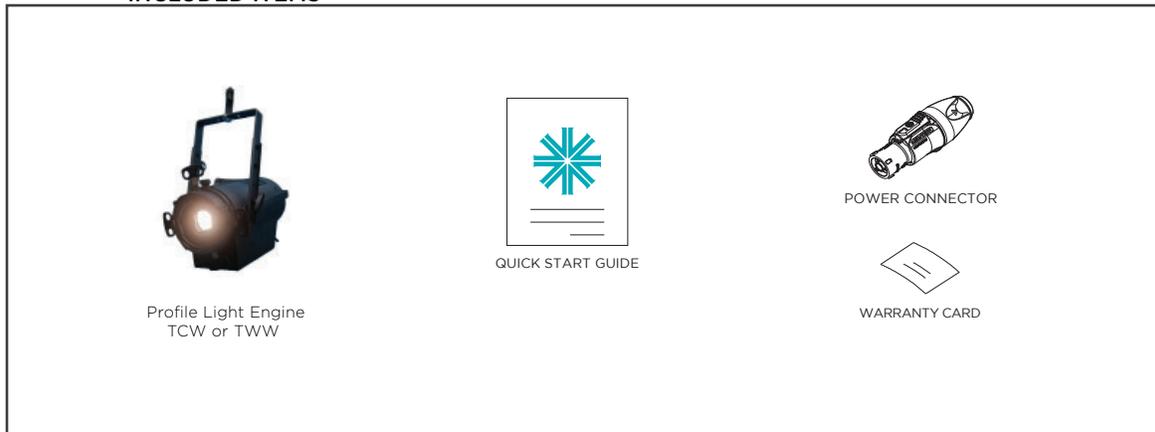
2 INSTALLATION

MOUNTING

The unit should be mounted via its screw holes on the bracket. Always ensure that the unit is firmly fixed to avoid vibration and slipping while operating. Always ensure that the structure to which you are attaching the unit is secure and is able to support a weight of 10 times of the unit's weight. Always use a safety cable that can hold up to 12 times the weight of the unit when installing the fixture.

The luminaire must be mounted by professionals.
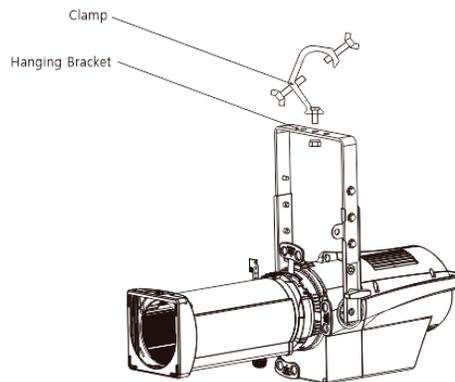
INSTALLING SHUTTER ASSEMBLY AND LENS TUBES

To install shutter/lens:

Step 1. Slide shutter assembly into the body. Clamp in place with shutter retainer and tighten knob.

Step 2. Pull he locking lever on the lens tube toward the front of the lens.

Step 3. Slide the lens tube down into the body until the locking lever can latch. Loosen focus lock knob and adjust focus as desired. Tighten to lock. Reverse process to remove. (SPX lens shown).

Visit **www.vari-lite.com** for a complete list of compatible lens tubes.
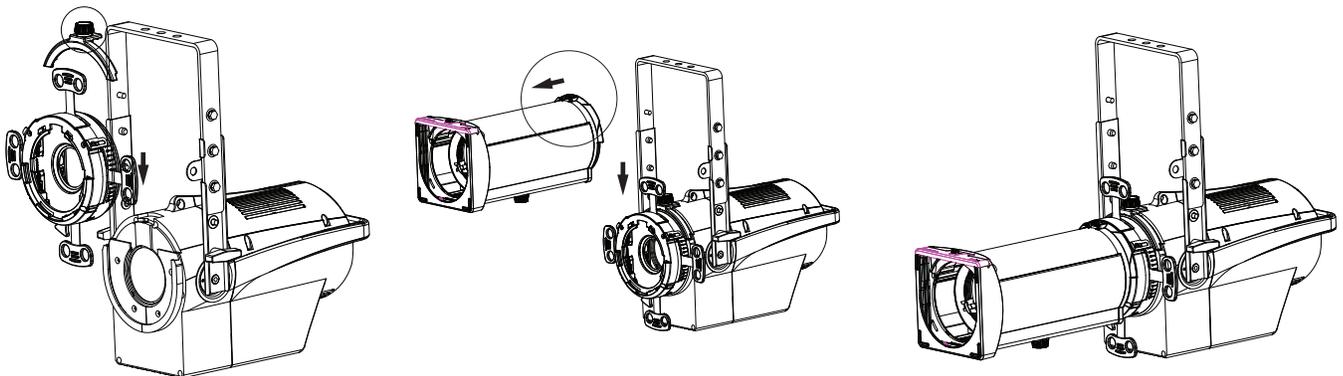
NOTE: Lens tube may need to be moved foward (away from the body) on PLT or internal lenses moved forward on SPX to install or remove. Loosen focus lock knob to adjust.

3 MENU OPERATION

CONTROL PANEL

Press the MENU button to select any functions, until the required function is shown in the display. Select the desired function by pressing ENTER, which will cause the display to blink. Use the UP and DOWN button to change the mode. Once the required mode has been selected, press the ENTER button to accept the selection. Press MENU to return to the previous menu or let the unit idle for one minute to exit menu mode automatically.
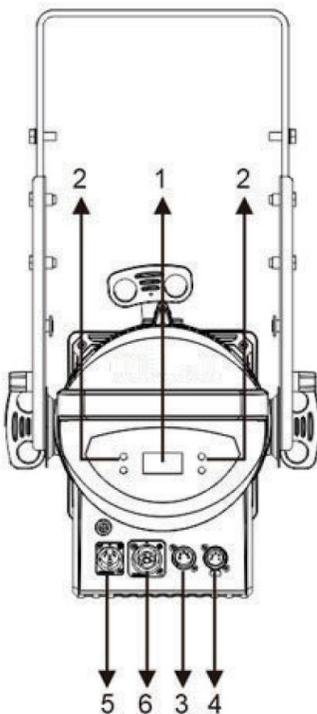
1. LCD display - shows the menu and selected functions

2. Buttons:
MENU - To select the programming functions DOWN - To go backward in the selected functions UP - To go forward in the selected functions ENTER - To confirm the selected functions

3. DMX IN - 5-pin XLR cable to link DMX console DMX

4. OUT - 5-pin XLR cable to link to the next unit DMX In -

5. connects to power supply

6. Power Out - connects to next fixture

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	LEVEL 6	DEFAULT
Address	001-506(16 Bit), 001-508(8 Bit), 001-511(2 Channel)					001
Configure	LED	LED Hours	XXXXXX h			
		Reset LED Hour	Are you sure?			
		Dimming Curve	Square Curve			Default
			S Curve			
			Linear Curve			
		Dim Snap	On (Fast)			
			Off (Slow)			Default
		Output Mode	Standard			Default
			Studio			
			Whisper			
		Fan Mode	On			
			Auto			Default
		LED Frequency	1200Hz			Default
			2500Hz			
			5000Hz			
			10000Hz			
			20000Hz			
			25000Hz			
	Disp Timeout	30 Sec				Default
		5 Min				
		10 Min				
		On				
	Reset	Yes/No				
DMX	Address	001-506(16 Bit), 001-508(8 Bit), 001-511(2 Channel)				001
	DMX Mode	16 Bit				Default
		8 Bit				
		2 Channel				
	DMX Fail	Hold				Default
		Blackout				
		Go to Preset				
	Data	Ch 1 - Intensity XXX (Value)				
		Ch 2 -Intensity Fine XXX (Value)				
		...All functions				
Fixture	UID	UID electronic format				
	Status	(No Errors..or displays a list of errors)				
	Reboot Fixture	Are you sure?				
	Version	VXXX				
	Fixture Hours	XXXXXX h				
	Crossload (Software)	Send				
	Service	Diagnostics	Fan Check	X rpm		
			Board Check	(No Errors..or displays a list of errors)		
			Sensor Check	X °C		

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	LEVEL 6	DEFAULT
Manual Preset	Playback	Power Up Preset	01 - 20			
		Intensity	0 - 255			255
		Priority	Preset			Default
			DMX			
		Power Up?	Off			Default
			On			
	Edit Programs	Load Preset	01 - 20			
		Edit Settings	Intensity	0 - 255		
			Cool or Warm	0 - 255		
			Nautural	0 - 255		
		Store	01 - 20	Are you sure?	Yes	
					No	
		Clear	01 - 20	Are you sure?	Yes	
					No	
		Clear All	Are you sure?	Yes		
				No		

MENU SYSTEM

DISPLAY AND MENU SYSTEM OPERATION

The Display Menu system consists of several categories. Use the Menu Button to access the menu. Then use the Up/Down arrow to navigate. When you reach the desired item, touch the Enter Button. To go backwards, touch the Menu Button.

To navigate and access menu settings/selections:

Step 1.   Make sure unit is powered and turned on.

Step 2.   Touch [MENU] to access menu categories.

Step 3.   Use two Arrow (▲▼) buttons to navigate through the various options and settings.

Step 4.   Once menu item is reached, touch [ENTER] to access the menu item parameters.

Step 5.   Make changes to parameters as desired.

Step 6.   Press [ENTER] button to accept changes.

ADDRESS

ADDRESS

Sets the starting DMX address for the fixture. Can also be set via RDM.

CONFIGURE

LED

This menu allows for viewing the LED engine hours, setting the dimming curve, dim snap, output mode, fan mode, and LED frequency.

LED Hours

Displays the current LED engine hours.

Reset LED Hours

Allows the LED hours of the engine to be reset. Should only be done if the engine has been replaced

Dimming Curve

Select from Linear, S-Curve and Square Law. Can also be set via the control channel and RDM.

Dim Snap

Dim Snap On allows for fastest output changes between levels but reduces smoothness dimming the LED engine. Dim Snap Off ensures all fades between output levels remains smooth and flicker free but limits fast, instant snaps between levels. Can also be set via the control channel and RDM.

Output Mode

Standard mode provides full LED output. Studio mode reduces fan speed to reduce the fan noise of the fixture. Whisper mode decrease the fan noise further. In both Studio mode and Whisper mode, the LED output will decrease accordingly. Can also be set via the control channel and RDM.

Fan Mode

Fan On runs fans at continuous max speed based on Output Mode. Fan Auto will reduce/increase speed on demand based on LED operating temperature. The fan will not exceed the maximum permissible level based on Output Mode. Can also be set via the control channel and RDM. See Appendix B.

LED Frequency

Choose the refresh rate of the LED engine (see Display Menu Tree for list).

DISPLAY TIMEOUT

Sets how long the display remains illuminated after the last button touch. Choose from 30 seconds, 5 minutes, 10 minutes, or always on.

RESET

Resets all the factory defaults of the fixture. This includes setting the DMX Address to 001. Can also be done via RDM and via the control channel.

NOTE: Control channel will not change the current DMX address.

DMX

ADDRESS

Sets the starting DMX address of the fixture. Can also be set via RDM.

DMX MODE

16 Bit

16 Bit DMX control of Intensity and CCT, plus 8 Bit DMX control of Strobe, Fan and Luminaire Control.

8 Bit

8 Bit DMX control of Intensity, CCT, Strobe, Fan and Luminaire Control.

2 Channel

8 Bit DMX control of Intesnity and CCT.

DMX FAIL

DMX Hold

If DMX is lost, fixture will maintain its present state until DMX is restored.

Blackout

If DMX is lost, fixture will go to blackout until DMX is restored.

Goto Preset

If DMX is lost, fixture will go to the preset (1 through 20).

DATA

Allows the current DMX value present on each of the luminaire's DMX channels to be viewed.

FIXTURE

UID

Displays the UID as set in the luminaire.

STATUS

Shows list of error message from previous calibration. If none, it will say No Errors.

REBOOT FIXTURE

Restarts the entire operating system of the fixture. Can be performed via the control channel or RDM.

VERSION

Shows the current software version of the fixture. Version is listed in MM/DD/YY format. Can be viewed via RDM.

FIXTURE HOURS

Shows the accumulated hours the fixture has been powered on. Can be viewed via RDM.

CROSSLOAD (SOFTWARE)

Allows the current version of software installed in the fixture to be sent to other units via an attached DMX cable.

SERVICE - DIAGNOSTICS

Fan Check

Shows the current fan speed in RPM.

Board Check

Shows the current status of the control board.

Sensor Check

Shows the current temp at the LED in °C.

MANUAL PRESET

PLAYBACK

Power Up Preset

Selects the preset (1 to 20) that will be played back after power up if enabled.

Intensity

Selects the master intensity of a preset being played back (0 to 255).

Priority

Choose Preset if you always want a preset to playback. Choose DMX if you only want a preset to playback if there is no DMX present.

Power Up?

Choose Preset On if you want the fixture to playback the preset at power up. Choose Preset Off if you do not want a preset to play.

EDIT PROGRAMS

Load Preset

Select from preset 1 to 20 and touch [ENTER]. That preset will be played back.

Edit Settings

Choose the function from the list you wish to edit and touch [ENTER]. Use the [UP]/[DOWN] buttons to set desired value. Touch [ENTER] to store. Then continue to adjust all function desired.

Store

After setting all your functions, select which preset number you wish to store (1 to 20) and touch [EN-TER]. Touch [ENTER] again to confirm when prompted.

Clear

Select the preset (1 to 20) you wish to clear and touch [ENTER]. Touch [ENTER] again to confirm when prompted.

Clear All Presets

When prompted, touch [ENTER] to confirm and all presets (1 to 20) will be erased.

WARNING: Clearing the presets CANNOT be undone!

4 DMX MAPPING

The fixture can be operated by DMX controller. The following tables assumes a DMX start address of 1. When a different starting address is used, this address becomes channel 1 function and other functions follow in sequence.

TABLE 1. 16 BIT

DMX CHANNEL	PARAMETER	DEFAULTS	RANGE DMX	DESCRIPTION
1	Intensity (High)	0	0 - 65535	16-bit Intensity (Dimmer) Control
2	Intensity (Low)			0 - 100% Outut
3	Strobe	0	0 - 255	Control of Strobe
			0 - 9	No Strobe Function - Shutter open
			10 - 99	Strobe S>>>>>F
			100 - 109	No Strobe Function - Shutter open
			110 - 179	Lighting Strobe S>>>>>F
			180 - 189	No Strobe Function - Shutter open
			190 - 255	Random Strobe S>>>>>F
4	Fan Control	0	0 - 255	Dynamic control of fan speed vs LED output
			0 - 4	Automatic fan/output adjustment
			5 - 255	Linear control fo fan speed and LED output*
				DMX 5 = Highest Constant Fan Speed
				DMX 255 = Lowest Constant Fan Speed
				* Standard mode only
5	Control Channel	0	0 - 255	Control Channel used for fixture settings
				Set discrete value of desired effect, wait >3 seconds,
				then set value to 0 (idle)
				**Function does not require 3 second rule to activate function
			0 - 5	Idle (Default must be 0)
			6 - 10	Full luminaire Re-Cal - also wakes from shutdown
			11 - 15	Fixture Shutdown
			16 - 20	Reserved
			21 - 25	Display - Menu ON
			26 - 30	Display - Menu OFF
			31 - 40	Reserved
			41 - 45	Dimming Curve Linear**
			46 - 50	Dimming Curve S-Curve**
			51 - 55	Dimming Curve Square Law (Default)**
			56 - 60	Reserved
			61 - 65	Dimmer Snap On**
			66 - 70	Dimmer Snap Off (Default)**
			71 - 110	Reserved
			111 - 115	Standard Mode (Default)
			116 - 120	Studio Mode - Reduced output with lower fan
			121 - 125	Whisper Mode - Reduced output with lower fan
			126 - 135	Reserved
			136 - 140	Fan On (Default)
			141 - 145	Fan Auto
			146 - 170	Reserved
			171 - 175	Reset defaults
			176 - 255	Reserved
6 7	CCT High CCT Low	0	0 - 65535	Tunable LED array 0 - 100%
				0 = 4000K (TCW) or 2700K (TWW)
				255 = 6500K (TCW) or 4500K (TWW)

TABLE 2. 8 BIT

DMX CHANNEL	PARAMETER	DEFAULTS	RANGE DMX	DESCRIPTION
1	Intensity	0	0 - 255	8 bit Intensity (Dimmer) Control
				0 - 100% Output
2	Strobe	0	0 - 255	Control of Strobe
			0 - 9	No Strobe Function - Shutter open
			10 - 99	Strobe S>>>>>F
			100 - 109	No Strobe Function - Shutter open
			110 - 179	Lighting Strobe S>>>>>F
			180 - 189	No Strobe Function - Shutter open
			190 - 255	Random Strobe S>>>>>F
3	Fan Control	0	0 - 255	Dynamic control of fan speed vs LED output
			0 - 4	Automatic fan/output adjustment
			5 - 255	Linear control fo fan speed and LED output*
				DMX 5 = Highest Constant Fan Speed
				DMX 255 = Lowest Constant Fan Speed
				* Standard mode only
4	Control Channel	0	0 - 255	Control Channel used for fixture settings
				Set discrete value of desired effect, wait >3 seconds,
				then set value to 0 (idle)
				**Function does not require 3 second rule to activate function
			0 - 5	Idle (Default must be 0)
			6 - 10	Full luminaire Re-Cal - also wakes from shutdown
			11 - 15	Fixture Shutdown
			16 - 20	Reserved
			21 - 25	Display - Menu ON
			26 - 30	Display - Menu OFF
			31 - 40	Reserved
			41 - 45	Dimming Curve Linear**
			46 - 50	Dimming Curve S-Curve**
			51 - 55	Dimming Curve Square Law (Default)**
			56 - 60	Reserved
			61 - 65	Dim Snap On**
			66 - 70	Dim Snap Off (Default)**
			71 - 110	Reserved
			111 - 115	Standard Mode (Default)
			116 - 120	Studio Mode - Reduced output with lower fan
			121 - 125	Whisper Mode - Reduced output with lower fan
			126 - 135	Reserved
			136 - 140	Fan On (Default)
			141 - 145	Fan Auto
			146 - 170	Reserved
			171 - 175	Reset defaults
			176 - 255	Reserved
5	CCT	0	0 - 255	Tunable LED array 0 - 100%
				0 = 4000K (TCW) or 2700K (TWW)
				255 = 6500K (TCW) or 4500K (TWW)

TABLE 3.   2 CHANNEL

DMX CHANNEL	PARAMETER	DEFAULTS	RANGE DMX	DESCRIPTION
1	Intensity	0	0 - 255	8 bit Intensity (Dimmer) Control
				0 - 100% Output
2	CCT	0	0 - 255	Tunable LED array 0 - 100%
				0 = 4000K (TCW) or 2700K (TWW)
				255 = 6500K (TCW or 4500K (TWW)
			5 - 255	Linear control fo fan speed and LED output*
				DMX 5 = Highest Constant Fan Speed
				DMX 255 = Lowest Constant Fan Speed
				* Standard mode only

TABLE 4.   CONTROL CHANNEL

DMX RANGE	ITEMS	DESCRIPTION	POWER CYCLE RULES	FUNCTION SELECTION VIA U
0 - 255	Control Channel	Control channel used for fixture settings Set discrete value of desired effect, wait >3 seconds, then set value to 0 (idle) **Function does not require 3 second rule to activate function	N/A	N/A
0 - 5	Idle (Default)	Default value used to active functions. Should default to 0	N/A	N/A
6 - 10	Full Luminaire ReCal	Recalibrates all functions in the luminaire. Also used to wake from shutdown	N/A	Yes
11 - 15	Fixture Shutdown	Shuts down all fixture output and turns off all fans. Fixture can be re-actived by a power cycle or via the ReCal command	Will restart normally	Yes, press Menu twice to wake
16 - 20	Reserved			
21 - 25	Display - Menu On	Switches UI display on remotely - Display will time out as set in UI	N/A	Button press turns display on
26 - 30	Display - Menu Off	Switched UI display off remotely if on.	N/A	N/A
31 - 40	Reserved			
41 - 45	Dimming Curve Linear**	Selects Linear Dimming Curve	Holds setting on power cycle	Yes
46 - 50	Dimming Curve S-Curve**	Selects S-Law Dimming Curve	Holds setting on power cycle	Yes
51 - 55	Dimming Curve Square Law (Default)**	Selects Square Law Dimming Curve	Holds setting on power cycle	Yes
56 - 60	Reserved			
61 - 65	Dimmer Snap On**	Allows for fastest output changes between levels but reduces smoothness of dimming and color	Holds setting on power cycle	Yes
66 - 70	Dimmer Snap Off (Default)**	Ensure fades between levels remain smooth and flicker free but limits instand snaps	Holds setting on power cycle	Yes
71 - 110	Reserved			
111 - 115	Standard Mode (Default)	Standard mode - Full LED output + full continuous fan at max speed (loudest setting). Fan remains at constant speed (unless in fan auto mode). NC40	Holds setting on power cycle	Yes
116 - 120	Studio Mode	Studio mode - Fan speed reduced to reduce dB levels 10% of full speed and LED output approximatly 80% of standard. Fan remains constant speed (unless in fan auto mode). NC35	Holds setting on power cycle	Yes
121 - 125	Whisper Mode	Whisper Mode - Fan speed reduced to reduce dB levels 30% of full speed and LED output approximatly 60% of standard. Fan remains constand speed (unless in fan auto mode). NC25	Holds setting on power cycle	Yes
126 - 135	Reserved			
136 - 140	Fan On (Default)	Fan runs at continuous speed for selected output mode	Holds setting on power cycle	Yes
141 - 145	Fan Auto	Fans will increase/decrease speed based on LED operation	Holds stting on power cycle	Yes
146 - 170	Reserved			
171 - 175	Reset default	Resets all paramters to factory default with the exception of DMX address and fixture DMX Mode	N/A	Yes, but will reset DMX address and DMX Mode
176 - 255	Reserved			
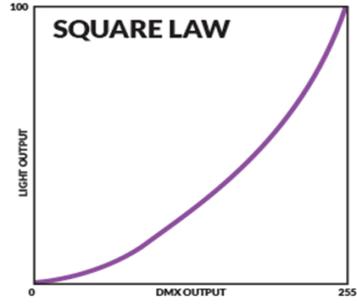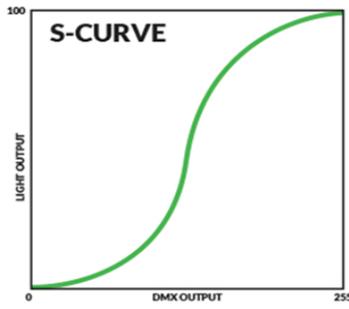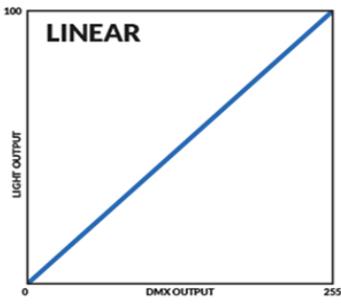
DMX512 CONNECTION

- At last unit, the DMX cable has to be terminated with a terminator. Solder a 120Ω 1/4W resistor between pin 2(DMX-) and pin 3(DMX+) into a 5-pin XLR-plug and plug it in the DMX-output of the last unit.
- Connect the unit together in a `daisy chain` by XLR plug from the output of the unit to the input of the next unit. The cable cannot branched or split to a `Y` cable. DMX 512 is a very high-speed signal. Inadequate or damaged cables, soldered joints or corroded connectors can easily distort the signal and shut down the system.
- The DMX output and input connectors are pass-through to maintain the DMX circuit, when one of the units' power is disconnected.
- Each lighting unit needs to have an address set to receive the data sent by the controller. The address number is between 0-511 (usually 0 & 1 are equal to 1).
- The end of the DMX 512 system should be terminated to reduce signal errors.
- 5 pin XLR: Pin 1: GND, Pin 2: Negative signal (-), Pin 3: Positive signal (+), Pin 4/Pin 5: Not used.
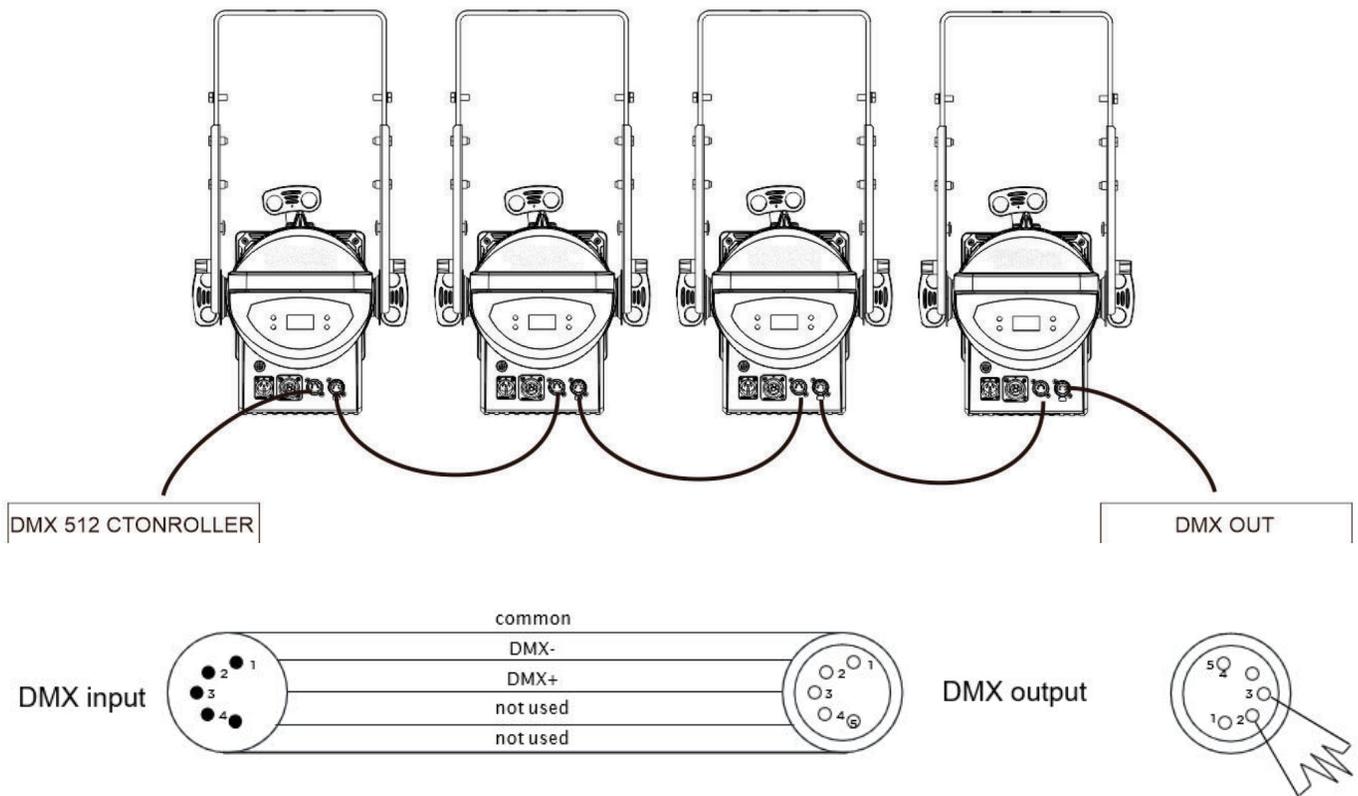
5 RDM PARAMETER IDs

Remote Device Management (RDM) is a protocol enhancement to USITT DMX512 that allows bi-directional communication between a lighting or system controller and attached RDM compliant devices over a standard DMX line. This protocol will allow configuration, status monitoring, and management of these devices in such a way that does not disturb the normal operation of standard DMX512 devices that do not recognize the RDM protocol.

LEKO LED OUTDOOR, RDM PRODUCT PARAMETER IDS				
Model ID	Manufacturer	Vendor ID	Model Description	Product Category
0x0116	Vari-Lite	0x564C	Profile Light Engine TCW	0x0101
0x0117	Vari-Lite	0x564C	Profile Light Engine TWW	0x0101

The table on the following pages outlines and describes all the RDM parameters IDs associated with the.

GET ALLOWED	SET ALLOWED	RDM PARAMETER IDS	VALUE	COMMENT	ESTA STANDARD	REQUIRED /	DMX / UI DESCIPTION
Category - Network Management							
		DISC_UNIQUE_BRANCH	0x0001		X	X	
		DISC_MUTE	0x0002		X	X	
		DISC_UN_MUTE	0x0003		X	X	
X		PROXIED_DEVICES	0x0010				
X		PROXIED_DEVICES_COUNT	0x0011				
X	X	COMMS_STATUS	0x0015				
Category - Status Collection							
X		QUEUED_MESSAGE	0x0020				
X		STATUS_MESSAGES	0x0030			X	Status
X		STATUS_ID_DESCRIPTION	0x0031			X	
	X	CLEAR_STATUS_ID	0x0032				
X	X	SUB_DEVICE_STATUS_ REPORT_THRESHOLD	0x0033				
Category - RDM Information							
X		SUPPORTED_PARAMETERS	0x0050		X	X	
X		PARAMETER_DESCRIPTION	0x0051		X	X	
Category - Product Information							
X		DEVICE_INFO	0x0060		X	X	
X		PRODUCT_DETAIL_ID_LIST	0x0070				
X		DEVICE_MODEL_ DESCRIPTION	0x0080			X	
X		MANUFACTURER_LABEL	0x0081			X	
X	X	DEVICE_LABEL	0x0082			X	
X	X	FACTORY_DEFAULTS	0x0090			X	Reset Defaults
X		LANGUAGE_CAPABILITIES	0x00A0				
X	X	LANGUAGE	0x00B0				
X		SOFTWARE_VERSION_ LABEL	0x00C0		X	X	Version
X		BOOT_SOFTWARE_ VERSION_ID	0x00C1				
X		BOOT_SOFTWARE_ VERSION_LABEL	0x00C2				
Category - DMX512 Setup							
X	X	DMX_PERSONALITY	0x00E0			X	DMX Mode
X		DMX_PERSONALITY_ DESCRIPTION	0x00E1			X	
X	X	DMX_START_ADDRESS	0x00F0		X	X	Address
X		SLOT_INFO	0x0120			X	
X		SLOT_DESCRIPTION	0x0121			X	
X		DEFAULT_SLOT_VALUE	0x0122			X	
Category – Sensors 0x02xx USE							
X		SENSOR_DEFINITION	0x0200			X	
X	X	SENSOR_VALUE	0x0201	Fan Speed and		X	Diagnostics
	X	RECORD_SENSORS	0x0202				
Category - Dimmer Settings 0x03xx - FUTURE USE							
X	X	Dimmer Curve	0x0343			X	

GET ALLOWED	SET ALLOWED	RDM PARAMETER IDS	VALUE	COMMENT	ESTA STANDARD	REQUIRED /	DMX / UI DESCIPTION
X		Dimmer Curve Description	0x0344			X	
X	X	Modulation Frequency	0x0347			X	
X		Modulation Frequency Description	0x0348			X	
Category - Power / Lamp Settings 0x04xx							
X	X	DEVICE_HOURS	0x0400			X	Fixture Hours
X	X	LAMP_HOURS	0x0401				
X	X	LAMP_STRIKES	0x0402				
X	X	LAMP_STATE	0x0403				
X	X	LAMP_ON_MODE	0x0404				
X	X	DEVICE_POWER_CYCLES	0x0405				
Category - Display Settings 0x05xx							
X	X	DISPLAY_INVERT	0x0500				
X	X	DISPLAY_LEVEL	0x0501				
		Category - Configuration 0x06xx					
X	X	PAN_INVERT	0x0600				
X	X	TILT_INVERT	0x0601				
X	X	PAN_TILT_SWAP	0x0602				
X	X	REAL_TIME_CLOCK	0x0603				
Category - Control 0x10xx							
X	X	IDENTIFY_DEVICE	0x1000		X	X	
	X	RESET_DEVICE	0x1001			X	
X	X	POWER_STATE	0x1010				
X	X	PERFORM_SELFTEST	0x1020	All Test, Pan/Tilt, Encoder			
X		SELF_TEST_DESCRIPTION	0x1021				
	X	CAPTURE PRESET	0x1030	See E1-20_2010a			
X	X	PRESET PLAYBACK	0x1031	Table A-7 defines			
		ESTA Reserved Future RDM	0x7FE0-0x7FFF				
		Manufacturer-Specific PIDs	0x8000-0xFFDF				
X	X	Output Power Mode	0x8A97	Value range depends on options (Standard, Studio, etc)		X	LED Output Mode
X	X	Pan/Tilt Feedback (On/Off)	0x8AD3				
X	X	Display On Time	0x8AA0	Value range depends on options		X	Display On Time
X	X	LED Dimmer Curve	0x8AA1	Value range depends on options			LED Dimming Curve
X	X	Pan Tilt Movement (On/Off)	0x8AA2				
X	X	Head Motor Movement (On/Off)	0x8AA3				

GET ALLOWED	SET ALLOWED	RDM PARAMETER IDS	VALUE	COMMENT	ESTA STANDARD	REQUIRED /	DMX / UI DESCIPTION
X	X	Auto Shutdown Mode	0x8AA4	Value range depends on options			
X	X	LED Hours	0x8AA5				
X	X	Dim Snap (On/Off)	0x8AA6				
X	X	Color Snap (On/Off)	0x8AA7				
X	X	Auto Fan Mode (On/Off)	0x8AA8				LED Fan Mode
X	X	Gamma Shift	0x8AA9	Value range depends on options			
X	X	Tungsten Dimming (On/Off)	0x8AAA				
X	X	CTB Correction (On/Off)	0x8AAB				
X	X	LED Refresh Rate	0x8AAC	Value range depends on options			LED Refresh Rate
X	X	Side Hang (On/Off)	0x8AAD				
X	X	Focus Track (On/Off)	0x8AAE				
	X	Control Signel select DMX only/ARtNET (On/Off)	0x8AAF				
	X	Recalibrate Fixture (Level)	0x8AB0	different levels (all, position, color, etc)			
X	X	DMX Fail (Hold, Blackout, GOTO Preset)	0x8AB1				DMX Fail
X	X	ArtNet Universe	0x8AB2				
X	X	ArtNet Net	0x8AB3				
X	X	ArtNet Sub-Net	0x8AB4				
X	X	ArtNet Ethernet IP	0x8AB5				
X	X	ArtNet Ethernet Sub-Net Mask	0x8AB6				
X	X	Manual PRESET Playback Power Up Preset	0x8AB7				
X	X	Manual PRESET Playback Preset Intensity	0x8AB8				
X	X	Manual PRESET Playback Priority	0x8AB9				
X	X	Manual PRESET Playback Power Up?	0x8ABA				
X	X	LED Color Calibration (On/Off)	0x8ABB			X	LED Color Calibration

APPENDIX A
CARE AND MAINTENANCE

TROUBLESHOOTING

The following are a few common problems that may occur during operation.

Luminaire does not work; light and fan do not turn on.

- Check power connection and main fuse.
- Measure the mains voltage on the main connector.

Not responding to DMX controller.

- If DMX LED is not illuminated, verify that the DMX cables are properly connected.
- If the DMX LED is illuminated and there is no response, verify DMX address settings and the DMX polarity.
- If you experience intermittent DMX signal problems, check the pins on the connectors or on the PCB.
- Test with a different DMX controller.
- Check if the DMX cables run near or alongside high voltage cables that may cause interference to the DMX interface circuit.

CLEANING

Cleaning the inside of the luminaire must be carried out periodically in order to optimize the light output.Cleaning frequency depends on the environment in which the fixture operates. Damp, smoky or particularly dusty surroundings can cause greater accumulation of dirt on the fixture's optics.

- Clean with a soft cloth using glass cleaning fluid.
- Dry parts carefully.
- Clean the external optics at least every 30 days.

APPENDIX B
FAN SPEED AND CONTROL

ADDENDUM

FAN SPEED AND CONTROL

All Vari-Lite luminaires will be governed by the same fan speed vs. noise levels. vs. maximum power output rules as detailed below. The noise related to these levels will conform to the Noise Criteria levels, details of which are contained within this document.

There are three control parameters that can be selected separately or in conjunction (when permitted) to manage fan speed vs. noise levels vs. maximum power output.

NOTE: Not all fixtures have all modes or functions. Refer to DMX map and User Interface menu tree to see if your product has one or more of these functions.

Output Modes

These modes are selectable at the fixture's DMX control channel or via the fixture's user interface screen.

Boost mode - LED output boosted to >100% of standard output. Fan speeds increased to manage heat level of LED (may be limited to only run for XX hours). Fixture will not exceed NC45-NC55 sound levels in this mode.

Standard mode - Full LED output. Fan speed is set to cool LED appropriately but not exceed NC40 sound level in this mode.

Studio mode - Fan speed reduced to achieve 10% dB reduction from Standard mode and not exceed NC35 sound level. LED output is approximately 80% of Standard output to ensure LEDs operate at optimum temperature and output efficiency. Fan speed remains constant and does not ramp up or down.

Whisper mode - Fan speed reduced to achieve 30% dB reduction from Standard mode and not exceed NC25 sound level. LED output is approximately 60% of Standard output to ensure LEDs operate at optimum temperature and output efficiency. Fan speed remains constant and does not ramp up or down.

Silent mode - fans are turned off or turn very slowly to not contribute to fixture noise. LED output is capped to ensure LEDs operate at optimum temperature and output efficiency. Fans are either off or fan speed remains constant. Target NC15 sound level in this mode.
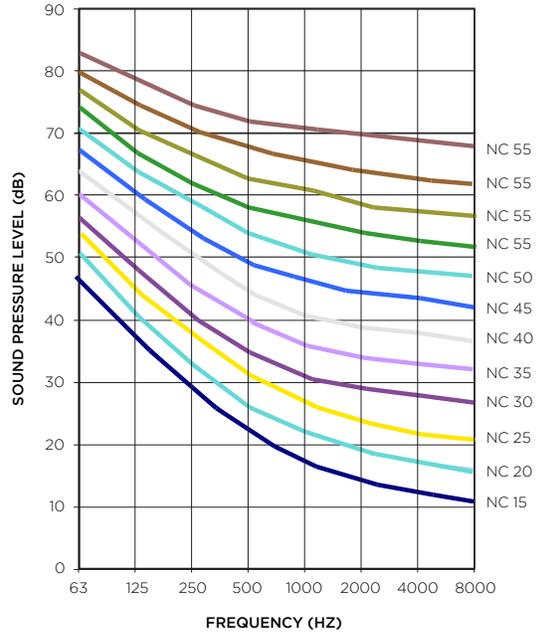
MODE	LED OUTPUT	FAN SPEED	NOISE CRITERION	EQUIVALENT SOUND LEVEL DBA (@3M)
Boost Mode	>100%	Boosted fan speed constant	NC45	50
Standard Mode	Full 100%	Full 100% constant	NC40	45
Studio Mode	80%	Appropriate speed to reduce dB levels >10% of full speed	NC35	40
Whisper Mode	60%	Appropriate speed to reduce dB levels >30% of full speed	NC25	35
Silent Mode	TBC	Fan off	NC15	25

NOISE CRITERION	OCTAVE BAND CENTER FREQUENCY (HZ)							
	63	125	250	500	1000	2000	4000	8000
	SOUND PRESSURE LEVELS (DB)							
NC-15	47	36	29	22	17	14	12	11
NC-20	51	40	33	26	22	19	17	16
NC-25	54	44	37	31	27	24	22	21
NC-30	57	48	41	35	31	29	28	27
NC-35	60	52	45	40	36	34	33	32
NC-40	64	56	50	45	41	39	38	37
NC-45	67	60	54	49	46	44	43	42
NC-50	71	64	58	54	51	49	48	47
NC-55	74	67	62	58	56	54	53	52
NC-60	77	71	67	63	61	59	58	57
NC-65	80	75	71	68	66	64	63	62
NC-70	83	79	75	72	71	70	69	68

vls_adm_fan-tk-jan

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