

# FiberLamp™

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OPERATION MANUAL

FL5600

FiberLamp

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## 1. Product Overview

### **IMPORTANT SAFETY INFORMATION:**

The FiberLamp FL5600 is a professional grade fiber optic LED luminaire. Only a licensed professional should install this fixture.

Before installing or powering the FL5600, read this manual and follow the safety precautions listed below.

- The FL5600 can be used indoors and is suitable for wet locations.
- Supply only with power that complies with local building and electrical code with voltage between 110-240VAC at 50-60Hz.
- Never bypass electrical fuse on the fixture. Replace defective fuse with fuses only of specified type and rating.
- Do not attempt to modify the fixture.
- Allow a minimum 2 inches of clearance from any vent opening on the fixture.
- Install away from any location likely to gather dust and debris.

### **FL5600 Overview**

The FiberLamp FL5600 is a wet location rated LED based fiber optic luminaire that has dynamic color changing abilities and twinkle effect wheel. It can be controlled with manual, USB, 0-10V and DMX512 interfaces.

The FL5600 is designed for use with both side and end-emitting fiber optics.

### **Models**

The FL5600 is offered with a single colored light source or a multicolored light source. All models can be equipped with a motorized “twinkle wheel” for use with bundled strands of fiber.

### **COLOR OPTIONS**

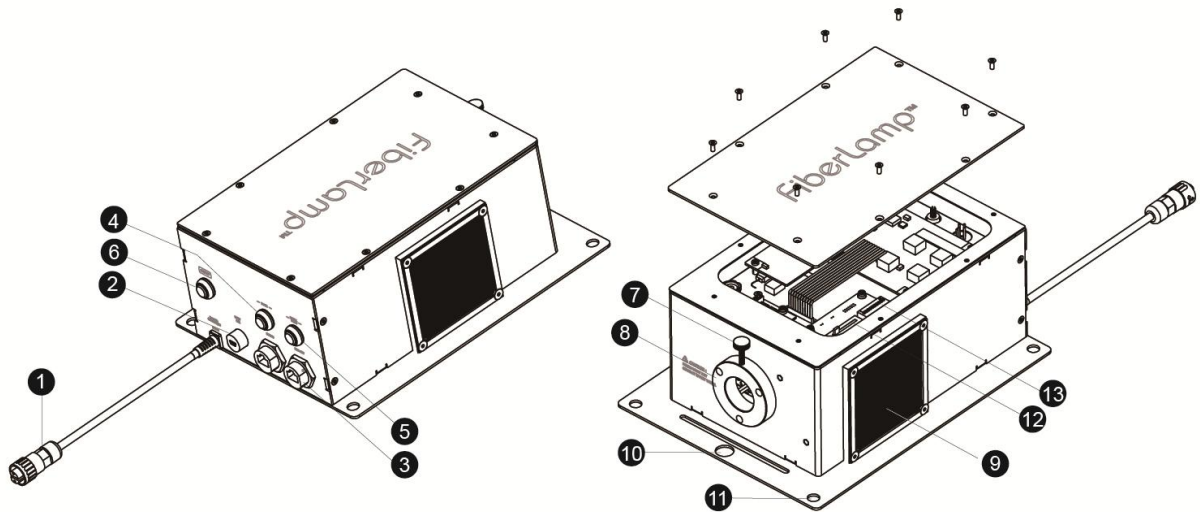
Multicolor options are offered as RGBW (Red, Green, Blue, 5000K White) or RGBA (Red, Green, Blue, Amber). An FL5600 with a multicolored light source is the best option when color-changing abilities are required.

Single color options are offered in 2800K, 3000K, 4200K, 4400K, 5000K and 6500K white color temperatures. An FL5600 with a single colored light source is the best option when high light intensity is required.

### **FIBER INSTALLATION PORT OPTIONS**

The FL5600 is offered with a standard 30mm or a custom 33mm fiber installation port. Accessories ACS30 and ACS33 are offered to couple bundles of up to 1200 fibers in the same common end.

## 2. Hardware Diagram



**Figure 1:** Featured hardware identification diagram.

1. Waterproof cable connector
2. Mini-USB connector
3. RJ45 Female connectors for DMX connection
4. Twinkle Wheel speed selector pushbutton
5. Mode selector pushbutton
6. ON/OFF pushbutton
7. Fiber Set Screw
8. Fiber Installation Port
9. Exhaust Vent
10. 11mm Clamp mounting Holes
11. 5.5mm Surface Mounting Holes
12. Intensity Slider Switch
13. DIP Switch for DMX addressing

## 3. Manual Operation

### Power switch

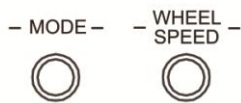
Once connected to the AC mains, the power switch controls the power supplied to the unit. Be sure to set the power switch to ON before operation.

In the event of a power disconnect, when power is restored, the unit will return to its operating state.

Note: Once the power switch is set to ON, the cooling fan should immediately operate. If the fan fails to turn on with the power switch, but the unit is still able to output light, set the power switch to OFF and contact the manufacturer.

### Pushbuttons

There are two pushbuttons on the side of the unit labeled “Wheel Speed” and “Mode” shown in Figure 1.



### WHEEL SPEED

If a twinkle wheel is installed in the fixture, the “Wheel Speed” pushbutton is used to control the twinkle wheel. Pressing this pushbutton cycles through different preset twinkle speed modes with rotation in one direction (Note: Both forward and reverse rotation can be controlled with DMX). Each mode corresponds to different twinkle speeds as described in the Table 1 below.

**Table 1:** *Preset twinkle speed modes that can be selected using the “Wheel Speed” pushbutton*

Mode	Wheel Speed
0	Off
1	Slow
2	Slow-med
3	Medium
4	Med-fast
5	Fast

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## MODE

The “Mode” pushbutton is used to select through preset lighting modes saved on the fixture. Each mode is either a static color or a Playlist. A static color mode can only display one solid color. A Playlist mode can display a timed sequence of color scenes. Modes 1-7 can only be static colors. Modes 8-11 can be static colors or Playlists. Table 2 lists the factory-preprogrammed settings for each model of FL5600. Modes 0-6 are fixed, but modes 7-11 can be reprogrammed using the LightMix software described in section 4 of this manual.

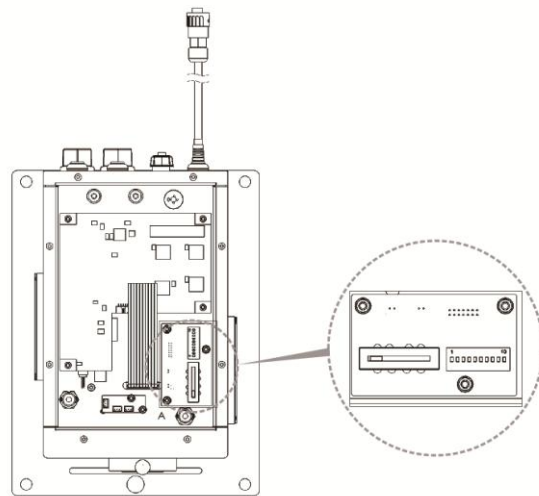
**Table 2:** *Factory preset modes*

Mode	Multicolor		Single Color
	RGBW	RGBA	
1	White	Blue	Programmable: Single Color
2	Red	Red	Programmable: Single Color
3	Green	Amber	Programmable: Single Color
4	Blue	Green	Programmable: Single Color
5	Yellow	Orange	Programmable: Single Color
6	Cyan	Chartreuse	NA
7	Programmable: Mixed 5000K White	Programmable: Mixed 5000K White	NA
8	Programmable: Rainbow	Programmable: Rainbow	NA
9	Programmable: Blank	Programmable: Blank	NA
10	Programmable: Blank	Programmable: Blank	NA
11	Programmable: Blank	Programmable: Blank	NA

*Note: The Rainbow Playlist slowly fades between colors, while mixing to display all colors on the color pallet.*

## VR intensity

To adjust the intensity in the outdoor model, unscrew the eight screws on the top, remove the cover. It is located in the bottom right hand corner of the FL5600. The intensity can be adjusted in Mode 0 through Mode 7. Only remove the cover in a dry environment free of dust and debris.



## 4. Software Operation

### LightMix Overview

The LightMix Software is designed to give users the ability to create and run any lighting scene or sequence of lighting scenes on the FL5600 as a stand-alone fixture. LightMix also provides a way to synchronize lighting scenes between several FL5600 fixtures in an installation.

### Software Installation

LightMix is compatible with 32-bit and 64-bit systems running Windows XP, Windows Vista and Windows 7. It is not compatible with any Mac OS.

Before installing LightMix, be sure to completely uninstall any existing versions of LightMix from your computer.

To install, please download the zip file at official website:

[http://www.fiberlamp.com/support/software\\_download.php](http://www.fiberlamp.com/support/software_download.php).

Double-clicking on this file, **LightMix.exe**, starts the installation process and follow the instructions until the installation is complete.

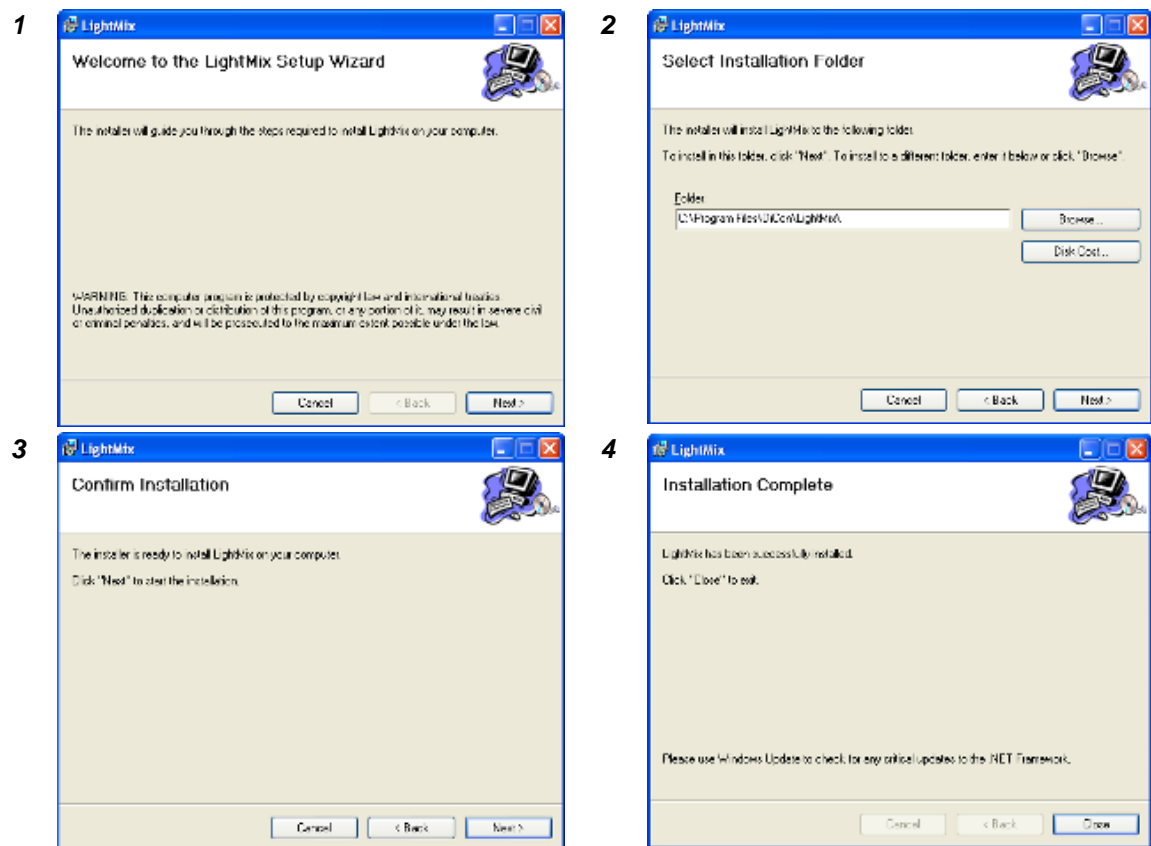


Figure 2: Installation screenshots (left to right, top to bottom).



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## Hardware Setup

1. Make sure that the Power Switch is in the OFF position.
2. Connect the FL5600 to the computer with a USB to Mini-USB cable.
3. Connect the FL5600 to AC mains power using the 24V power supply.
4. Set the Power Switch to the ON position.
5. Open the program on the computer.

## Definitions

- **Preset mode:** A static color or Playlist saved on the built-in flash memory of the FL5600. Accessible through the pushbutton.
- **Playlist:** A collection of steps built in LightMix programmed onto the FL5600 to be played repeatedly as a dynamic color light show.
- **Profile:** A small collection of steps to help construct a large and complicated Playlist, especially useful when repetition appears frequently in the desired Playlist.
- **Step:** The set of attributes (color, fade option, blink rate, time duration) that define individual elements in a Profile or Playlist. This is also referred to as a Scene amongst lighting designers.
- **Blink rate:** Represents how fast the current step will blink. A blink rate of zero means the step does not blink. Blink rates become increasingly faster as the blink rate is increased.
- **Fade:** An option that specifies whether the color of the current step gradually fades into the color of the next step.
- **DMX mode:** Determines a fixtures role in a DMX network (Master or Slave).
- **DMX Master:** If the fixture is in DMX master mode, the FL5600 will continuously send out DMX commands to fixtures set to the same DMX address as the master. The commands will tell DMX slave fixtures to execute the same tasks as what the DMX master executes. When in DMX master mode, the fixture will not follow DMX commands.
- **DMX Slave:** If the fixture is in DMX slave mode, the FL5600 will receive DMX commands. If the commands are for addresses identical to those set on the fixture, the fixture will execute according to the commands. The DMX commands can come from a DMX controller, or a fixture in DMX master mode.

## Programming a Static color Preset Pushbutton Mode

Follow the steps below to create a unique sequence of lighting scenes and save it to a preset Playlist Mode of a fixture for stand-alone operation.

1. Use scroll bars in the **Color** section to customize the color of the light output during the step. The scroll bars control the intensity of the single color strings of LEDs in the fixture.
2. Click the Write button
3. Disconnect the fixture from the computer and use the Mode pushbutton to select mode 1 for single colored FiberLamps, or mode 7 for multicolored FiberLamps, to which the new static color has been written.

## Programming a Playlist Preset Pushbutton Mode

Follow the steps below to create a unique sequence of lighting scenes and save it to a preset Playlist Mode of a fixture for stand-alone operation.

1. Use scroll bars in the **Color** section to customize the color of the light output during the step. The scroll bars control the intensity of the single color strings of LEDs in the fixture.
2. Decide how long the step will last by choosing a Play Time in the **Step Duration** section tab.
3. If fading throughout the step to the next step is desired, check the Fade box at the bottom of the **Step Duration** section tab.
4. If blinking is desired throughout the step, set desired the blinking rate using the Blink Rate scroll bar.
5. Once the step is complete, click Add Step at the bottom of the Step Duration section tab and the step will be shown in detail in the **Step Parameters** section as a step.
6. Repeat until the series of steps reflect the desired lighting sequence.
7. Click the Save button on the right hand side of the **Step Parameters** section. After naming the 'Profile', it will be displayed in the **Saved Profiles** section.
8. To write the 'Profile' to the FL5600, Click and Drag the saved 'Profile' from the **Saved Profile** section to the **Selected Profile** section.
9. In the section **Write Selected Profile to FiberLamp** at the bottom of the LightMix window, select which 'Playlist Number' to assign the newly created 'Profile' by clicking on the empty circle to the left of the 'Playlist Number'.
10. Click the Write button on the right hand side of the **Write Selected Profile to FiberLamp** section.
11. Disconnect the fixture from the computer and use the Mode pushbutton to select the mode to which the new Playlist has been written.

## 5. DMX Operation

### DMX Overview

DMX is an abbreviation for “digital multiplex”. It is an RS-485 based protocol that has become the industry standard for digital lighting control interfaces. DMX allows users to synchronize lighting effects between fixtures with a centralized lighting controller.

### DMX Hardware

The FL5600 is equipped with two RJ45 female connectors. These connectors are provided such that they can be placed in a DMX daisy chain with DMX input and output ports. If at the end of a daisy chain, a 120-Ohm termination resistor should be applied to the DMX output port of the FL5600.

#### CAT-5E CABLE

Most architectural installations use Cat-5e cable to transmit DMX data to fixtures. This cabling can be coupled with RJ45 connectors to be compatible with the one of the RJ45 connectors on the FL5600. In order to daisy chain, a second Cat-5e cable with RJ45 connector can be connected to the second RJ45 connector on the FL5600.

#### PINOUTS

**Table 3:** Pinout assignments for RJ45 on the FL5600

Function	RJ45	Color
Data (+) in	1	White/Orange
Data (-) in	2	Orange
Not Assigned	3	White/Green
Internal use only	4	Blue
Internal use only	5	White/Blue
Not assigned	6	Green
DMX Ground	7	White/Brown
DMX Ground	8	Brown

## DMX Wiring Configurations

Depending on the size of the installation, there are several configurations that will ensure that each fixture receives a clear signal.

### INSTALLATIONS WITH LESS THAN 32 FIXTURES

For installations under 32 fixtures and installations less than 1,200 meters (3,900 feet) in cable length, the signal can be daisy chained in series from one unit to the next using either Cat-5e cable or XLR cables.

### LARGER INSTALLATIONS OR LONG DISTANCE

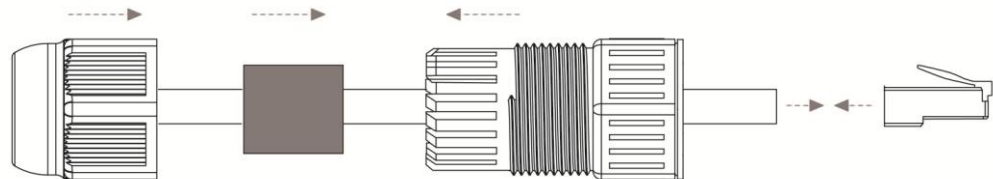
Installations requiring more than 32 fixtures or installations spanning cable lengths greater than 1,200 meters (3,900 feet) will need to use a DMX amplifier. Due to the limitations of the RS-485 protocol, this is needed to ensure that each string of 32 fixtures receives sufficient signal strength.

### DATA TERMINATION

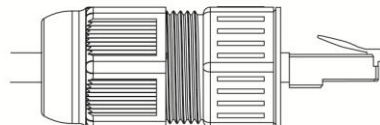
It is always recommended to terminate DMX daisy chains with a resistor of the same characteristic impedance as the cable (typically 100-120 Ohms). To terminate a DMX daisy chain, place the resistor across Data pin (+) and Data pin (-), which are specified in Table 3.

### WATERPROOF CONNECTOR CONFIGURATION

1. Insert the unconnectorized Cat-5e cable through the compression nut as shown in the image.



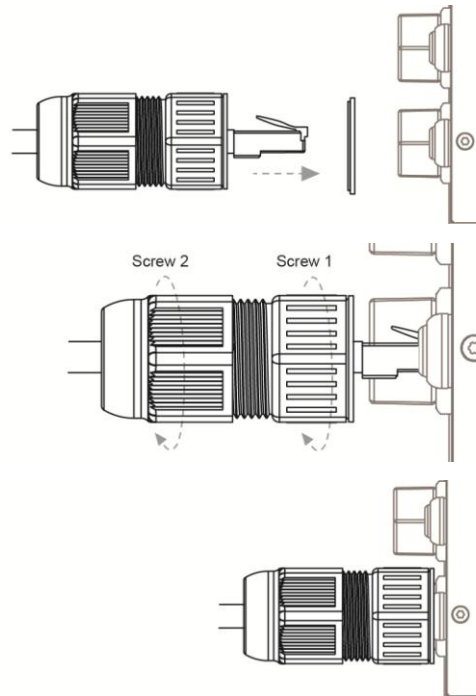
2. Insert the Cat-5e cable through the compression O-ring.
3. Insert the Cat-5e cable through the compression fitting, then insert the compression O-ring into the compression fitting. Thread the compression nut onto the compression fitting, but do not tighten.
4. Install RJ45 connector to the end of the Cat-5e cable.



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## WATERPROOF CONNECTOR INSTALLATION TO THE FIBERLAMP

1. Place the Gasket over the RJ45 connector on the FiberLamp, then connect the RJ45 connectors on the Cat-5e cable and FiberLamp.
2. Thread and tighten the compression fitting to the FiberLamp first, then tighten compression nut to the Cat-5e cable.



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## DMX Addressing

To set the DMX address of the FL5600, you must first access the DIP-switch located under the top cover. Refer to the Hardware Set-up in section 2 to determine how to remove the top cover and to find the DIP-switch. The FL5600 is controlled with 8 DMX channels and must be assigned to 8 DMX addresses. The DIP-switch defines the first DMX address of the sequence of 8 DMX addresses (for single color models there will only be 3 DMX channels needing 3 DMX addresses). The 7 remaining addresses are automatically assigned to the 7 addresses that succeed the address set on the DIP-switch. (For example, if the DIP-switch is set to address #4, the FL5600 will be controlled by DMX channels 4, 5, 6, 7, 8, 9, 10 and 11.)

Table 4 can be used as a guide for configuring the DIP-switch to any DMX address. To determine the DIP-switch configuration that corresponds to a DMX address, find the DMX address in the table below. Then set the DIP-switch such that pins 1-5 are set as described on the left hand side of the table and pins 6-9 are set as described at the top of the table, with respect to the specific DMX address.

**Table 4:** DIP-switch setting table for assigning an FL5600 to a specified DMX address

DIP-switch Settings					#9	0	0	0	0	0	0	0	1	1	1	1	1	1	1		
					#8	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
					#7	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
					#6	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
#1	#2	#3	#4	#5																	
0	0	0	0	0																	
1	0	0	0	0	1	32	64	96	128	160	192	224	256	288	320	352	384	416	448	480	
0	1	0	0	0	2	33	65	97	129	161	193	225	257	289	321	353	385	417	449	481	
1	1	0	0	0	3	34	66	98	130	162	194	226	258	290	322	354	386	418	450	482	
0	0	1	0	0	4	35	67	99	131	163	195	227	259	291	323	355	387	419	451	483	
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1	0	0	1	0	9	40	72	104	136	168	200	232	264	296	328	360	392	424	456	488	
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1	1	0	1	0	11	42	74	106	138	170	202	234	266	298	330	362	394	426	458	490	
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1	1	1	0	1	23	54	86	118	150	182	214	246	278	310	342	374	406	438	470	502	
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1	1	0	1	1	27	58	90	122	154	186	218	250	282	314	346	378	410	442	474	506	
0	0	1	1	1	28	59	91	123	155	187	219	251	283	315	347	379	411	443	475	507	
1	0	1	1	1	29	60	92	124	156	188	220	252	284	316	348	380	412	444	476	508	
0	1	1	1	1	30	61	93	125	157	189	221	253	285	317	349	381	413	445	477	509	
1	1	1	1	1	31	62	94	126	158	190	222	254	286	318	350	382	414	446	478	510	
						63	95	127	159	191	223	255	287	319	351	383	415	447	479	511	

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## DMX Controls

The FL5600 is controlled with 8 DMX channels as shown in Table 5 below. These channels can be assigned, in series only, to any of the 512 addresses within the DMX universe.

Table 5: DMX channel sequence table for different models.

DMX Channel Sequence	Model		
	Multicolor		Single Color
	RGBW	RGBA	
1	White	Blue	Single Color
2	Red	Red	Twinkle Wheel
3	Green	Amber	Strobe Control
4	Blue	Green	NA
5	Mixed 5000K White	Mixed 5000K White	NA
6	Master Light Intensity	Master Light Intensity	NA
7	Twinkle Wheel	Twinkle Wheel	NA
8	Strobe Control	Strobe Control	NA

### LIGHT OUTPUT CONTROL

Channels 1-6 for multicolored models and only channel 1 for single color models are channels that control the light output of the FL5600. As DMX controls operate on an incremental number scale from values of 0 to 255, a DMX value of 0 corresponds to no light and a DMX value of 255 corresponds to maximum light output.

For multicolored models, channels 1-4 correspond to individual colors on the LED light source. In multicolor models, new colors can be achieved with varying intensity combinations.

Channel 5 for multicolored controls the intensity of a color combination created in the LightMix software and saved to Mode 7. For multicolor models, Mode 7 is calibrated at the manufacturing facility to the brightest 5000K White light possible from the light source.

**Channel 6 for multicolored models is the master intensity control (if channel 6 is set to DMX value 0, then no light will turn on, even with channels 1-5 set to max intensity).** Having a Master intensity channel gives the advantage of finding a color using channels 1-4 and controlling its intensity without changing that color.

### TWINKLE WHEEL CONTROL

The twinkle wheel control operates on the same incremental number scale from values of 0 to 255 as all other DMX controls. The DMX channel that controls the twinkle wheel controls both the rotational speed and direction of the twinkle wheel.

The values in this channel are split. The lower half of the number values, 2 to 125, correspond to twinkle wheel speeds in one rotational direction, and the higher half of the number values, 132 to 255, correspond to twinkle wheel speeds in the opposite rotational direction. The values 0-1 and 126-131 are reserved to stop the twinkle wheel from rotating as shown in Table 4 below.

Table 6: Twinkle wheel response to DMX signals

DMX Value	0 - 1	2 - 125	126 - 131	132 - 255
Wheel Response	Stop	Slow → Fast	Stop	Fast → Slow in opposite direction

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## STROBE CONTROL

DMX channel 8 controls the strobe rate of the light. A DMX value of 0 on this channel will not strobe the light. A DMX value of 255 on this channel will strobe the existing light settings very fast.

## Master/Slave Operation

The FL5600 is able to act as a DMX Slave or a Master on the DMX line, depending on the settings declared using the software. Each FL5600 is preprogrammed to DMX Slave mode as a factory default setting.

### DMX MASTER OPERATION

When in DMX Master Mode, the FL5600 broadcasts the display color, twinkle wheel speed and strobe rate as a DMX signal at the configured DMX addresses on the fixture from the DMX ports described in the DMX Hardware section above. *Note: When in DMX Master Mode, the FL5600 cannot not receive incoming DMX signals.*

To engage DMX Master Mode, follow these instructions:

1. Connect the FL5600 to a PC with the USB cable and launch the LightMix software.
2. On the designated master FL5600 fixture, verify that the DMX base address is the same as all of the Slave units in the installation. If not, set the respective DMX address on the fixtures DIP-switch.
3. In the DMX mode section to the bottom left of LightMix window, check the “Master” bubble and click “Set.”
4. After the FL5600 has been properly installed at the desired physical location, turn on the unit. Use the push button to access the desired preprogrammed mode, and then plug in the DMX data cable that connects it to the Slave units.

### DMX SLAVE OPERATION

When in DMX Slave mode, the FL5600 receives DMX signals from a DMX controller, and will respond if the DMX addresses it is configured to matches that of the DMX controller. *Note: The DMX controller may be either a third party device or the FL5600 configured in DMX Master Mode.*

To ensure that the FL5600 responds properly to DMX signals, make sure the unit is configured to be in DMX Slave mode and set to the correct DMX addresses.

To engage DMX Slave Mode, follow these instructions:

1. Connect the FL5600 to the PC with the USB cable and launch the LightMix software.
2. On the FL5600 fixture, verify that the DMX base address corresponds to the respective addresses on the DMX controller. If not, set the respective DMX address on the fixtures DIP-switch
3. In the DMX mode section to the bottom left of LightMix window, check the “Slave” bubble and click “Set.”
4. After the FL5600 has been properly installed at the desired physical location, turn the unit on, and plug in the data cable from the DMX controller. Verify that the DMX controller is outputting signal and that the FL5600 is responding accordingly.



## 6. Installation Recommendations

### General

The FL5600 is intended for both indoor and outdoor use. Installation should take into consideration room for access to all input and output ports, as well as easy access to manual controls.

#### COOLING FAN OBSTRUCTION

The cooling fan is an important factor in prolonging the lifetime of the LED light source. It is important that the input and output vents are clear of any obstructions so that there is proper airflow through the device for cooling.

Install the FL5600 in a location free from dust and debris, as the fan will pull in any dust and debris within a close proximity. Excessive dust and debris build up within and around the FL5600 will decrease the performance of the thermal management system, resulting in a shortened lifetime of the LED light source.

### Mounting

The FL5600 uses dynamic thermal management and can therefore be mounted in any orientation except with the fiber installation port facing up.

#### SURFACES

The mounting plate at the bottom of the unit is fit to be mounted on wood, masonry, drywall, or metal. Use the four 5mm holes on the four corners of the base to mount to a surface with M4 x P0.7 screws. Be sure that the mounting surface is capable of supporting the weight of the unit.

#### HANGING APPARATUS

There is one 11mm hole at the center of the front and back ends of the mounting plate. This hole is meant to secure one rigging clamp to the unit using M10 bolt and lock nut. Verify that the clamp and mounting structure can safely support the weight of the unit along with anything else relying on the structure for support.

## 7. Troubleshooting

**Table 5:** Possible problems and remedies for FL5600 failure.

Problem	Remedy
<b>Unit does not turn on</b>	Make sure that the power switch is set to ON.
	Press the push button several times to make sure that the unit is not in the “off” mode or a blank mode.
	Use LightMix and check for individual light channel response. If responsive, click the “Restore” button to restore the preset modes to the external pushbuttons.
<b>Light output only appears red</b>	Make sure that the protective dust cover on the end cap has been removed.
	Push the button several times to engage different color modes.
<b>Fan does not turn on</b>	The fan should be on constantly while the power switch is set to ON. If the fan fails to engage, turn off the unit immediately and contact the manufacturer.
<b>Unit is not emitting all of the colors</b>	Press the push button several times and scroll through the factory preset modes. If any of the colors appear unusually dim, check each scroll bar in LightMix for full intensity control. If still dimmer than usual, please contact the manufacturer.
	Use LightMix to check for individual color channel response. If responsive, click the “Restore” button to restore the preset modes to the external pushbuttons. If any of the channels are not completely responsive, please contact the manufacturer.
<b>Unit is not responding to DMX signal</b>	Verify that the addresses set on the DIP-switch correspond to the channels being controlled on the DMX controller.
	If there is no light, make sure that the 6 <sup>th</sup> channel in the address sequence is set to a DMX value >0.
	Make sure the fixture is not set to DMX Master mode.
	Make sure the pin assignments and polarities on the DMX connectors are properly aligned.
	Terminate the DMX signal line with a resistor of the same characteristic impedance as the cable.
	Check to verify that the DMX controller is broadcasting a signal by connecting it to a different fixture.
<b>Unit flickering issue</b>	Check to make sure that the twinkle wheel is stopped.
	If occurring on a Playlist mode, write another Playlist to the flickering Playlist mode and check if flickering still occurs. If flickering persists, contact manufacturer.
	If occurring on a static factory preset mode, contact manufacturer.
	If connected to DMX, make sure the strobe channel is set to a DMX value of 0.
	<b>If warm and the fan is not operating correctly, turn off and contact manufacturer.</b>
<b>There is no light output and the unit is no longer cool to the touch</b>	Check to make sure the fan is operating properly and the device is being used within its environmental temperature range defined in the Specifications section.
	Make sure there is nothing obstructing the airflow to the FiberLamp.

## 8. Specifications

### Environmental Specifications

**Table 6:** Environmental Specifications for the FL5600

Operating Temp. Range	Storage Temperature Range	Humidity
0/40°C	-40/+70°C	10-90%

### Electrical Specifications

**Table 7:** Electrical Specifications for the FL5600

Input Voltage Range	Power Rating
24V DC	120W

### Mechanical Dimensions

**Table 8:** *Mechanical Dimensions*

Parameter	Dimension
Base	283.5mm x 215mm
Height	113.5mm

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## Mechanical Drawing

All measurements are in mm.

