



Operation Manual, Maintenance & Troubleshooting



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Troubleshooting Your Merlin-W

## Introduction

Thank You for Purchasing the TopLite International products.

In this manual, you will find everything you need to set up, operate, maintain and troubleshoot your Light. If you have any further questions, stop by our website at: [www.toplit.com](http://www.toplit.com) for contact information, frequently asked questions and larger-scale product support.

### About Your goods Shipping Box

After removing your Lights from its shipping box, **DO NOT** discard the box or the packing pieces inside! Place the foam inserts and plastic bags back inside the box and store them in a cool, dry place. They may well come in handy *and* save you some money later in the unlikely event that you should have to ship or return your Merlin for service or should any warranty issues arise.



Shipping your Lights in **anything** other than the original, **intact** factory shipping box and packing materials **or** a professional, custom-built flight/road case will **void** all warranties! We will **NOT** accept Merlin's at our factory or at any authorized Dealers in any other type of container, crate or box. The unit will be shipped back immediately, *un-opened*, at the sender's expense. **NO EXCEPTIONS!**

In fewer words: **Keep the box and the packing materials!**

## WARNING!

The lights is for INDOOR use only!  
Any other use could void the warranty and/or damage your unit!  
Recommended Operating Temperature Range: -20 to +45 Degrees Celsius

Before plugging in and using your Lights, it must first be prepped and lamped. Please make yourself acquainted with the Goods nomenclature and all of its parts and features on the following pages (Section One) *before* you begin.

### Inventory of Your **Merlin**<sup>®</sup>-W Box

Inside this box you will find:

1. A 96-270volt 50-60Hz Merlin-W pro Moving Light
2. A 1.5 meter UL/CE-listed a/c power cord
3. 2X Clamp Mounts

Section One

1

Overview And Nomenclature Of Your **Merlin®-W**

- \* Color: RGB color mixing
- \* Strobe: Variable electronic dimmer (0 – 100%) and Variable electronic strobe
- \* Sound-Active, Stand-Alone, Master / Slave, 12 DMX Channels, Pan / Tilt Invert
- \* Pan: 520° Tilt: 245°
- \* Automatic Pan/Tilt position correction. Switchable 8 to 16bit mode.
  - Built-in automated programs via master/slave (fast and slow)
  - Built-in sound activated programs via master/slave
  - User-selectable basic or advanced operating modes
  - User-selectable pan/tilt ranges
- \* Lamp:
  - Merlin-W18: High Power RGB LED 18watt Lamp
  - Merlin-W30: High Power RGB LED 30watt Lamp
  - Merlin-W60: High Power RGB LED 60watt Lamp
  - Merlin-W120: High Power RGB LED 120watt Lamp
- \* Size (mm): 270 x 250 x 250
- \* Weight: 4.8 kg



Figure 1. Display-Side View



Figure 2.  
Clamp Mounts, Carrying Handle and Safety Anchor



Figure 3.  
Removing the Y-Axis Covers for Cleaning

Section Two

2

The Fuse Holder and Replacing Fuses

Your Merlin is shipped with 84-270 volt, 2 amp, fast-blow fuse already installed in the holder. We have also included a spare fuse, conveniently located right inside the holder! Should you need to replace a fuse, we recommend you quickly replace the extra fuse for next time! Then you will never be caught without one! To swap fuses, first make sure the power switch is in the “off” position or that the Merlin is unplugged. Then, simply pull out the holder by pulling it free with a fingernail, small knife or flat-head screwdriver; remove the old fuse, discard and then snap in the fresh fuse. (See figures 4 & 5) Push the holder back into the Merlin and you are ready to power the unit up! If the new fuse should blow upon powering up the Merlin, there is a bigger problem and you should have the unit serviced by a qualified Toplite technician.

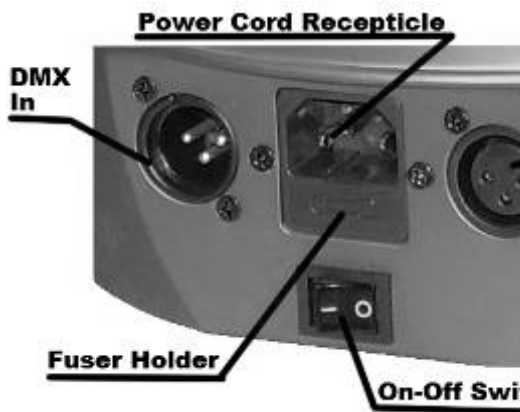


Figure 4.  
Close-up of Power/Data Side

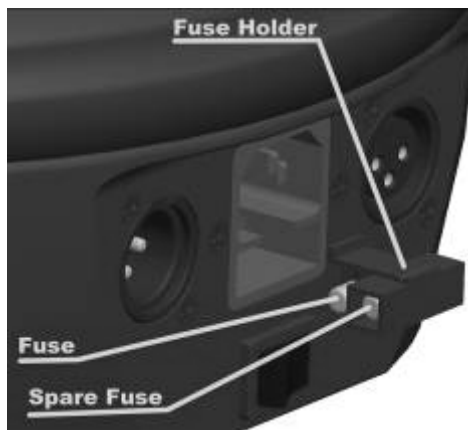


Figure 5. Fuse Holder Assembly

Section Three

3

Display Functions and Operation

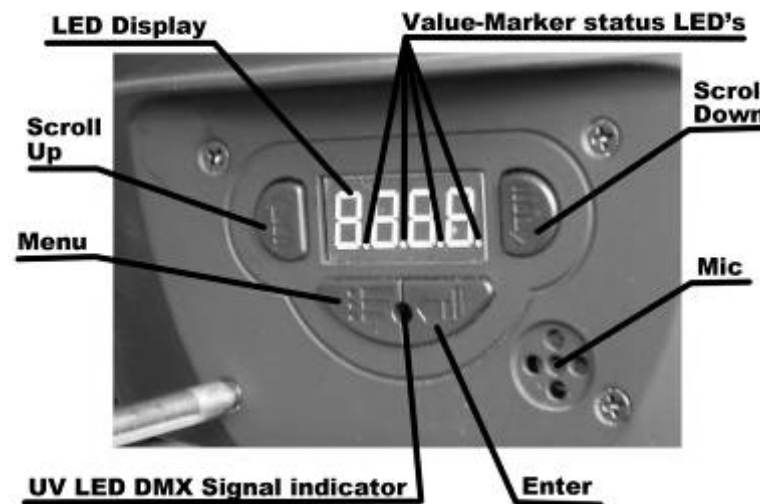


Figure 6. The LED Display Section

THE LED DISPLAY

This Panel allows you to “talk” to your Merlin-W; set it up, control it, operate it and even test it in many diverse ways. For example: You can assign it a DMX address, set it to run in many different “modes” or test its different functions, Understanding how it works and what it can do will make your experience with, and ability to utilize the Merlin-W to its fullest potential.

Power Up & First Focus

The first time you power up your Merlin-W, it will automatically home itself, strike the lamp and go into a factory default “DMX Address” mode. While it powers up, the display will read: “**TOPLILTE**”. After it is homed and the lamp is struck, the display will read: “**8001**”. Meaning it has been addressed at channel one at the factory. If receiving a good DMX signal, the purple/UV LED DMX signal indicator will be lit.

In order to focus your Merlin-W for the first time, press the “**Menu**” key and scroll through the menu using the “**Scroll Up**” or “**Scroll Down**” keys until the display reads “**8888**”. Press the “**Enter**” key and then scroll

through the test modes using the or keys until the display reads: “8888”. Press .

DMX Addressing/Address Mode

After focusing your Merlin-W, you may wish to cable it up to a DMX controller and address it. To do that, you must first understand that your Merlin-W uses 12 channels of DMX per “Address”. That is to say that each Merlin has 12 channels of control and so the first Merlin-W in your system will have the starting DMX address of “8008”, the second will have the starting address of “8888”, and so on.

To set the DMX address of your Merlin-W, press the key and scroll through the menu using the or keys until the display reads: “8888”. Press the key and then raise or lower the “address” value (or starting channel number) using the or keys until you have found the correct number. Press the key and your Merlin-W is now addressed.

Each DMX channel or “handle” coming from a controller has 255 “increments” of power within that “handle”. That channels function and the things triggered by the ascending increments within that channel for your Merlin-W are listed here:

**Merlin –W18&W30&W60 DMX CONFIGURATION**

CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8	CH9	CH10	CH11	CH12
Pan	Pan 16bit	Tilt	Tilt 16bit	Pan/Tilt Speed	Strobe	Dimmer	Red	Green	Blue	Color Mixing	Reset
255 	255 	255 	255 	255 	255 	255 	255 	255 	255 	255 	190 
0 	0 	0 	0 	0 	254 	3 	0 	0 	0 	129 	128 
					132 	2 				127 	
					131 	1 				120 	
					11 	0 				100 	
					10 	0 				80 	
					0 	0 				60 	
					0 	0 				40 	
					0 	0 				20 	
					0 	0 				0 	

This section of the menu allows you to operate your Merlin in many diverse ways. To enter the operating mode section of your Merlin-W, press the key and scroll through the menu using the or keys until the display reads: “8888”. Press the key and then scroll through the different modes using the or keys until you have found the mode you wish to use. Press the key when you have found the mode you wish to use. The modes, what they do and the LED displays for each mode are as follows:

“Master” or “DMX” Mode Display reads: “8888”

“Standard” Display reads: “8088”

This is the mode for using DMX control. After selecting this mode, you must also “address” your Merlin-W accordingly (See Page 12). This is also the “Master Mode” in which this particular unit will be the “Master” of a chain of “Slave” units all doing the same thing. (See Below)

“Slave Mode” Display reads: “8888”

Selecting this mode will render this unit a “Slave”. It will now do exactly what the unit in front of it in the DMX cable data stream is doing as long as the first unit is set up as a “Master” and has a DMX address. For example: The first Merlin-W in your cable run is set to “Master” and given a DMX address of 001, then you set the next two heads down the cable run to “Slave”, with no DMX address. They will do exactly what the “Master” is being told to do by the console. You can then place another Merlin-W in the cable run after those “slaves”, set it to “Master” and address it as 008 (a different address from the first “Master”). If you set the next unit (or units) in the cable run to “Slave”, they will copy *that* (number 013) master unit’s movements exactly and so on down the cable run.

“Auto Mode” Display reads: “8888”

“Standard” Display reads: “8088”

This is the factory default setting, no Auto program.

“Inverted” Display reads: “8888”

We have programmed a small, multi-stepped program into each Merlin-W. Without any outside control, your Merlin-W unit will go through all of its ranges of Motion, Color, Gobo and Shutter repeatedly. At this time, and on this model, this function is not re-programmable and cannot be changed by the end user.

“Sound-Activated Mode” Display reads: “0850”

“Standard” Display reads: “0000”

This is the factory default setting, no sound-activated.

“Inverted” Display reads: “8888”

This is the sound-activated, “Stand-alone” mode. Each Merlin-W is equipped with a highly-sensitive microphone (See Figure 6.) It will react to deep bass or loud sounds by going through all its different abilities. Each Merlin-W will act differently, so you won’t have a bunch of heads doing the exact same thing. This mode is useful if you just want to have some fun with your Merlin-W and don’t want to set up a controller and miles of cable. Or if, for some reason, your control console has gone down, you can still have a “moving” light show to get you through the night.

Pan/Tilt Inversion Modes

This section of the menu allows you to “invert” the pan and tilt function of your Merlin-W. This is handy when trying to program or operate a unit that has been hung “upside-down” from a pipe or truss.

Pan Inversion Mode

To enter the “pan” mode section of your Merlin-W, press the “E” key and scroll through the menu using the “G” or “B” keys until the display reads: “2222”. Press the “T” key and then scroll through the two choices using the “G” or “B” keys until you have found the mode you wish to use and press the “T” to choose it:

“Standard” Display reads: “0000”

This is the factory default setting, the unit responds normally.

“Inverted” Display reads: “8888”

Movement on the Pan or “X”-axis will be reversed to any control inputs (Left is right, right is left, etc.)

Tilt Inversion Mode

To enter the “tilt invert” mode section of your Merlin-W, press the “E” key and scroll through the menu using the “G” or “B” keys until the display reads: “2222”. Press the “T” key and then scroll through the two choices using the “G” or “B” keys until you have found the mode you wish

to use and press the “T” to choose it:

“Standard” Display reads: “0000”

This is the factory default setting, the unit responds normally.

“Inverted” Display reads: “8888”

Movement on the Tilt or “Y”-axis will be reversed to any control inputs (Left is right, right is left, etc.)

Display Inversion Mode

To enter the “Display” mode section of your Merlin-W, press the “E” key and scroll through the menu using the “G” or “B” keys until the display reads: “2222”. Press the “T” key and then scroll through the two choices using the “G” or “B” keys until you have found the mode you wish to use and press the “T” to choose it:

“Standard” Display reads: “0000”

This is the factory default setting, the display reads normally.

“Inverted” Display reads: “8888”

This will invert the display for easier reading/operation when the unit is hung upside-down

To enter the “NO Display” mode section of your Merlin-W, press the “E” key and scroll through the menu using the “G” or “B” keys until the display reads: “2222”. Press the “T” key and then

scroll through the two choices using the “G” or “B” keys until you have found the mode you wish to use and press the “T” to choose it:

“Standard” Display reads: “0000”

This is the factory default setting, the display reads normally.

“Inverted” Display reads: “8888”

This will close the display for after six second before you press any key.

Colors Controll Mode

To enter the “Manual Reset” mode section of your Merlin-W, press the “E” key and scroll

through the menu using the "H" or "B" keys until the display reads: "8888". Press the "F" key

to choose it:

**"Red"** Scroll through the menu using the "H" or "B" keys until the display reads: "8888" or "8255".

To enter the "Manual Reset" mode section of your Merlin-W, press the "F" key and scroll through the menu using the "H" or "B" keys until the display reads: "8888". Press the "F" key

to choose it:

**"Green"** Scroll through the menu using the "H" or "B" keys until the display reads: "8888" or "8255".

To enter the "Manual Reset" mode section of your Merlin-W, press the "F" key and scroll through the menu using the "H" or "B" keys until the display reads: "8888". Press the "F" key

to choose it:

**"Blue"** Scroll through the menu using the "H" or "B" keys until the display reads: "8888" or "8255".

#### Manual Reset Mode

To enter the "Manual Reset" mode section of your Merlin-W, press the "F" key and scroll through the menu using the "H" or "B" keys until the display reads: "8888". Press the "F" key

to choose it:

**"Reset"** Display reads: "8888" or "8888"

This is the factory default reset setting, the unit will automatically Home/Reset all of its parameters (*including* its DMX address) .

This is an "end-all" function for an instrument that has failed to respond to all other tests. If you simply wish to test or reset a particular function on the unit, use the test function mode or use the reset in the DMX channel number 12.

## Section Four

# 4

### Care and Maintenance of your *Merlin-W*

We have strived in engineering to make your Merlin-W as maintenance free as possible. If you remember only a few things, it will be very easy to maintain and should give you many, many years of faithful service.

The Merlin-W pro has three enemies:

**Dirt:** You must keep your Merlin-W clean! Clean the lenses with a dry optics cloth available at any sunglasses store. Clean the outside with a damp cloth. Do not use solvents or cleaners on either as this may damage, discolor or otherwise hurt the finish of both. All of the bearings inside your Merlin-W are sealed, so they cannot get dirty and you never have to oil them!

Purchase a can of "Dry Air" or other Air-in-a-can type electrical component air blaster and a small, fine horse hair paint brush from the hardware store or an art supply shop. Once every two or three weeks, open the Side Plates, the Base Access Covers, the Y-axis Covers and the Lamp Plate. Using your brush and your can of air, gently blow-out and clean the inside of your unit, making sure that you clear any ports, vents or holes that help your Merlin-W get fresh, cool air. Take a good look at the fans and make sure that they are especially clean. Take care not to bump any of the circuit cards too hard or damage your lamp as you do this. For the details on the care and cleaning of position sensors, please go to [www.toplit.com](http://www.toplit.com)

**DO NOT** use an air compressor to do this job! First of all, most compressors are much too powerful and you may well damage a number of components inside your Merlin-W. Secondly, most air compressors have far too much moisture in them due to condensation and you could end up getting the inside of your unit WET!

This leads us to another enemy:

**Water:** If you get the inside of your Merlin-W wet, you could likely do more damage than you want to pay for. A shorted circuit card could cause other electrical components to overheat or go bad as well. Never use your Merlin-W outdoors unless you are under some sort of cover or are absolutely sure that there is no chance of rain or horse-play involving liquids! Outside installs are an absolute NO-NO!

The last enemy, and probably the one you will encounter the most is:

**Heat:** If you get the inside of your Merlin-W too hot, you will cause irreversible damage. This is

why you must keep it dust and dirt free. It is also why you must **not** use the Merlin-W outside. Besides bug infestation, you can also get condensation from dew, rain or rapid temperature change and the Merlin-W was not designed for use in these conditions. NEVER operate your Merlin-W when the ambient temperature is at or exceeds: 45 degrees Celsius. Your Merlin-W was engineered to run VERY cool. You will notice that with the exception of the Lamp-Plate, you can touch the unit anywhere, even after it has been running for *hours!* Keep it clean and it will *always* run cool!

We have included an extra belt for each axis on your Merlin-W; a large one for the X-axis and a thinner one for the Y-axis. Eventually, these belts will wear out and either begin to jump off their gears or break altogether. We didn't want you to have to wait for the part, so we gave you the first ones for free! For instructions on replacing one of these belts, please go to our website:

www.toplit.com

## Section Five

# 5

### Troubleshooting Your *Merlin-W*

We have worked tirelessly to engineer your Merlin-W for years of trouble-free service. We built it as good as it could be built with the highest quality materials available. Each unit is exhaustively tested at the factory before it ever goes into its shipping box. Before we released the Merlin-W to the public we tested units in every condition imaginable (and a few that aren't!). We banged on them, we shook them, we spun them, we heated them and we cooled them ... **While** they were running! We even left units running for over five days straight without stopping! We don't recommend that you do any of these things to your Merlin-W, but believe us, this is one tough instrument.

#### Belts/Movement/Un-Responsive Heads

##### **(Head won't respond, does things on its own, won't stay lit)**

As with anything that moves or has moving parts, you will eventually have parts wear out. This is par for the course, so to speak. The first and most obvious things to wear are belts.

If one of your Belts should start to jump the gear or fail/break completely, please see our website for complete instructions on swapping them out. Or, you can call any Factory-authorized TopLite Dealer. If the instrument will not move on one or both axis, (and it is *not* a belt) then the problem is one of two things: either your DMX data is corrupt or you have a problem on a circuit card inside

your Merlin-W.

To begin troubleshooting this problem, first, run both a pan and tilt test (see "Test Mode" in section three), if it works, then the problem is most likely data. This can be one of several things: A bad cable, a unit not sending data down the cable run or a unit not reading the data as it arrives.

To check your data, first look to see if the Purple/UV LED DMX Signal Indicator is lit (see figure 13.) The light should be on solid and not blinking or "stuttering". If it is, then the data may be bad due to a bad cable. A sure sign of this is that every head beyond the first "bad" head is also acting strangely. However, if the cable is good, there may be a chance that the Merlin-W in the cable run *before* your bad head is actually not transmitting data. That would mean your trouble is actually with *that* unit and that the rest are fine. This unit will need to be serviced by a trained technician.

To test for this, reconfigure/experiment with your cable run to look for clear data and to find the point where the data goes corrupt. You may also wish to check that your Terminator plug in the last unit is snug in its socket. If the problem is not a belt, cable, terminator plug or the transmitted data, then you have a bad circuit card inside your Merlin-W and it must be serviced by a trained technician.

#### End will not power up

Check the Power cord (make sure it is not damaged *and* that it is plugged in on both ends!), check the fuse (if it is bad, swap it out), check the On/Off Switch (make sure it is in the "on" position) and check the Circuit Breaker of your buildings power supply (Make sure that it is on and that it wasn't somehow tripped). If it is not one of these problems, then the unit most likely needs to be serviced by a trained technician. Remove it from your system and have it serviced.

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