

**Garkinhall** **GKH 575**  
systems

# **COLOR WASH USER MANUAL**

**V1.0**



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## Important Safety Information



*Caution: Risk of fire and electrocution. Inappropriate use may result in serious injury or death.*

- *This device should be installed and maintained by qualified personnel only.*
- *Read all instructions and warnings in this user manual before attempting to use this device.*
- *Mains power should be properly grounded before energizing.*
- *Replace fuses with proper size and voltage rating only.*



*Caution: Risk of ultraviolet (UV) exposure. Looking directly at light source without protection may cause retina damage. Do not attempt to open fixture housing without first disconnecting power.*

Garkinhall Systems, Inc. accepts no liability for damages resulting from the failure to read and observe the warnings in this manual, unauthorized modifications to the device, or the use of the device other than that for which it is intended.

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## Introduction

The GKH 575 Wash from Garkinhall Systems, Inc. is an automated color wash luminaire with RGB dichroic color mixing, an auxiliary color wheel for more saturated colors, lenticular glass for beam shaping and a remote zoom to vary the field angle. The optical train includes a 575-watt MSR lamp and a dichroic glass faceted reflector for maximum efficiency. The extensive user-configurable features allow you to set up the fixture to suit your applications, and the built-in diagnostic features speed troubleshooting and minimize down time.

The GKH 575 Color Wash is ideally suited for a variety of applications where soft-edge dichroic color mixing is needed, including houses of worship, live concerts and events, permanent installations, television and production applications.

With the proper maintenance and upkeep, the GKH 575 Wash luminaire will provide years of service. This manual is intended as a guide to the proper set up, operation and care of your fixture. Please read this manual, follow the recommended procedures and keep it in a safe place for future reference.



## Setting Up

### ***A. Unpacking***

Upon receipt of your fixtures, carefully inspect the outside of the packaging and look for any damage that may have occurred during shipping. Open the package and carefully inspect its contents for signs of damage. Should there be any apparent damage, notify the freight company right away. Keep all the packaging in the event that the freight company dispatches an inspector.

### ***B. Checking the Contents***

Included in the packaging are the following items:

1. GKH 575 Color Wash luminaire
2. MDR 575 lamp
3. (2) Omega rigging brackets with quarter-turn fasteners
4. safety cable
5. User manual

### ***C. Before Applying Power***

Once you have made a visual inspection of the packaging and the fixture, you should set it up and perform a bench test to insure that it is operating correctly. Before applying power to the unit, make sure to follow these procedures:

1. Check to see that the voltage marked on the packaging matches that of the power supply. In North America it should be 120V/60Hz.
2. Install the lamp.
  - a. Insure that the fixture is disconnected from the power source.



*Caution: Surface may be extremely hot. Allow several minutes to cool.*

- b. Using a Phillips screwdriver, remove the three screws on the back of the fixture head labeled X, Y, and Z.



*Caution: Never touch the lamp with your bare hands. The oil from your hands can cause the quartz envelope of the lamp to heat up and explode.*

- c. Without touching the lamp with your bare hands (wear gloves or use a protective sleeve to hold the lamp), hold the ceramic base of the lamp and insert it into the lamp socket until it is seated completely.
- d. Replace the lamp and socket assembly in the head of the fixture and replace the three screws, X, Y and Z.

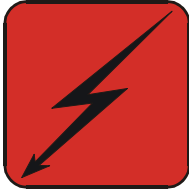


3. Install the power connector using the following wiring convention:

- a. Green/yellow – ground
- b. Blue – neutral
- c. Brown – live or hot

#### **D. Applying Power**

Apply power only after the voltage has been confirmed, the lamp installed and the connector correctly installed.



*Warning: Risk of electrical shock.*

#### **E. Turning On the Fixture**

Connect the fixture to a power source and turn on the red power button located on the base of the fixture (0=off, 1=on). The fixture will automatically perform a power-on self test. During the test, the fixture will perform a sequence of procedures in which each of the functions will be activated, tested and homed. The self-test will be noisy; this is normal. It will last approximately one minute, and then the head will return to its home position and the LED display on the base will display the default DMX512 address (001).

#### **F. Aligning the Lamp**

Before operating the fixture for the first time and each time after the lamp is changed, it is critical that the lamp is correctly re-aligned in the reflector.



*Caution: Operating the fixture without correctly aligning the lamp in the reflector may cause damage to internal components. Always align the lamp before operating for the first time and each time after changing the lamp.*

#### **G. Lamp Aligning Procedure**

To align the lamp, find a location with a long, clear sight line to a white wall. Place the fixture on the floor or on a work bench and perform the following lamp alignment procedure:

1. Turn on the fixture.
2. After it finishes the power-on self-test, the lamp should be on and the yoke should be in the default position (pointing straight up if the fixture is sitting on the ground or pointing straight down if the fixture

is hanging from a pipe or truss). You should be able to see a small amount of light leak from the back of the fixture head. If the lamp is on, skip to step 7.

3. Strike the Lamp:
  - a. Using the menu display function, press the **[UP]** or **[DOWN]** button on the LED menu display several times until it reads **LAMP**.
  - b. Press the **[ENTER]** button.
  - c. Press the **[UP]** or **[DOWN]** button until the display reads **on**.
  - d. Press the **[ENTER]** button. The lamp should turn on.  
NOTE: It takes approximately five minutes for the lamp to reach its full operating temperature.
  - e. Press the **[MODE]** button to back out of the **LAMP** function.
4. Adjust the dimmer to full and focus the pan and tilt using the menu display Adjust function:
  - a. Press the **[UP]** or **[DOWN]** button on the LED menu display several times until the display says **SPEC**.
  - b. Press the **[ENTER]** button.
  - c. Press the **[UP]** or **[DOWN]** button several times until the display says **Adj**.
  - d. Press the **[ENTER]** button.
  - e. Press the **[UP]** or **[DOWN]** button several times until the display says **dim** (dimmer).
  - f. Press the **[ENTER]** button.
  - g. Press and hold the **[UP]** button until the display reaches the number **255**. If you pass it, press the **[DOWN]** button until it stops at **255**. The light should fade up as the dimmer opens.
  - h. Press the **[ENTER]** button.
  - i. Press the **[UP]** or **[DOWN]** button several times until the display reads **tilt**.
  - j. Press the **[ENTER]** button.
  - k. Press and hold the **[UP]** or **[DOWN]** button until the fixture head is focused on a white wall. (Rotate the fixture if necessary or go to the **PRN** function and adjust the value until it is correctly focused.)
5. Using the three lamp adjustment screws (labeled A, B, and C) in the rear of the fixture head, adjust the lamp so that it is centered correctly in the X, Y, and Z planes of the reflector (side-to-side and in and out).
  - a. Using a 4mm (5/32") hex wrench, turn the three screws clockwise one revolution one at a time. Observe the spot on the wall while adjusting the bolts.
  - b. If the spot appears brighter as you turn each screw, keep adjusting them in rotation until it no longer has an intensifying effect. If the spot appear dimmer as you turn



- each screw, adjust them in rotation in a *counterclockwise* direction until the spot is as bright as possible.
- c. Adjust the screws individually so that the hot spot is in the center of the beam.
  6. Press the **[MODE]** button on the menu display several times to back out of the Adjust mode. Stop when the display reads *ADD1* (or the assigned DMX address).
  7. Reset the lamp timer to 000 (see Setting the Fixture Personality below).

### ***H. Setting the Fixture Personality***

The GKH 575 Wash fixture has several customizable attributes that allow you to configure the personality of the fixture to meet the requirements of your particular application. There is an on-board menuing system in the base labeled “control board” in which you will find a number of settings related to various aspects of the fixture.



A map of the personality settings are outlined below and a full explanation of each setting follows.

**ADD1** — *ADD1 - RS12*

**r.PAn** — *on/off*

**r.t.it** — *on/off*

**16b.r.** — *on/off*

**LAt1** — *XXX*

**Pot1** — *XXX*

**LAMP** — *on/off*

**dENo** — *nod.1 / nod.2*

**rESE.** — *rSt*

**SPEC** —

**PARn** —

**PARn** — *PARn.1, PARn.2, or PARn.3*

**t.lt** — *t.lt.1, t.lt.2, or t.lt.3*

**SPEd** — *SPd.1 – SPd.5*

**CoL.o** — *Co.0 – Co.9*

**CYAn** — *CYA.0 – CYA.5*

**NAGe** — *NAG.0 – NAG.5*

**YELL** — *YEL.0 – YEL.5*

**CSPd** — *CSP.1 – CSP.5*

**NAcr.** — *oFF NA.1 – NA.30*

**EFEC** — *(HoLE, SHA.1, SHA.2, SHA.3, FroS*

**2.ooN** — *2.oo.0 – 2.oo.4*

**Stro.** — *oPEn, Str.1 – Str.9 (increasing strobe speed)*

**d, Nr** — *d, n.0 – d, n.5*

**LARu** —

**POOn**

**EnSn**

**dN. In** —

**PARn** — *0-255*

**t.lt** — *0-255*

**SPEd** — *0-255*

**CoL.o** — *0-255*

**CYAn** — *0-255*

**NAGe** — *0-255*

**YELL** — *0-255*

**CSPd** — *0-255*

**NAcr.** — *0-255*

**EFEC** — *0-255*

**2.ooN** — *0-255*

**Stro.** — *0-255*

**d, Nr** — *0-255*

**d, SP** —

**turn**

**on** — *on / oFF*

**d. Int** — *20, 40, 60, 80, 100*

<b>FEEd</b>	- on / oFF
<b>d.L.oF</b>	- on / oFF
<b>tENP</b>	- XXX
<b>FRn.S</b>	- Lo.oF Lo.H I Auto H IGH rEG
<b>dF.SE</b>	
<b>Adj.</b>	-
<b>PRn</b>	- 0-255
<b>t.lt</b>	- 0-255
<b>SPEd</b>	- 0-255
<b>CoLo</b>	- 0-255
<b>CYAn</b>	- 0-255
<b>MAGE</b>	- 0-255
<b>YELL</b>	- 0-255
<b>CSPd</b>	- 0-255
<b>MACr.</b>	- 0-255
<b>EFEC</b>	- 0-255
<b>2.oon</b>	- 0-255
<b>Stro.</b>	- 0-255
<b>d, Pr</b>	- 0-255
<b>F.CAL</b>	- R.rES

## I. Personality Settings

A detailed explanation of each personality setting follows. At any time during the processes listed below, pressing the **[MODE]** button will cancel the pending setting and exit to the next highest menu level.

**A001**

- DMX512 Address. The current DMX512 address setting. This is the starting address for which the fixture receives information from the controller.

To change the DMX512 address:

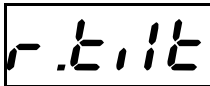
1. Press the **[ENTER]** button.
2. Press and hold the **[UP]** or **[DOWN]** button until you reach the desired DMX512 address.
3. Press the **[ENTER]** button. The display should now read AXXX, where XXX is the new DMX512 address.



**r.Pan** – Reverse pan. This setting allows you to invert the pan so that opposing fixtures will pan in the same direction given the same command from the controller.

To invert the pan:

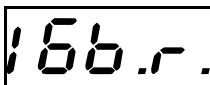
1. Press the **[UP]** or **[DOWN]** button until the display reads **r.Pan**.
2. Press the **[ENTER]** button.
3. Press the **[UP]** or **[DOWN]** button until the display reads **On**.
4. Press the **[MODE]** button to get out of the **r.Pan** mode.



**r.tilt** – Reverse tilt. This setting allows you to invert the tilt so that fixtures that are rigged inverted (e.g., hanging from a truss) will tilt in the same direction as fixtures that are rigged upright (e.g., sitting on the floor) given the same command from the controller.

To invert the tilt:

1. Press the **[UP]** or **[DOWN]** button until the display reads **r.tilt**.
2. Press the **[ENTER]** button.
3. Press the **[UP]** or **[DOWN]** button until the display reads **On**.
4. Press the **[MODE]** button to get out of the **r.tilt** mode.



**16b.r.** – Resolution of movement. This setting allows you to choose between 16-bit resolution and 8-bit resolution. 16-bit resolution requires two channels for pan (course and fine adjust) and two channels for tilt (course and fine adjust), but it gives you 65,536 steps of resolution which translates to smoother movement and higher target accuracy. 8-bit resolution requires only one channel for pan and one channel for tilt, but it only gives you 256 steps of resolution over 540 degrees of movement in the pan and 270 degrees of movement in the tilt. That translates to about one degree per step in the tilt function, which, over a throw distance of 35 feet, is about 8" of movement per step. If you are concerned about having enough DMX512 channels to run all of your fixtures, you may consider changing this function to the 8-bit setting to free two channels per fixture.

To change the setting of the movement resolution:

1. Press the **[UP]** or **[DOWN]** button until the display reads **16b.r.**
2. Press the **[ENTER]** button.
3. Press the **[UP]** or **[DOWN]** button until the display reads **OFF**.
4. Press the **[ENTER]** button.
5. Press the **[MODE]** button to get out of the **16b.r.** mode.

**LAti**

– Lamp timer. This setting indicates the number of hours of operation since the lamp was installed and the lamp timer was reset.

To display the number of lamp operating hours:

1. Press the **[UP]** or **[DOWN]** button until the display reads **LAti**.
2. Press the **[ENTER]** button. The display will show four digits indicating the lamp time in hours.
3. To reset the lamp time, press and hold the **[UP]** and the **[DOWN]** buttons at the same time until the display reads **0000**.
4. To confirm lamp hours reset, or to exit the lamp hours without resetting, press the **[ENTER]** button.
5. Press the **[MODE]** button to get out of the **LAti** mode.

**Poti**

– Power time. This setting indicates the total number of hours of operation of the fixture. It is non-resettable.

To display the number of hours of operation:

1. Press the **[UP]** or **[DOWN]** button until the display reads **Poti**.
2. Press the **[ENTER]** button. The display will show four digits indicating the number of hours the fixture has been used. This is a non-resettable function.
3. To exit, press the **[ENTER]** button.
4. Press the **[MODE]** button to get out of the **Poti** mode.

**LAMP**

– Lamp on/off. This setting allows you to manually turn the lamp on or off from the menu display.

To manually turn the lamp on:

1. Press the **[UP]** or **[DOWN]** button until the display reads **LAMP**.
2. Press the **[ENTER]** button.
3. Press the **[UP]** or **[DOWN]** button until the display reads **ON**.
4. Press the **[ENTER]** button. The lamp will turn on.
5. Press the **[MODE]** button to get out of the **LAMP** mode.

**dENo**

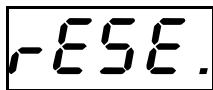
– Demonstration mode. This setting allows you to demonstrate the features of the fixture without the use of a controller. There are two demo modes:

mode 1 and mode 2. Mode 1 does not change the pan and tilt settings but cycles through all the other attributes of the fixture. Mode 2 changes all of the attributes of the fixture, including pan and tilt, in sequence.

To put the fixture in demonstration mode 1:

1. Press the **[UP]** or **[DOWN]** button until the display reads *dENo*.
2. Press the **[ENTER]** button.
3. Press the **[UP]** or **[DOWN]** button until the display reads *Mod.1*.
4. Press the **[ENTER]** button.
5. Press the **[UP]** or **[DOWN]** button until the display reads *PAn*.
6. Press the **[ENTER]** button. The display will read a value between 0 and 255 indicating the current pan position of the head.
7. Press the **[UP]** or **[DOWN]** button until the fixture is panned to the desired position.
8. Press the **[ENTER]** button.
9. Press the **[UP]** or **[DOWN]** button until the display reads *t,lt*.
10. Press the **[ENTER]** button. The display will read a value between 0 and 255 indicating the current tilt position of the head.
11. Press the **[UP]** or **[DOWN]** button until the fixture is tilted to the desired position.
12. Press the **[ENTER]** button.
13. Press the **[UP]** or **[DOWN]** button until the display reads *zoon*.
14. Press the **[ENTER]** button. The display will read a value between 0 and 255 indicating the current zoom value.
15. Press the **[UP]** or **[DOWN]** button until the zoom is at the desired position.
16. Press the **[ENTER]** button.
17. Press the **[UP]** or **[DOWN]** button until the display reads *Go...*
18. Press the **[ENTER]** button. The display will read run, the shutter will open, and the fixture will begin executing a sequence demonstrating its features.
19. To exit the demonstration mode, press the **[MODE]** button twice.

To put the fixture in demonstration mode 2, follow the procedure above and choose the *Mod.2* option.



– Reset. This setting can be used to reset all the functions of the fixture. Should any of the attributes become misaligned or if there is an error, it is a good idea to reset the fixture to see if the problem goes away.

To reset the fixture:

1. Press the **[UP]** or **[DOWN]** button until the display reads *rESE..*

2. Press the **[ENTER]** button. The display will read **r5t** and the fixture will reset and begin a self-test sequence. When the fixture resets, the motors will make some noise. This is normal. Once the entire self-test sequence has been completed, the fixture will return to the previous setting and the display will read **RXXX**, where XXX is the DMX512 address for which it has been set.



**SPEC** – Special functions. This setting allows you to access a variety of useful functions including manual control, lamp operation, DMX512 input monitoring, display settings, position encoding, temperature monitoring, fan settings, and calibration. The specific functions are outlined below.

To access the special functions menu and submenus:

1. Press the **[UP]** or **[DOWN]** button until the display reads **SPEC**.
2. Press the **[ENTER]** button.
3. Press the **[UP]** or **[DOWN]** button until you reach the desired function listed below.
4. Press the **[ENTER]** button. The instructions for each function are listed below.



**PRnu** – Manual operation. This setting allows you to manually recall factory presets for every function of the luminaire including pan, tilt, speed of movement, color wheel, magenta, cyan and yellow color mixing, speed of color change, macros, effects, zoom, strobe and dimming. The attributes can be set one at a time by selecting the **PRnu** option from the **SPEC** function of the display (see **SPEC** above) and choosing from the available options below:

**PRn** – Choose one of three pan focus settings listed below by using the **[UP]** and **[DOWN]** buttons until the display reads **PRn**, and then pressing the **[ENTER]** button. Use the **[UP]** and **[DOWN]** buttons to select the desired pan setting (**PRn.1**, **PRn.2**, or **PRn.3**), then press **[ENTER]**. The display will then go back to the next highest menu level.

**t,lt** – Choose one of three tilt position settings listed below by using the **[UP]** and **[DOWN]** buttons until the display reads **t,lt**, and then pressing the **[ENTER]** button. Use the **[UP]** and **[DOWN]** buttons to select the desired tilt setting (**t,lt.1**, **t,lt.2**, or **t,lt.3**), then press **[ENTER]**. The display will then go back to the next highest menu level.

***SPEED*** (speed)– Choose one of five speed of movement settings listed below by using the **[UP]** and **[DOWN]** buttons until the display reads ***SPEED***, and then pressing the **[ENTER]** button. Use the **[UP]** and **[DOWN]** buttons to select the desired speed setting (***SPEED.1*** – ***SPEED.5***), then press **[ENTER]**. The display will then go back to the next highest menu level.

***COLOR*** (color) – Choose one of ten color wheel settings listed below by using the **[UP]** and **[DOWN]** buttons until the display reads ***COLOR***, and then pressing the **[ENTER]** button. Use the **[UP]** and **[DOWN]** buttons to select the desired color setting (***COLOR.0*** – ***COLOR.9***), then press **[ENTER]**. The display will then go back to the next highest menu level.

***CYAN*** – Choose one of six cyan color settings listed below by using the **[UP]** and **[DOWN]** buttons until the display reads ***CYAN***, and then pressing the **[ENTER]** button. Use the **[UP]** and **[DOWN]** buttons to select the desired cyan setting (***CYAN.0*** – ***CYAN.5***), then press **[ENTER]**. The display will then go back to the next highest menu level.

***MAG*** (magenta) – Choose one of six cyan color settings listed below by using the **[UP]** and **[DOWN]** buttons until the display reads ***MAG***, and then pressing the **[ENTER]** button. Use the **[UP]** and **[DOWN]** buttons to select the desired magenta setting (***MAG.0*** – ***MAG.5***), then press **[ENTER]**. The display will then go back to the next highest menu level.

***YELLOW*** (yellow) – Choose one of six yellow color settings listed below by using the **[UP]** and **[DOWN]** buttons until the display reads ***YELLOW***, and then pressing the **[ENTER]** button. Use the **[UP]** and **[DOWN]** buttons to select the desired yellow setting (***YELLOW.0*** – ***YELLOW.5***), then press **[ENTER]**. The display will then go back to the next highest menu level.

***COLOR SPEED*** (color speed) – Choose one of five color-changing speed settings listed below by using the **[UP]** and **[DOWN]** buttons until the display reads ***COLOR SPEED***, and then pressing the **[ENTER]** button. Use the **[UP]** and **[DOWN]** buttons to select the desired color-changing speed setting (***COLOR SPEED.1*** – ***COLOR SPEED.5***), then press **[ENTER]**. The display will then go back to the next highest menu level.

***MACRO***. (macro) – There are 30 macros built into the fixture memory. These macros may be accessed manually using the manual operation feature of the ***SPEC*** menu. Choose one of 30 macro settings listed below by using the **[UP]** and **[DOWN]** buttons until



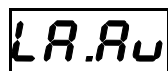
the display reads **MACr.**, and then pressing the **[ENTER]** button. Use the **[UP]** and **[DOWN]** buttons to select the desired macro setting (OFF, MA. 1 – MA.30), then press **[ENTER]**. The display will then go back to the next highest menu level. To turn off the macros, select the **OFF** setting using the same procedure as above and press the **[ENTER]** button.

**EFEC** (effects) – Choose one of four effect settings listed below by using the **[UP]** and **[DOWN]** buttons until the display reads **EFEC**, and then pressing the **[ENTER]** button. Use the **[UP]** and **[DOWN]** buttons to select the desired effect [HOLE (open – no effect); SHA.1 – SHA.3 (three beam shaping effects); FroS (frost)], then press **[ENTER]**. The display will then go back to the next highest menu level.

**2.000** – Choose one of five zoom settings listed below by using the **[UP]** and **[DOWN]** buttons until the display reads **2.000**, and then pressing the **[ENTER]** button. Use the **[UP]** and **[DOWN]** buttons to select the desired zoom setting (**2.00.0** – **2.00.4**), then press **[ENTER]**. The display will then go back to the next highest menu level.

**Stro.** (strobe) – Choose one of nine strobe settings (plus no strobe) listed below by using the **[UP]** and **[DOWN]** buttons until the display reads **Stro.**, and then pressing the **[ENTER]** button. Use the **[UP]** and **[DOWN]** buttons to select the desired strobe setting [OPEn (no strobe); **Str.1** – **Str.9** (increasing strobe speed)], then press **[ENTER]**. The display will then go back to the next highest menu level.

**d, 0r** (dimmer) – Choose one of six dimmer settings listed below by using the **[UP]** and **[DOWN]** buttons until the display reads **d, 0r**, and then pressing the **[ENTER]** button. Use the **[UP]** and **[DOWN]** buttons to select the desired dimmer setting (**d, 0.0** – **d, 0.5**), then press **[ENTER]**. The display will then go back to the next highest menu level.



**LA.AU** – Lamp Auto function. This function allows you to set the lamp to come on when the fixture is turned on. It also allows you to bypass the lamp on sensor for emergency operation in the event that the sensor fails.

To set up the fixture so that the lamp automatically turns on when the fixture is powered on:

1. Select the **LA.AU** option from the **SPEC** function of the display (see **SPEC** above).

2. Press the **[ENTER]** button.
3. Press the **[UP]** or **[DOWN]** button until the display reads **PoOn**.
4. Press the **[ENTER]** button.
5. Press the **[UP]** or **[DOWN]** button until the display reads **on**.
4. Press the **[ENTER]** button.
5. Press the **[MODE]** button twice to back out of the special functions mode.

If the auto lamp on function is set to **oFF**, then the lamp will stay off until the fixture receives a lamp on signal from the controller or until the lamp is turned on manually through the menu operation.

In the fixture head there is a photoreceptor that is used to detect the presence or absence of light. The purpose of this light sensor is to prevent the ignitor from damaging the lamp circuit by continually trying to ignite the lamp if it is already on or if the lamp is unable to turn on. The lamp light sensor can be turned off in the event that the sensor is non-functional so that the fixture may be used in emergency situations.

*Note: If the **EnSn** function has been turned **oFF** then the heat error message will only appear if the lamp has been turned off from the controller or the menu display and turned back on within five minutes. It will not automatically detect a lamp off condition should the lamp extinguish by itself.*

To turn the lamp light sensor off:

1. Select the **LA.Lu** option from the **SPEC** function of the display (see **SPEC** above).
2. Press the **[ENTER]** button.
3. Press the **[UP]** or **[DOWN]** button until the display reads **EnSn**.
4. Press the **[ENTER]** button.
5. Press the **[UP]** or **[DOWN]** button until the display reads **oFF**.
4. Press the **[ENTER]** button.
5. Press the **[MODE]** button twice to back out of the special functions mode.

*Caution: In the event that the **EnSn** function has been turned **oFF** and the lamp extinguishes by itself, then the software will not prevent the ignition of the lamp within the five minute window or if the lamp fails to ignite within 28 seconds of attempting to turn it on. Damage may occur from the high voltage ignition should the fixture receive repeated lamp on commands.*

**dm. In** – DMX input monitor. This function allows you to read the current DMX512 signal input value for each attribute. It is a valuable

troubleshooting tool that can be used to confirm the integrity of the input control signal and rule out problems with DMX addressing, controller output, and cabling problems in the event of a failure.

To check the DMX512 input value of a particular attribute:

1. Select the ***d, In*** option from the **SPEC** function of the display (see **SPEC** above).
2. Press the **[ENTER]** button.
3. Press the **[UP]** or **[DOWN]** button to select an attribute to monitor. The options are: pan (***PAn***), tilt (***t,lt***), speed of movement (***SPEd***), color wheel (***Col.o***), cyan (***CYAn***), magenta (***MAGe***), yellow (***YELL***), color change speed (***CSPd***), macros (***MACr.***), effects (***EFEe***), zoom (***Z.oon***), strobe (***Stro.***), and dimmer (***d, In***).
4. Press the **[ENTER]** button. The display will show the current input value in the range of 0 – 255.
5. Press the **[MODE]** button twice to back out of the special functions mode.

***d, SP*** – Display functions. This function allows you to set up the LED menu display according to your needs. There are three attributes of the display that may be adjusted: the orientation of the display (upside down or right side up), whether the display is on or off, and the intensity of the display.

***turn*** The orientation of the display may be changed in order to suit the application. If the fixture is rigged from a structure in an upside down orientation, then it is advantageous to invert the display so that it will be easier to read.

To invert the display:

1. Select the ***d, SP*** option from the **SPEC** function of the display (see **SPEC** above).
2. Press the **[ENTER]** button.
3. Press the **[UP]** or **[DOWN]** button until the display reads ***turn***.
4. Press the **[ENTER]** button. The display will invert.
5. Press the **[MODE]** button twice to back out of the special functions mode.

***on*** The display may be set to the off position in the event that the fixture is visible to the audience and the red LED light is a distraction.

To turn the menu display off:

1. Select the **d. SP** option from the **SPEC** function of the display (see **SPEC** above).
2. Press the **[ENTER]** button.
3. Press the **[UP]** or **[DOWN]** button until the display reads **on**.
4. Press the **[ENTER]** button.
5. Press the **[UP]** or **[DOWN]** button until the display reads **off**.
6. Press the **[ENTER]** button. The display will turn off in two minutes.
7. Press the **[MODE]** button twice to back out of the special functions mode.

When the menu display is off, it will turn back on when any button on the menu display is pressed. It will stay on for two minutes after the last button press and then turn off again.

**d. Int** Display intensity setting. This setting allows you to set the intensity of the display in five increments of 20%.

To change the intensity setting of the display:

1. Select the **d. Int** option from the **SPEC** function of the display (see **SPEC** above).
2. Press the **[ENTER]** button.
3. Press the **[UP]** or **[DOWN]** button to select the desired value of intensity (20%, 40%, 60%, 80% or 100%).
4. Press the **[ENTER]** button.
5. Press the **[MODE]** button twice to back out of the special functions mode.

**FEED** – Position feedback. This setting allows you to turn on or off the position encoder that automatically repositions the yoke in the event that it is bumped or moved.

To turn the position encoder off:

1. Select the **FEED** option from the **SPEC** function of the display (see **SPEC** above).
2. Press the **[ENTER]** button.
3. Press the **[UP]** or **[DOWN]** button until the display reads **off**.
4. Press the **[ENTER]** button.
5. Press the **[MODE]** button twice to back out of the special functions mode.

## **d.L.oF**

– DMX512 control of lamp off. This function allows you to turn off the lamp via a DMX512 control signal. If this function is set to **oFF**, then the lamp off signal from the console has no effect.

To turn the DMX512 lamp off function off:

1. Select the **d.L.oF** option from the **SPEC** function of the display (see **SPEC** above).
2. Press the **[ENTER]** button.
3. Press the **[UP]** or **[DOWN]** button until the display reads **oFF**.
4. Press the **[ENTER]** button.
5. Press the **[MODE]** button twice to back out of the special functions mode.

## **tEMP**

– Temperature monitor. This function monitors the internal temperature of the fixture head.

To read the internal temperature:

1. Select the **tEMP** option from the **SPEC** function of the display (see **SPEC** above).
2. Press the **[ENTER]** button. The display will indicate the current temperature in degrees Celsius.
3. Press the **[MODE]** button twice to back out of the special functions mode.

## **FAn.S**

– Fans settings. This setting allows you to adjust the fan speed and or the way the fan functions according to your needs. It may be advantageous to temporarily lower the fan speed and thus reduce the fan noise during quiet passages, e.g., between songs. If noise is an issue, the fans may be set to one of five different settings to help reduce the noise level.

To adjust the fan speed setting:

1. Select the **FAn.S** option from the **SPEC** function of the display (see **SPEC** above).
2. Press the **[ENTER]** button.
3. Press the **[UP]** or **[DOWN]** button to select one of five fan speed settings – **Lo.oF**, **Lo.H I**, **Auto**, **H I GH**, and **REG**. The behavior of each setting is described below:

**Lo.oF** – The fan will operate at the very lowest speed until the lamp heats up above a predetermined temperature level.

When that temperature threshold is reached, the lamp will automatically turn off by itself.

*L o . H i* – The fan will operate at the very lowest speed until the lamp heats up above a predetermined temperature level. When that temperature threshold is reached, the fan will automatically switch to the highest operating speed until the lamp cools off below the predetermined temperature level.

*R u l e* – The fan will operate at the required speed in order to keep the lamp cool. The speed of the fan automatically adjusts itself accordingly.

*H i G H* – The fan always operates at the highest speed setting.

*r E C* – The fan speed is under control of the DMX512 input signal unless the lamp temperature reaches a predetermined limit. If the temperature reaches the threshold value, then the fan is automatically adjusted to its highest speed setting.

4. Press the **[ENTER]** button.

5. Press the **[MODE]** button twice to back out of the special functions mode.

**df.SE** – Default settings. This setting returns all of the menu settings to their default values. The default values are:

Personality Setting	Default Value
<i>r.PAn</i>	<i>oFF</i>
<i>r.t.lk</i>	<i>oFF</i>
<i>lbb.r.</i>	<i>on</i>
<i>L.R.Au</i>	<i>Pos.0n</i>
<i>d, SP</i>	<i>turn</i> (right side up)
<i>d, SP</i>	<i>on</i>
<i>d, SP</i>	<i>80</i> (80% intensity)
<i>FEEd</i>	<i>on</i>
<i>d.L.OFF</i>	<i>OFF</i>
<i>FAn.S</i>	<i>HIGH</i>

To reset the fixture to the default personality settings:

1. Select the **df.SE** option from the **SPEC** function of the display (see **SPEC** above).
2. Press the **[ENTER]** button. The display will read **rSt** and the fixture will reset and begin a self-test sequence. During the reset, the fixture will make noise. This is normal. Once the entire self-test sequence has been completed, the fixture will return the personality settings to the default values and the display will read **RXXX**, where XXX is the DMX512 address for which it has been set.

## **Adj.**

– Adjust default positions of yoke and effects. Occasionally, for various reasons, the calibration of the moving parts within this fixture – yoke, color wheels, effects wheel, zoom lens, and shutters – may become slightly misaligned. You will know when this happens by looking at the output of the fixture. If some of the apertures for the color wheel, effects wheel, etc., are not centered in the beam correctly or if the default position of the yoke is not where it should be, then the *Adj.* setting may be used to remedy the problem. This setting allows you to make adjustments to each parameter individually.

To adjust the default setting of a particular parameter:

1. Select the *Adj.* option from the **SPEC** function of the display (see *SPEC* above).
2. Press the **[ENTER]** button.
3. Press the **[UP]** or **[DOWN]** button to select a parameter to adjust. The options are: *PAn*, *tilt*, *SPEd* (speed of movement), *CoLo* (color wheel), *CYAn*, *MAGe* (magenta), *YELL* (yellow), *CSPd* (color change speed), *MACr* (macros), *EFEC* (effects), *Zoom*, *Stro* (strobe), and *di Br* (dimmer).
4. Press the **[ENTER]** button. The display will show the current value in the range of 0 – 255.
5. Press the **[UP]** or **[DOWN]** button to adjust the setting to the desired value.
6. Press the **[ENTER]** button.
7. After setting each parameter that needs to be adjusted, press the **[UP]** or **[DOWN]** button until the display reads *F.CAL*.
8. Press the **[UP]** or **[DOWN]** button until the display reads *RES*. The fixture will reset and the newly adjusted values will be written to memory.
9. Press the **[MODE]** button twice to back out of the special functions mode.

## **J. Setting the DMX512 Address**

The DMX512 address for each fixture must be set in order for it to correctly respond to a DMX512 controller. Each fixture uses a block of 16 DMX512 channels in order to control all of its attributes such as pan, tilt, color, etc. In a system with multiple fixtures, each fixture should have a unique DMX512 address and the starting DMX512 addresses of consecutively addressed fixtures should allow for each 16-channel block of control channels. If, for example, four fixtures are to be addressed and the first one has a starting DMX512 address of 001, then the second should be addressed starting with 0017, the third, 0033, and the fourth 0049.

To calculate the correct DMX512 starting address, begin with the first address and add 16 channels for each fixture. Each address should be unique and the 16-channel blocks should not overlap.

It is often easier to set the DMX512 starting address on the ground before rigging the fixture in the air.



## II. Rigging the Fixture

The lamp should be installed, the fixture tested, and the DMX512 starting address set before rigging the fixture.



*Caution – Falling Hazard: Use extreme care when hanging fixture. Always use a qualified rigger. Always use two clamps and a safety cable.*



*Caution – Fire Hazard: Allow a minimum of 2 meters (79”) clearance from the lens to any flammable materials such as curtains or set pieces..*

Two Omega rigging brackets are shipped with the fixture. These brackets are necessary to properly rig the fixture.

Install a half-coupler or heavy-duty c-clamp with a minimum 500 pound (222 kg) capacity on *each* Omega bracket using SAE grade 8 or class 8.8 hardware. Insert a 3/8” bolt with a washer through the Omega bracket and into the clamp. Tighten securely.

Fasten the two Omega brackets with clamps under the base of the fixture by inserting both quarter-turn fasteners into the mounting holes on the bottom of the base and turning clockwise a full quarter turn. The fasteners should lock into place securely.

Insert a safety cable through the two openings in the center of the bottom of the base of the fixture.



*Caution: Never use the handles of the fixture for the safety cables. They are not rated for the dynamic load of the fixture.*

*Caution: Never lift the fixture by the yoke or head. Damage may occur. Instead, use the carrying handles.*

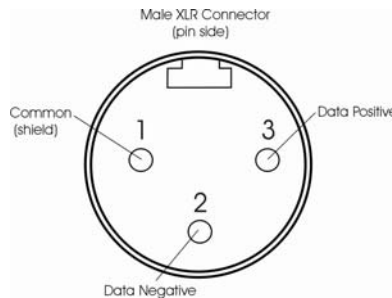
Hang the fixture on the rigging structure and tighten the two clamps securely. Loop the safety cable around the rigging structure and clip the ends together. The safety cable should now be rigged so that it will hold the weight of the fixture should the clamps or brackets fail.

### III. Cabling the Fixture

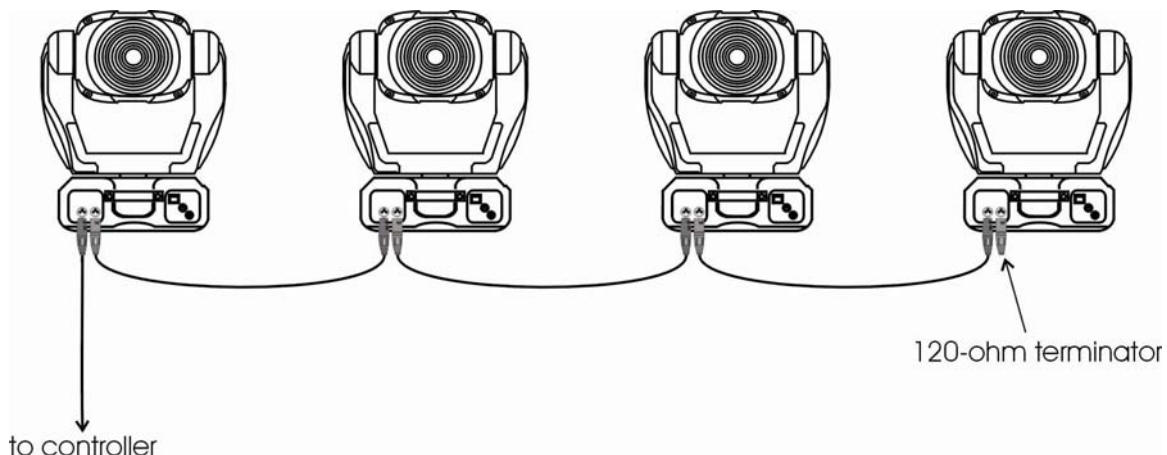
In addition to the power input connection, the fixture requires a data input from a control source. The control input to the fixture is a male 3-pin XLR connector that accepts a DMX512 control signal. The output is a female 3-pin XLR connector that passes the control data through to the next fixture.

The cable should be a low impedance data cable (not high impedance microphone cable) such as Belden 9841, ProPlex, or DuraFlex. The connectors should be wired according to the DMX512-1998 standard:

- pin 1 – common (shield)
- pin 2 – data complement (data 1-)
- pin 3 – data true (data 1+).



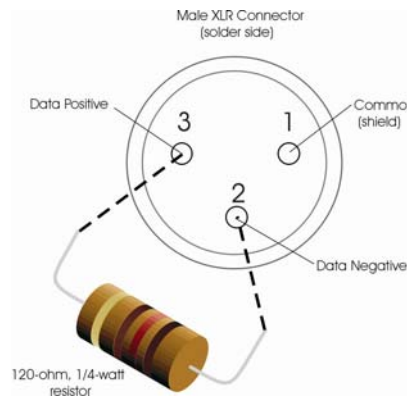
Run the control signal in a daisy-chain fashion starting from the controller and then to each fixture. The output of the controller connects to the input of the first fixture, the output of the first fixture connects to the input of the second fixture, and so on, all the way down the line. The last fixture in each chain should be terminated with a DMX512 data terminator.



#### A. Data Termination

A DMX512 data terminator is a connector with a 120 ohm, 1/4-watt resistor soldered across pins 2 and 3 of a 3-pin XLR connector. It helps prevent signal

reflections that distort and interfere with the control signal. A data terminator should be used at the end of every data run.



If groups of fixtures are separated by some distance, for example, some on the downstage truss, some on the upstage truss, some on the ground, then it is strongly advisable to use an opto-isolated data splitter to split the data signal and run a separate data line for each group. Remember to terminate each data run.



*Warning: Using more than one fixture without data termination may result in erratic behavior.*

## IV. Operating the Fixture

The fixture should be powered, addressed, and cabled properly before operating it with a controller. In order to control the fixture, the DMX512 protocol should be configured or imported from the fixture library, and each fixture should be patched in the controller. For instructions on how to do this, refer to the controller user manual.

The DMX512 protocol shown below indicates how each fixture attribute is mapped to its control channel.

### A. DMX512 Protocol

Channel (16-bit mode)	Channel (8-bit mode <sup>1</sup> )	Value	Function	Type	Default Value
1	1	0-255	<b>Pan</b>	Proportional	128
2		0-255	<b>Pan fine</b>	Proportional	128
3	2	0-255	<b>Tilt</b>	Proportional	128
4		0-255	<b>Tilt fine</b>	Proportional	128
5	3	0 1-249 250-255	<b>Speed (pan/tilt)</b> Max speed (tracking mode) Vector mode <sup>2</sup> (max – min) Blackout during movement <sup>3</sup> (tracking mode)	Proportional	0
6	4	0-127 128-139 140-229 230-239 240-255	<b>Control Channel</b> Fan speed (max-min) Lamp on (reset) No function Lamp off (3 second delay) No function	Proportional	0
7	5	0-17 18-35 36-53 54-72 73-90 91-108 109-127 128-190 191-192 193-255	<b>Color Wheel</b> Open/white Red Yellow Magenta Green Orange Medium Blue Light Magenta Open Scroll left (min-max)	Proportional	0
8	6	0-255	<b>Cyan</b> (white-max saturation)	Proportional	0
9	7	0-255	<b>Magenta</b> (white-max saturation)	Proportional	0
10	8	0-255	<b>Yellow</b> (white-max saturation)	Proportional	0
11	9	0-255	Color mix, dimmer <b>speed</b> (max-min)	Proportional	0
12	10	0-7 8-15	<b>Color Macros</b> Off Macro 1	Stepped	0

		16-23 24-31 32-39 40-47 48-55 56-63 64-71 72-79 80-87 88-95 96-103 104-111 112-119 120-127 128-135 136-143 144-151 152-159 160-167 168-175 176-183 184-191 192-199 200-207 208-215 216-223 224-231 232-239 240-247 248-255	Macro 2 Macro 3 Macro 4 Macro 5 Macro 6 Macro 7 Macro 8 Macro 9 Macro 10 Macro 11 Macro 12 Macro 13 Macro 14 Macro 15 Macro 16 Macro 17 Macro 18 Macro 19 Macro 20 Macro 21 Macro 22 Macro 23 Macro 24 Macro 25 Macro 26 Macro 27 Macro 28 Macro 29 Macro 30 Macro 31		
13	11	0-70 71-230 231-255	<b>Effects</b> Open Beam Shaper Frost	Stepped/ Proportional	0
14	12	0-255	<b>Zoom</b> (max-min)	Proportional	255
15	13	0-31 32-63 64-95 96-127 128-159 160-191 192-223 224-255	<b>Shutter/Strobe</b> Closed Open Strobe (slow-fast) Open Pulse effects Open Random strobe (slow-fast) Open	Stepped	255
16	14	0-255	<b>Dimmer</b> (min-max)	Proportional	255

<sup>1</sup> – To switch to 8-bit mode, see *Table 1* under **Setting the Fixture Personality**.

<sup>2</sup> – Vector mode moves the pan and tilt values from one setting to another at the speed designated by the control channel. When using the vector mode, the crossfade time on the controller should be set to zero. Using any other value will cause erratic movement as the fixture tries to “vectorize” the continual stream of position values coming from the controller.

<sup>3</sup> – Blackout during movement automatically closes the shutter while changing values of pan, tilt, color and gobo, and then re-opens it upon completion of the move.

After addressing, rigging, powering, and cabling the fixture, the controller should be connected and turned on. The DMX512 protocol of the fixture (channel/attribute assignments) should be written into the controller. It can either be taken from a built-in fixture library or built from scratch (see controller user manual for details). After the controller has been patched, then you should be able to take control of each fixture and change its parameters. Begin by making sure all of the lamps are on. Select all fixtures, and using the control channel (channel 6 in 16-bit mode, channel 4 in 8-bit mode), set the value between 128-139. You should see each fixture reset itself and in a couple of minutes you should see enough light leakage to know the lamps are on. If a fixture does not reset, check the power, data and control.

Once the lamps have all been turned on, test the controller/fixtures configuration to make sure you have control of each fixture. Select each fixture one at a time in sequence, make sure the shutter is open and the dimmer is at full, then check pan and tilt to make sure you have control of each fixture.

You are now ready to begin programming.

## V. Troubleshooting the Fixture

In the event that you should have trouble during set up or after the system has been in operation, there are a number of ways to isolate the problem and remedy the situation.

### A. Power Check

Whether a single fixture goes down or the entire system fails to respond, the first thing to do is to check the power. When the power is connected and the on/off switch is in the on position, the red power switch is illuminated. If the power switch is not illuminated, check the breaker panel to make sure the circuit is on and the breaker has not tripped. If it has tripped, turn it back on and see if it holds. If it does not hold, unplug the fixture and try it again. If it holds without the fixture plugged in but not when the fixture is plugged in, then the power supply in the fixture should be serviced.

If the circuit breaker has not tripped but the fixture is not powered, check the main fuse in the base of the fixture using a continuity checker.



Note: A visual inspection of the fuse does not always determine if it is good. The only positive way to check a fuse is with an ohm meter or a continuity checker.

Replace the fuse only with a 15-amp, 250V ¼" x 1-1/4" ceramic fast blow fuse such as a Buss ABC-15.

### B. Data Check

The second thing you should always check after checking power in a non-responsive fixture is the data connection. If the fixture is receiving data, then the menu display will be lit solidly. If there is no data, e.g. if the controller is turned off or if the data cable is unplugged or broken, then the menu display will blink slowly. If the menu display is blinking, then try unplugging the data cable from a nearby fixture and plugging it into the non-responsive unit. If that solves the problem, then chances are you have a bad data cable.

### C. Fixture Check

If the power and data are confirmed good yet the fixture is still unresponsive, then you can test the fixture by resetting it from the controller or using the demo mode in the menuing system. (See *demo* in **Setting the Fixture Personality** above)

## **D. Error Messages**

The fixture has some built-in diagnostic features that can help you isolate and repair problems internal to the fixture. It has an ability to display certain error message on the menu display that give an indication of any problems. The error messages are as follows:

**CoEr** – Color wheel error. The color wheel has a small magnet glued onto its circumference. It signals the magnetic sensor when the wheel is in the home position. Should the sensing circuit fail, either because the magnet is missing or the sensor has failed, then the color wheel error message will appear on the menu display. When that happens, the color wheel may not be positioned correctly.

**FAn** – Fan off. This message indicates that the fixture has overheated and the lamp and fan were automatically turned off.

*Note: This state can only occur in the event that the **Lo.F** option under **SPEC** was set to **oFF**. (See **Setting the Fixture Personality**)*

**FrEr** - Frequency error. This message will appear if the mains frequency is anything other than 50 or 60Hz.

**FtEr** – Fixture overheating error. If the fixture overheats the temperature sensor will automatically turn off the lamp and the fixture overheating error will be displayed. When the temperature drops to a suitable level, then the display will change to a heat error, indicating that the fixture will not attempt to ignite the lamp for five minutes. After the five minute time out, the heat error message will disappear and the fixture will automatically strike the lamp.

**HEAt** – Heat error. The lamp requires a 5 minute cool down period before it can be turned on again after it has been operating. If you try to turn on the lamp within five minutes of the lamp having been turned off, the heat error message will flash in the menu display. After a period of five minutes, the fixture will automatically try to ignite the lamp again. The heat error message will also appear if the lamp fails to ignite within 28 seconds of attempting to turn it on, indicating a possible lamp circuit problem (missing lamp, or bad lamp, ignitor or ballast).

*Note: If the **En.Sn** function (lamp light sensor – see **Setting the Fixture Personality**) has been turned **oFF** then the heat error message will only appear if the lamp has been turned off from the controller or the menu display and turned back on within five minutes. It will not automatically detect a lamp off condition should the lamp extinguish by itself.*



*Caution: In the event that the  $E_n.S_n$  function (lamp light sensor – see **Setting the Fixture Personality**) has been turned  $OFF$  and the lamp extinguishes by itself, then the software will not prevent the ignition of the lamp within the five minute window or if the lamp fails to ignite within 28 seconds of attempting to turn it on. Damage may occur from the high voltage ignition should the fixture receive repeated lamp on commands.*

**LAErr** – Lamp error. The lamp has failed to ignite seven times in a row. It is an indication that the lamp may be bad or missing, the fixture is overheating, which might be an indication that the ambient temperature is too high, or there is another problem with the lamp circuit such as a failure of the ignitor or ballast. Check the lamp, consider the ambient temperature or check the ignitor and ballast.

***Note:** This error message will be disabled if the  $E_n.S_n$  function (lamp light sensor) is turned off.*

**MBErr** – Motherboard error. The main PC board is not communicating correctly with the communications board. Check the main PC board and/or the comm board.

**PAErr** – Pan error. The panning mechanism has an optical encoder that signals the processor when the yoke has panned to the home position. Should the optical encoding circuit fail, then the pan error message will appear on the menu display. When that happens, the yoke may not be panned correctly.

**POErr** – Power error. If the power to the fixture is briefly interrupted, the display will indicate a power error.

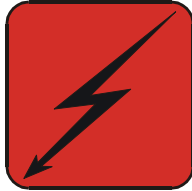
**SEnErr** – The fixture has a photoreceptor in the head that senses the presence or absence of light. If the sensor fails then the menu display will indicate a sensor error.

***Note:** If the  $E_n.S_n$  in the  $SPEC$  function of the personality settings is turned off, then this error message will be disabled.*

**TErr** – Tilt error. The tilt mechanism has an optical encoder that signals the processor when the yoke tilt has reached the home position. Should the optical encoding circuit fail, then the tilt error message will appear on the menu display. When that happens, the yoke may not be tilted correctly.

## VI. Maintenance and Cleaning

To insure proper operation of the fixture it is essential to keep it clean and free of dust, dirt and smoke fluid residue inside and out. Failure to do so can result in reduced air circulation and lower light output. Reduced air circulation will result in the build up of heat, which is very destructive to the fixture.



**Caution – Electric shock hazard: Before opening the fixture for cleaning, be sure to remove power from the unit. Disconnect the power cable before attempting to service or clean this fixture.**

To clean the fixture:

1. Remove the four thumb screws, two on top and two on the bottom of the fixture head.
2. Remove the two clamshell housing covers on the back of the fixture head.
3. Using a can of compressed air or an air compressor, blow out the inside of the fixture head to remove dust and dirt.

Caution: Do *not* use compressed air on the fans without first holding the blade to prevent it from spinning freely. Allowing the fan blades to spin rapidly could damage the internal electronics.

4. Using a soft lint-free cloth and alcohol-free glass cleaning fluid, clean all internal glass components including the reflector, infrared filter, dichroic filters and lenses.
5. Check for any loose components and tighten the fasteners.
6. Replace the covers and secure the four thumb screws.
7. Remove the screws securing the two covers on the base of the fixture.
8. Check for any loose components and tighten the fasteners, particularly the two ballasts and the transformer.
9. Replace the base covers.

## **VII. Technical Specifications**

### ***A. Power supply***

Magnetic ballast  
Voltage: 120VAC 60Hz  
Main fuse: T10, 10-amp, 250V ceramic slow blow  
Power consumption: 680VA  
Lamp: Philips MSR 575/2, MSD 575 or Osram HSR575/2  
Lamp base: GX9.5  
Color temperature: 7200K  
Average lamp life to 50% failures: 1000 hours

### ***B. Optical System***

Reflector: Dichroic glass coated parabolic  
Focus lens and variable zoom lens system  
200mm Fresnel lens  
Field angle: 24-35°  
Beam angle: 13° - 22.5°  
All lenses anti-reflection coated  
CMY color mixing  
31 color macros  
Color wheel: 7 dichroic colors plus open, variable speed rotation  
Effects wheel: beam shaper, frost  
Strobe: variable speed (1 - 10 flashes per second), preprogrammed macros with variable/random pulse effects  
Dimmer: micro-stepped dimming  
Frost  
Focus/Zoom: remote controlled focus, motorized zoom 24° - 35°

### ***C. Electronics***

Manual control via control panel with LED menu-driven display  
Fixture and lamp hour meter  
DMX512 input monitor  
Temperature monitoring  
Built-in error messaging  
Remote lamp switch - on/off  
Built-in demo sequences  
Remote fan speed adjustment  
Self-resetting thermal fuse  
3-pin XLR input/output for DMX

### ***D. Mechanical***

Pan: 530°

Tilt: 280°

Maximum pan speed: 530° in 4.5 seconds

Maximum tilt speed: 280° in 2.6 seconds

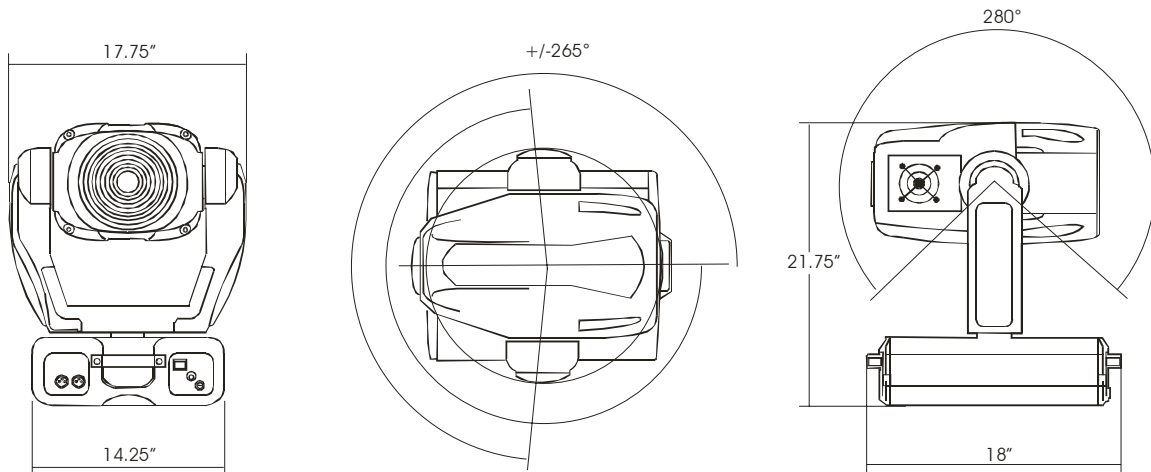
16-bit movement resolution

Automatic pan/tilt position correction

Rigging: floor mount or structural mount with two Omega clamps

Weight: 84 pounds

Dimensions:



### ***E. Operation***

Maximum ambient temperature: 40° C

Maximum internal temperature (head): 80° C

Optional Accessories

Clamps

Data cable

DMX512 data terminator

## VIII. Photometric Data

