1.01 WASH LIGHTING

A. General

1. The fixture shall be a compact, lightweight color-mixing LED wash fixture with 8 or 16 bit DMX control of intensity and color. The fixture shall be the Spectra Cube as manufactured by Altman Stage Lighting, Inc. or approved equal.

2. The fixture shall incorporate a state of the art microprocessor-controlled solid-state LED light engine incorporating Red, Green, Blue, Amber / White color LEDs, and an on-board power supply.

3. The fixture shall incorporate a single cell multi-channel design in combination with an LED engine to provide even coverage on vertical and horizontal surfaces through use of diffusion.

4. The fixture shall be incorporate silent, convection cooling without employing the use of fans or filters. Fixtures incorporating fan cooling systems generate unacceptable levels of noise are not equal and shall not be accepted.

5. IES Photometric files shall be available from the manufacturer to model light output using industry standard design software.

6. The fixture shall comply with USITT DMX-512 A and ANSI E1.20-2006 Remote Device Management over USITT DMX-512A Standard (RDM).

7. The fixture shall be ETL Listed to UL1573, and UL8750 LED for stage and studio use as well as Portable Electric Luminaires (UL Standard 153), Surface Mount Luminaires (UL Standard 1598).

8. Fixtures which do not comply with this specification shall not be accepted.

B. Physical

1. The fixture shall be constructed of 18-gauge steel and extruded aluminum componentry. Construction shall employ all corrosion-resistant materials and hardware and shall be free of pits and burrs.

    a. Standard Finish shall be Epoxy Sandtex black, electrostatic application and shall be available in white, black, and custom color finishes as specified.

    b. Power supply, cooling and electronics shall be integral to each unit.

c. The housing shall serve as a convection chimney when installed in a vertical or horizontal orientation to provide for convection cooling of the LED array, integral driver, and integral power supply.

2. Fixture dimensions shall be 8" (203.2mm) L x 11.25" (285.8mm) H x 6.13" (155.75mm) Dia. and weigh 8lbs (3.64kg).

3. The fixture shall incorporate an integrated rigid flat steel yoke with locking dog tilt handle shall be available for overhead pipe mounting.

   a. Pipe mounted fixtures shall be supplied with a cast iron C-clamp Altman #510 suitable for use on up to 2" (50mm) O.D. pipe. Clamp must incorporate a 360-degree rotational "safety stud" with locking bolt. Any clamp not offering this safety feature will not be acceptable.

   b. Fixtures shall be supplied with safety cable for use when securing the fixture to a pipe.

4. The design of the fixture shall allow for track mounting options and shall be ETL listed for track use.

5. Power supply, cooling and electronics shall be integral to each unit.

C. Thermal

1. The luminaire shall be cooled via natural convention with no aide of fans or other cooling systems.

2. Under normal operating conditions, the LED engine shall be capable of 50,000 hours rated lifespan to Led manufacturers recommended LM-70 / 70% maximum calibrated intensity with convective cooling, units utilizing active cooling shall not be accepted.

3. Ambient operating temperature shall be 32°F to 104°F (0 – 40 °C) non-condensing and IP-20 rated for indoor dry location use.

4. The LED substrate is coupled to a highly efficient heat sink and cooling system for prolonged life of the LEDs. LED fixture housing shall transfer heat from the LED board and associated electronics to the outside environment.

D. Electrical

1. The fixture shall be equipped with 100V to 240V 50/60 Hz auto-ranging internal power supply and requires power from a constant “non-dim” power source.

2. The fixture shall receive power from the track head mount or a hard wired power connection 5’-0” (1.5m) power cord with:
    a. 2 P&G (Stage Pin)
    b. NEMA 5-15P
    c. NEMA L520 (Twistlok)
    d. Territory Power Plug

E. Control and User Interface

1. A local control keypad with a three digit LCD display shall be provided for configuration and control of:
    a. DMX-512A Device Address
    b. Fixture Personality
    c. Stand Alone (Manual) Operation

2. It shall be possible to lock out the control keypad at the fixture to prevent accidental change in fixture configuration during operation. Locking and unlocking the control keypad shall be via predefined key sequence.

3. Each fixture shall be compatible with the USITT DMX512-A control protocol and ANSI E1.20-2006 Remote Device Management over DMX512-A (RDM) standard. DMX and RDM Control shall be connected via integral 6’ control leads with installed 5-Pin XLR input and output connectors for the portable units. Smart Track mounted units shall receive their data from the Track. Fixtures unable to meet this criteria shall not be accepted.

4. The DMX-512A device address for each fixture shall be user selectable.

5. It shall be possible to set the DMX-512A device address for the fixture while the fixture is installed and connected to the system via the RDM (ANSI E1.20-2006 protocol) and an appropriate device such as a PC or a handheld programmer.

6. Fixtures which do not allow for setting of the DMX address via both local controls at the fixture and remotely while installed via RDM shall not be accepted.

7. The fixture shall have an available “Master Channel” function to provide control of intensity without changing the color of the output of the fixture. The Master shall operate in either 8-bit or 16-bit resolution as defined by the configuration of the fixture.

8. The fixture shall have user selected personalities to correctly match response to the application and control system utilized. Personalities shall provide the following options which may be combined as desired:
    a. 8 or 16 Bit DMX operation
    b. Master Channel On / Off
    c. Smoothing On / Off
    d. Stand-alone effects
    e. Stand-alone fixed output

9. The fixture shall be capable of standalone operation, activated and configured at the control keypad. Standalone modes shall include the following:
    a. Fixed color temperature defined with local controls
    b. Strobe with user selectable color and speed
    c. Slave

F. Optical

1. Fixture shall feature a custom matrix of LED Cells to provide color or tunable white light or fixed white light. Variations of LED matrices to include:
    a. Red, Green, Blue, Amber
    b. Red, Green, Blue, White
    c. 3000, 6000 Kelvin white tune-able
    d. Fixed white (3000 or 6000 Kelvin)
    e. Custom arrays.

2. The fixture shall optimized for low saturate colors (pastels) as well as high saturate colors used in theatrical applications. Fixtures utilizing 3-color (Red, Green, and Blue) mixing systems cannot produce sufficient skin saturate ambers, lavenders, or oranges and shall not be accepted.

3. Lens assemblies shall be available in variations of:
    a. Prismatic spread lens

b. Linear spread lens

c. Light Blocking screens 20%, 30%, or 40%

G. Light Emitting Diodes

1. The fixture shall use a variety of LEDs for a wide range of color mixing or tuning for color models the standard configurations shall be Red, Green, Blue, and Amber LEDs or Red, Green, Blue and White LEDs. For white models the standard configurations shall be white LEDs at 3,000° Kelvin color temperatures or variable white between 3,000° and 6,000° Kelvin, with custom arrays available.

2. Manufacturer of LED systems shall utilize an advanced production LED binning process to maintain color consistency.

3. LED emitters should be rated for nominal 50,000 hour LED life

4. LED system shall comply with all relevant patents.

H. Dimming Engine

1. Luminaire shall provide full range dimming performance based upon its DMX input control signal and configuration and shall be equipped with an LED system compatible with standard 8-bit and 16-bit input, with high resolution dimming.

2. Dimming curves shall be optimized for smooth dimming at low intensities and over longer timed fades.

3. LEDs shall be driven by Pulse Width Modulation. (PWM)

4. Additional smoothing algorithms shall be available to augment the high resolution dimming engine

END SPECIFICATION