

## 1.01 RECESSED DOWN LIGHTING

### A. General

1. The fixture shall be an LED fixture with either DMX or Mains Dimmable control. The fixture shall be the Chalice down light 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, and on-board power supply.
3. The fixture shall incorporate silent, convection cooling without employing the use of fans or filters.
4. The fixture shall utilize a high efficiency lenses to determine beam angle and shape.
5. IES Photometric files shall be available upon request from the manufacturer to model light output using the 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) for DMX controlled models.
7. The fixture shall be UL1573, and UL8750 LED listed for stage and studio use.
8. Fixtures which do not comply with this specification shall not be accepted.

### B. Physical

1. The fixture shall be constructed of a spun aluminum housing with steel fittings and attachment components, all free of pits and burs.
2. Standard finish shall be Epoxy Sandex White, electrostatic application. The fixture shall be available with optional Black and White colors with additional custom color finishes available upon request.
3. Power supply, cooling and electronics shall be integral to each unit.

4. Mounting options shall be in a new construction NON-IC tray mounted for low profile ceiling applications
5. The housing shall serve as a directional chimney to guide heat away from the LED array, integral driver and integral power supply.
6. The LED substrate is coupled to a highly efficient heat sink cooling system

C. Thermal

1. The luminaire shall be cooled via natural convection 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 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.

D. 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 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.
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" 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

E. Optical

1. Fixture shall feature a custom matrix of LEDs 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

- e. Custom arrays.
  2. All lenses to feature cosine beam and field distribution and feature a 4:1 beam to field distribution ratio.
  3. Lens assemblies shall be available in variations of:
    - a. 20 degree
    - b. 30 degree
    - c. 40 degree
    - d. 60 degree
    - e. 22 degree diffusion
- F. 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.
- A. 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 algorithm shall be available to augment the high resolution dimming engine

END SPECIFICATION

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