

**STATE OF NEW JERSEY
DEPARTMENT OF TRANSPORTATION
TRENTON, NEW JERSEY 08625**

**METRIC SPECIFICATIONS FOR A LED (LIGHT EMITTING DIODE)
PEDESTRIAN-COUNTDOWN SIGNAL MODULE**

N.J. Specification No. EBM-LED-PEDCSM

Effective Date: October 14, 2004

New Jersey Department of Transportation Specifications for LED (Light Emitting Diode) Pedestrian-Countdown Signal Module.

The purpose of these specifications is to describe minimum acceptable requirements for an LED (Light Emitting Diode) Pedestrian-Countdown Signal Module.

GENERAL - I

1-1 LED pedestrian-countdown signal modules shall conform to the following:

- A. Manual on Uniform Traffic Control Devices (MUTCD).
- B. Applicable provisions of the current specification of the Institute of Transportation Engineering (ITE) standard titled Vehicle Traffic Control Signal Heads – Part 2: Light Emitting Diode (LED) Vehicle Traffic Signal Modules (VTCSH Part 2).
- C. Current specification of the Institute of Transportation Engineering (ITE) Standard titled Pedestrian Traffic Control Signal Indications (PTCSI).
- D. FCC Title 47, Subpart B, Section 15 on the Emission of Electronic Noise.
- E. Current NEMA Standard TS-1 for operational compatibility.

The manufacturer must supply certification, which includes a copy of the test report by an independent technical laboratory as to the module compliance with ITE specifications (where it applies). The report shall also indicate that the tests were performed only after the modules received a thirty (30) minute operational warm-up period immediately preceding the tests.

CONSTRUCTION - II

2-1 The LED module shall replace the reflector, socket, gasket and lens assembly of the incandescent signal indication as specified in current New Jersey Department of Transportation Specification EBM-PS-1 "Specification for Adjustable Face Pedestrian Signal Heads Incandescent Type Legend – Walk – Don't Walk."

- 2-2 The LED module shall be watertight when properly mounted in the traffic signal housing and shall not allow the ingress of water into any section of the traffic signal assembly. A continuous soft rubber or silicone gasket completely surrounding the unit shall be provided with each unit.
- 2-3 The LEDs and required circuit components shall be encased in a rigid housing for protection in shipping, handling and installation.
- 2-4 The lens shall be smooth-surface, frosted (to prevent sun phantom) ultraviolet stabilized material. If polycarbonate material is used, the lenses must have a protective coating for scratch resistance.
- 2-5 AllInGaP (Aluminum Indium Gallium Phosphorus), Portland Orange (amber hand and countdown numbers) LEDs shall be utilized. The substrate material maybe either transparent or absorbing. The white LEDs (white man) shall be InGaN (Indium Gallium Nitide).
- 2-6 The LED module shall display a solid Portland orange hand and lunar white man and two seven inch minimum Portland orange countdown numbers (00-99).
- 2-7 The LED module must be certified to have passed the Environmental Simulation Vibration Test (MIL-Std 883 Method 2007).
- 2-8 The LED module shall be made of UL94VO flame retardant materials.
- 2-9 The colors of the LED module shall conform to chromaticity requirements of Section 5.3 and Figure C of the PTCSI Standard.

ELECTRICAL - III

- 3-1 The LED module shall connect directly to the line voltage, 120 volts nominal, and shall be able to operate over the voltage range of 80 -130 volts AC. The variation in line voltage shall not cause the light intensity to vary by more than 10% over the entire operating voltage range.
- 3-2 The Portland Orange hand and two countdown numbers and lunar white man shall consume no more than 11 Watts.
- 3-3 The LEDs shall operate over the temperature range of -40 °C to +74 °C.
- 3-4 The forward current, as measured through each LED, shall not exceed 60% of the LED manufacture's maximum current rating when operating at 25 °C.
- 3-5 The LEDs shall be wired in series parallel strings. The failure of any one LED, and its associated string of LEDs, shall not cause the loss of more than 20% of the light output of the complete LED module.
- 3-6 The LEDs shall not emit visible light when subjected to a 120 volt AC, 4 milliamp leakage current from a NEMA solid-state load switch (load switch in the off state).

- 3-7 Transient voltage suppression/protection shall be provided internal to the LED module to minimize the possibility of damage due to extreme over voltage.
- 3-8 The LED module shall be operationally compatible with current NEMA TS-1 type controllers and conflict monitors.
- 3-9 The LED module shall be supplied with three conductors one (1) meter in length for each connection to the terminal board of the traffic signal indication. Each conductor shall be 600 volt, stranded No. 20 AWG minimum copper wire, rated for service at +105 degrees C, capable of withstanding all adverse effects of moisture, corrosive atmosphere and temperatures associated with the operation of the signal head. Spade lugs shall be installed on the ends of each conductor.

INSTRUCTION AND GUARANTEES - IV

- 4-1 Upon request, one schematic wiring diagram and installation manual shall be provided with each LED module.
- 4-2 No changes or substitutions in these requirements will be accepted unless authorized in writing. Inquires regarding this specification shall be addressed to the Manager, Office of Traffic Signal and Safety Engineering, New Jersey Department of Transportation, 1035 Parkway Avenue, CN 613, Trenton, New Jersey 08625.
- 4-3 LED pedestrian-countdown signal modules shall be replaced or repaired if an LED pedestrian signal module fails to function as intended due to workmanship material defects within the first 60 months from the date of delivery.
- 4-4 The company agrees upon the request of the Manager, Office of Traffic Signal and Safety Engineering to deliver to the Office, a sample of the LED module to be supplied in compliance with these specifications for test before acceptance. After completion of the test, the sample shall be returned.