

**San Francisco**  
**2009 Type 1 Traffic Signal, Pedestrian, & Symbol Specification**  
**Rev. 5/13/2009 Ed Timmer**

**I. Type 1 BALL VEHICLE LED**

- A. 8" and 12" ball vehicle signal LED's shall comply with the Type 1 LED signal modules specifications from the Institute of Transportation Engineers Vehicle Traffic Control Signal Heads (VTCSH) LED Circular Signal Supplement June 7, 2005 see

[http://www.ite.org/standards/VTCSH\\_LED\\_Circular\\_Signal\\_Final.pdf](http://www.ite.org/standards/VTCSH_LED_Circular_Signal_Final.pdf))

and included in the Intertek ETL LED certification program see

[www.intertek-etlsemko.com/ledtraffic](http://www.intertek-etlsemko.com/ledtraffic) or [http://www.intertek-etlsemko.com/portal/page/cust\\_portal/ITK\\_PGR/DOCUMENTS\\_PROD\\_PG/LED\\_Directory\\_Traffic\\_Signal\\_Modules\\_Certified\\_Products.pdf](http://www.intertek-etlsemko.com/portal/page/cust_portal/ITK_PGR/DOCUMENTS_PROD_PG/LED_Directory_Traffic_Signal_Modules_Certified_Products.pdf) with

the following provisions:

1. All modules are to be water tight and resist wicking water into the housing where wires or terminals penetrate the housing. Each unit shall be sealed by use of an O-ring gasket compressed radially or have a lens permanently sealed in production. Screwed on front lenses are not allowed.
2. All modules shall have a visual appearance similar to an incandescent lamp. They shall have a smooth, uniform, non-pixelated appearance. The LED module shall use Hi Flux LED's as a centralized light source. No 5mm LED's shall be used.
3. All modules shall be warranted for 5 years. The warranty must include workmanship, materials, and the modules must maintain minimum luminance intensity as per the ITE VTCSH-LED Circular Signal Supplement 4.1.1 for all colors throughout the warranty period.
4. LED modules must be GE GT1 (-17A) or Dialight X/XL series part numbers or other accepted equal.
5. All modules on-board circuitry shall include voltage surge protection to withstand high-repetition noise transients and low-repetition, high-energy transients as stated in NEMA Standard TS-2-2003 section 2.1.8. In addition the module shall comply with the following standards: 1) IEC 1000-4-5, ANSI/IEEE C62.41.2-2002 at 3KV with a 2 ohm source impedance, and 2) IEC 1000-4-12 & ANSI/IEEE C62.41.2-2002 at 6KV, 30 Ohms, 200A, and 100 kHz ring wave.

6. For uniformity of appearance the unlit lens shall be the color of the LED output and the manufacturer and must comply with the specifications for all three colors in both 8" and 12" sizes.
7. Each LED module shall have a readily discernable date or easily decipherable date code on it to indicate month and year of manufacture for warranty ascertainment purposes.

## II. Type 1 ARROW VEHICLE LED'S

- A. 12" vehicle signal arrow LED's shall comply with the Type 1 LED vehicle signal arrows modules specifications from the Institute of Transportation Engineers Vehicle Traffic Control Signal Heads (VTCSH) LED Vehicle Arrow Traffic Signal Supplement July 1, 2007 see <http://www.ite.org/standards/> and included in the Intertek ETL LED certification program see [www.intertek-etlsemko.com/ledtraffic](http://www.intertek-etlsemko.com/ledtraffic) or [http://www.intertek-etlsemko.com/portal/page/cust\\_portal/ITK\\_PGR/DOCUMENTS\\_PROD\\_P/G/LED\\_Directory\\_Traffic\\_Signal\\_Modules\\_Certified\\_Products.pdf](http://www.intertek-etlsemko.com/portal/page/cust_portal/ITK_PGR/DOCUMENTS_PROD_P/G/LED_Directory_Traffic_Signal_Modules_Certified_Products.pdf) with the following provisions:
  1. All modules are to be water tight and resist wicking water into the housing where wires or terminals penetrate the housing. Each unit shall be sealed by use of an O-ring gasket compressed radially or have a lens permanently sealed in production. Screwed on front lenses are not allowed.
  2. All modules shall have a visual appearance similar to an incandescent lamp. They shall have a smooth, uniform, non-pixelated appearance.
  3. All modules shall be warranted for 5 years. The warranty must cover workmanship, materials, and the modules must maintain minimum luminance intensity as per the ITE VTCSH- LED Vehicle Arrow Traffic Signal Modules specification for all colors throughout the warranty period.
  4. LED modules must be GE GT1 (-17A) or Dialight X/XOD series part numbers or accepted equal.
  5. All modules on-board circuitry shall include voltage surge protection to withstand high-repetition noise transients and low-repetition, high-energy transients as stated in NEMA Standard TS-2-2003 section 2.1.8. In addition the module shall comply with the following standards: 1) IEC 1000-4-5, ANSI/IEEE C62.41.2-2002 at 3KV with a 2 ohm source impedance, and 2) IEC 1000-4-12 & ANSI/IEEE C62.41.2-2002 at 6KV, 30 Ohms, 200A, and 100 kHz ring wave.
  6. For uniformity of appearance the unlit lens shall be the color of the LED output and the manufacturer must comply with the specifications for all three colors.
  7. Each LED module shall have a readily discernable date or easily decipherable date code on it to indicate month and year of manufacture for warranty ascertainment purposes.

8. Arrow LED's shall be omni-directional. They shall be capable of being displayed in any angle of orientation from horizontal to vertical.

### III. PEDESTRIAN LED COUNTDOWN MODULES 16" x 18"

A. Countdown pedestrian signal LED modules shall comply with current LED pedestrian signal modules specifications from the Institute of Transportation Engineers Pedestrian Traffic Control Signal Indications (PTCSI) Part 2: LED Pedestrian Traffic Signal Modules (Adopted March 19, 2004) ( and included in the Intertek ETL LED certification program see [www.intertek-etlsemko.com/ledtraffic](http://www.intertek-etlsemko.com/ledtraffic) or [http://www.intertek-etlsemko.com/portal/page/cust\\_portal/ITK\\_PGR/DOCUMENTS\\_PROD\\_PG/LED\\_Directory\\_Traffic\\_Signal\\_Modules\\_Certified\\_Products.pdf](http://www.intertek-etlsemko.com/portal/page/cust_portal/ITK_PGR/DOCUMENTS_PROD_PG/LED_Directory_Traffic_Signal_Modules_Certified_Products.pdf) with the following provisions:

1. The ITE specification and the Intertek ETL testing and certification apply for the Hand/Person characteristics only. Additions and modifications to the ITE specification for countdown characteristics are stipulated in this document.
2. LED modules must be GE GT1(-26A) or Dialight X series part numbers or other approved by the City and County of San Francisco prior to bid advertisement.
3. All modules shall have a visual appearance similar to an incandescent lamp. They shall have a smooth, uniform, non-pixelated appearance. Hand and Person icons are to appear solid. No outline icons are allowed.
4. The module shall display the correct countdown display when a Walking/Person follows a Flashing Red/Hand without an intervening display of Solid Red/Hand. The countdown display shall be able to countdown two or more times concurrent with the same "GREEN" vehicle phase.
5. The module shall countdown through Flashing Red/Hand only. No mode switch need be provided which would enable other countdown display choices.
6. All modules are to be water tight and resist wicking water into the housing where wires or terminals penetrate the housing.
7. All modules on-board circuitry shall include voltage surge protection to withstand high-repetition noise transients and low-repetition, high-energy transients as stated in NEMA Standard TS-2-2003 section 2.1.8. In addition the module shall comply with the following standards: 1) IEC 1000-4-5, ANSI/IEEE C62.41.2-2002 at 3KV with a 2 ohm source impedance, and 2) IEC 1000-4-12 & ANSI/IEEE C62.41.2-2002 at 6KV, 30 Ohms, 200A, and 100 kHz ring wave.
8. Conductors shall be 1 meter (3.3 ft) in length, with fully insulated female quick disconnect terminals attached to a 6.35 mm (.25") tab, and conform to Section 86-4.01C, "Electrical Components," of the Caltrans

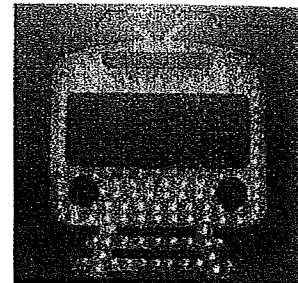
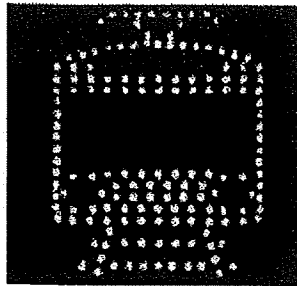
Standard Specifications. (Additional information to Caltrans LED pedestrian specification section 2.7)

9. The countdown display timer shall count down the duration of the "Flashing Raised Hand" phase. The controller shall provide 95% accurate whole second values for such durations. The countdown numerical display shall not flash.
  10. The LED timer may have a dipswitch, which would enable / disable the countdown display.
  11. The countdown display shall be two digits, and the numbers 00 to 99 on the numerical display shall have a minimum height of 229 mm (9 inches) and a minimum width of 178 mm (7 inches) and a segment width of 17.78 mm (0.7 inches) and shall be Portland Orange in color.
  12. The Hand & Man icons shall be 297 mm (11 inches) high and 178 mm (7 inches) wide.
  13. The countdown timer shall utilize the standard 3 field wire configuration found in a typical pedestrian signal head; a neutral wire, a hot wire for the walking man, and a hot wire for the solid/flashing hand.
  14. The Hand and Man icons shall be superimposed on each other to the left of the countdown numerals as viewed from the front.
  17. When displaying the countdown number "1" only the far right vertical line of the countdown display shall light and for the number "11" only the right vertical section of both countdown numerals shall light.
  15. During initial power up or any other "Flashing Red Hand" interval change, when the countdown module requires 1 to 3 signal cycles to "learn" the programmed countdown, the countdown portion of the display shall remain off.
  16. The countdown numerical indication's highest value displayed shall consistently equal the total length of the flashing red hand period from the intersection controller, even if the 1<sup>st</sup> and last half cycle of flashing red hand are less than 0.5 seconds. Countdown values shall be consistent when driven by any Type 170, any NEMA Type TS1, any NEMA TS2 Type 1, any Type 2070, Eagle EPIC 140, TCT LS-186 or 248, TCT LMD-40 controller.
  17. The countdown pedestrian module shall employ two separate power supplies for the Hand and Man icons. This is to guarantee that only the icon which is powered on by the intersection controller will light and not both or the other icon. The power supplies shall be integral to the pedestrian LED module.
  18. Each LED module shall have a readily discernable date on it to indicate month and year of manufacture for warranty ascertainment purposes.
  19. Dimming circuitry is not required in the Countdown LED Pedestrian Modules.
- IV. **Type 1 SYMBOL LED's** (All Symbol LED's shall be warranted for five years and all items shall be traceable by serial number and shall have a manufacture date.)

- 12" R/R X-Buck:
1. All modules shall have a visual appearance similar to an incandescent lamp. They shall have a smooth, uniform, non-pixelated appearance. The lens shall be tinted the color of its LED display.
  2. Modules shall be moisture resistant to the MIL-STD-810F specification.
  3. Operating Temperature shall be -40 to +70 degrees Celsius.
  4. Modules shall meet the NEMA TS-2 transient protection specification and shall be FCC compliant.
  5. Modules shall be designed to operate in the range of 80 to 135vac at 60 Hz.
  6. LED modules must be Leotek TSL-12R-LX-IL3-XB-A1 or TSL-12G-LX-IL2-XB-A1 part numbers or other approved by the City and County of San Francisco prior to bid advertisement.
  7. Each cross-arm of the "X" shall be 1" (inch) wide by 10" (inches) long.
  8. The X-Buck lamps shall be either green or red.
- 12" Transit "T":
1. All modules shall have a visual appearance similar to an incandescent lamp. They shall have a smooth, uniform, non-pixelated appearance. The lens shall be tinted the color of its LED display.
  2. Modules shall be moisture resistant to the MIL-STD-810F specification.
  3. Operating Temperature shall be -40 to +70 degrees Celsius.
  4. Modules shall meet the NEMA TS-2 transient protection specification and shall be FCC compliant.
  5. Modules shall be designed to operate in the range of 80 to 135vac at 60 Hz.
  6. LED modules must be Leotek TSL-12R-LX-IL3-XB-A1 or TSL-12G-LX-IL2-XB-A1 part numbers or other approved by the City and County of San Francisco prior to bid advertisement.
  7. The riser in the "T" shall be 1" (inch) wide by 6" (inches) long. The top bar of the "T" shall be 1" wide by 8" long. The riser and top bar shall be separated by a 1" (inch) gap.
  8. "T" lamps shall be red or white.
- 16" X 18" Trolley Car Coming:
1. The module shall fit in a standard 16" (inches) by 18" (inches) pedestrian housing. It shall seal in weather tight when the housing is closed.
  2. The symbol is a white silhouette front view of a trolley car on rail tracks. It shall measure 11.5" (inches) tall by 9 1/2" (inches) wide.
  3. LED modules must be Leotek TP16R-LW part number or other approved by the City and

County of San Francisco prior to bid advertisement.

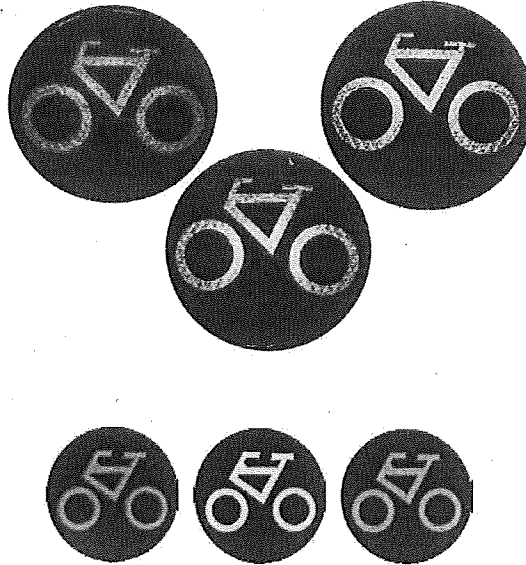
4. Display May be pixilated in appearance.
5. Modules shall be designed to operate in the range of 80 to 138vac at 60 Hz and use 12 watts.
6. Symbol Image:



- 12" R/R White Bar:
1. The display may be pixilated in appearance.
  2. Modules shall be moisture resistant to the MIL-STD-810F specification.
  3. Operating Temperature shall be -40 to +70 degrees Celsius.
  4. Modules shall meet the NEMA TS-2 transient protection specification and shall be FCC compliant.
  5. Modules shall be designed to operate in the range of 80 to 135vac at 60 Hz.
  6. The bar symbol shall measure 1 ½" (inches) wide by 9" (inches) long and shall be omnidirectional. It can be displayed in any angle of orientation from horizontal to vertical.
  7. LED modules must be GE TR6-WC5H-01A-51 part number or other approved by the City and County of San Francisco prior to bid advertisement.

- 12" Bicycle:
1. All modules shall have a visual appearance similar to an incandescent lamp. They shall have a smooth, uniform, non-pixilated appearance. The lens shall be tinted the color of its LED display.
  2. The lamp shall not require the user installation of an internal or external mask to display the bicycle symbol.
  3. Modules shall be moisture resistant to the MIL-STD-810F specification.
  4. Operating Temperature shall be -40 to +70 degrees Celsius.
  5. Modules shall meet the NEMA TS-2 transient protection specification and shall be FCC compliant.
  6. Modules shall be designed to operate in the range of 80 to 135vac at 60 Hz.

7. LED modules must be Leotek TP12A-BA-IL or TP12A-BB-IL or TP12A-BC-IL or Excellence Opto. Inc. TRB-R12E-E2T or TRB-Y12EG-E2T or TRB-G12EG-E2T part numbers or other approved by the City and County of San Francisco prior to bid advertisement. In order to be approved, the bicycle icon in any brand bidding must match these signals bicycle icon. See acceptable samples below:



- 12" Yellow Ball 12vdc:
1. Lamps shall operate in the range of 9vdc to 15vdc.
  2. Operating Temperature shall be -40 to +70 degrees Celsius.
  3. Modules shall meet the NEMA TS-2 transient protection specification and shall be FCC compliant.
  4. Modules shall be suitable for use in solar powered beacons.
  5. LED modules must be GE DR6-YTFB-23B or Dialight 431-3230-005 part numbers or other approved by the City and County of San Francisco prior to bid advertisement.

- V. Testing and warranty information for LED vehicle and pedestrian modules shall be submitted as follows:
1. Manufacturer's testing data shall be submitted to DPT Traffic Engineer at DPT, 1 South Van Ness Avenue, 7<sup>th</sup> Floor, SF CA 94103-5417.
  2. All warranty documentation shall be given to DPT Traffic Engineer at DPT, 1 South Van Ness Avenue, 7<sup>th</sup> Floor, SF CA 94103-5417
  3. Pedestrian LED modules shall be tested and approved for by the San Francisco MTA DPT Traffic Signal Shop, 901 Rankin Street, CA 94124 prior to bid advertisement.