



**Public Works Department
Lighting District**

**Supplemental Specifications for
Flashing Beacon Installations
December 2018**

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**CHARLOTTE COUNTY LIGHTING DISTRICT
SUPPLEMENTAL SPECIFICATIONS FOR
SOLAR SCHOOL FLASHING BEACON INSTALLATION**

December 2018

PURPOSE:

All work associated with the design and installation of school flashing beacons and rectangular rapid flash beacon (RRFB) shall conform to current Florida Department of Transportation (FDOT) Design Standards, the most current edition of the Manual on Uniform Traffic Control Devices (MUTCD), the National Electrical Codes (NEC), and/or this supplement. It is the intent of this supplement to detail installation requirements, dictated by the County, which exceed standard FDOT and NEC requirements. It is the Engineer of Record and Contractor's responsibility to note these extended specifications and to adhere to the methods and requirements mandated in this document. Included within this document is a photo illustrating the intended appearance of the finished product.

WORKMANSHIP:

All work is to be performed in a workmanlike manner. It is the Contractor's responsibility to provide the labor, skilled in the appropriate areas, necessary to provide an acceptable and professional finished product. The Contractor and his personnel shall have, at all times, all the necessary paperwork needed to complete the job. It is expected that plumb surfaces shall be plumb. Spacing of multiple components, such as conduit stubs or straps, shall be in equal increments. All materials shall be in new or like-new condition.

All school flashing beacon poles shall be leveled to the satisfaction of the Lighting District Inspector.

QUALIFICATION OF SIGNAL CONTRACTOR PERSONNEL:

The Contractor who is engaged in installing traffic signals within Charlotte County shall have all work performed under the supervision of a technician certified by the International Municipal Signal Association (I.M.S.A) as a Level II, Traffic Signal Technician Construction or Field. All cabinet-related work shall be performed by an I.M.S.A. Level II Technician, certified in traffic signals. This certification shall be presented at the pre-construction conference or upon request. This technician shall be present on-site during any traffic control device installation activities.

During all working hours, the Contractor shall have a responsible, English-speaking superintendent on the project, with the capabilities and authority required by FDOT. Specifications, Section 5-8.

Employees shall be trained in and familiar with the safety related work practices, safety procedures, and other safety requirements that pertain to their respective job

assignments per OSHA Standard 1910 – Electrical and Federal Register 29 CFR Part 1926 Cranes and Derricks in Construction; Final Rule. Employees shall also be trained in and familiar with any other safety practices, including applicable emergency procedures that are not specifically addressed, but are related to their work and are necessary for their safety.

RESPONSIBILITY OF SIGNAL CONTRACTOR PERSONNEL:

Charlotte County Lighting District Inspection staff shall be notified in writing either via form letter (to: Charlotte County Lighting District, 7000 Florida St., Punta Gorda, FL 33950) or e-mail (LightingInspector@CharlotteCountyFL.gov) a minimum of 72 hours prior to the commencement of jobs that include overhead or underground work that will be conducted as part of construction or maintenance projects within the Charlotte County or State road right of way.

Charlotte County Lighting District inspection staff shall be notified in writing either via form letter (to: Charlotte County Lighting District, 7000 Florida St., Punta Gorda, FL 33950) or e-mail (LightingInspector@CharlotteCountyFL.gov) a minimum of 24 hours prior to any and all daily work to be performed throughout the entire length of construction or maintenance projects. Any changes that necessitate the rescheduling of work that has been previously scheduled shall be provided in writing via e-mail no later than the morning that it was to be performed.

For new traffic control devices, conditional acceptance and inspection will be scheduled with Mr. Andrew Amendola of the Charlotte County Lighting District, 941.575.3648, before the signal is placed in the normal operational mode. Notification is also required before placing the traffic control device into operation.

The Contractor shall submit cut sheets on all materials proposed for the installation of a traffic control device. The material submittal will be reviewed by Charlotte County for conformance and returned to the Contractor within five business days.

The Charlotte County Lighting District Inspector assigned to the project shall have the authority to make final determinations on whether workmanship, materials, and/or final product(s) meet the specifications contained herein.

The Contractor shall be responsible for coordinating with all utilities having overhead or underground facilities in close proximity or possible conflict with the Contractor's excavations and underground cable installation. The Contractor shall notify all utility companies and maintaining agencies 48 hours in advance of commencing work. Hand digging will be required in all areas where the utilities stake or locate a possible conflict, or where hand digging is specified on the plans. The exact location of utilities shall be determined by the Contractor, when necessary, during construction.

TRANSFER OF MAINTENANCE:

Once the Contractor has begun any work on any portion of the project, all traffic control devices, including interconnect, within the project limits of this contract shall become the full responsibility of the Contractor.

Whenever a new traffic control device is to be installed at a location where no device exists, the installing Contractor will assume full responsibility for the maintenance of said device from the time of activation of the device until such time as a final inspection is completed by the County and the installation is accepted.

Should a signal malfunction occur, the Contractor shall respond within 2 hours of notification and repair the traffic control device so that it is operating in a safe manner. The Contractor shall be responsible for the permanent repair and shall notify the County of the completion of the repairs within 24 hours. If the Contractor fails to respond within 2 hours, the County reserves the right to either repair the malfunction or employ alternate personnel and charge all costs incurred by Charlotte County to the Contractor. Authorized Charlotte County personnel may, at any time, enter the controller cabinet in order to restore any and all signal equipment to proper operation, if the malfunction or non-function of such equipment poses a hazard or inconvenience to motorists or pedestrians. Such authorized entry may occur at any time within the period of the contract, and such authorized entry shall in no way relieve the Contractor or manufacturer of his respective warranties.

The Contractor shall be responsible for coordinating with all utilities having overhead or underground facilities in close proximity or possible conflict with the Contractor's excavations and underground cable installation. The Contractor shall notify all utility companies and maintaining agencies 72 hours in advance of commencing work. Hand digging will be required in all areas where the utilities stake or locate indicates a possible conflict or where hand digging is specified on the plans. The exact location of utilities shall be determined by the Contractor, when necessary, during construction.

Traffic shall be maintained in accordance with the "Manual on Uniform Traffic Control Devices" and "Roadway and Traffic Design Standards" and as designated in the plans. Existing signalization shall remain in place to the longest extent possible and shall be used for maintenance of traffic as required. Except as approved by the County, there will be no lane closures or signal shutdowns during the following periods:

- Monday through Friday, from 7:00 a.m. until 9:00 a.m. and from 4:00 p.m. until 6:00 p.m., or as specified on the local agency permit documents.

The Contractor will be permitted to work in the roadway during all other time periods, unless informed otherwise by the County. Under no circumstance shall the Contractor close more than one lane without approval of the County.

CONCEALED WORK:

All work which will not be readily visible upon completion shall not be concealed until a County Lighting Inspector gives approval. In the event the below items are concealed, it will be the Contractor's responsibility to expose the questioned item(s) for the Inspectors' approval, at no additional cost to the County. This includes, but is not limited to:

- Buried or imbedded conduit
- Ground wire, rods, and array
- Leveling nuts before grouting

SURFACE TREATMENTS:

The application of the following materials to various solar school flashing beacon components shall be performed during assembly:

- Threaded Hardware: All non-electrical threaded hardware (i.e., all Astro Brac hardware, pole hardware, or any threaded surface) shall be coated with Ideal Noalox Anti-Oxidant Compound or County-approved equivalent. The amount of Noalox being applied shall be sufficient to be visibly seen.
- Gasketing Surfaces: All gasket surfaces shall be lightly coated with County-approved silicone grease.
- Electrical Connections: All mechanical/electrical connections shall have the various components of the splice or termination coated with a County-approved oxide inhibitor.
- Weatherproofing: Irregular mating surfaces shall be rendered weatherproof by applying an appropriate bead of clear silicone caulk, such as Silicone II or County-approved equivalent. The areas to be sealed are those which are typically prone to moisture infiltration.
- Cable Entry/Exit: Wherever a cable enters or exits a field-drilled hole, the hole shall be protected by a permanently-installed rubber grommet.

GROUNDING:

Minimum size of all ground/bond wire will be stranded #6 AWG. Bare wire will not be accepted inside a conduit. Ground wire shall be attached to the ground rod by means of a grounding acron with a hex bolt. Exothermic bonding of ground wire to ground rods will not be acceptable. Multiple conductors shall not be joined together with a grounding acron. One conductor shall be terminated under the acron, and all others shall be joined with a split bolt. The grounding wire shall be attached to the pole base by means of a solderless lug.

All ground rods shall be 5/8" x 10', copper clad bonded to a steel core.

BASE AND POLE:

Unless otherwise specified, solar school flashing beacons and rectangular rapid flashing beacons shall be mounted onto a square pedestal base with an aluminum door using Pelco, part #PB 5334. The base assemblies shall be equipped with Pelco, part

#PB 5325 pole and base collar assembly. All poles are to be 4 ½" O.D. aluminum and shall have a spun finish. The length of the pole shall be sufficient to mount the sign so that the bottom of the sign is 7' above the edge of pavement elevation. All signal, solar collector, and sign mounting hardware shall be manufactured by Pelco Products Inc.

The pedestal base shall be mounted on a concrete base. The minimum size for pedestal base mounted solar beacons shall be 24" inch round x 30" inch deep. Anchor bolts shall be manufactured by Pelco, part #PB-5306-GLV. Square washers are required.

SIGNAL EQUIPMENT:

Each school flashing beacon shall have a three-section traffic signal display, with two (2) displays facing forward and one (1) facing rearward. Each of the three sections shall utilize a tunnel visor. Each signal indication shall have a 12-volt DC, 12" yellow LED module insert, as manufactured by GE Lighting Solutions or Diallight. The signal displays shall be mounted to the aluminum pole or mast arm structure by means of products manufactured by Pelco Products, Inc. The two forward facing signal indications shall flash alternately.

Each solar beacon shall be equipped with a minimum of one (1)-65-wattsolar panel. The solar panel shall be mounted to the pole by means of an aluminum slip fitter collar or appropriate hardware as manufactured by Pelco Products, Inc. A Beldon cable shall be installed between the solar panel and the flasher cabinet.

All rectangular rapid flashing beacons shall be manufactured by Carmanah Traffic, part #R920-E or Transportation Control Systems (TCS), part #'s 654-001-008.1477B & C. CH. All RRFB's shall be equipped with bi-directional light bars. The controller cabinet for the RRFB on the TCS system shall be mounted at a height specified by Charlotte County.

The solar panel shall face in a southerly direction.

CABINET:

Each solar school flashing beacon shall be equipped with a solar flasher cabinet as manufactured by Transportation Control Systems, located at 1030 86th Street, Tampa, Florida 33619, Phone 813.630.2800. The solar flasher cabinet used is part #TCSFLN202FT.

Each cabinet shall contain a Powersonic 103 AH sealed, deep-cycle battery, part #PG12V103FR or other County approved equivalent.

The time clock shall be an RTC brand AP22 cellular programmable time switch. The time switch shall utilize a RTC model 3G M2M Cellular Communications Modem, part #506435-3 utilizing an external omni antenna.

SIGN:

The sign shall be mounted to the aluminum poles by means of 4½" O.D. U bolt sign clamp assembly with 5/16" hardware as manufactured by Pelco Products, Inc.

Signs mounted upon mast arm structures shall utilize a FTP-31-06 sign and signs mounted upon ground mounted beacons shall utilize a S5-1 sign.

Signs mounted upon aluminum poles for rectangular rapid flashing beacons shall utilize two-sided sign clamps, Pelco part #SH-0203-4-PNC

Example:
Rapid Flash Beacon

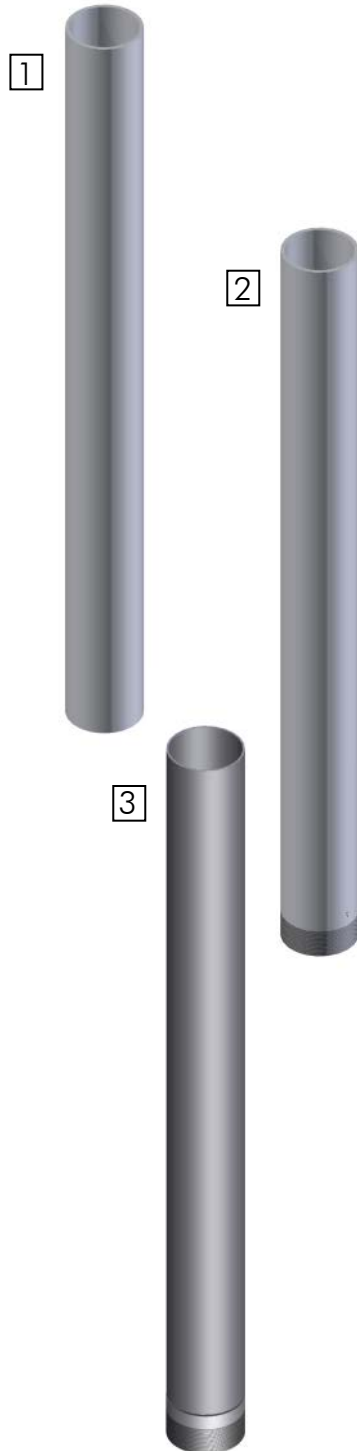


Example:
Solar School Flashing Beacon



Pedestal Poles

Pelco offers aluminum, iron, and plastic bases in various sizes as well as poles in aluminum and steel. Pelco's cast aluminum square base is FHWA certified and meets or exceeds AASHTO break-away requirements. Plastic replacement doors offer an economical way to deter vandalism.



1. **Pedestal Pole, 4" Sch 40, Spun Alum No Threads**

PB-5101 - Length - Coating
 PNC=Process No Color
 P__=Paint

2. **Pedestal Pole, 4"- 8 NPT Sch 40, Spun Alum w/ Pelican ID**

PB-5100 - Length - Coating
 PNC=Process No Color
 P__=Paint

Pedestal Pole, 4"- 8 NPT Sch 80, Spun Alum

PB-5102 - Length - Coating
 PNC=Process No Color
 P__=Paint

Pedestal Pole, 4"- 8 NPT Sch 40, Steel

PB-5201 - Length - Coating
 P__=Paint

Pedestal Pole, 4"- 8 NPT Sch 40, Galv Steel

PB-5200 - Length - Coating - GLV -
 Blank=Galvanized Only
 P__=Paint over Galvanized

3. **Pedestal Pole, Welded, 4"- 8 NPT w/ 2-3/4" Nipple Length, Steel**

PB-5218 - Length - Coating
 GLV=Galvanized
 P__=Paint

Pedestal Pole, Welded, 4"- 8 NPT w/ 5-1/2" Nipple Length, Steel

PB-5219 - Length - Coating
 GLV=Galvanized
 P__=Paint

Note: 1. Standard poles are typically sold in 1 foot increments. For other lengths contact sales.
 2. See Reference Section for available paint colors.

Pole & Base Accessories

Pole and base collar assemblies, for both square and octagonal bases, are available in highwind areas to add strength and help prevent loosening of connection.



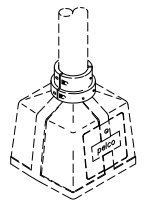
Pole & Base Collar Assembly, Alum Square Base

PB-5325 -

Coating

PNC=Process No Color

P__=Paint



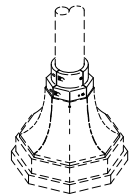
Pole & Base Collar Assembly, Alum Octagonal Base

PB-5326 -

Coating

PNC=Process No Color

P__=Paint



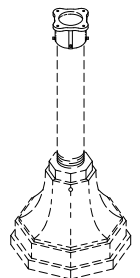
Pedestal Adapter, 4" (4-1/2" OD Pole), Alum 6-1/2" Bolt Circle

SE-3104 -

Coating

PNC=Process No Color

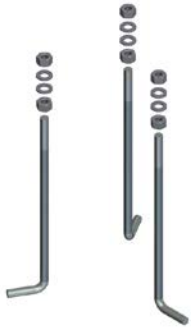
P__=Paint



Note: 1. All assemblies are supplied standard with stainless steel fasteners.
2. Specify options when ordering.
3. See Reference Section for available paint colors.

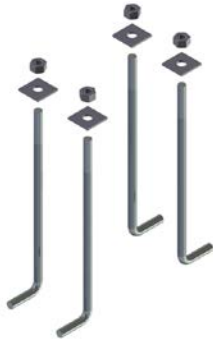
Anchor Bolts

Anchor bolt cages allow the critical bolt circle dimensions to be maintained when the steel is cast into the concrete. These cages may be used instead of anchor bolt sets.



PB-5305-GLV **Anchor Bolt Set of 3 w/Hardware
3/4"-10NC, Galv**

Note: Includes 3 Bolts, 6 Washers and 6 Nuts.



PB-5306-GLV **Anchor Bolt Set of 4 w/ Hardware
3/4"-10NC, Galv**

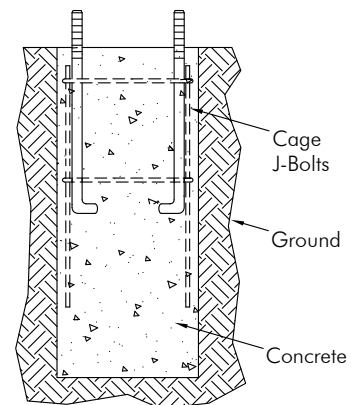
Note: Includes 4 each: Bolts, Washers and Nuts.

PB-5518-GLV **Anchor Bolt Set of 4 w/ Double Hdwr
3/4"-10NC, Galv**

Note: Includes 4 Bolts, 8 Washers and 8 Nuts.



AP-1095-GLV **Anchor Bolt Cage, w/ Hardware
3/4"-10 x 18", 36" Rebar
13" Bolt Circle, Galv**



Typical Footing Detail

Square Pedestal Bases Aluminum

Pelco offers aluminum, iron, and plastic bases in various sizes as well as poles in aluminum and steel. Pelco's PB-5334 and PB-5335 cast aluminum square bases are FHWA certified and meets or exceeds AASHTO break-away requirements. Plastic replacement doors offer an economical way to deter vandalism.



Square Base Assembly, Alum w/ Alum Door



PB-5334

Door - - Set Screws in Collar - - Grounding Lug - - Coating -

NL=No Logo
Blank=Pelco Logo
1S=1 Hex Bolt
3S=3 Set Screws
Blank=None
GL=Grounding Lug
Blank=None
PNC=Process No Color
P__=Paint

Square Base Assembly, Alum w/ Plastic Door

PB-5335

Door - - Set Screws in Collar - - Grounding Lug - - PNC

NL=No Logo
Blank=Pelco Logo
1S=1 Hex Bolt
3S=3 Set Screws
Blank=None
GL=Grounding Lug
Blank=None

Square Base Assembly, Alum Heat Treated w/ Alum Door



PB-5336

Door - - Set Screws in Collar - - Grounding Lug - - Coating -

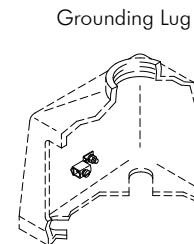
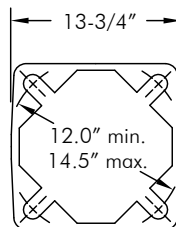
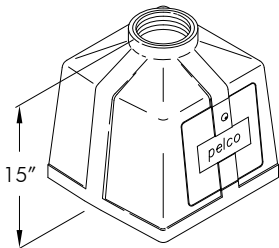
NL=No Logo
Blank=Pelco Logo
1S=1 Hex Bolt
3S=3 Set Screws
Blank=None
GL=Grounding Lug
Blank=None
PNC=Process No Color
P__=Paint

Square Base Assembly, Alum Heat Treated w/ Plastic Door

PB-5337

Door - - Set Screws in Collar - - Grounding Lug - - PNC

NL=No Logo
Blank=Pelco Logo
1S=1 Hex Bolt
3S=3 Set Screws
Blank=None
GL=Grounding Lug
Blank=None



- Note: 1. AASHTO Certified Square Aluminum Base: PB-5334 and PB-5335 aluminum square bases above are available with AASHTO certifications and FHWA approval. Please specify by adding the Certification Part No. C-1001 in addition to the base part number.
2. All assemblies are supplied standard with stainless fasteners.
3. See Reference Section for available paint colors.

R920-E

RECTANGULAR RAPID FLASHING BEACON



MUTCD-compliant, pedestrian-activated warning beacon for uncontrolled marked crosswalks

- The R920-E is the benchmark for Rectangular Rapid Flashing Beacons (RRFBs)
- Ultra-efficient optics and Energy Management System (EMS)
- Compact design to simplify installation
- Proven technology platform
- Meets and exceeds MUTCD requirements, including IA-21

RRFBs have been found to provide vehicle yielding rates between 72 and 96 percent for crosswalk applications, including 4 lane roadways with average daily traffic (ADT) exceeding 12,000*.

Superior Design and Technology

The R920-E utilizes a self-contained solar engine integrating the Energy Management System (EMS) with an on-board user interface, housed in a compact enclosure together with the batteries and solar panel. MUTCD interim approval IA-21 flash pattern and multiple configurations enable the R920-E to handle all crosswalk applications.

Easy Installation

With its highly efficient and compact design, installation is quick and uncomplicated, dramatically reducing installation costs. Retrofitting can be done where existing sign bases are used to enhance existing marked crosswalks in minutes, and new installations can be completed without the cost of larger poles, new bases, and trenching.

Advanced User-Interface

The R920-E comes with an on-board user interface for quick configuration and status monitoring. It allows for simple in-the-field adjustment of flash pattern, duration, intensity, ambient auto adjust, night dimming, and many more. Settings are automatically sent wirelessly to all units in the system.

Reliable

Designed with Carmanah's industry-leading solar modeling tools to provide dependable year-after-year operation.


Trusted

With thousands of installations, Carmanah's beacons are the benchmark in traffic applications and other transportation applications worldwide.



WE SIMPLIFY PLANNING.

Contact us to get your Energy Balance Report and purchase specifications.

 1.844.412.8395

 traffic@carmanah.com

 carmanahtraffic.com

REPRESENTED IN YOUR REGION BY:

* U.S. Department of Transportation Federal Highways Administration, Publication No. FHWA-HRT-10-043 - "Effects of Yellow Rectangular Rapid-Flashing Beacons on Yielding at Multilane Uncontrolled Crosswalks"

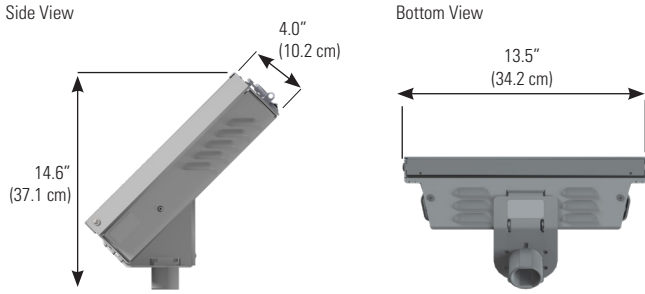
R920-E

RECTANGULAR RAPID FLASHING BEACON

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DIMENSIONS



SOLAR ENGINE MOUNTING

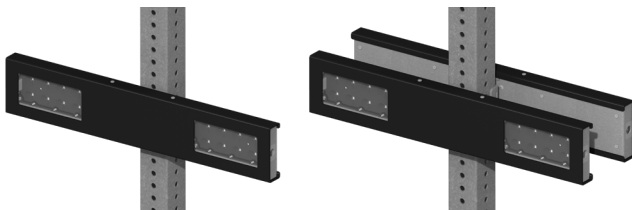
2.0" - 2.5" Perforated Square Pole Mount 2.38" - 2.88" Diameter Round Pole Mount 4.0" - 4.5" Diameter Round Pole Mount Side Pole Mount



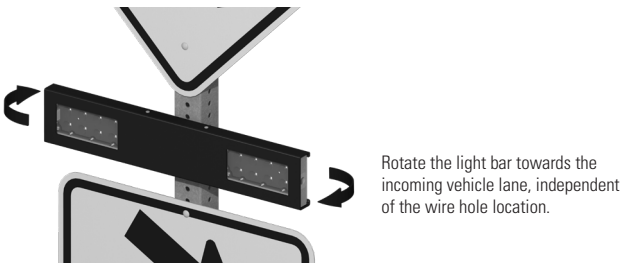
LIGHT BAR CONFIGURATION

Uni-directional Configuration

Bi-directional Configuration



IN-THE-FIELD AIMING



	Adjustable system settings with auto-scrolling LED display on our latest EMS
	System test, status, and fault detection: battery, solar, button, beacon, radio, day/night
	Flash patterns: RFB1 (WW+S), RFB2 (WSDOT), 0.5 sec. alternating (MUTCD), 0.5 sec. unison (MUTCD), 0.1 sec. unison, 0.25 sec. unison, 0.1 sec. x3 quick flashes unison, 0.1 sec. x3 quick flashes alternating
	Input: momentary for push button activation, normally open switch, normally closed switch
	Flash duration: 5 sec. to 1 hr.
On-Board User Interface (OBU)	Intensity setting: 20 to 1400 mA for multiple RFBs, circular beacons, or LED enhanced signs
	Nighttime dimming: 10 to 100% of daytime intensity
	Ambient Auto Adjust: increases intensity during bright daytime
	Automatic Light Control: reduces intensity if the battery is extremely low
	Temperature correction: yellow or red beacons
	Calendar: internal time clock function
	Radio settings: enable/disable, selectable channel from 1 to 14
	Output: enabled when beacons flashing daytime and nighttime, or nighttime only
	Activation counts and data reporting via OBU or optional USB connection
	MUTCD interim approval IA-21 and MUTCDC compliant
	Purpose-built light bar optics = maximum efficiency and no stray light Exceeds SAE J595 class 1 intensity by 2.5 to 3x when used as recommended Meets SAE J578 chromaticity
Optical	3 in (76 mm) x 7 in (178 mm) clear, UV-rated polycarbonate lens with yellow LEDs
	High-power LEDs: +90% lumen maintenance (L90) based on IES LM-80
	Side-emitting pedestrian confirmation LEDs
	Independent, stainless steel mounting brackets make back-to-back installation simple and enable in-field aiming for maximum effectiveness
	Yellow, black, or green powder coated light bar covers
	Encrypted, wireless radio with 2.4 GHz mesh technology
	Wireless update of settings from any unit to all systems on the same radio channel
	User-selectable multiple channels to group different beacons and ensure a robust wireless signal
Connectivity	Communicates with all other Gen III radio-enabled systems including our R820-E, -F, and -G circular beacons
	Instantaneous wireless activation: <150 ms
	Wireless range: 1000 ft (305 m)
	Integrated, vandal-proof antenna
Energy Collection	13 W high-efficiency photovoltaic solar panel
	45 deg tilt for optimal energy collection
	Maximum Power Point Tracking with Temperature Compensation (MPPT-TC) battery charger for optimal energy collection in all solar and battery conditions
Energy Storage	12 V 14 Ahr. battery system
	Replaceable, recyclable, sealed, maintenance-free, best-in-class AGM batteries offer the widest temperature range and longest life
	Battery design life: +5 yrs.
	Tool-less battery change with quick connect terminals and strapping for easy installation
Solar Engine Construction	Weatherproof, gasketed enclosure with vents for ambient air transfer (NEMA 3R)
	Lockable, hinged lid for access to on-board user interface and batteries
	Corrosion-resistant aluminum with stainless steel hardware
	Raw aluminum finish or yellow, black, or green powder coated
	Prewired to minimize installation time
	High-efficiency optics and EMS = the most compact, lightweight system
	19 lb (8.6 kg) including batteries, excluding beacons and push button
Environmental	-40 to 165° F (-40 to 74° C) system operating temperature
	-40 to 140° F (-40 to 60° C) battery operating temperature
	150 mph (241 kph) wind speed as per AASHTO LTS-6
Activation	Push button: ADA-compliant, piezo-driven with visual LED and two-tone audible confirmation
Warranty	5-year limited warranty



Specifications subject to local environmental conditions, and may be subject to change.

All Carmanah products are manufactured in facilities that are certified to ISO quality standards.

US Patent No 6,573,659, Other patents pending.

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