R820-G

Cabinet-Based Circular Beacon

Circular flashing crosswalk beacons improve pedestrian safety by increasing yield rates at unsignalized, marked crosswalks.

- The R820-G meets MUTCD requirements and is Buy America compliant
- Audible pushbutton or passive pedestrian activation
- Solar or AC-powered
- Energy Balance Report™ (EBR) prepared for every location to ensure battery longevity

Superior Design and Technology

The R820-G is a cabinet-based system with a separate, high-power solar panel. This design enables the R820-G to work with audible pushbutton stations, passive activation sensors, and remote monitoring, as well as operate at higher intensities and increased activations in challenging environments. MUTCD flash patterns, available ITE intensity, and multiple configurations enable the R820-G to handle all crosswalk applications.

Easy Installation

All components, including the battery or AC power supply, Energy Management System (EMS) and optional audible pushbutton controller are housed in a compact, lockable, purpose-built enclosure. It also incorporates a wire routing and termination system, and all components are wired at the factory for an efficient installation.

Advanced User Interface

The R820-G 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.

Compatibility

Compatible with the Carmanah R820-E, R820-F, and our RRFBs. Interchange solar and AC power models within the same application.

Reliable

Designed with Carmanah's industry-leading solar modeling tools to provide dependable year-after-year operation. We prepare an Energy Balance Report (EBR) for every location.

Trusted for 20+ Years

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

R820-G

Cabinet-Based Circular Beacon

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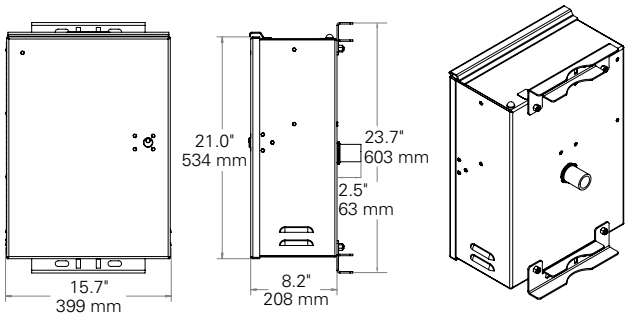
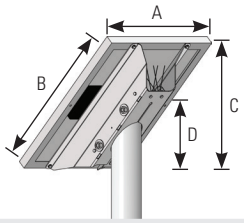
CABINET DIMENSIONS

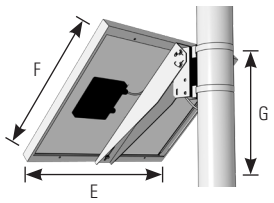


SOLAR PANEL MOUNTING

4.5" Diameter Round Top of Pole Mount



Side of Pole Mount

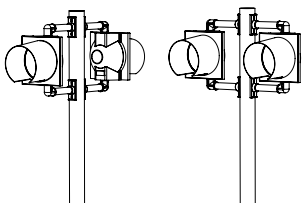


PANELS*	A	B	C	D	E	F	G
20 W	-	-	-	-	13.6" (345 mm)	18.5" (470 mm)	13.8" (350 mm)
50 W	21.2" (538 mm)	26.3" (668 mm)	19.6" (497 mm)	10.0" (254 mm)	26.3" (668 mm)	21.2" (538 mm)	16.0" (405 mm)
80 W	30.7" (780 mm)	26.5" (672 mm)	19.7" (500 mm)	10.0" (254 mm)	30.7" (780 mm)	26.5" (672 mm)	19.7" (500 mm)

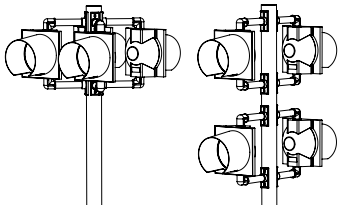
* Carmanah will conduct a site assessment and provide an Energy Balance Report™ to determine the correct solar panel and battery size.

BEACON MOUNTING

Dual Beacon



Quad Beacon

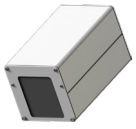


ACTIVATION OPTIONS

Standard Pushbutton

Audible Pushbutton Station

Passive Activation Sensor



BEACON SPECIFICATIONS

Optical	MUTCD compliant: 2009 MUTCD, Chapter 4L, Flashing Beacons, Manual on Uniform Traffic Control Devices (MUTCD)
	ITE VTCSH-LED Circular Signal Supplement compliant: meets ITE or 1.7x ITE intensity when used as recommended
	12 in (305 mm) or 8 in (203 mm) diameter LED modules, yellow
	High-power LEDs: +90% lumen maintenance (L90) based on IES LM-80
	Yellow, black, or green signal heads in UV-resistant polycarbonate or aluminum

SYSTEM SPECIFICATIONS

On-Board User Interface (OBUI)	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: RFB (WW+S), RFB1 (WW+S legacy), RFB2 (WSDOT), 0.5 sec. alternating (MUTCD), 0.5 sec. unison (MUTCD), 0.5 sec. x3 alternating (MUTCD), 0.1 sec. unison, 0.25 sec. unison, 0.1 sec. x3 quick flashes unison, 0.1 sec. x3 quick flashes alternating, steady on
	Input: momentary for pushbutton activation, normally open switch, normally closed switch
	Flash duration: 5 sec. to 1 hr.
	Intensity setting: 20 to 1400 mA for multiple circular beacons, RRFBs, 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 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 E.g., for relay control of overhead lighting
	Activation counts and data reporting via OBUI or optional USB connection
Beacon Communication	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
	Communicates with all other Gen III radio-enabled systems including our R920-E, R920-F, and SC315 RRFBs
	Instantaneous wireless activation: <150 ms
	Wireless range: 1000 ft (305 m)
	Integrated, vandal-proof antenna
Power System	Solar or AC-powered
	AC: 100-240 VAC input, 6-14 AWG Replaceable AC-DC power supply, circuit breaker, terminal block wiring
Energy Collection	20, 50, or 80 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 battery system with multiple sizes: 35, 55, 100 Ahr.
	Replaceable, recyclable, sealed, maintenance-free, best-in-class AGM batteries offer the widest temperature range and longest life
	Battery design life: +5 yrs.
Cabinet Construction	Weatherproof, gasketed enclosure with vents for ambient air transfer (NEMA 3R)
	Lockable, hinged door with #2 lock Optional padlockable latch
	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
Environmental	-40 to 165° F (-40 to 74° C) system operating temperature
	-40 to 162° F (-40 to 72° C) battery operating temperature
	150 mph (241 kph) wind speed as per AASHTO LTS-6
Activation	Pushbutton: ADA-compliant, piezo-driven with visual LED and two-tone audible confirmation
	Audible pushbutton station: ADA-compliant, piezo-driven with visual LED and customizable voice message confirmation
	Passive activation: microwave-based sensor detects pedestrian
Warranty	**5-year limited warranty**

ADA ite IMSA Your Partner in PUBLIC SAFETY MUTCD IA-21

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

Document: SPEC_TRA_R820-G_RevB

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]

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=Ground 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

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

Square Base Assembly, Alum Heat Treated w/ Alum Door

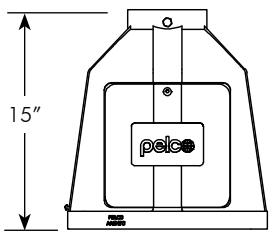
PB-5336 - [Door] - [Set Screws in Collar] - [Grounding Lug] - [Coating]

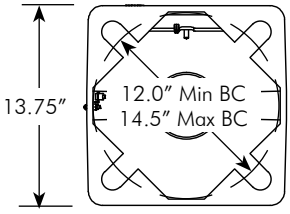
Door	Set Screws in Collar	Grounding Lug	Coating
NL=No Logo Blank=Pelco Logo	1S=1 Hex Bolt 3S=3 Set Screws Blank=None	GL=Ground Lug Blank=None	PNC=Process No Color P_ _=Paint

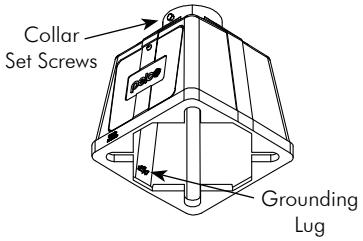
Square Base Assembly, Alum Heat Treated w/ Plastic Door

PB-5337 - [Door] - [Set Screws in Collar] - [Grounding Lug] - PNC

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







Note: 1. PB-5334 and PB-5335 aluminum square bases above are available with AASHTO certifications and FHWA approval.
2. All assemblies are supplied standard with stainless fasteners.
3. See Reference Section for available paint colors.

Purchase Specification
for a
AC-Powered Cabinet-Based Circular Flashing Beacon (CFB)

1.0 Overview

Each CFB shall be cabinet-based and use AC power. The industry-standard cabinet will house the charge controller, flash controller, on-board user interface, wireless communications, AC/DC power supply and circuit breakers. Each CFB shall include from one to four beacons. The CFB shall meet all requirements for design, illumination, and color of signal sections required by 2009 MUTCD, Chapter 4L, Flashing Beacons (MUTCD: Manual on Uniform Traffic Control Devices). The CFB shall be pre-wired to the maximum extent possible. The manufacturer shall also offer a smaller self-contained solar version of CFB that is fully compatible.

2.0 Mechanical Specifications

The control cabinet shall be constructed from aluminum with a lockable industry standard #2 lock and tamper-proof hinged door. No other external control cabinet shall be required. The control cabinet shall be vented to provide air circulation and cooling of the electronic system. The vents shall be screened to prevent ingress by insects and debris.

The overall weight of the control cabinet shall not exceed 90lbs (41 kg) and shall have the approximate dimensions: 24” H x 16” W x 8” D (61cm H x 41cm W x 21 cm D).

Fasteners shall be stainless steel.

3.0 Fixtures

3.1 Circular Beacons

The LED beacons shall conform to the requirements of the Manual of Uniform Traffic Control Devices 2009 with May 2012 Revisions 1 and 2. LED beacons shall also comply with the intensity and beam shape requirements of the ITE Vehicle Traffic Control Signal Heads, Light Emitting Diode (LED) Circular Signal Supplement.

The CFB shall be capable of driving beacons at ITE-compliant intensities.

The beacons shall be current-driven LED strings without active electronics. The LEDs shall be driven by pulse-width modulated fixed current.

The CFB shall support one, two, three, or four LED beacons. The CFB shall support 12” (305mm) and 8” (203mm) LED signal modules. The LED signal modules must be yellow.

The LED beacon optics shall be premium, UV-resistant polycarbonate.

LED Beacon wiring harnesses shall be included.

3.2 LED Enhanced Signs

The CFB shall be able to optionally operate flashing LEDs in the border of a sign.

4.0 Signal Housing

The signal housing shall meet the equipment standard of the Institute of Transportation Engineers (ITE) Vehicle Traffic Control Signal Heads (VTCSH) Chapter 2.

The signal head's bracket assembly shall be constructed such that the signal head can be removed easily in the field.

The signal housing must be able to rotate independent of the bracket for lens alignment.

The signal housing shall be constructed from a choice of UV-resistant polycarbonate or aluminum. The signal housing shall be available in yellow, green or black.

The beacon(s) shall also be capable of being mounted to a post or pole using a separate bracket assembly to facilitate mounting multiple beacons in either vertical, horizontal, or back-to-back (bi-directional) arrangements.

The signal housing shall open for access to the wiring connections for the LED beacons. The signal housing shall be rated to NEMA 3R.

5.0 Mounting

Mounting adapter hardware for the CFB cabinet shall be available for 4" – 4.5" (101mm – 114mm) round poles or square posts.

Side-of-Pole mounting shall offer banding as standard with an option for Z-bar and U-bolts. The signal housing shall be able to mount directly to the above supports using C-brackets. Signal housing shall be able to mount in a single or dual (vertical, horizontal or back-to-back) configuration. LED-enhanced signs shall be able to mount in a single or back-to-back (bi-directional) configuration.

Mounting configurations shall not require specialized tools.

6.0 Configuration

The CFB cabinet shall house an auto-scrolling LED on-board user interface that provides on-site configuration adjustment, system status and fault notification.

The user interface shall provide a display of four (4) alphanumeric characters and three (3) control buttons to navigate and change settings and activate functions.

When editing the configuration, the user interface will flash the display indicating it is ready to accept editing and will flash the display rapidly 3 times to indicate the setting change has been accepted.

The flash duration shall be adjustable in-the-field from 5 to 60 seconds in one second increments, 60 to 1,200 seconds in 60-second steps, and 3,600 seconds. Default flash duration shall be 20 seconds.

The system shall provide configurable nighttime intensity settings ranging from 10% to 100% of daytime intensity.

The system shall be capable of enabling or disabling ambient brightness auto-adjustment. This feature allows the system to provide optimal output brightness in relation to ambient light levels. If

enabled, the ambient brightness auto-adjustment shall adjust output to a range between 50% and 100% of daytime intensity.

The User Interface shall provide viewing and/or programming access for the following:

- Activation Duration (5 to 60, 60 to 1200, or 3600 seconds)
- Digital output that is active during the flashing cycle that allows the control of external devices such as crosswalk illumination. Digital output shall be configurable for night operation only or operation day or night
- 6 Flash Patterns
- Radio Channel (Choice of 1 to 14)
- Radio Status
- Night Intensity Setting
- Adjustment for Ambient Daytime Brightness
- Intensity (20 mA to 1400 mA)
- Self-Test / BIST (Built-In Self-Test) including the detection of shorts or open circuits in the fixture outputs
- Battery Status – General description and actual battery voltage (not applicable for AC model)
- Day or Night Status (as determined by dedicated photosensor)
- Solar Panel Voltage (not applicable for AC model)
- Automatic Light Control. If this safety feature is enabled, it allows the CFB to temporarily reduce the intensity of the beacons to maintain energy equilibrium. The user interface shall report the amount of dimming being applied in the range of 10% to 100% (not applicable for AC model)
- Daily activations averaged over 90 days
- Pushbutton detection
- Firmware Version number

Activation duration, Night intensity setting and adjustment for ambient daytime brightness shall be automatically broadcast to all CFBs in the system when changed in one CFB.

7.0 AC/DC Power Supply

The CFB shall include a universal AC/DC power supply that accepts conventional AC power input and outputs 15 volts DC. It shall be rated for at least 50 watts. AC wiring input shall terminate on a DIN-rail circuit breaker rated for 4 amps.

8.0 Operational Specifications

The CFB shall provide configurable intensity settings up to and including the ITE VTCSH LED circular signal supplement requirement.

The CFB shall offer an MUTCD-compliant flash pattern and activation including alternate, unison and quick-flash

The CFB shall conform to the provisions of the MUTCD 2009 Edition Chapter 4L. Flashing Beacons standard of a flash rate of not less than 50 or more than 60 times per minute, where the illuminated period of each flash shall be a minimum of 1/2 and a maximum of 2/3 of the total cycle.

The controller shall be able to support up to 1.4 amps combined current through the CFB fixtures simultaneously.

The system shall use a dedicated light sensor to detect night and day states and apply any optionally-enabled intensity adjustments.

9.0 Radio System

The radio system shall operate at 2.4GHz

Upon detection of a pushbutton press, a CFB will broadcast an activation to all other nearby CFBs sharing the same channel.

The CFB shall have the capability to activate other CFBs by wireless communications within 1,000 feet (304 meters).

The CFB shall have a minimum of 14 unique channels that can be configured on-site to avoid inadvertent activation of nearby systems.

The antenna shall be a low-profile “button” shape that cannot be bent or broken by vandals

10.0 Activations

The system shall be capable of activation by either pedestrian push button, pedestrian push button with voice message, or passive detection. The CFB shall be capable of operating with either 1 or 2 pushbuttons.

The pedestrian push buttons shall have an LED indicator with audible tone with Piezo control and shall be ADA compliant. The pedestrian push button with voice message shall have three LED indicators, locate tone, and voice message with the MUTCD IA-21 approved message “Yellow lights are flashing”. The message shall be spoken twice. The push button shall be ADA compliant with directional arrow.

The passive detection system shall use a short-range microwave sensor providing the necessary range at a low power consumption. The passive detection system shall provide pedestrian presence detection within the targeted area of a crosswalk or trail crossing.

All CFBs in the system shall initiate activation simultaneously within 150ms of activation.

If an additional activation occurs while the system is activated, the flash duration shall reset. For example, with the flash duration set to 20 seconds, if an additional activation occurs after the CFB has been activated for 15 seconds the CFB will continue for an additional 20 seconds, or 35 seconds in total.

If the CFB has ceased operation, any subsequent activation shall activate the CFB without delay regardless of how recently the CFB ceased operation.

Pushbutton wiring harnesses shall be included.

11.0 Environmental Testing

The CFB cabinet and beacons shall be rated to a minimum of NEMA 3R.

12.0 Packaging

Packaging shall consist of only recyclable corrugated cardboard and soft plastic bags.

13.0 Qualifications

The CFB shall be FCC certified to comply with all 47 CFR FCC Part 15 Subpart B Emission requirements.

The CFB shall be manufactured in the USA and shall be Buy American compliant.

Manufacturer shall provide a 5-Year Limited Warranty.

The Manufacturer shall be ISO 9001 certified.

Manufacturer: Carmanah Technologies Inc.
Model: R820-G_AC Circular Flashing Beacons
Toll-Free: 1-877-722-8877
www.carmanah.com