carmanah®

Innovation in Motion

Carmanah Solar Solutions for the Traffic Industry

Carmanah's innovative solar solutions for the traffic industry are designed to keep you moving forward. Improving the safety, security and efficiency of transportation systems, Carmanah's solar technology provides clean, green solutions that boast rugged reliability, years of field-proven performance and a network of satisfied customers that spans the globe.

we put solar to work™

At Carmanah, we put solar to work for you.

Breaking through the challenges that arise from costly installation procedures, remote locations and labour-intensive maintenance cycles, Carmanah technology puts solar to work for you.

Installing easily and cost-effectively, Carmanah solar solutions eliminate the need for specialized work crews, costly trenching and digging, lengthy construction delays and costly permit requirements.

Operating free of electrical connections, Carmanah solar technology is ruggedly reliable, continuing to provide power and illumination regardless of electrical grid failures. As a self-sustaining energy alternative, Carmanah solar technology also represents a visible move toward eco-friendly practices.

Built tough, Carmanah's rugged construction and intelligent design offer steely performance in one compact, self-contained unit. With up to five years of maintenance-free performance, Carmanah solar solutions offer the ultimate in powerful, efficient, cost-effective lighting and power solutions for traffic applications.

- Simple, cost-effective installation: requiring no trenching, wiring, cabling or specialized work crews, installing Carmanah solar solutions is easy.
- Versatile and adaptable: with no connection to the electrical grid, Carmanah solar solutions can be placed in virtually any location.
- Rugged reliability: Carmanah solar solutions are designed to operate maintenance free for up to five years and are immune to electrical grid failures, providing peace of mind — always.
- Significant cost savings: eliminating electrical bills, minimizing installation costs and reducing maintenance cycles, Carmanah solar solutions can put dollars back into an agency's pocket.

There is a reason the world's most demanding customers trust Carmanah technology. Plain and simple: it performs.

Here at Carmanah, there is nothing more important than ensuring our products can meet the challenges we know they will face each and every day. That's why we take a total system approach to engineering. We pay attention to every component and work diligently to ensure that every step of the energy conversion process is maximized. It's our tireless attention to detail that makes our products the most compact, easy to install, endlessly reliable and ruggedly durable solar products on the market. When it comes to solar technology it's what's inside that counts, and here at Carmanah we look after what's inside better than anyone else. Just ask our clients.

The Energy Conversion Process: Every step counts

At Carmanah our goal is your peace of mind. Each component of our solar products is carefully selected, integrated and configured to ensure you receive the most compact, reliable and efficient solar product possible. We expect our products to perform and so should you.

Solar Panel

Carmanah uses only the highest quality solar panels available to ensure our solutions collect the maximum amount of energy available during sunlight hours. Allowing for increased system autonomy and aiding system performance during periods of low solar insolation, our choice in solar panels is just one of the reasons our solutions are proven to perform in some of the most difficult solar conditions on earth.

Charge Circuit

Our charge circuits are optimized to deliver the maximum amounts of energy collected from the solar panels to the battery. This means the energy collected is the energy stored, and all of this attention to energy stockpiling translates into solar products that outlast, outperform and outshine the competition.

Batteries

Carmanah employs the highest quality batteries available. We know our products are going to be put to the test in some of the most extreme environments on earth and we need to know our batteries are up to the challenge. Allowing for maximum charge efficiency, and offering field-proven performance within an impressive temperature range, our batteries are the powerhouse behind our reputation for dependability.

LED Driver

Our LED drivers are purpose built by Carmanah to deliver the optimum amount of energy to our LEDs. We know our lights are being asked to perform very specific jobs in mission critical locations, and not every job is the same. That's why we make certain our lights are delivering the right kind of illumination for the task. Our lights provide you with the purpose-specific performance you need to get down to business.

LEDs

Carmanah integrates the most advanced LEDs on the market into each and every one of our systems. Offering high-efficiency, ultra-bright illumination, our LEDs are able to perform at the top of their game because we carefully attend to our thermal management techniques, ensuring an optimum operating environment for our LEDs. All this translates into the brightest, most reliable solar illumination possible.

Light Management

Carmanah optics are some of the best in the world. Designed to meet the exact requirements of our self-contained solar lighting applications, the optics inside Carmanah solar lighting products make the most of the light produced. We're serious about our light output, and demand focused illumination from our products that minimizes light trespass and places light exactly where it's needed.

Energy Management

Dynamic and responsive, our lights are the most intelligent solar solutions on the market – and we give them a lot to think about. Our lights are constantly monitoring their surroundings and can adjust light output according to prevailing solar conditions. The brain power inside our lights ensures that you receive consistent light output regardless of conditions. Our lights also accept direction – featuring on-demand functionality and intelligent operating profiles that can be pre-programmed to allow for times of less illumination according to installation needs. Our lights are always thinking, which means you can be assured of reliable performance and functionality that meets your specific needs.

Here at Carmanah we take pride in the world-class performance of our lights. From energy input to light output and energy management, we attend to every detail of the energy conversion process. Our total system approach to engineering ensures that our lights are up for the challenge, whatever it may be. As the most compact, easily installed, durable and reliable solar technology on the market our solutions do exactly what you expect them to do: perform.

Designed around the details, built to uncompromising standards: Carmanah solar solutions put solar to work unlike any other solution on the market.

Intelligent design, compact construction and robust performance: Carmanah solar flashing beacons are in a class all their own

Featuring bright, crisp illumination in a compact design, Carmanah solar flashing beacons significantly improve the visibility of important safety signage and help alert drivers to the presence of pedestrian crossings, rail crossings and important safety hazards. Meeting NCHRP-350 road safety standards when installed on a 2" square break-away post, Carmanah solar flashing beacons also meet MUTCD and ITE specifications.

R247 – 24 Hour Flashing Beacon

Flashing 24 hours a day, 365 days a year, Carmanah's R247 provides added visibility for important hazard and road marking signage. Installing easily onto existing sign posts with just a wrench and a screwdriver, the R247 can be integrated into existing roadway infrastructure in minutes.

Available in red or yellow, Carmanah's R247 can be programmed for set hours of operation or remotely activated as needed.

For more information, see the R247 specifications on page 9.

R820 – Solar Pedestrian Crosswalk Flashing Beacon

Featuring a push-button activated flashing beacon, the R820 allows pedestrians to alert traffic to their presence at a crosswalk. With optional centralized control and the ability to wirelessly link between beacons in a system, Carmanah's R820 allows for maximum programmability and convenience.

For more information, see the R820 specifications on page 8.

R829 – Solar School Zone Flashing Beacon

Research shows that flashing beacons decrease vehicle speeds an average of five to seven miles per hour in school zones. As one of the most effective safety improvements a school zone can make, solar school zone flashing beacons offer the added benefit of easy installation and no ongoing operational costs. Carmanah's R829 solar school zone flashers also fit into Safe Routes to School (SRTS) infrastructure funding models.

Incorporating an intuitive Microsoft® Windows® based graphical program, users can pre-program flashers for up to 500 days of operation based on individual school zone schedules. Centralized control also allows for remote programming using third party devices for maximum flexibility and control.

For more information, see the R829 specifications on page 8.

R838 – Solar ITS Flashing Beacon with ENCOM Onboard

With wireless activation and remote operation, Carmanah's R838 solar ITS flasher incorporates industry leading solar technology from Carmanah with field-proven wireless technology from ENCOM Wireless Data Solutions Inc..

Allowing users to activate several beacons on-demand using a master controller, the R838 solar ITS flasher is ideal for use at fire halls, weigh scales and 'congestion ahead' warning signs. The R838 is user configurable and allows flasher on and off times to be programmed for the exact application for which it is installed. With ENCOM wireless technology onboard, beacons are enabled with two-way communication that allows for switch closure confirmation at remote sites.

For more information, see the R838 specifications on page 9.

A resilient, reliable, renewable solution: Carmanah solar transit lighting keeps you moving forward.

Installing quickly and easily, solar transit lighting provides a cost-effective way to improve existing infrastructure quickly. By avoiding the trenching, cabling and wiring normally associated with the installation of lighting at transit stops, Carmanah solar lighting brings increased safety and convenience to virtually any location.

i-STOP® – Solar Bus Stop Lighting

Featuring three rider-friendly design elements, Carmanah i-STOP solar bus stop lighting increases the convenience and ease of night time ridership with:

- i-SIGNAL™ flashing beacon: Designed to reduce rider pass-bys, this push-button activated feature lets bus drivers know when a rider is waiting for pick up.
- Security downlighting: This push-button activated feature enhances rider convenience and perception of safety while waiting.
- Illuminated schedule: With a push-button activated design, this feature provides on-demand illumination of important bus scheduling information for easy visibility in night time environments.

For more information, see the i-STOP specifications on page 9.

Client Testimonials

"We installed 85 of Carmanah's R829C Compact Solar School Zone Flashers at elementary schools throughout Snohomish County, and are pleased to report that we have had nothing but positive feedback from the public.

All 85 units have performed flawlessly throughout our exceptionally grey winter. As an aside, one systems was installed with the solar panel disconnected from the battery, resulting in an 'accidental' test of the system. The beacon operated without any solar charging for two months!

We have been monitoring the effectiveness of these solar flashing beacons and preliminary results show that vehicle speeds are being reduced by at least five to seven miles per hour in our school zones. Your product has proven to be reliable and effective, and the programming software is intuitive and easily updated."

Traffic Investigator
Snohomish County, Everett, Washington, USA

Compact solar engine design houses all components in one self-contained unit. Solar engines available in 10 and 20 Watt configurations.

A pivoting top provides easy access to unit components.

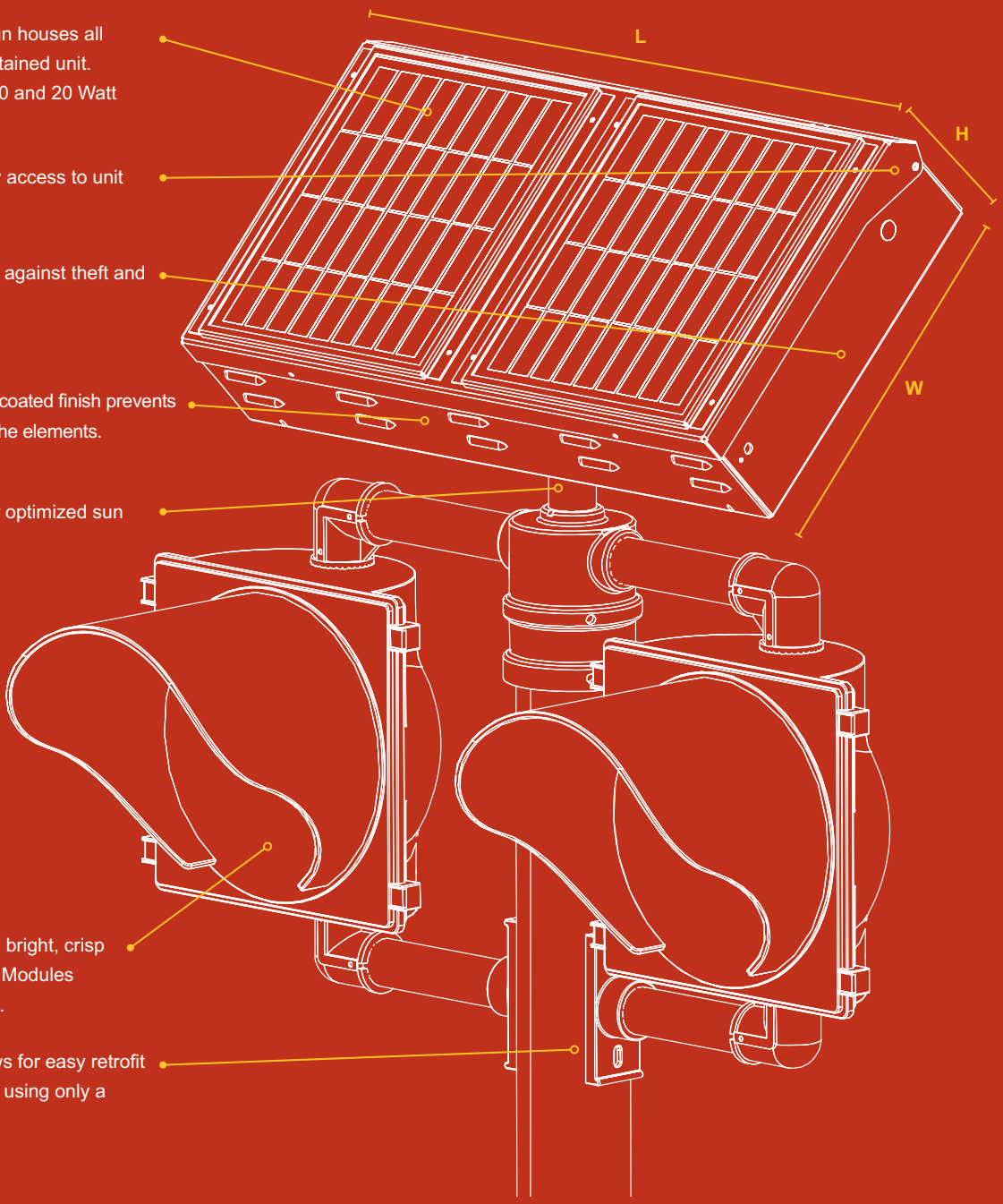
A secure enclosure protects against theft and vandalism.

Carmanah's durable powder coated finish prevents corrosion and damage from the elements.

Solar engine tilt provides for optimized sun exposure.

LED signal modules provide bright, crisp illumination in red or yellow. Modules available in 8" and 12" sizes.

Mounting configuration allows for easy retrofit onto existing pole structures using only a wrench and a screwdriver.



Component	Dimension			
	Length (L)	Width (W)	Height (H)	Options
Single Beacon	25" (635 mm)	15" (381 mm)	33.5" (851 mm)	
Dual Beacon (configuration with beacons facing forward)	17.6" (447 mm)	39.5" (1003 mm)	~39" (991 mm)	(can vary based on installation)
Dual Beacon (configuration with beacons facing to the side)	14.5" (368 mm)	52" (1321 mm)	~39" (991 mm)	
10w Engine	15" (381 mm)	14.8" (376 mm)	4.76" (121 mm)	(9.15" (232 mm) w/antenna)
20w Engine	15.75" (401 mm)	29.25" (743 mm)	5.95" (151 mm)	(9.15" (232 mm) w/antenna)

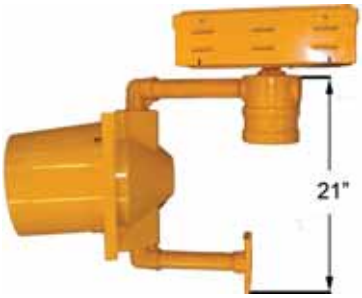
Mounting Options

Carmanah solar flashing beacons can be configured for a variety of different mounting options including:

Single Beacon

Sign Post Round

Sign Post Square

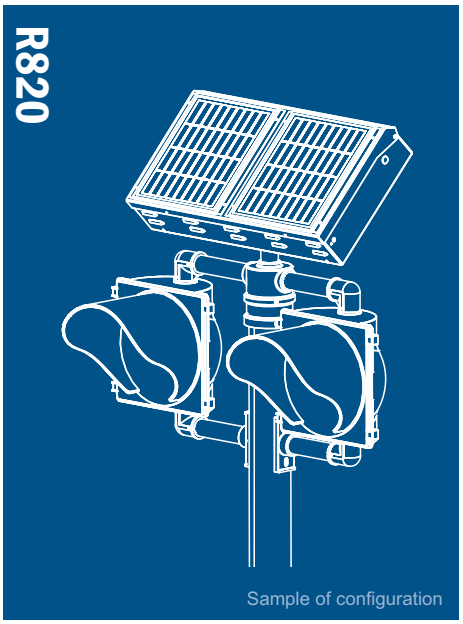


4.5” Post

Dual Beacon

Vertical top of pole mount

Horizontal top of pole mount



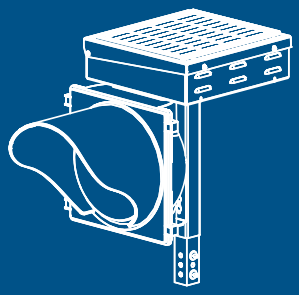
Sample of configuration

Sample of configuration

	SOLAR-POWERED PEDESTRIAN BEACON	SOLAR-POWERED LED SCHOOL ZONE FLASHER
	OPERATION	**OPERATION**
Control	Push Button	Override switch box or pager unit
	ENERGY MANAGEMENT SYSTEM	**ENERGY MANAGEMENT SYSTEM**
Daily operation profile	540, 20 seconds activations per day (3 hours cumulative)	Up to 12 hours per day
	WIRELESS ACTIVATION	**WIRELESS ACTIVATION**
Activation	Push button activation sends wireless signal to all units	Upload activation schedule for up to 500 days Download schedule for verification
Duration	5 – 60 second flash duration (adjustable by 5 sec. increments)	Schedule event times
Frequency	900 Mhz FHSS (frequency hopping spread spectrum) – North America Only	—
Effective range	165 ft / 50 m line of sight	Wide range capability

COMMON SPECIFICATIONS FOR ALL BEACONS	
OPERATION	
Flash pattern	MUTCD compliant
Activation	MUTCD compliant
Engine Colour	Black, Yellow and Green
LED SIGNAL MODULE	
Size	12” (300 mm) diameter 8” (200 mm) diameter
LED Colour	8” Yellow or 12” Yellow or Red
Standard	ITE VTCSH LED circular signal supplement*
	ENVIRONMENTAL
Ambient operating temperature	5°F to 122°F (–15°C to +50°C)
MOUNTING HARDWARE	
Options	Pelco traffic signal mounting hardware 2” square, 2 1/2” round, 4 1/2” round
CERTIFICATION	
	NCHRP 350, FDOT

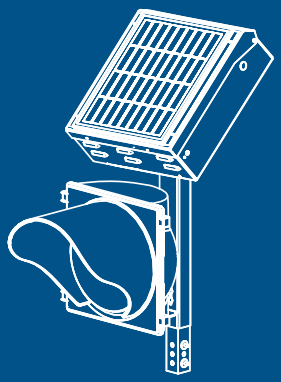
R247



Sample of configuration

SOLAR-POWERED 24/7 FLASHER
OPERATION
—
ENERGY MANAGEMENT SYSTEM
30 days
WIRELESS ACTIVATION
—
—
—
—

R838



Sample of configuration

R838 REMOTE-ACTIVATED SOLAR FLASHING BEACON
OPERATION
Radio Configuration - PC based ControPAK software is included, input connector - DB9 (female)
ENERGY MANAGEMENT SYSTEM
1 hour per day
WIRELESS ACTIVATION
Push-on/ Push-off or Auto-timeout configurable up to 1 Hrs
—
900 MHz, ISM Band – North America Only
500 ft (305 m) line of sight

R838 MASTER CONTROLLER SPECIFICATIONS	
Weight	1.8 lbs (0.8 Kg)
Dimensions	4.7”(H) X 4.7”(W) X 3.1”(D) (120mm X 120mm X 80mm), plus antenna
Power supply	AC Adaptor (60 Hz)
Power supply-backup	Primary - 2 Hrs, Secondary - 24 Hrs (at 25 deg C)
Power supply-vehicle	12V Cigarette Lighter Adaptor
Mounting	Wall mount or handheld
SYSTEM DESCRIPTION	
Max qty R838 Master Controllers	2
Max qty R838 Transceivers	8
MOUNTING HARDWARE	
	Wall mount or handheld

I-STOP

SOLAR-POWERED LED-ILLUMINATED SIGNAL LIGHT	
SIGNAL LIGHT	
Night visibility range	~ 1 mile (1.6 km)
Day visibility range	~ 0.25 mile (0.4 km)
Flasher Colours	White
Flash pattern	60 fpm (Flashes/Minute)
Duration of flashing per activation	60 seconds default*
Output Colour	White
Illumination technology	Bright, high-intensity LEDs
SECURITY DOWNLOADING	
Illumination technology	Bright, high-intensity LEDs
"On" time per activation	5 minutes default*
Output Colour	White
Illumination area (NEEP?)	~ 6 ft (182 cm) diameter circle from 10 ft (304 cm) pole
INTERNALLY LED ILLUMINATED SCHEDULE	
Illumination technology	Bright, high-intensity LEDs, edge-lit acrylic panel
"On" time per activation	30 seconds default*
Dimensions (viewable area)	5.9" (15 cm) wide x 19.9" (51 cm) long*
Actual dimension of schedule	6.25" (15.88 cm) wide x 19.75" (50.17 cm) long*
Construction	Vandal-resistant aluminum extrusion
SOLAR ENGINE	
Power Management	MICROSOURCE® Energy Management System
Ambient Operating Temperature	–30 to 122 °F (–30 to 50 °C)
Housing	Injection-molded high-impact polycarbonate, UV-protected
Patent	ALC patent #: 6,573,659 and 5,782,552

Carmanah's innovative solar technology suite doesn't stop with just solar applications. The company's product line also includes general lighting and power system solutions for a wide variety of applications.

Solar Area Lighting

Experience the empowerment of solar area lighting. Featuring an intelligent operating profile and the most advanced LED technology on the market, Carmanah's solar area lighting solution provides industry leading performance and light control features that are unmatched by any other solar lighting solution on the market.

For more information, please see Carmanah's solar area lighting brochure.

DuraGEN™ Solar Engine

Designed as a standalone power supply, the DuraGEN Solar Engine comes as one complete, easy to install system that arrives pre-assembled, pre-wired and ready for use. The DuraGEN Solar Engine is available in a variety of standard outputs and configurations to accommodate a wide range of remote power needs.

For more information, please see Carmanah's DuraGEN Solar Engine brochure.

About Carmanah Technologies Corporation

As one of the most trusted names in solar technology, Carmanah has earned a reputation for delivering strong and effective products for industrial applications worldwide. Industry proven to perform reliably in some of the world's harshest environments, Carmanah's lights and power systems provide a durable, dependable and cost effective energy alternative.

Carmanah Technologies Corp.

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For more information or to find the regional office nearest you, visit carmanah.com.

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Specifications may be subject to change.

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