



carmanah®

MODEL

M650H

SOLAR LED MARINE LANTERN

- COMPACT, DURABLE AND VERSATILE
- 3 NM RANGE FOR MOST LOCATIONS<sup>1</sup>
- UP TO 60 CD IALA PEAK
- CONFIGURE WITH ON-BOARD USER INTERFACE, INFRARED PROGRAMMER OR PC SOFTWARE
- GPS SYNCHRONIZED FLASH OPTION
- USCG PATON 33CFR67 CLASS C

### Applications

- Fixed or floating visual aids to navigation
- Marina and dock lighting
- Port lighting
- Offshore oil & gas infrastructure
- Hazard marking
- Barge lighting
- Bridge lighting

### Range

Depending on location, colour and flash pattern, the M650H is capable of up to 60 cd and over 4 NM range.

To view performance in your installation location visit [www.carmanahmarine.com/selector](http://www.carmanahmarine.com/selector)

### Easy Installation

Just mount the M650H and it emits light dusk-to-dawn while maintaining its battery. High-quality construction increases vandal and theft resistance.

### Low Maintenance

The M650H integrates solar panels, battery, electronics, and LED light source into a compact, stand-alone, maintenance-free unit. The replaceable battery extends service life well beyond 5 years.

### Reliable

The Energy Management System (EMS) monitors all operations to provide consistent output in the harshest environments. Testing to demanding industry standards and MIL specifications ensures high performance for many years.

### Trusted

With thousands of installations worldwide, Carmanah solar LED lights operate year-round and are trusted by:

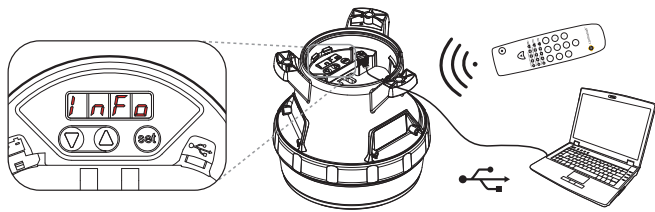
- Australian Maritime Systems
- Brazilian Naval Commission
- Canadian Coast Guard
- Maritime and Port Authority of Singapore
- SERBA, Uruguay
- Petrobras, Brazil
- PDVSA, Venezuela
- NOAA – National Data Buoy Centre
- Panama Canal
- Suez Canal, Egypt
- Trinity House Light House Service, UK
- United States Coast Guard
- Vancouver Port Authority



# Sensor Systems ( NZ ) Ltd

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SABIK

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MODEL

# M650H

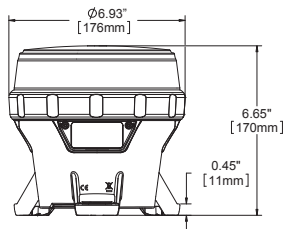
SOLAR LED MARINE LANTERN

## SPECIFICATIONS

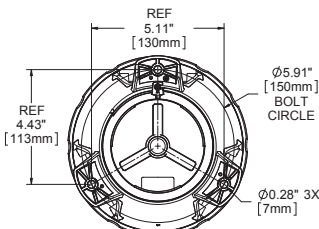
Solar Panel	High-efficiency cells with bypass and blocking diode function. Maximum power point tracking (MPPT) for optimal energy collection.
Battery	Tool-less replaceable and recyclable best-in-class battery pack with extreme temperature range. Battery status feedback of Good, Charge, Low or Bad (Replace) and actual battery voltage.
Light Source	High-power LED. Colour-specific temperature-corrected LED drivers provide consistent intensity under all operating conditions.
Maximum Peak Intensity (as per IALA rating)	60 cd (White LEDs)
Vertical Divergence	> 8° (FWHM)
Flash Patterns	256+ (including steady-on) Custom available.
Day / Night Transition	Selectable from 25 to 925 lux in 25 lux increments.
Construction	Premium grade UV resistant, polycarbonate/polysiloxane co-polymer body and lens material. Double O-ring sealing with waterproof vent.
Colours	Red, Green, White, Yellow and Blue. As per IALA "Optimum" Recommendation E-200-1, dated December 2008.
Operating Temperature	-45 to 124 °F (-43 to 51 °C) ambient temperature. The M650H will function up to 190 °F (88 °C) internal and surface temperatures.
Storage Temperature	-45 to 176 °F (-43 to 80 °C) Not including batteries.
Colour Indicator	Yes. Red, Green, White, Yellow and Blue.
Bird Deterrent	Yes. Stainless steel.
Weight	3.5 lb (1.58 kg)
Wind Loading	140 knots (72 m/s)
Ice Loading	0.03 psi (22 kg/m <sup>2</sup> )
Automatic Light Control (ALC)	When enabled, ALC will dynamically reduce brightness in response to unusually low amounts of sunlight to ensure continued operation.
GPS Synchronization	Optional GPS enables two or more lanterns to flash in unison.
Compliance	USCG PATON 33CFR66 & CFR67 Class C RoHS, WEEE

## DIMENSIONS

### SIDE VIEW

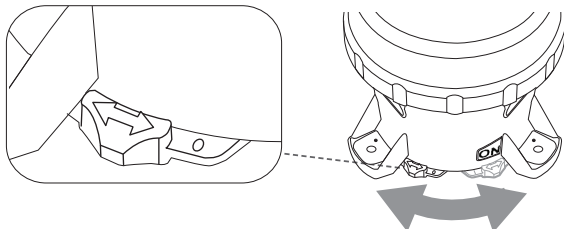


### BOTTOM VIEW

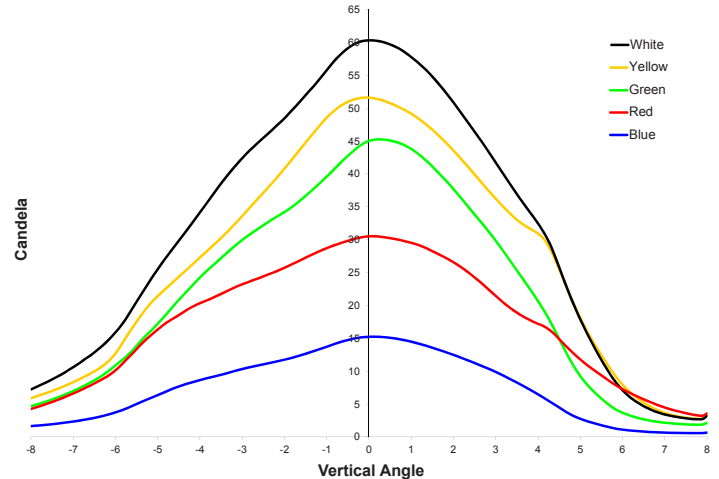


Also available with 7" (200 mm) bolt circle adapter

### SWITCHED VIEW



## PHOTOMETRIC PERFORMANCE



Note: Peak IALA intensity dependent on location. Plot based on equatorial location of 12-hour night duration and 21% duty cycle flash code. To view performance in your installation location visit [www.carmanahmarine.com/selector](http://www.carmanahmarine.com/selector)  
<sup>1</sup> Transmissivity of 0.74.

## Designed and tested to the toughest industrial standards:

<b>Immersion:</b>	EN 60529; IP68; MIL-STD-202G: Method 104A, Test Condition B.
<b>Shock and Vibration:</b>	MIL-STD-202G: Shock, Specified Pulse, Method 213B, Test Condition G; Vibration, Method 204, Test Condition B, 10g peak.
<b>Corrosion:</b>	MIL-STD-810G: Salt Fog, Method 509.4, 2 cycles of 48 hr. at 35°C, ASTM B117-73 (1979).
<b>Solar Radiation:</b>	MIL-STD-810G: Solar Radiation, Method 505.5, Procedure II, Climate cycle A2.
<b>Chemical Resistance:</b>	Tested to MIL-STD-810G, Method 504, Procedure II.
<b>Hail:</b>	EN 61215, 25mm OD up to 23m/s.
<b>EMC/EMI/ESD:</b>	47 CFR Part 15, Subpart B, Section 15.109; EN 60945: 2002, Clauses 9.1, 9.3, 10.1, 10.4 and 10.9; EN 61000: ESD, 6-2: 2005, table 1; 4-2: 200, 4-5: 2001, EMI, 4-3: 1995.
<b>Light Source:</b>	IALA E-200-1 (2008)

## CONFIGURATION

MODEL	OUTPUT ▼	SWITCH ▼	CONTROL ▼	CHASSIS ▼
M650H	RED GREEN WHITE YELLOW BLUE	SWITCHED NON-SWITCHED	GPS NON-GPS	GREY



The management system governing the manufacture of this product is ISO 9001:2008 certified.

US Patent Numbers 6573659, 6013985. Other patents pending.

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