# Solar-Powered LED Marine Lanterns
## Model M701-5/M702-5/M702-5-GPS - 3 Nautical Miles[1]

Carmanah®

- **Completely self-contained**
  The solar panels, batteries and LEDs are brought together into one unique product.
- **Sealed Unit**
  Waterproof and vandal proof.
- **Built-in GPS receiver**
  Model M702-5-GPS has a built-in GPS receiver that enables any number of M702-5-GPS units to flash in synchronization.
- **Multiple mounting patterns**
  Features 3, 4 and 5-bolt mounting patterns.
- **Automatically turns on & off**
  On at dusk and off at dawn.
- **Self-cleaning solar dome**
  Self-cleaning solar dome that protects the solar panel, increases solar-charging efficiency and reduces the need for a bird deterrent (although, a bird deterrent is still available as an option).
- **Ultra-bright LEDs**
  Uses an array of bright light emitting diodes (LEDs) -no bulbs to replace, ever.

### Built to Perform in Harsh Environments

Carmanah 3NM (5.4 Km) solar-powered LED lanterns are the world's most advanced, solar-powered LED navigational and hazard-marking lanterns. They are completely self-contained, install in minutes and require no maintenance or servicing for up to five years.

### Reliable Technology

Through the innovative combination of solar power and LED technology, the 700 Series lanterns charge during the day, even under cloudy conditions, and turn on automatically at night. Instead of relying on short-lived incandescent bulbs, the 700 Series use durable, ultra-bright light emitting diodes (LEDs), which have an operating lifespan of up to 100,000 hours.

### Quality Manufacturing

As a result of being designed and built under contract with the U.S. Coast Guard, the 700 Series lanterns had to meet the Coast Guard's standards for reliability and durability. They were the first solar-powered LED lanterns to enter the U.S. Navigational Aids System and are manufactured in accordance with ISO 9001:2000 Quality Assurance Standards.

There are a number of models of the 700 Series, offering a range of versatility depending on your location and navigational hazard-marking requirements:

**Model M701-5:**

The Model M701-5 is designed for locations where there is plenty of sunshine, with no long periods of poor weather or long winter nights. This is Carmanah's most cost-effective solution for a 3NM solar-powered LED lantern.

**Model M702-5:**

For certain locations, and applications that require more autonomy, the Model M702-5 has more battery storage and larger solar panels than the Model M701-5.

**Model 702-5-GPS:**

The Model 702-GPS adds the additional capability of flash synchronization between any number of lanterns at any location in the world.

***30-day satisfaction guarantee and three-year warranty!***

Canadian Coast Guard, Canada

United States Coast Guard, Lake Tahoe

Milford Haven, South West Wales

CHANGE THE WORLD WITH US™

**Toll-Free US and Canada:** 1-877-722-8877 **Worldwide:** (250) 380-0052 **www.carmanah.com**

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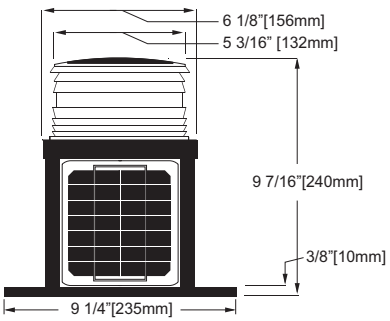
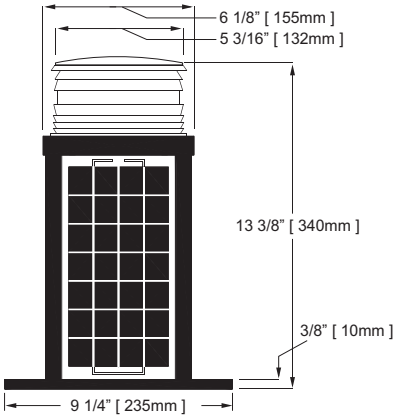
### Side View

**Model M701-5**

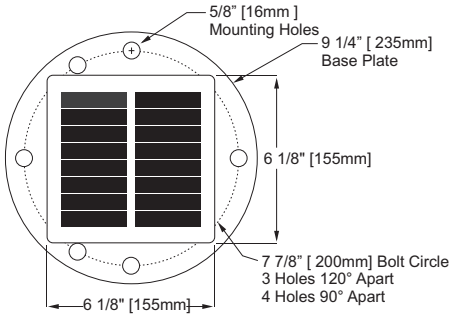



**Model M702-5/M702-5-GPS**




### Top View

**Model M701-5/702-5/M705-5-GPS**




## SPECIFICATIONS

### LIGHT OUTPUT

| | FLASHING[2] |
|---|---|
| Effective Intensity *(Transmissivity constant of 0.74)* | |
| Green | ~ 22 Candela |
| Red | ~ 16 Candela |
| Amber | ~ 11 Candela |
| White | ~ 20 Candela |
| Nominal Night Range[1] *(Employs Method of Schmidt-Clausen)* | |
| Green | ~ 3.4 NM |
| Red | ~ 3.1 NM |
| Amber | ~ 2.7 NM |
| White | ~ 3.3 NM |
| Vertical Divergence | 7° |
| Horizontal Output | 360° |

### OPERATION

| | |
|---|---|
| Minimum Autonomy[3] | (M701-5) 150 Hours<br>(M702-5 /M702-5 GPS) 300 Hours |
| Latitude Range[4] | 55° S to 55° N |
| On / Off Level | 70 / 100 Lux |
| Illumination Technology | 24 Ultra-Bright Light Emitting Diodes |
| Lifespan of LEDs[5] | Up to 100,000 Hours |
| Chromaticity of Color Output | Meets IALA specifications |
| Available Standard Flash Patterns *(Custom patterns available)* | 256 including "steady-on" (user-adjustable) |
| Power Management System | MICROSOURCE™ |

### CONSTRUCTION

| | |
|---|---|
| Solar Panels | Mono-Crystalline<br>Potted with UV-protected polyurethane |
| Battery | Sealed pure lead-tin - recyclable |
| Battery Venting | Vent at the bottom of the lantern |
| Sealing | Self-contained unit, sealed with gaskets |
| Weight | (Model M 701-5) 11.5 lbs (5.21kg) \|\| (M702-5 / M702-5 GPS) 17 lbs (7.75 kg) |
| Lantern base | Marine grade aluminum |
| Mounting | 3, 4 & 5 bolt mounting pattern |

### ENVIRONMENTAL and ELECTRICAL

| | |
|---|---|
| Temperature Range[6] | -40° to 176° F<br>(-40° to +80° C) |
| Waterproof | As per IP67 (NEMA 6) |
| CE Approval | As per EN 60945:1997 |

### TRADEMARKS and PATENTS

| | |
|---|---|
| Trademarks and Patents | US Patents: 5,782,552 & 6,013,985<br>European Patent Application: 96925627.0<br>Other Patents Pending |

[1] *Actual range is dependant on flash pattern, intensity, and LED color.*
[2] *All "Flashing" light specifications are based on 100% intensity setting at 12.5% duty cycle (code 064).*
[3] *Actual figures for autonomy depend on the intensity level setting.*
[4] *Lights will function reliably at higher latitudes than 55° North or South if intensity/autonomy is properly adjusted to suit operating environment by an Authorised Carmanah Representative.*
[5] *Amber, Red, Green: ~14 years to 80% of original effective intensity when operated at night with a 12.5% duty cycle..*
[6] *Consistent ambient temperatures above +77°F (+25°C) may affect overall battery life. Temperatures above +140°F (+60°C) may affect output.*

*All specifications are subject to change without notice.*

## REPRESENTED BY

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**Optional Infrared Programmer**

**Optional Bird Deterrent**

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