

TIDELAND SIGNAL CORPORATION MLED-120 LED LANTERN

The Tideland MLED-120 LED lantern is a stand-alone replacement for 155mm and 250mm lanterns used on buoys and structures. The original MLED-120's were purchased as a field test to replace 155mm lanterns using 12-volt, 0.55 amp lamps. Self contained LED lanterns like the Carmanah 704-5 and Vega VLB-36 have since replaced lanterns in this application. However, the MLED-120 has been authorized on buoys and structures requiring higher intensities where a self contained LED lantern is not viable or a replacement lantern is needed at an economical price (the MLED-120 is cheaper than a complete 250mm). The MLED-120 requires a legacy solar power system for proper operation.



Tideland MLED-120

Selection Criteria

Intensity selection should be based on the operational requirements of the aid. To determine the intensity requirements for any aid, Districts shall use the standard procedures for selecting an AtoN light signal as prescribed in the AtoN Technical Manual (Chapter 6, Section 6.B, page 6-1) and the Visual Signal Design Manual (Chapter 3). These references describe how operational range, luminous range, light color, light characteristic, background lighting, and meteorological visibility are used to calculate intensity needs.

Tideland MLED-120 Effective Intensity Data (candelas)

Rhythm	1 Tier				2 Tiers			
	White	Yellow	Red	Green	White	Yellow	Red	Green
Fixed	35	22	31	60	65	34	59	126
FL6(.6)	31	31	29	46	50	60	55	95
FL4(.4)	23	27	25	41	45	53	49	84
FL2.5(.3)	21	24	23	37	40	47	44	76
FL(2+1)6	21	23	23	37	40	46	43	76
Q	21	22	22	37	40	42	42	76
Mo(A)	23	25	--	--	45	47	--	--
FL2.5(1),	29	28	29	51	56	53	57	105
Iso2	29	27	29	50	55	50	57	105
Iso 6	33	30	33	56	62	56	64	118
Oc4	33	25	31	56	62	44	59	118

Selection Criteria (cont'd)

Rhythm	Tideland MLED-120 Effective Intensity Data (candelas) (cont'd)							
	3 Tiers				4 Tiers			
	White	Yellow	Red	Green	White	Yellow	Red	Green
Fixed	102	48	82	197	143	52	112	256
FL6(.6)	70	85	72	118	88	110	98	154
FL4(.4)	77	95	81	132	98	124	110	171
FL2.5(.3)	87	107	91	149	110	140	124	192
FL(2+1)6	69	83	71	118	88	107	97	154
Q	67	73	67	118	88	94	92	154
Mo(A)	75	81	--	--	97	105	--	--
FL2.5(1),	93	93	90	164	122	118	123	213
Iso2	92	84	86	164	121	106	118	213
Iso 6	103	95	97	185	136	119	133	240
Oc4	100	70	87	185	135	83	119	240

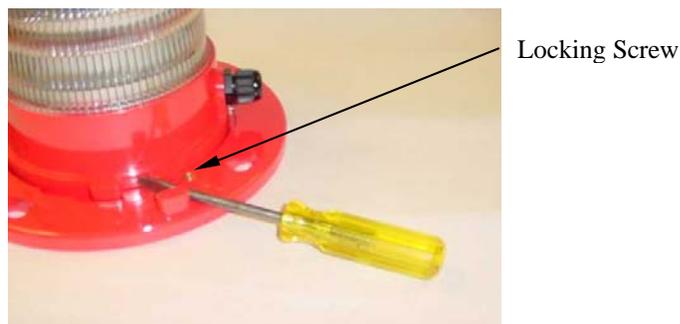
The above effective intensities are correct. Some colors are sensitive to contact closure time (CCT) and duty cycle. The more heat the LED generates, the lower the effective intensity.

Purchase

The MLED-120 lantern is on GSA Schedule GS-07F-6104P at www.gsaadvantage.gov. Type in the schedule number, click "120E" and three pages of products are displayed. Note: we are only using item numbers: 010.1143-SA, 010.1143-SA-1, 010.1143-SA-2, 010.1143-SA-3.

Programming

Remove the locking screw on the base of the lantern with a Phillips screwdriver. Use the screwdriver to pry the lantern counter clockwise to loosen the base. Align the tabs with the slots and separate the lantern from the base.



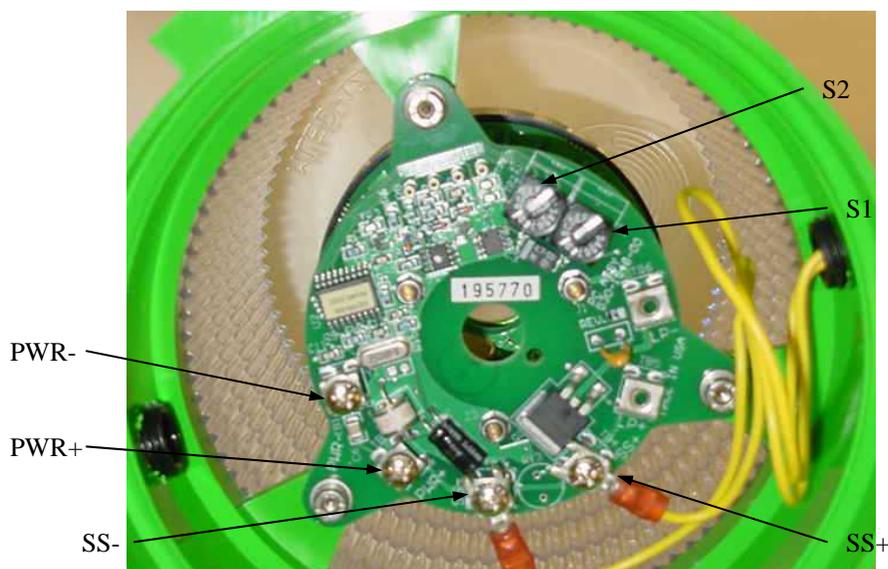
The flash rhythm must be set using the two rotary switches (labeled S2 and S1 on the bottom circuit board; see next page). Each switch has a clear cover over the numbers/letters and a slot aligned with the "arrow" molded into the knob. Align the arrow or window to the desired character. The first character of code setting in the chart on the next page refers to S1 and the second to S2.

Programming (cont'd)

Buoys/Structures		Ranges	
Rhythm	Code Setting	Rhythm	Code Setting
FL2.5 (0.3)	1C	Iso 6	55
FL4 (0.4)	09	Mo(A)	E6
FL6 (0.6)	1D	Iso 2	51
Q	99	FL2.5(1)	??
Mo(A)	E6	Oc 4	90
FL (2) 6	23	Fix	00
FL (2+1) 6	4B		
FL (2) 5	8D		

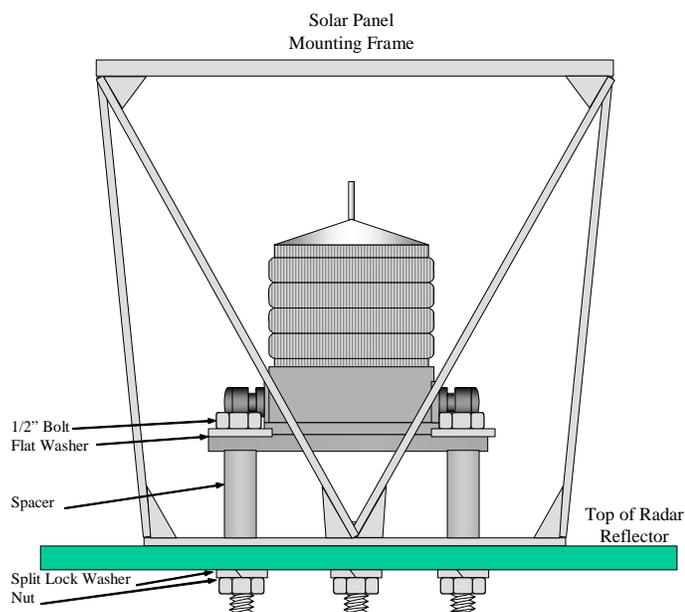
For example, the code for a FL6(0.6) is **1 D**. Switch S1 is code **1** and switch S2 is code **D**.

The power cords for the Tideland lanterns were shipped to your unit/cutter separately. Remove the stuffing tube nut and feed the end of the power cord, one lug at a time, through the stuffing tube until the black outer jacket just protrudes inside the lantern. Be sure that the packing gland (rubber sleeve) remains in the stuffing tube. Slide the stuffing tube nut up the cable and secure to the stuffing tube. Attach the black wire to the PWR+ terminal and the white wire to the PWR- terminal. The yellow wires attached to the SS+ and SS- terminals are for the Tideland daylight control.

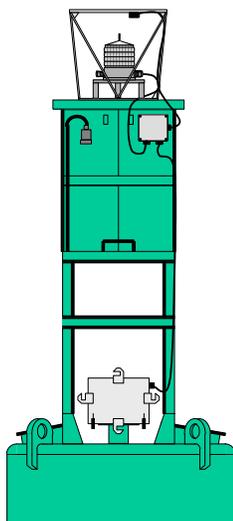


Close the lantern by aligning the tabs in the slots and turning clockwise. Use the screwdriver, as shown in Figure 1, to securely lock the lantern in place. Reinstall the locking screw, if rough surf conditions exist and/or to discourage vandalism.

Installation - Buoys



Sandwich the panel stand between the lantern and buoy and attach with 1/2" threaded stainless steel bolts, flat washers, split lock washer and nuts. Be sure to use the supplied spacers to elevate the lens above the lantern ring on the buoy.

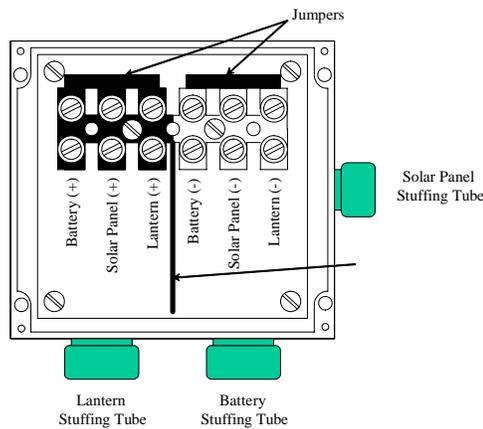


Install the solar panel using the solar panel installation kit and the appropriate number of batteries, and connect as outlined in the Short Range Aids to Navigation Servicing Guide.

The LED Lantern Junction Box should be mounted to one of the radar reflectors (preferably one of the closed sections) to protect it from rain and guano, as shown above. Install using the template provided in the LED Lantern Junction Box; mark the four holes to be drilled on the radar reflector with a center punch. Be sure the area behind the radar reflector has room to install hardware (no cross ribs, vertical reflectors, etc.). Drill four 9/32" diameter holes through the reflector. Install the junction box using the provided hardware. Route the wires through the stuffing tubes. Tie the cables to adjacent support structures and cut off the excess in the box (keep the cable as short as possible). Strip the ends of the wire and insert into the Euro type terminal strips and secure with a 3/16" flat blade screwdriver. The terminals are labeled and color coded black for positive and white for negative. The box is gray and may be painted to match the buoy, if desired.

Installation – Buoys (cont'd)

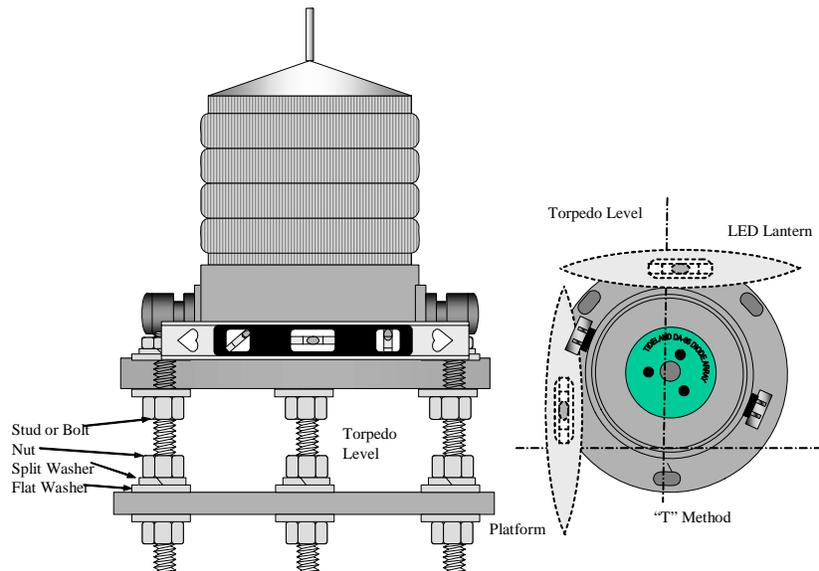
Note:
 Cable size for the MLED-120 is 0.345" diameter.
 Order a 2C packing via MILSTRIP, NSN5330-00-202-2588



Cover the daylight control to simulate nighttime and check for proper operation.

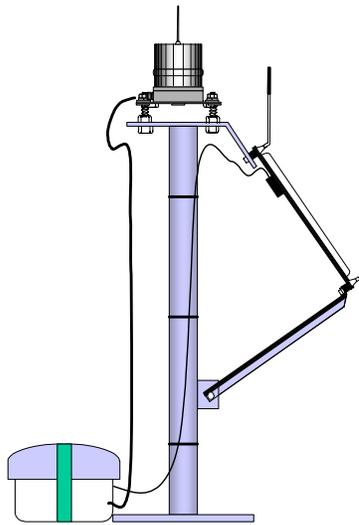
Installation - Structures

Mount and level the lantern using three 1/2" stainless steel studs or bolts. Place a torpedo level on the top of the lens (if not flat, use the base). Use the "T" method as shown below and adjust the nuts beneath the base until level. After tightening, recheck using the level in both directions.



The power cable is provided and is replaceable. Use 18/2 AWG Neoprene Rubber Jacket, 600 VAC Type SOOW McMaster Carr 7081K11 or equivalent. 18AWG wire is sufficient for these lanterns.

Installation – Structures (cont'd)



The leads from the lantern and solar panel should be terminated in the battery box. Route the wires and zip tie it along structural members then coil the excess inside the battery box. Crimp the proper ring lug onto each wire, and attach the black leads to the positive terminal on the battery and the white leads to the negative terminal on the battery. Apply No-ox grease or a suitable anticorrosion coating to the battery terminals.

Cover the daylight control to simulate nighttime and check for proper operation.

Solar Design

To design a solar power system to operate the MLED-120 lantern, use either the Buoy Solar Sizing Program or the Minor Fixed Aid Solar Program on our website (<http://www.uscg.mil/hq/cg4/cg432/>) under Pubs/Software. The number of tiers is available from the pull down menus in the spreadsheets.

Service Life

Lanterns may be kept in service as long as they provide an acceptable signal to the mariner. Signs of crazing of the lens, deterioration of the housing or evidence of failed LEDs are grounds for removal.

Servicing

- The service interval for the lantern is three years.
- Ensure that the lens is clean, not discolored or crazing. Wipe with a cloth dampened with mild soap and water, if necessary. Replace if not clear or cracks could compromise its strength or light transmission.
- Inspect the wiring and power system in accordance with the Short Range Aids to Navigation Servicing Guide. Load test the battery.
- Cover the daylight control to ensure that the lantern flashes on rhythm. Observe the LEDs around the lantern. Noticeable dark spots indicate that one or more LEDs are out. If one or more LEDs are out the lantern should be replaced at the earliest convenience after posting a local notice to mariners. An easy way to check LED lanterns is to wrap white paper around the lens and observe the light pattern. Dark sectors on the paper indicate failed LEDs (note: failed LEDs are very rare).
- If the lantern fails for any reason, replace it with another LED lantern or a 155mm lantern, conventional programmable flasher, lampchanger, DLC and lamps.

Troubleshooting

No light.

- Check battery voltage. Minimum voltage is 10 volts for the LED lanterns to operate. No reduction in LED intensity will occur at this voltage. Replace wire or battery, if necessary.
- Disconnect one lead from the battery, wait 10 seconds, then reconnect.
- Replace the LED lantern assembly if the power system checks out and the lantern fails to light.

Improper rhythm

- Check the position of the code selection switches.
- Disconnect one lead from the battery, wait 10 seconds, then reconnect.
- Replace the LED lantern if it does not display the proper rhythm.

Various LEDs out (dark sectors)

- The MLED-120 lantern has equally spaced LEDs around its perimeter. If the light pattern is not consistent, as projected on a sheet of white paper wrapped around the lens, replace the lantern.

Reporting Requirements

Units and Cutters shall enter the following information into IATONIS so that your district and CG Headquarters can monitor these lanterns. Enter the following data in the fields listed below for these lantern combinations:

<u>LANTERN TYPE</u>	<u>LAMP TYPE</u>
LED TIDMLED 120-1TIER	LED
LED TIDMLED 120-2TIER	LED
LED TIDMLED 120-3TIER	LED
LED TIDMLED 120-4TIER	LED

(Note: to determine the number of tiers, merely count the LED stacks inside the lantern.)

Contact Info:

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 Rene Champagne
 Website – www.tidelandsignal.com

In addition, specific problems, concerns, observations and questions may be directed to anyone on the COMDT (CG-432A) staff via the website <http://www.uscg.mil/hq/cg4/cg432/>.