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LO200M LED Range Light Signal

# **Product Manual**

Version: 1.11 Date: May 3<sup>rd</sup>, 2021



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### 1. Introduction

#### 1.1. Overview

The LO200M signal is designed for applications requiring medium and long range directional light, such as range lights and port entry signals. The LO200M is a signal with integrated flasher and extremely low power consumption. It is also very easy to install and has a durable design. LO200M lantern can be equipped with GPS synchronization and Light Guard monitoring. The lanterns are available in many different versions; please refer to the Sabik product key (Appendix) for more information. If needed, the lanterns light character can be programmed by using Sabik EasyProgrammer, PC/USB (ProgrammerLite) and Sabik PDA programmer as detailed in this manual.

### 1.2. Standard Features

- High intensity precision range light
- Intensity adjustable from 5% to 100%
- Housing fully waterproof with PTFE vent for breathing
- Visual range up to 15nm (Tc = 0,74)
- Standard IALA colours Red, Green, White and Yellow
- Low power consumption, ideal for solar powered systems
- Flasher with day light switch can be integrated in lantern or installed externally in battery cabin
- Integrated 16 ampere PWM solar panel regulator when flasher is integrated
- Programming with wireless Sabik easyProgrammer, PDA Programmer or USB/IR interface
- Optionally internal GPS synchronization. Optional night time reduction if operated day and night

### 1.3. Optional Features

- Integrated GPS synchronization
- GPS Position Monitoring
- Optical Feedback
- Integrated GSM Remote monitoring
- Event-log with records from up to 3 years



### 2. Technical Details

# 2.1. Main specification table

Specification	Value
Lens Visual/Mechanical diameter	200mm (8")
Lens material	UV stabilized Polycarbonate
Light source	High power Light Emitting Diode (LED)
Lens horizontal divergence	$6^{\rm o} \ @ \ 50\%$ ( $\pm 1^{\rm o}$ ) of peak intensity
Supply Voltage	10 – 32 VDC
Power Consumption	4W at full intensity
Controller	Sabik SMC flasher
Temperature range	-40° C+60° C
Unit Life Time	Up to 10 years
Weight	13 kg
Ingress protection	IP 67 (Each lantern factory tested)

## 2.2. Optical performance

The maximum luminous intensity for each colour is defined by the table below:

Maximum Fixed Intensity	cd
Colour	At full power
White	13 000 cd
Red	7 000 cd
Green	7 000 cd
Yellow	7 000 cd



## 3. Mechanical

The L0 200M is made of high grade marine aluminium. It can be mounted on a horizontal or vertical base. It can easily be mounted on any flat surface. See the section Commissioning/mounting for details.

The lantern is equipped with a PTFE vent for pressure adjustment.

## 4. Electrical

The Optical Feedback feature is a hardware dependent option. Light sensors are installed in the lantern and calibrated at the factory. If the LEDs are degrading or the LEDs fail, a value in % of initial intensity can be read. When the light output falls below a pre-defined level, an alarm will be set.

## 4.1. Light Sensor

The combined light sensor and IR transceiver is located inside a stainless steel gland. The IR transceiver is also used when programming the lantern using any of SABIK programmers. The light sensor is configured to ambient luminance level (lux) and the user can also program the hysteresis between turning ON and turning OFF the light. The factory default setting is to switch on the light at 15 lux and off at 60 lux.





### 5. **Power Supplies**

The LO200M is provided with a ready-made power supply cable. In this section a number of application examples are provided to assist choosing the right configuration/connection.

## 5.1. Solar Charger

In this section a number of application examples are provided to assist choosing the right configuration. A programmable solar panel regulator capable of handling up to 16 amps is



integrated in the lantern, enabling the lantern to control solar panel charging directly without the need to install external chargers. The charger settings are programmable by the user enabling the lantern to be connected to various types of batteries and also battery voltages.

The solar panel charger is a series charging regulator with temperature compensation (built-in sensor). The solar panel output is controlled by Pulse Width Modulation (PWM) in order to optimize the charging process. In the table below you can find the typical settings for both lead acid and open cell nickel cadmium types of batteries in 12 volt systems.



## 5.2. Solar Battery with Photovoltaic

The maximum allowed solar panel current is 16A and must not be exceeded. It is recommended to install a 16 A fuse as close to the battery as possible. Long cables will result in an energy loss due to the voltage drop in the cable.



Charger Setting	Recommended settings,	12V systems
	Lead Acid	Nickel Cadmium
Cut In Voltage	13.8V	14.8V
Cut Out Voltage	14.4V	15.2V
Temperature compensation	-30mV/°C	-30mV/°C

For other types of batteries and other types of nominal voltages, please consult your battery manufacturer for the corresponding values. Because the built-in charger is fully programmable, other types of battery chemistry's, like Nickel Metal Hydride, can also be charged safely by the lantern. For detailed instruction on how to enable this function please refer to the "SABIK PDA Programmer Manual".

## 5.3. Primary Battery

Even though the minimum operating voltage of the lantern is 10V, it should not be connected to a primary (backup) battery with a nominal voltage of less than 12V to allow for voltage drop when being discharged.

If the primary battery used does not have an internal fuse, an external one must be included in the system.





## 5.4. Other DC Power Supply

When using AC/DC main operated power supplies, special attention should be paid to make sure that the power supply selected is capable of powering the unit. Especially the ripple, the transient current capability and inductance should be checked against the requirement of the lantern.



## 5.5. Wire Synchronization

Even though the sync signal is a single wire solution, the units need to be connected to a common battery minus. If they are running on the same power system then only the sync connection is needed.

For the wire synchronization, a cable with 5 leads is required (provided by Sabik on request). This option require programming using the Sabik PDA Programmer!

## 6. Event Log

LO200M maintains a log for storing information. Please refer the programmer options for residing and storing the information. The lantern can be configured to also store main events which can be retrieved by service technician using the Sabik PDA programmers. All day / night transitions as well as any malfunction will be stored in the lantern, and can be download over the infrared port at any point. The lantern has room for an about three years of events. The data is stored in a non-volatile memory independent on external power supply.

## 7. Environmental

The lantern is designed for the marine conditions including exposure for high UV radiation and salt spray. The robust aluminium housing and lens is designed to survive the conditions present in the marine environment. See the Main specification table. For disposal of units, refer to the chapter "Disposal".





## 8. Commissioning

The installation procedure is simple, as the lantern is (usually) pre-installed/configured at the factory. If you must install additional hardware, or change settings, please follow the instructions below or contact Sabik Oy for instructions.

## 8.1. Mounting

The lantern is fixed to the fundament using Four M12 bolts. The lantern can be mounted on a horizontal base or through a (vertical) wall.

#### Mounting on a horizontal base





#### Wall Mounting







## 8.2. Precise Aligning of the Light Beam

Aligning is done using the spring loaded aligning nuts.



Horizontal Adjusting



Align the beam horizontally by adjusting the horizontal alignment nuts using two 19mm wrenches.

You may attach and use a telescopic-sight (sold as a separate accessory) for precise adjusting.

Align the beam vertically by adjusting the vertical alignment nuts using two 19mm wrenches. Use the precision level to set

Telescopic Sight

the beam horizontally. The level is factory set – **DO NOT** loosen the level! It is factory pre-set for horizontal alignment of the beam.



Precision Level



Vertical Adjustment



## 9. Programming

Programming can be done with a wireless Sabik Easy Programmer, PDA Programmer or PC/USB interface. Below you will find short instructions on how to use the Sabik easyProgrammer.

## 9.1. Sabik easyProgrammer



Sabik easyProgrammer is a stand-alone simple programmer for lanterns with an infrared-Interface. With the aid of easyProgrammer PC software, you can download/upload information to/from the handheld programmer to a Windows based personal computer.

This is done using the SABIK Infrared USB interface (sold separately).

To insert/change batteries, open the back cover and insert/replace by 3 standard size AAA (R3) batteries. We recommend that you remove the batteries when the programmer is stored for a longer period.







## 9.1.1. Using the programmer

#### Start/Shut Down

To start the programmer, press and hold down the green (Enter) button.

1. Start programmer: Press green ENTER for at least 2sek.

2. Set/Check Date and time settings: Select ADVANCED -> DATE/TIME

#### To check/change existing lantern settings

1. Select SETTINGS and press green ENTER

2. Point at lantern's IR diode to read lantern's settings. The programmer beeps twice, when reading is completed.

3. To change existing settings, press DOWN/UP keys to select, and press ENTER to change setting. Press ENTER again to write to lantern.



A. LCD display

B. UP button. Go up in menu.

- C. Enter button, accept selection, read data from lantern (press and hold to power up)
- D. Down button. Select down in menu.
- E. Cancel button (press and hold to shut down)

#### To set a new flash code

- 1. Select SETTINGS and press green ENTER
- 2. Point at lantern's IR diode to read lantern's settings.

3. Press ENTER and select Flash code from the list (pressing and holding UP or DOWN keys you can scroll thru the list).

4. Press ENTER and select YES to send the new flash code to the lantern.

To shut down, press and hold down the red X (Cancel) button.

Please refer to the easyProgrammer product manual for more detailed information.





On the following pages you will find the Sabik easyProgrammer built-in flash character list where:

Number: Flash character number used by Sabik. Flash Character: Flash character name. Duty Cycle: Light on time (seconds) in percent. Min flash duration: Shortest light on time in one cycle.



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sh arac	5		õ e	_	-	~	~	_	<del>с</del>	-	4		φ.	~	6		~	~		_	ത
Chi Fla	Dut		i i i i	5	E E	5	E E	1	B	1	E C	E.	B	1	L L L	5	ы Ш	L.	ы Ш	Ľ.	ы Ш
001 Fixed light	100,0%		-	-	-																
002 FI(2) 10s	10,0%	2 FI(2) 10s 10%	0,50	0,5	1	0,5	8														
003 FI(2) 10s	10,0%	3 FI(2) 10s 10%	0,50	0,5	1,5	0,5	7,5					ļ			ļ	ļ	Ļ	ļ'			ļ
004 FI(2) 10s	16,0%	4 FI(2) 105 16%	0,80	0,8	1,2	0,8	7,2									Ļ	<b> </b>	ļ!			
005 FI(2) 10s	20,0%	5 FI(2) 10s 20%	1,00	1	1	1	1									<b> </b>		ļ			
000 FI(2) 105	20,0%	0 FI(2) 105 20%	1,00	0.5	1,5	0.5	0,0														
007 F1(2) 125	25.0%	8 FI(2) 125 070	1.50	15	2	15	10									<u>+</u>	<u> </u>				
009 FI(2) 15s	13.3%	9 FI(2) 15s 13%	1.00	1,0	2	1,0	11														
010 FI(2) 5s	20,0%	10 FI(2) 5s 20%	0,50	0,5	1	0,5	3					1				<u> </u>					
011 FI(2) 5s	40,0%	11 FI(2) 5s 40%	1,00	1	1	1	2														
012 FI(2) 6s	16,7%	12 FI(2) 6s 17%	0,50	0,5	1	0,5	4														
013 FI(2) 6s	26,7%	13 FI(2) 6s 27%	0,80	0,8	1,2	0,8	3,2														
014 FI(2) 6s	33,3%	14 FI(2) 6s 33%	1,00	1	1	1	3										L				
015 FI(2) /s	28,6%	15 FI(2) /S 29%	1,00	1	1	1	4										<u> </u>	ļ			ļ
010 FI(2) 8S	25.0%	10 FI(2) 85 13%	1 00	0,5	1	0.5	5										───		<u>├</u> ──┤		
019 E1(2+1) 10c	25,0%	17 FI(Z) 05 ZJ70 19 EI(2+1) 10c 15%	0.50	0.5	0.7	0.5	21	0.5	57								<u> </u>				
019 FI(2+1) 12s	20.0%	19 FI(2+1) 12s 20%	0,30	0.8	12	0,3	24	0,0	6							<u> </u>					
020 FI(2+1) 12s	25,0%	20 FI(2+1) 12s 25%	1,00	1	1	1	4	1	4							<u> </u>					
021 FI(2+1) 15s	20,0%	21 FI(2+1) 15s 20%	1,00	1	2	1	5	1	5												
022 FI(2+1) 6s	15,0%	22 FI(2+1) 6s 15%	0,30	0,3	0,4	0,3	1,2	0,3	3,5												
023 FI(3) 12S	12,5%	23 FI(3) 12S 13%	0,50	0,5	2	0,5	2	0,5	6,5							L	L				
024 FI(3) 10s	15,0%	24 FI(3) 10s 15%	0,50	0,5	1,5	0,5	1,5	0,5	5,5						ļ	Ļ	Ļ	ļ'	Ļ'	<sup> </sup>	
025 FI(3) 10s	30,0%	25 FI(3) 10s 30%	1,00	1	1	1	1	1	5							<u> </u>		<b>↓</b> '	<u> </u>	$\vdash$	<u> </u>
020 FI(3) 128	20,0%	20 FI(3) 12S 20%	08,0	0,8	1,2	0,8	1,2	0,8	1,2			ł				<u> </u>	<u> </u>	<u> </u> '	<b>├</b> ──┤		<u> </u>
027 FI(3) 155 028 FI(3) 15e	10.0%	28 FI(3) 158 0%	0,30	0,3	1,7	0,3	1,7	0,3	10,7							<del> </del>	<u> </u>	<u> </u>	$\vdash$		<u> </u>
029 FI(3) 20s	7.5%	29 FI(3) 20s 8%	0,50	0,5	3	0,5	1,0	0,5	12.5			<b> </b>				<del> </del>	<b> </b>		<b>├</b> ──┤		
030 FI(3) 9s	26.7%	30 FI(3) 9s 27%	0.80	0.8	1.2	0.8	1.2	0.8	4.2								<u> </u>				
031 FI(4) 10s	20,0%	31 FI(4) 10s 20%	0,50	0,5	1	0,5	1	0,5	1	0,5	5						-				
032 FI(4) 10s	32,0%	32 FI(4) 10s 32%	0,80	0,8	1,2	0,8	1,2	0,8	1,2	0,8	3,2										
033 FI(4) 12s	26,7%	33 FI(4) 12s 27%	0,80	0,8	1,2	0,8	1,2	0,8	1,2	0,8	5,2										
034 FI(4) 15s	13,3%	34 FI(4) 15s 13%	0,50	0,5	1,5	0,5	1,5	0,5	1,5	0,5	8,5										
035 FI(4) 15s	26,7%	35 FI(4) 15s 27%	1,00	1	1	1	1	1	1	1	8					ļ	<b>_</b>	ļ			ļ
036 FI(4) 20s	10,0%	36 FI(4) 20s 10%	0,50	0,5	1,5	0,5	1,5	0,5	1,5	0,5	13,5	0.0	44.0			ļ		ļ!			
037 F1(5) 20S	20,0%	37 FI(5) 20S 20%	0,80	0,8	1,2	0,8	1,2	0,8	1,2	0,8	1,2	0,8	11,2								
030 FI(5) 205	20,0%	30 FI(3) 205 2376	0.50	0.5	1	0.5	1	0.5	1	0.5	1	0.5	1	0.5	7		<u> </u>				<u> </u>
040 FL-*	75.0%	40 FL-* 75%	1.00	0,5	1	0,5	1	0,5		0,5	· ·	0,5	'	0,5							
041 FL-**	70.0%	41 FL-** 70%	1.00	5	1	1	1	1	1							<u> </u>	<u> </u>				
042 FI 1.5s	20,0%	42 FI 1.5s 20%	0,30	0,3	1,2																
043 FI 1.5s	33,3%	43 Fl 1.5s 33%	0,50	0,5	1																
044 FI 10s	5,0%	44 FI 10s 5%	0,50	0,5	9,5																
045 FI 10s	10,0%	45 FI 10s 10%	1,00	1	9		ļ									<b></b>	<b> </b>	ļ!			ļ
046 FI 10s	15,0%	46 FI 10s 15%	1,50	1,5	8,5											ļ		ļ'			
047 F1 12S	10,0%	4/ FI 12S 10%	1,20	1,2	10,8																
040 F1 2 5s	12.0%	40 FI 2 5c 12%	0.30	03	22												┼───				
050 FI 2.56	20.0%	50 FL 2 5s 20%	0.50	0,5	2,2																
051 FI 2.8s	10,7%	51 FI 2.8s 11%	0.30	0.3	2.5											<u> </u>					
052 FI 2s	10,0%	52 FI 2s 10%	0,20	0,2	1,8																
053 FI 2s	15,0%	53 FI 2s 15%	0,30	0,3	1,7																
054 FI 2s	20,0%	54 FI 2s 20%	0,40	0,4	1,6												L				
055 FI 2s	25,0%	55 Fl 2s 25%	0,50	0,5	1,5											<b> </b>	<b> </b>	ļ'	<u> </u>	$\vdash$	
050 F128	35,0%	50 FL2S 35%	0,70	0,7	1,3							1			<u> </u>	───	<u> </u>	<b>├</b> ───┤	<u>├</u> ──┤		
058 FI 39	40,0%	58 FL3s 10%	0,00	0,0	2.7											<u> </u>	<u>+</u>	<u> </u>	<u>├</u> ──┤		
059 FL3s	16,0%	59 FL3s 17%	0.50	0,3	2,1							†				<del> </del>	<u> </u>	<b>├</b> ──┤	<u>├</u> ──┤	┝──┦	
060 FI 3s	23,3%	60 FI 3s 23%	0,70	0.7	2.3							1				t	<u> </u>				
061 FI 3s	33,3%	61 FI 3s 33%	1,00	1	2											<u> </u>					
062 FI 4.3s	30,2%	62 FI 4.3s 30%	1,30	1,3	3																
063 FI 4.4s	9,1%	63 FI 4.4s 9%	0,40	0,4	4																
064 FI 4s	12,5%	64 FI 4s 13%	0,50	0,5	3,5											Ļ	Ļ				
065 FI 4s	20,0%	65 FI 4s 20%	0,80	0,8	3,2												ļ	ļ!			
0667 51 40	25,0%	60 FI 4S 25%	1,00	1 1 5	3											<u> </u>	──				
068 FI 5e	57,5% 6.0%	68 FI 56 6%	0.30	1,0	2,0 17							+			<u> </u>	<u>+</u>	<u>+</u>	<u> </u>			
069 FI 5s	10.0%	69 FI 5s 10%	0.50	0,5	4.5							1				<u> </u>	t	<u> </u>			<u> </u>
070 FI 5s	20,0%	70 FI 5s 20%	1,00	1	4							1				<u> </u>	<u> </u>				
071 FI 5s	25,0%	71 FI 5s 25%	1,50	1,5	4,5																
072 FI 6s	8,3%	72 FI 6s 8%	0,50	0,5	5,5																
073 FI 6s	10,0%	73 FI 6s 10%	0,60	0,6	5,4																
074 FI6s	16,7%	74 Fl 6s 17%	1,00	1	5											L	L				L
075 FI 6s	30,0%	75 FI 6s 30%	1,50	1,5	3,5											<b> </b>		<b> </b> '	$\vdash$	$\vdash$	<b> </b>
0/6 FI /.5s	10,7%	/b H /.55 11%	0,80	0,8	6,7										ļ	<b> </b>		ļ <sup>1</sup>	<u> </u>		<b> </b>
077150 105	50,0%	78 190 29 50%	5,00	5	5											──	<del> </del>	<b>├</b> ──┤	<b>├</b> ──┤		
079180 49	50.0%	79 180 48 50%	2.00	2	2							t			<u> </u>	┼───	<u>+</u>	<u>├</u> ───┤	<u>├</u> ──┤	┝┦	
080 ISO 5S	50.0%	80 ISO 5S 50%	2,50	2.5	2.5											<u> </u>	<u> </u>				



5	ter	y c le		~																		
mbe	as h la rac	ty c		u o	÷	5	2	я		8	4	7	S.	8	g	8	~	5	8	8	6	8
Ž	문망	B		ΣË	1	8	L.	Ш	L.	Ш	1	Ш	L.	Ш	L.	EC	L.	ы	L.	ы	1	ш
081	ISO 6S	50,0%	81 ISO 6S 50%	3,00	3	3																┝───┤
083	ISO 3S	50.0%	83 ISO 3S 50%	1.50	1.5	1.5																
084	LFL 10S	20,0%	84 LFL 10S 20%	2,00	2	8																
085	LFL 10S	30,0%	85 LFL 10S 30%	3,00	3	7																$\vdash$
086	LFL 10S	40,0%	80 LFL 10S 40%	4,00	4	10																├
088	LFL 15S	26,7%	88 LFL 15S 27%	4,00	4	11																
089	LFL 5S	40,0%	89 LFL 5S 40%	2,00	2	3																
090	LFL 6S	33,3%	90 LFL 6S 33%	2,00	2	4																$\vdash$
091	LFL 85	25,0%	97 LFL 85 25%	2,00	2	5																
093	MO(A) 10S	20,0%	93 MO(A) 10S 20%	0,50	0,5	0,5	1,5	7,5														
094	MO(A) 15s	16,7%	94 MO(A) 15s 17%	0,50	0,5	1,5	2	11														
095	MO(A) 6s	21,7%	95 MO(A) 6s 22%	0,30	0,3	0,6	1	4,1														$\vdash$
090	MO(A) 85 MO(B) 15S	20.0%	95 MO(A) 85 40% 97 MO(B) 15S 20%	0,80	0,8	1,2	2,4	3,0	0.5	0.5	0.5	10.5										
098	MO(U) 10S	15,0%	98 MO(U) 10S 15%	0,30	0,3	0,7	0,3	0,7	0,9	7,1	0,0	10,0										
099	MO(U) 10S	20,0%	99 MO(U) 10S 20%	0,40	0,4	0,6	0,4	0,6	1,2	6,8												
100	MO(U) 10S	25,0%	100 M O(U) 10S 25%	0,50	0,5	0,5	0,5	0,5	1,5	6,5												
101	MO(U) 155 MO(U) 155	10,7%	101 M O(U) 158 17% 102 M O(U) 158 17%	0,50	0,5	0,5	0,5	0,5	1,5	11,5												
103	MO(U) 15S	22,0%	103 M O(U) 15S 22%	0,70	0,7	0,5	0,7	0,5	1,9	10,7												
104	MO(U) 15S	23,3%	104 M O(U) 15S 23%	0,70	0,7	0,7	0,7	0,7	2,1	10,1												
105	MO(U) 15S	23,3%	105 M O(U) 15S 23%	0,75	0,75	0,45	0,75	0,45	2 02	10,6												┝──┤
100	MO(U) 155 MO(U) 155	39,3%	100 M O(U) 155 30%	1,15	1,15	0,73	1,15	0,73	3,03	8,21												┢───┤
108	MO(U) 15S****	21,0%	108 M O(U) 15S**** 21%	0,75	0,75	0,15	0,75	0,15	1,65	11,55												
109	MO(U) 15S*	15,0%	109 M O(U) 15S* 15%	0,45	0,45	0,45	0,45	0,45	1,35	11,85												
110	MO(U) 15S**	17,0%	110 M O(U) 15S** 17%	0,55	0,55	0,35	0,55	0,35	1,45	11,75												
112	MO(U) 10S	10,0%	112 M O(U) 10S 10%	0,00	0,0	0,3	0,0	0,3	0.6	7.4												
113	OC 10S	70,0%	113 OC 105 70%	7,00	7	3																
114	OC 10S	75,0%	114 OC 10S 75%	7,50	7,5	2,5																
115	OC 15S	66,7%	115 OC 15S 67%	10,00	10	5																
117	0C 3S	83.3%	117 OC 3S 83%	2,00	25	0.5																
118	OC 4S	75,0%	118 OC 4S 75%	3,00	3	1																
119	OC 5S	60.0%	119 OC 5S 60%	3,00	3	2																┝──┤
120	00.55	90,0%	120 0 0 55 80%	4,00	4	0.5																
122	OC 6S	66,7%	122 OC 6S 67%	4,00	4	2																
123	OC 6S	75,0%	123 OC 6S 75%	4,50	4,5	1,5																
124	OC 6S	83,3%	124 OC 6S 83%	5,00	5	1																
125	0.125	41 7%	126 0 1 28 42%	0,50	0,5	0,9																
127	Q 1.2S	50,0%	127 Q 1.2S 50%	0,60	0,6	0,6																
128	Q 1S	20,0%	128 Q 1S 20%	0,20	0,2	0,8																L
129	Q 1S 0 1S	30,0%	129 Q 1S 30%	0,30	0,3	0,7																┝──┤
131	Q 1S	50,0%	131 Q 1S 50%	0,50	0,5	0,5																
132	Q 1S	80,0%	132 Q 1S 80%	0,80	0,8	0,2																
133	Q(2) 10S	10,0%	133 Q(2) 10S 10%	0,50	0,5	1,5	0,5	7,5														
134	0(2) 105	12,0%	134 Q(2) 105 12%	0,00	0,0	0,4	0,0	8,4														
136	Q(2) 6S	10,0%	136 Q(2) 6S 10%	0,30	0,3	0,7	0,3	4,7														
137	Q(2) 6S	11,7%	137 Q(2) 6S 12%	0,35	0,35	0.7	0,35	4,6														
138	Q(3) 10S	9,0%	138 Q(3) 10S 9%	0,30	0,3	0,7	0,3	0,7	0,3	7,7												┝──┤
140	Q(3) 105	18.0%	140 Q(3) 10S 18%	0,35	0,55	0,05	0,35	0,05	0,35	7,05												
141	Q(4) 10S	12,0%	141 Q(4) 10S 12%	0,30	0,3	0,7	0,3	0,7	0,3	0,7	0,3	6,7										
142	Q(4) 12S	10,0%	142 Q(4) 12S 10%	0,30	0,3	0,7	0,3	0,7	0,3	0,7	0,3	8,7										
143	Q(4) 15S	9,3%	143 Q(4) 15S 9%	0,35	0,35	0,7	0,35	0,7	0,35	0,7	0,35	11,5										
145	Q(4) 6S	26,7%	145 Q(4) 6S 27%	0,50	0,5	0,5	0,5	0,5	0,5	0,5	0,5	2.6										
146	Q(5) 10S	15,0%	146 Q(5) 10S 15%	0,30	0,3	0,7	0,3	0,7	0,3	0,7	0,3	0,7	0,3	5,7								
147	Q(5) 20S	7,5%	147 Q(5) 20S 8%	0,30	0,3	0,7	0,3	0,7	0,3	0,7	0,3	0,7	0,3	15,7								$\vdash$
148	Q(5) 20S	12,5%	148 U(5) 20S 13%	0,50	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	15,5								┟───┤
149	Q(6) 10S	18,0%	150 Q(6) 10S 18%	0,30	0,3	0,7	0,3	0,7	0,3	0,7	0,3	0,7	0.3	0.7	0,3	4,7						
151	Q(6)+LFL 15S	25,3%	151 Q(6)+LFL 15S 25%	0,30	0,3	0,7	0,3	0.7	0.3	0.7	0.3	0.7	0,3	0.7	0,3	0,7	2	7				
152	Q(6)+LFL 15S	21,0%	152 Q(6)+LFL 15S 21%	0,35	0,35	0,65	0,35	0,65	0,35	0,65	0,35	0,65	0,35	0,65	0,35	0,65	1,05	7,95				
153	Q(6)+LFL 15S Q(9) 15S	37,3%	153 Q(b)+LFL 15S 37% 154 Q(9) 15S 18%	0,60	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	2	5,8	03	07	0.2	67
155	Q(9) 158	21,0%	155 Q(9) 158 21%	0,35	0,35	0,65	0,35	0,65	0,35	0,65	0,35	0,65	0,35	0,65	0,35	0,65	0,35	0,65	0,35	0,65	0,35	6,65
156	Q(9) 15S	36,0%	156 Q(9) 15S 36%	0,60	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	0,6	4,8
157	VQ 0.5S	30,0%	157 V Q 0.58 30%	0,15	0,15	0,35															]	
158	VQ 0.55 VQ 0.65	40,0%	158 V Q 0.55 40%	0,20	0,2	0,3																├
160	VQ 0.6S	50,0%	160 V Q 0.6S 50%	0,30	0,3	0,3																



Number	Flash Character	Duty cycl	Min ON Time	FLI	ECI	FL2	EC	FL3	ß	FL4	EQ	FLS	ECS	FLG	ECG	FLZ	EC7	FLB	ECB	ମ ମ	8
161	VQ(3) 5S	9,0% 161 VQ(3) 5S 9%	0,15	0,15	0,35	0,15	0,35	0,15	3,85												
162	VQ(3) 55 VO(3) 55	12,0% 162 VQ(3) 55 12%	0,20	0,2	0,3	0,2	0,3	0,2	3,8												
164	VQ(6)+LFL 10S	32,0% 164 VQ(6)+LFL 10S 32%	0,20	0,2	0,3	0,3	0,3	0,3	0,3	0,2	0,3	0,2	0,3	0,2	0,3	2	5				
165	VQ(6)+LFL 10S	38.0% 165 VQ(6)+LFL 10S 38%	0,30	0.3	0.3	0,3	0.3	0.3	0.3	0.3	0.3	0,3	0.3	0,3	0.3	2	4,4	0.45	0.05	0.45	5.05
167	VQ(9) 10S	13,5% 166 VQ(9) 105 14%	0,15	0,15	0,35	0,15	0,35	0,15	0,35	0,15	0,35	0,15	0,35	0,15	0,35	0,15	0,35	0,15	0,35	0,15	5,85
168	VQ(9) 10S	27,0% 168 VQ(9) 10S 27%	0,30	0,2	0,3	0,2	0,3	0,2	0,3	0,2	0,3	0,2	0,3	0,3	0,3	0,2	0,3	0,2	0,3	0,3	4,9
169	Q(2) 7S	14,3% 169 Q(2) 7S 14%	0,50	0,5	1	0,5	5														
170	FI(2) 5s FI(2) 10c	12,0% 170 F(2) 5s 12%	0,30	0,3	0,4	0,3	83														
172	FI(5) 20s	12,5% 172 FI(5) 20s 13%	0,50	0,5	1	0,5	1	0,5	1	0,5	1	0,5	13,5								
173	FI(2) 10s	20,0% 173 FI(2) 10s 20%	1,00	1	2	1	6														
174	FI 4s	10,0% 174 Fl 4s 10%	0,40	0,4	3,6	0.4	2.0														
175	F1(2) 05 Mo(A) 8s	30.0% 176 Mo(A) 8s 30%	0,40	0,4	0,6	0,4	<u> </u>														
177	FI 2.5s	40,0% 177 FI 2.5s 40%	1,00	1	1,5	~															
178	FI(3+1) 20 s	10,0% 178 FI(3+1) 20 s 10%	0,50	0,5	1,5	0,5	1,5	0,5	4,5	0,5	10,5										
1/9	FI(3+1) 20 s	12,0% 179 FI(3+1) 20 s 12% 13,0% 180 FI(3+1) 20 s 13%	0,60	0,6	1,4	0,6	1,4	0,6	4,4	0,6	10,4										
181	FI(3+1) 20 s	14,0% 181 FI(3+1) 20 s 14%	0,70	0.7	1.3	0,7	1,33	0,00	4,33	0,00	10,33										
182	FI(3+1) 20 s	16,0% 182 FI(3+1) 20 s 16%	0,80	0,8	1,2	0,8	1,2	0,8	4,2	0,8	10,2										
183	FI(2) 7s	14,3% 183 FI(2) 7s 14%	0,50	0,5	1,5	0,5	4,5	0.5	1.5												
185	LFL 11s	18,2% 185 LFL 11s 18%	2,00	2	9	0,0	1,0	0,0	4,0												
186	FI(6+1) 15s	33,3% 186 FI(6+1) 15s 33%	0,50	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	2	7				
187	Mo (0) 12s	37,5% 187 Mo (0) 12s 38%	1,50	1,5	0,5	1,5	0,5	1,5	6,5												
188	0 1S	25 0% 189 O 1S 25%	1,50	0.25	0.75	1,5	0,5	1,5	9,5												
190	Q (3) 4.6s	19,6% 190 Q (3) 4.6s 20%	0,30	0,3	0.7	0,3	2	0,3	1												
191	FI 7.5s	6,7% 191 FI 7.5s 7%	0,50	0,5	7																
192	FI (4) 11s FI (3) 21s	18,2% 192 FI (4) 11s 18%	0,50	0,5	1,5	0,5	1,5	0,5	1,5	0,5	4,5										
194	FL (3) 6s	25,0% 194 FL (3) 6s 25%	0,50	0,5	0,5	0,5	0,5	0,5	3,5												
195	FL(3)10s	15,0% 195 FL(3)10s 15%	0,50	0,5	0,5	0,5	0,5	0,5	7,5												
196	FL(9)15s	30,0% 196 FL(9)15s 30%	0,50	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	6,5
198	OC(3)8s	62,5% 198 OC(3)8s 63%	1,00	3	1	1	1	1	1												
199	OC(4)10s	60,0% 199 OC(4)10s 60%	1,00	3	1	1	1	1	1	1	1										
200	FL(2)6s	16,7% 200 FL(2)6s 17%	0,50	0,5	1,5	0,5	3,5														
201	FL(1)05 FL(3)15s	6.0% 202 FL (3)15s 6%	0,50	0,5	1,5	0.3	17	0.3	10 7												
203	FL(2)5s	8,0% 203 FL(2)5s 8%	0,20	0,0	0,8	0,2	3,8	0,0													
204	FL(2)4s	25,0% 204 FL(2)4s 25%	0,50	0,5	1	0,5	2														
205	FL(2)4.5s FL(3)10s	13,3% 205 FL(2)4.5s 13% 15,0% 206 FL(3)10s 15%	0,30	0,3	15	0,3	2,9	0.5	5.5												
207	FL(3)15s	10,0% 207 FL(3)15s 10%	0,50	0,5	1,5	0,5	1,5	0,5	10,5												
208	Mo(B)16s	25,0% 208 Mo(B)16s 25%	0,50	1,5	0,5	0,5	0,5	1,5	0,5	0,5	10,5										
209	Q 1s FI(2+1) 10s	15,0% 209 Q 1s 15% 18,0% 210 EV2+1) 10s 18%	0,15	0,15	0,85	0.6	1.8	0.6	5.8												
211	MO(U) 15S	13,3% 211 MO(U) 15S 13%	0,40	0,0	0,5	0,0	0,5	1,2	12												
212	Q 1.2S	16,7% 212 Q 1.2S 17%	0,20	0,2	1																
213	Q(3) 10S	6,0% 213 Q(3) 10S 6%	0,20	0,2	1	0,2	1	0,2	7,4	0.6	0.6	0.6	0.6	0.6	0.6	2	4 0				
214	VQ(3)5S	12.0% 215 VQ(3) 5S 12%	0,60	0,0	0,6	0,0	0,0	0,0	3,6	0,0	0,0	0,0	0,0	0,0	0,0	3	4,0				
216	VQ(6)+LFL 10S	48,0% 216 VQ(6)+LFL 10S 48%	0,30	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	3	3,4				
217	VQ(9) 10S	18,0% 217 VQ(9) 10S 18%	0,20	0,2	0,4	0,2	0,4	0,2	0,4	0,2	0,4	0,2	0,4	0,2	0,4	0,2	0,4	0,2	0,4	0,2	5
218	OC (3) 12S	66 7% 219 OC(4) 12S 67%	1,50	4,5	1,5	1,5	1,5	1,5	<u>1,5</u> 1	1	1										
220	FL(3) 12S	25,0% 220 FL(3) 12S 25%	1,00	1	1,5	1	1,5	1	6												
221	FL(4) 15S	26,7% 221 FL(4) 15S 27%	1,00	1	1,5	1	1,5	1	1,5	1	6,5										
222	FL(5) 20S	25,0% ZZZ FL(5) 20S 25%	1,00	1	1,5	1	1,5	1	1,5	1	1,5	1	9								
224	FL(5) 20S SADO	12,5% 224 FL(5) 20S SADO 13%	0,50	0,5	1,5	0,5	1,5	0,5	1,5	0,5	1,5	0.5	11.5								
225	FL(4) 15S	13.3% 225 FL(4) 15S 13%	0.50	0,5	2	0,5	2	0,5	2	0,5	7										
226	FL(5) 20S	12,5% 226 FL(5) 20S 13%	0,50	0,5	2	0,5	2	0,5	2	0,5	2	0,5	9,5	0.2		2	4 0				
228	Q(9) 15S	12.0% 228 Q(9) 15S 12%	0,20	0.2	1	0,2	1	0,2	1	0,2	1	0,2	1	0.2	1	0.2	-+,0 1	0.2	1	0.2	52
229	VQ(6)+LFL 10S	42,0% 229 VQ(6)+LFL 10S 42%	0,20	0,2	0,4	0,2	0,4	0,2	0,4	0,2	0,4	0,2	0,4	0,2	0,4	3	3,4			- ,	-1-
230	OC 2s	62,5% 230 OC 2s 63%	1,25	1,25	0,75																



## 9.2. Configuration using PC USB-interface and SABIK Programmer Lite



					S A B 🛉 K
ettings					
Flash Code			Intensit	y Photoce	Threshold
Dated shutdown	Start date	Stop date	Photoc III None	ell override	
tual State				Operation	al states
Battery Voltage	Temperature	Optical Feedback	Photocell value	RTC set	
6,52 V	19,0 °C	100 %	9 IX	Night	
Illumin. counter 68.44 h	Solarpanel tota 1.94 Ah	I Solar Current	2011-01-19	Plashing	
st 24h Values		Max Battery Voltage	Max Solar Curr	Alarms	
2000-00-00	00.00	6,55 V	0,92 A		
Lantern Stopped		Min Battery Voltage	Charged Ah		
2000-00-00	00.00	6,48 V	0,00 Ah		
out					
Product code:	SCN110.2WG	HW version:	SC110G RD	Product serial number:	100900700036
	20	SW version	V2.20	Power cycle counter:	6

## 9.2.1. Installation of application

Refer to Sabik Programmer Lite manual for installation of drivers and application.





# 9.2.2. Launching the application

Sabik programmer software can be launched in two ways:

- 1. Select Programmer Lite from your Start menu or
  - 2. If a shortcut is created on your desktop, doubleclick on it.



When the application is launched, the Main window will appear:

#### The Main window consists of the following areas:



#### A. Settings

Flash Code Drop-down list. This list can be edited with the Flash Code Editor \*. Intensity Drop-down list. % of maximum value. Photocell Threshold defines when the flasher starts, selectable 5 – 200 lx



**Dated Shutdown**. When Yes selected, please specify Start and End dates for, when the lantern is in Idle state.

Photocell override state:

- None: The lantern senses light level and starts/stops flashing.
- Day: The lantern does not flash, even if it is dark.
- Night: The lantern flashes all the time.
- B. Actual State displays real values read from the flasher (lantern) Battery voltage. Volts Temperature inside lantern. °C Optical Feedback. If the lantern has OFBS system installed, this value displays the current light level in % of the original value. Photocell value Current illumination level Illumination Counter Total time of lantern illumination Solar Panel Total Solar panel Current Ah Solar Current Solar panel charging current Internal clock date and time
- C. Last 24h values (read from flasher) Lantern Started Lantern Stopped Maximum Battery Voltage Minimum Battery Voltage Maximum Solar Current Charged. Ah
- D. About Misc. info about the lantern
- E. Operational states display Displays the current operational state of lantern.
- F. Alarms Display Displays if alarms has occurred.
- G. Status bar Read button reads data from flasher Write button sends settings to flasher

\*The Flash Code Editor is a separate application. See the Flash Code Editor instructions provided by Sabik.

#### **COM** port settings

To manually select a COM port, double-click Comport –label text, and after that right-click COM port setting to select available port. Right click baud rate to select baud rate.

**Connection:** USB interface connection and communication status indicator Yellow = Ready for communication (Click Read or Write button) Green light = Communication Success

Red light = Communication failed (Timeout)



## 9.3. Flash code editor

The Flash Code editor is a small simple database application for editing light characters. The values in this database can be selected in Programmer Lite Flash Code drop-down list.

Launch Flash Code Editor

Sabik programmer software can be launched in two ways:

Select Programmer Lite from your Start menu or double click the Flash Code Editor icon on your desktop (If you created a shortcut in your desktop).

Programmer Lite	Computer
Flash Code Editor	
Programmer Lite	Control Pan
Uninstall Programmer Lite	
PY Software	Devices and
JuickTime	
Snagit 10	Default Pro
Back	Help and Su
Search programs and files	Shut down
	1

#### Using Flash Code Editor

DescENG	0.1	Off1	0n2	Off2	0n3	Off3	On4
Q 1s [0.3s]	B 0,3	0,7					
VQ (3) 5s [0.2s]	0,2	0,3	0,2	0,3	0,2	3,8	
VQ (3) 5s [0.3s]	0,3	0,3	0,3	0,3	0,3	3,5	
VQ (6)+LFI 10s[0.2s]	0,2	0,3	0,2	0,3	0,2	0,3	0,
VQ (6)+LFI 10s[0.3s]	0,3	0,3	0,3	0,3	0,3	0,3	0,
VQ (9) 10s [0.2s]	0,2	0,3	0,2	0,3	0,2	0,3	0,
VQ (9) 10s [0.3s]	0,3	0,3	0,3	0,3	0,3	0,3	0,
VQ 0.5s [0.2s]	0,2	0,3	0,2	0,3			
FI (2) 5s (0.7s)	0,7	0,7	0,7	2,9			
Test	0,4	1,6	0,4	1,6	0,4	5,5	
* Haiko123	1	2	1				
Ý		Y		Ý			
•							•

- A. DescENG column is the name of flash character. This name is displayed in the Programmer Lite interface lash Code setting drop-down list. To modify an existing character name, just click in the cell and make your changes.
- **B.** On1, Off1, On2, Off2....columns are where you can insert light On and Off times (sek). To modify On or Off time, just click in the cell and make your changes. The values are in seconds.
- C. Click + button to insert a new record (row). Fill in your data from left to right, without any empty cells. Click  $\sqrt{(E)}$  button to apply changes. For the changes to take place, just close the Flash Code Editor and (re)start the Sabik Programmer Lite application.
- **D.** To delete a record (row), select record (row) and click on the button.
- E. Apply changes made.
- F. X button: Cancel edit (clears cell value)

For the changes to take place, just close the Flash Code Editor and (re)start the application.

### 10. Optional Modules

### Dated Shut-down

The dated shut-down feature is a software dependent option, which can be enabled with the Sabik PDA Programmer. By setting a shut-down date and a start-up date in the controller, the lantern can be switched off to save power during times when channels/fairways are closed.

For detailed instruction on how to enable this function please refer to the "SABIK PDA Programmer Manual".

# GSM LightGuard Monitoring & Control

With the LightGuard module Remote Monitoring and Control features are integrated in the lantern. The LightGuard Module uses the GSM Network to send Status messages (SMS) either to the Sabik WebSCADA system or directly to a mobile phone. A SIM card will be required.

Please refer to the chapter SIM Card Insertion/Change (only lanterns with GSM Module) for installation. The following key monitoring features are available:

- Alarm and Status reporting The LightGuard Module can be setup to report on Day/Night change or at a certain time of day e.g. at midnight. The report is sent automatically to a WebSCADA server and includes all data available from the lantern e.g. battery voltage, consumption, production, error status, temperature, operating hours, daylight-sensor status.
  - operating hours, daylight-sensor status, competitioner, in case of a fail: low battery voltage, collision etc. the LightGuard module will report immediately.
- Status Report on Request Using a normal mobile phone status reports can be requested by SMS to the requesting mobile phone or to the requesting WebSCADA Server.
- Light On Demand By SMS command the light can be activated remotely independent on the daylight sensor

In combination with the optional GPS module additional features becomes available:

- Out of Position Alarm LightGuard will monitor the GPS position and report if the buoy moves outside the position. An acceptable moving radius of the buoy can be defined.
- High Accuracy Position Determination Once per day LightGuard will determine the actual position down to an accuracy of +/- 1 meter and add the result to the status report.
- Synchronizing the light can be synchronized with other lights equipped with same option.

#### Commands

The following basic commands can be used by user to request status information about the lantern. The commands are sent to the module as SMS using a normal mobile phone, and the lantern will respond directly to the user's own GSM by an SMS message.









Command	Possible response
VER	The modem sends a message that displays the versions of the various components in the lantern:
	LG SMC MK II Version SMC Firmware: 02.27 GPS Hardware: 03.00 GPS Firmware: 01.09 GSM Software: 0.0.6 GSM Firmware: 421
TEL	The modem sends a message that displays the basic status of the SMC:
	SMC STATUS ACT.TIME: 1526 LIGHT: OFF FLASH CODE: 1.00+(1.00) BAT.LOADED: 0.0 BAT.UNLOADED: 12.3 SOLAR CURR.: 0.0 SOLAR AH: 0 TEMP.: 25
TEL1	The modem sends a message that displays the GPS monitoring data:
	GPS MONITORING FIXED LONG: 53.600131 FIXED LAT: 011.418727 LONG AVG.: 53.600093 LAT AVG.: 011.418694 PDOP AVG.: 02.59 FIXES: 143 DIST: 23 OLI: FALSE
CTEL	The modem sends a message that displays the basic configuration of the SMC.
	SMC CONFIG         LED CURR.: 0.75         LED INT.: 015         FIXED LIGHT: NO         FORCED: OFF         CUT IN: 14.50         CUT OUT: 14.50
	CODE: 0.30+(2.70) DUTY CYCLE: 10 PERIOD LEN: 3.0
RRTC	The modem sends a message that displays the current time and date of the internal clock:
	2014/08/31,11:15:34



Command	Possible response
RSSI	The modem sends a message that displays the "receive GSM signal strength indicator"
	RSSI:
	0: -113 dBm or less
	1: -111 dBm
	2 to 30: -109 to -53 dBm
	31: -51 dBm or greater
	99: not known or not detectable
RSMS	The modem resets the SMS counter

The LightGuard unit and all antennas are fully integrated in the design of the lantern. For detailed information on the LightGuard functionality and configuration please refer to the "SMC LightGuard Command" manual.



## 10.1. SIM Card Insertion/Change (lanterns with GSM Module)

These instructions are for authorized service personnel only. If the lantern is supplied with built-in GSM monitoring, it is recommended that the SIM card should have been supplied to Sabik or their authorised distributor for fitting and programming prior to delivery.

The service should be done in a dry place. Please use a grounding strap to prevent static discharges.

Before inserting/changing the SIM card the following items must be available: 4mm Allen key. SIM card (with disabled PIN-code request or PIN-code provided by Sabik).

#### Instructions

#### Disconnect the power supply!

Unscrew the four M6 Allen screws using a 4mm Allen key.





Carefully open the cover.

Attach a grounding strap and connect the clip to the protective earth (green-yellow wire connector) before touching the circuit board!

This is important, because static electricity could damage the sensitive electronics. If you don't have a grounding strap, please touch a grounded part of the circuit board (grounding connector) before touching any other parts.





Slide the SIM holder lock to the "OPEN" position and lift the holder upwards.

Push the SIM card into the holder and turn it down. Slide the SIM holder lock to "CLOSE" position.

Complete the service:

Carefully close the cover, without damaging the sealing ring. Tighten the 6mm screws.

Connect Power/Charger

Test the functions using a mobile phone (refer to the instructions below).





### 10.2. GPS Antenna Assembly instructions

To connect the external GPS antenna, please follow the instructions above (SIM Card Insertion/Change) and in chapter GPS Antenna Assembly and Installation.

The antenna assembly consists of 5 parts:

- 1. GPS antenna (Trimble)
- 2. Nylon Sleeve with lock screw
- 3. Adjustable foot
- 4. Cable
- 5. Cable Gland



GPS Antenna Parts



**Cable Gland** 



Thread the antenna cable (4.) thru the hole in the side of the nylon sleeve (2.) and connect it to the GPS antenna head (1.). Assemble the antenna and tighten the small Allen screw (using a 2,5mm key) to lock the sleeve to the foot.



GPS antenna assembled

Disassemble the cable gland and thread the cable thru it.

Assemble the cable gland.

Unscrew the protective plug and thread the cable using a coin, washer or a similar tool





Cable Gland Disassembled





Tighten the cable gland using a 22mm wrench. Check, that the fitting between cable and cable gland is tight.

Open the cover and connect the grounding strap following the instruction in chapter Inserting/changing optional SIM card

Connect the cable to the GPS antenna connector on the circuit board.

Complete the procedure by carefully assembling the lantern. Make sure not to damage the gaskets or sealing rings.



### 10.3. GSM antenna connection

Follow the instructions above (GPS antenna connection)

Connect the cable to the GPS antenna connector on the circuit board (the connector next to the SIM card).

Check that the GSM antenna is tightly fitted in its pass-through gland.

Complete the procedure by carefully assembling the lantern. Make sure not to damage the gaskets or sealing rings.





GSM Antenna



# 10.4. Checking Mobile Phone Communication

With the lantern in GSM coverage send text the message TEL to the mobile phone number recorded on the side of the box. The lantern will respond with its own text message giving the lantern configuration. By sending TEL1 the lantern will respond with the configuration that the factory has set including its character and intensity.

**Special note:** At the time the SIM card was provided to Sabik or distributor it should have been supplied with a 8240 pin, voice and GPRS data enabled. It operation will have been proven at time of dispatch, however some service providers block the number after in some cases 30 days if the card has not been used. If the lantern does not respond, check with the service provider that the card is still valid. If the card is verified as active they may ask you to remove the card and if so, follow the steps as Section SIM Card Insertion/Changing. Some customers will have selected only to have the lantern report in when there is an alarm, perhaps low voltage, to keep the cost of communications to a minimum. Others like government lighthouse services will often have elected to have the lantern report in at dawn and dusk on a PE change. Again this will have been factory set and with the uncovering of the lantern from the carton it will have reported in once recovered to simulate night. If this alarm has not been received, check with Sabik or your distributor that this has been set up.

# 10.5. Checking Photocell Functionality

It is impossible to tell visually which version has been supplied without reference to the label. All units are supplied with their own built in PE and IR programming sensor, but in order to check its operational status, the sensor should be completely covered for at least 30 sec before the lantern starts flashing. The light will then run for approximately 15-20 sec once uncovered before the PE cell will stop the lantern. In intense sunlight covering will need to be complete for a full 30 sec. A fast covering and uncovering will not activate the lantern so if in doubt wait for full 1 minute.

## 10.6. Checking GPS Position Functionality (if GPS fitted):

Provided GPS and GSM has been fitted standing outside the workshop with no sizeable obstruction and with a clear view of the sky with confirmed GSM coverage, send the text TEL1 to the lantern. It will respond with its latitude and longitude. This can be re-plotted in Google earth and the approximate position verified.

## 10.7. Checking the off-station alarm (If GPS fitted)

At the time of order you will have been asked the final position where the buoy was laid on and this will have been entered into the lantern at the factory via PDA programmer. Similarly the user would have been asked how they wished to monitor the lantern. This could either have been: Via a single mobile number perhaps the harbormaster himself.

Or

Via a distributors "small user - Webscada service"

Or

A client owned Webscada full monitor program

When the telephone number of that service was pre-programmed into the lantern. This is the number that the lantern will call when it has an alarm. Up till now all communications have been responding to the number that was asking it a question. However now in uncovering the lantern it would have discovered it was not in the position it though it should be and will therefore send an outstanding alarm provided the lanterns current position was in the buoy yard prior to deployment.

The user should know which number or e-mail address this alarm was being sent to. If it has not been received or a monitoring service contract set up to achieve this discuss this with your distributor or Sabik and this can been arranged.



handheld

## 10.8. Sabik Programmer for WM (PDA Programmer)

The following features are now available:

- Wireless communication (IR)
- Event log up to 3 years
- Lantern data stored in PDA memory
- Flexible GUI adjustments for administrators and users
- Data integrity protection

The view of the Programmer may vary depending on platform.

Refer to the Sabik Programmer for WM manual for more information.



### 11.1. Mechanical inspection and maintenance

- Clean the lantern
- Check the lens and clean it with a damp cloth (Do NOT use any solvents!)
- Check the mounting bolts and washers for damage and replace if necessary.
- Check the lantern for leakage (condensation inside the lens)

### 11.2. Functional inspection and maintenance

- Check that the lantern turns on by covering the photocell or putting the lantern in a dark place
- Check visually that the lantern has a uniform intensity when lit
- Read controller values with the programmer and check the status (note that values can also be saved in the programmer)
- Check battery voltage with the programmer. If battery voltage is low, replace the battery
- If the lantern has been in storage for several months, recharge the battery using the mains charger (accessory, sold separately).

### 12. Replacing the light unit

There are no user serviceable parts inside the lantern. For servicing of the light source, SIM card or GPS/GSM unit – please contact Sabik or distributor near you.





## 13. Troubleshooting (Q&A)

- Q: I covered the photocell, but the lantern does not turn on.
- A1: Read controller values with a programmer and check status. The battery voltage is below the minimum programmed value. Replace the battery.
- A2: The dated shut-down feature may be enabled. Re-programme to disable shut-down feature
- A3: Read controller values with the programmer and check status. The day light sensor setting or read value is abnormal. Re-programme if setting is wrong. Return the lantern for service if the read value is wrong.
- A4: Read controller values with the programmer and check status. There is a LED failure error. Return the lantern for service.
- **Q**: I covered the photocell, but the lantern does not turn on and I cannot read controller values with the programmer.
- A: Check the battery cables for damage or short-circuit. Replace the battery.
- **Q:** I covered the photocell, but the lantern does not turn on and I cannot read controller values with the programmer even though I replaced the battery.
- A: Return the lantern for service.

**Q:** The lantern seems to work normally, but I cannot read it with the programmer.

- A1: Locate the IR eye on your programmer and on the lantern. Place them facing each other.
- A2: Try to shade out the sun and put the programmer close to the lens during read process.
- A3: Try different angles when reading, the light beam might block out the IR sensor of the PDA.

#### Q: There is moisture inside the lantern. Where is the leakage?

**A1:** Check that the PTFE vent is free and not blocked, which might prevent the lantern from breathing. Replace the vent if required.

**A2:** Return the lantern for service – the unit should not be opened in field conditions and attempts to repair should not be undertaken unless appropriate product training has been obtained.



## 14. Appendix

## 14.1. Sabik LO200M Options and Label

Every Sabik product has a label with full product information. The label is on the product and the box.



#### **Option Matrix**

LightGuard GSM OPT 10	Integrated GSM based monitoring with external GSM antenna
LightGuard GSM + GPS OPT 9	Integrated GSM/GPS based monitoring with external antennas
GPS sync OPT 4	Integrated GPS sync with external GPS antenna
Battery Control Card OPT 11	Control card for secondary battery
Auxilary Card OPT 13	Auxilary card with I/0 port

Product Codes	Beam Colour
LO 200MW	White
LO200MR	Red
LO200MG	Green
LO200MY	Yellow



## 14.2. Main Dimensions

The dimensions are in mm.



# 14.3. Exploded View and Part List





ltem Number	Document Number	Title	Quantity
1	M000335	Housing	1
2	M000341	Housing service cover	1
3	M000774	Front frame	1
4	SA820632	Bolt M12x105mm	3
5	SA820636	Spring	3
6	SA634495	Washer M12 DIN125 A4	4
7	SA631603	Hexagon nut M12 DIN934	3
8	SA634326	Washer M5 A4 DIN125	5
9.	SA619277	Hexagon socket head cap screw M3x40 DIN912 A4	1
10	M000708	Bubble tube adjustment plate	1
11	SA820756	Bubble tube	1
12	SA619274	Hexagon socket head cap screw M4x10 DIN 912 A4	4
13	SA619273	Hexagon socket head cap screw M4x8 A4 DIN 912	1
14	SA619278	Hexagon socket head cap screw M4x16 DIN912 A4	1
15	M000601	Lens attachment flange	1
16	SA616493	Hexagon socket countersank head screw M6x10 DIN7991 A4	4
17	SA810261	Venting system M12x1,5	1
18	M000620	Light hood	1
19	SA619285	Hexagon socket head cap screw M5x10 DIN912 A4	4
20	SA619222	Hexagon socket countersank head screw M6x25 DIN7991 A4	4
21	SA591100	Cable seal M20x1,5 NI/MS	1
22	SA591120	Block plug M20x1,5 NI/MS	2
23*	SA651384	0-Ring 160x4 (FPM)	1
24	SA651390	0-Ring 209,14x3,53 FPM	1
25	SA636472	Serrated lock washer M8 DIN 6798-A4	1

ltem Number	Document Number	Title	Quantity
26	SA619280	Socket head cap screw M8x10 A4 ISO 4762 DIN 912	2
27	SA980053	SME Light Sensor	1
28		Type sign 80x20mm	1
29	SA636382	Spring lock washer M5 DIN127	4
30	M000709	Attachment unit	1
31	SA631605	Hexagon nut M12 DIN439 A4	6
32	SA619233	Hexagon head bolt M12x30 DIN933 A4	1
33	M000336	Lens bed	1
34	SA512810	RSW200 Outerlens	1
35	M001330	SME assembly unit	1
36	SA634301	Spring lock washer M4 A4 DIN127	3
37		0-Ring 190,09x3,53 FPM	1
38	SA512806	RSW200 Inside Lens	1
39		Washer M5 DIN9021 A4	3
40		Hexagon metal spacer M4x20mm	3

# 14.4. Recycling and Disposal of products

#### NOTICE! Incorrect handling or improper disposal can cause danger to the environment!

There can be serious damage to the environment if substances hazardous to the environment are handled incorrectly and if they are disposed of incorrectly.

- Separate waste and dispose of it separately.
- Observe the disposal instructions on containers/packaging and safety data sheets.
- Have dangerous waste disposed of by companies specialising in disposal.
- Immediately take appropriate action if substances hazardous to the environment are
  accidentally released into the environment. If in doubt, inform the responsible local authority of
  the damage.

#### Disposal

- Have electronic scrap, electronic components, lubricants and other auxiliary materials disposed of by specialist disposal companies.
- If in doubt, obtain information on environmentally-friendly disposal from the local authority or specific disposal specialists.

#### Guidelines

Below you will find some guidelines:

#### **Electronic components**

Electronic components and electronic scrap are classified as special waste and may only be disposed of by authorised specialist disposal companies.

#### Metals, plastics, paper

Unless there is a return or disposal contract, the dismantled compo-nents must be sent for recycling: Scrap metals.

Send plastic elements and paper for recycling.

Dispose of the remaining components according to their material compositions.

#### Greases, oils and other floating chemicals

Greases and oils contain toxic substances. They may not enter the environment. They must be disposed of by a company specialising in disposal.

#### **Batteries**

The batteries contained in the back-up power supply contain toxic substances. They may not enter the environment. They must be dis-posed of by a company specialising in disposal.

### The Dismantling process

Proceed as follows to dismantle a device:

Unless there is a return or disposal contract, the dismantled components must be sent for recycling:

- Scrap metals.
- Plastic elements.
- Sort the remaining components and dispose of them according to their material compositions.

