Document revision history

Revision	Date	Comments	Made by
1.80	May 12nd, 2021	Product name fix	Ha
1.70	Jan 4th, 2021	Graphic Update	Ruby
1.60	Sep 1st, 2020	Updated Exploded Diagram to SMC version	PL
1.50	Jan 17th, 2017	Added easyProgrammer and IrDA	CHL
1.40	Jan 7th, 2016	Added USB Programmer Lite	CHL
1.30	Oct 7th, 2014	SMC AUX-RS485 included	CHL
1.20	June 3rd, 2013	Updated photometric performance	LM
1.10	Oct 22nd, 2009	Minor editorial corrections	LM

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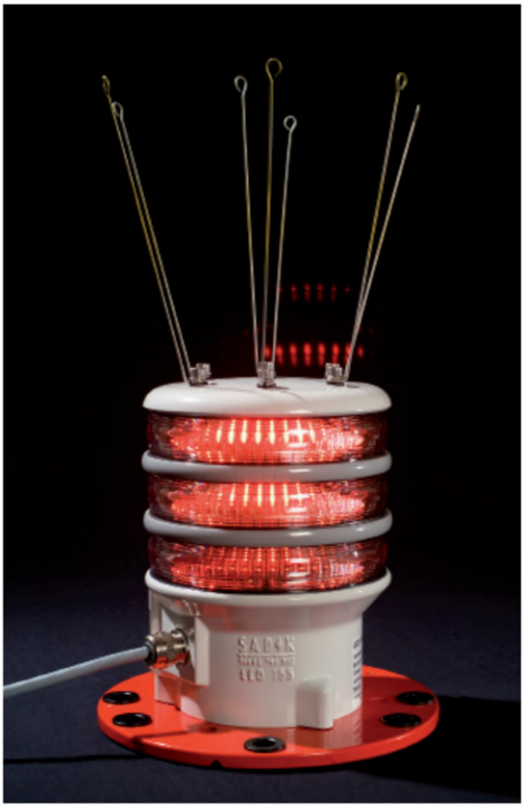

LED 155

Navigation Lantern

Product Manual

Version: 1.80

Date: May 12nd, 2021

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Contents

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1. Introduction

1.1. Standard features

- Modular design with max 3 tiers (simplex, duplex or triplex)
- Range up to 8 NM at Tc = 0,74 (12 NM at Tc = 0,85)
- Designed for both fixed and floating applications
- Narrow (6°)or Wide (10°) vertical divergence
- Standard IALA colours Red, Green, White, Yellow and Blue/Yellow
- Up to 450 cd peak intensity at 6 W power per tier with narrow lens
- Very low overall power consumption
- Flasher with free programmable character
- Programmable Intensity
- Integrated Solar Panel Charger up to 16 amps
- Daylight sensor (lux)
- Wire Synchronisation
- Accurate integrated power measurement system
- Wireless IR-Programming using SABIK PDA or USB Programmer Lite

1.2. Optional features

- Dated Shut-down
- GSM LightGuard Monitoring & Control
- GPS Synchronisation
- GPS Position Check-up
- Optical Feed-back
- Event-log with records for up to 3 years
- Shock and Tilt Sensor
- Standby Battery

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2. Technical Details

2.1. Optical Performance

The luminous intensity is adjustable between full intensity (100%) and minimum intensity (5%). The effective visual range is from 2 to 6 nautical miles depending on light colour and flash character and numbers of tiers. The lantern is available with narrow or wide lens. The maximum luminous intensity and power consumption for the two different lenses are listed in the tables below:

Narrow Lens **6° FWHM**	**Nominal Luminous Intensity and Power Consumption (± 10%) per tier**
Color	
Green	240 cd @ 6W
Red	140 cd @ 6W
White	420 cd @ 6W
Yellow	200 cd @ 6W

Wide Lens **10° FWHM**	**Nominal Luminous Intensity and Power Consumption (± 10%) per tier**
Color	
Green	160 cd @ 6W
Red	120 cd @ 6W
White	250 cd @ 6W
Yellow	100 cd @ 6W

(FWHM = Full Width, Half Maximum)
The actual visual range of the lantern is depending on the effective intensity, flash length and intensity setting of lantern. The effective intensity and hence the range of a single flash character should be calculated by means of Schmidt-Clausen as recommended in the IALA recommendation E-200 Part 4 (Dec 2008 edition 1) section 6.1.
In the lantern configuration device (Sabik PDA) the visual range will be automatically calculated and displayed depending on settings selected by user. The base for this calculation is the luminous intensity stored in the lantern at the factory test at Sabik's in-house photometric range.

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The main optical specifications are listed in the table below:

Specification	Value
Narrow lens divergence	6° ± 1° @ 50% of peak intensity
Wide lens divergence	10° ± 2° @ 50% of peak intensity
Production tolerances of divergence	-1° + 2°
Lens material	UV stabilized polycarbonate
Light colours	Red/Green/Yellow/White/Blue in accordance with IALA recommendation

2.2. Energy Consumption

The lantern is designed for a wide range of power supplies including solar power, primary battery and other DC supplies. A high overall efficiency is maintained over a wide range of supply voltages, and daytime idle consumption and consumption between flashes is minimized.

Specification	Value
Standard configuration	
Input voltage range	10…32 volts
Max power consumption/tier	6 W (± 10%) at full intensity
Daytime idle consumption	1.5 mW (less than 0.125 mA @ 12 VDC)
Consumption between flashes	12 mW (less than 1.0 mA @ 12 VDC)
Options	
GPS module installed	+ 12mW (less than 1 mA @ 12 VDC)
GSM module installed	+ 12mW (less than 1 mA @ 12 VDC)
OFBS module installed / tier	+ 25mW (less than 2 mA @ 12 VDC)
Standby battery card installed	+12 mW (less than 1 mA @ 12 VDC)
Tilt angle monitoring	+12 mW (less than 1 mA @ 12 VDC)
Shock sensor	+12 mW (less than 1 mA @ 12 VDC)

The lantern intensity and hence power consumption can be adjusted between 5% and 100% depending on range required. The overall daily power consumption is depending on duty cycle of character, intensity setting and setting of daylight sensor (when to turn on/off).

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When calculating the daily power consumption also the consumption between flashes and the consumption of any of the options installed should be considered.

Example of daily power consumption, no options:

Q: Lantern set to 50% intensity and a Fl 3s (0.3+2.7=3s), 14 hours operation

A: Daily consumption = 50% x 6W x (0.3/3s) x 14h = 4.2 Wh (0.35 Ah @ 12V)

+ [(3-0.3)/3s x 0.012W x 14h] + [0.0015W x 10h] = 0.1512 Wh + 0.015 Wh = 0.17Wh

Total daily consumption = 4.2 Wh + 0.17Wh = 4.37 Wh

2.3. Mechanical

The LED 155 unit is designed for both fixed and floating applications. The mounting flange is designed to be compatible with the 3-4 bolt mounting pattern at a bolt diameter of 200mm, a common mounting arrangement for incandescent lanterns. The mounting bolt holes are equipped with plastic insulators, to prevent galvanic contact with the mounting platform as well as protect the painting on the mounting flange during installation.
The standard mounting flange also supports 3 bolts at a 150mm mounting diameter, but these holes are not equipped with the plastic insulators. There are no serviceable parts inside the lantern.

Specification	Value
Weight of unit	3.9 kg single tier add 1.0 kg for additional tiers (max is 3 tiers)
Base material	Marine grade die cast aluminium, anodized and powder painted gray RAL 70
Total height above surface	144 mm (excluding bird spikes)
Total height (incl. bird spikes)	340 mm with stainless steel bird spikes
Lantern diameter	170 mm (230 mm including base flange)
Mounting of base	3-4 pcs M12 bolts at radius 200mm, or 3 pcs M8 bolts at radius 150mm (bolts not included)

The lantern is fully waterproof and pressure tested at factory before shipment. Breathing is arranged through a PTFE membrane mounted on the underside of the lantern, enabling the lantern to equalize pressure without the risk of letting the moisture into the lantern.

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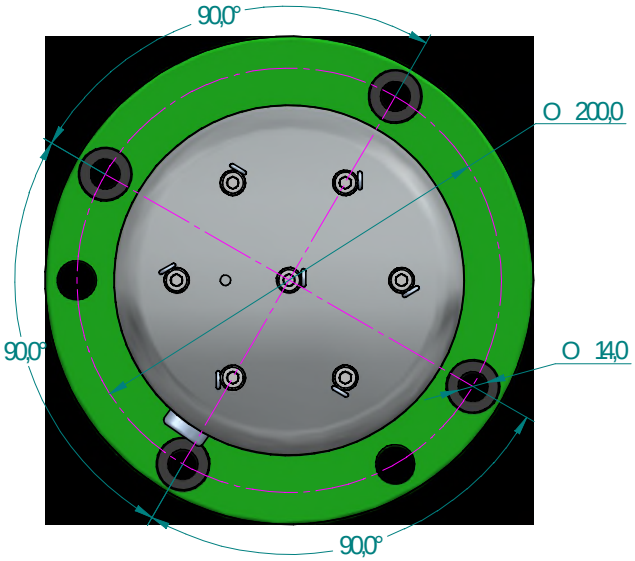
Top View



Bottom View

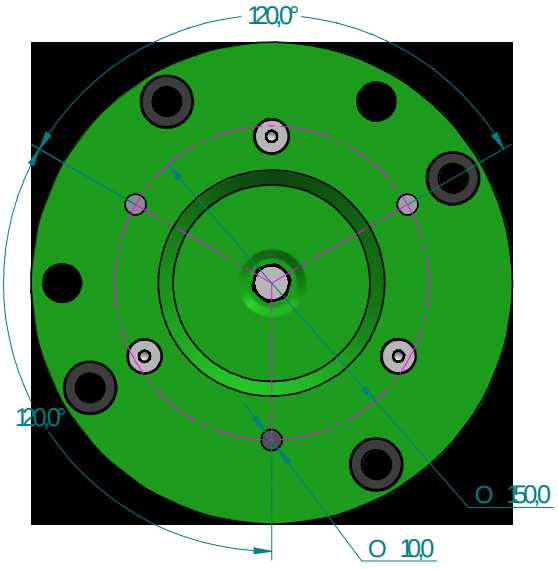


Figure 1- Mounting details of light

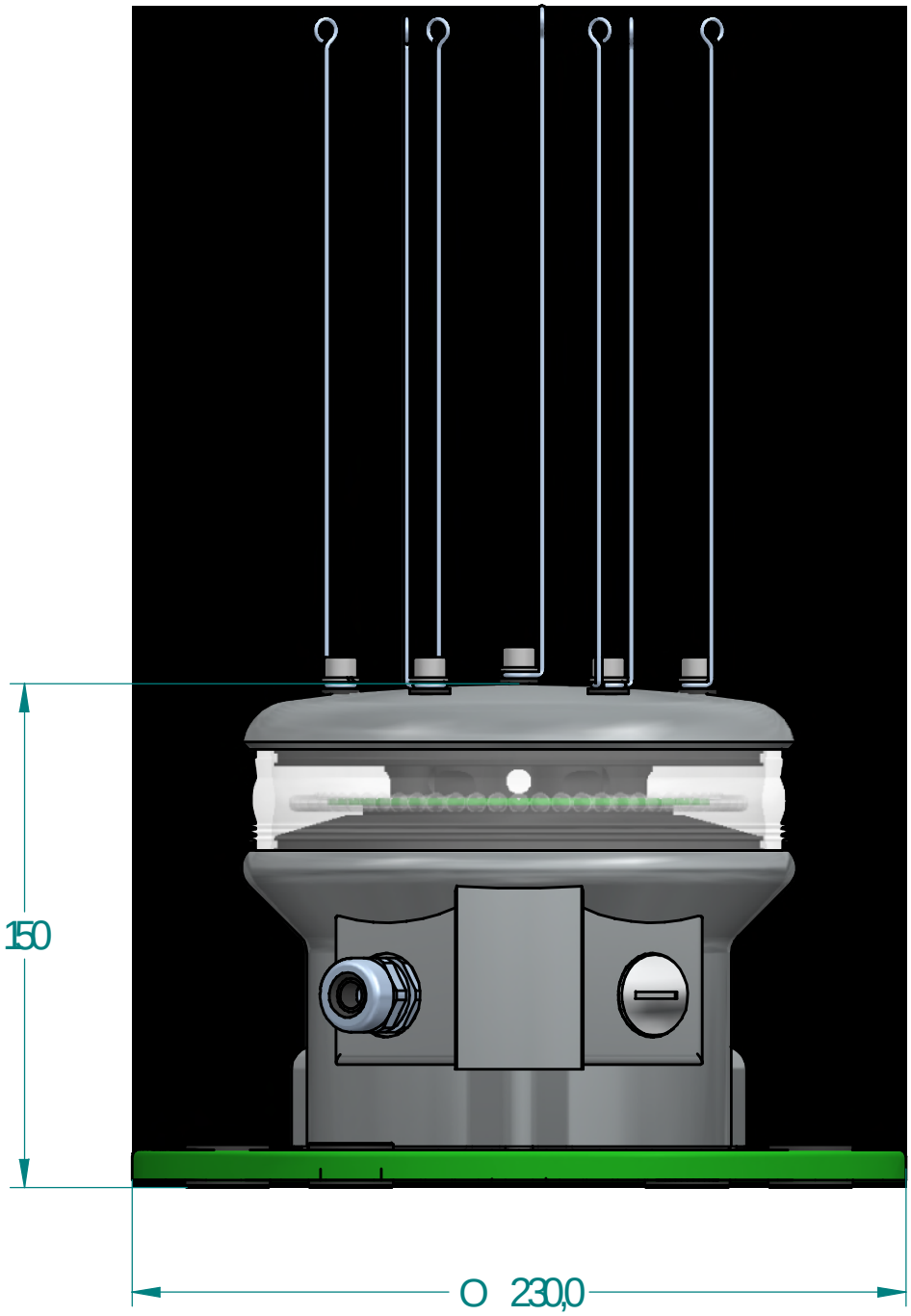


Figure 2 - General dimensions of lantern

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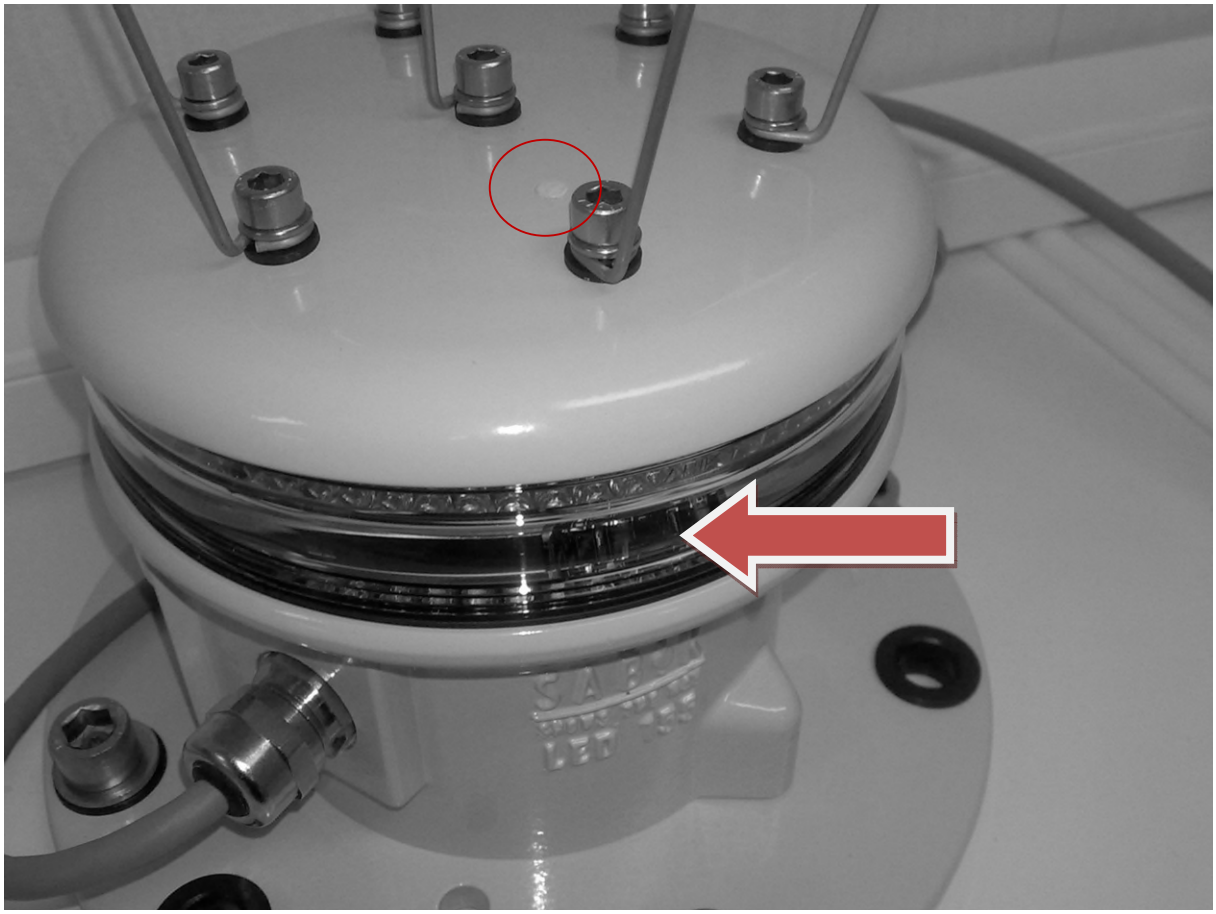
3. Electrical

The LED155 lantern can be operated on primary battery, solar system or mains power system. The built-in solar panel regulator makes it easy to use solar power for the lantern. In section **Error! Reference source not found.** the connection of various type of power supplies are explained. To utilize the solar facility a 3 wire system is required.

3.1. Light Sensor

The light sensor is located inside the optical lens, and located in the direction that is indicated by the colour marking stud in the hat of the lantern.



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. The built-in light sensor can also be utilized even if the lantern is set to fixed light, as it is able to get a reading between two light pulses (the LED's are powered using pulse width modulation). However, if the full 100% intensity is required, the lantern will automatically reduce this by 5% in order to enable the light sensor to get a reading between the PWM pulses.

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3.2. EMC

The lantern is tested for EMC in accordance with 89/336/EEC Electromagnetic Compatibility Directive, amended by 92/31/EEC & 93/68/EEC, and meets the following standards:

- IEC 61000-4-2/7.1
- IEC 61000-4-3
- IEC 61000-4-4/7.2
- IEC 61000-4-5/7.8
- IEC 61000-4-6/7.2
- IEC 61000-4-11/7
- EN 55022

On plastic buoys special care should be taken to ground the top of the buoy in order to prevent a high static charge to build up over time. By adding grounding cable from lantern mounting to the submerged part of the buoy this can be prevented.

3.3. Cable Synchronisation

The lantern comes with a cable sync port as standard. The sync line is a two-way signal enabling multiple lanterns to be synchronized to flash simultaneously or in sequences by connecting all lanterns to the same sync line. The user needs to enable this function in the lantern if he wants to utilize this function. The sync interface is not compatible with the LEDFlasher / SmartFlasher two-wire sync interface, and hence units cannot be mixed at same location.

The user can set sync offsets in order to enable running light patterns or flip-flop alternating lights.

3.4. Solar Charger

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. For other types of batteries and other types of nominal voltages, please consult your battery manufacturer for the corresponding values:

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

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.

4. Environmental

The lantern is designed for the marine conditions and is able to withstand temporary submersion if the buoy gets hit by a wave. The robust aluminium housing and the special polycarbonate lens is designed to survive the dynamic forces present in the marine environment by wind and waves.

Specification	Value
Temperature range	-40°C to +60°C ambient temperature
Ingress protection	Certified to IP68 Each lantern is pressure tested at factory prior to shipment

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5. Optional Modules

5.1. 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”.

5.2. LightGuard SMC MKII Monitoring & Control

The LightGuard module Remote Monitoring and Control features are integrated in the lantern. The LightGuard Module uses the GSM Network to send Status messages either to the Sabik WebSCADA or LightGuard Monitoring. A SIM card will be required. All important configuration values needed for the remote monitoring section are stored in the non-volatile memory area of the SMC. These values can be read and written via Sabik Programmers or by using remote commands. More information is provided in the LightGuard SMC MKII manual.

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 LightGuard server and includes all data available from the lantern e.g. battery voltage, consumption, production, error status, temperature, operating hours, daylight-sensor status.
  In case of a fail: low battery voltage, etc. is reported by LightGuard module immediately.
- **Status Report on Request** – Using a smart phone, status reports can be requested from the lantern to the requesting mobile phone or to the requesting LightGuard Server.
- **Light On Demand** – By a LOD (Light On Demand) 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 with an accuracy of down to +/- 1 meter and adds the result to the status report.
- **Synchronizing** – the light can be synchronized with other lights equipped with same option.

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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.

5.3. GPS synchronization

The GPS synchronization feature is an additional hardware and a software dependent option. By adding the GPS module, an integrated GPS antenna and by enabling the synchronization. Lanterns are synchronized via satellite. By altering the synchronization offset parameter in the controller, a running light or sequential light pattern can be created. If LightGuard remote monitoring option is installed, the GPS will also be utilized for the position monitoring.

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

5.4. Optical Feedback

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 fails, a value in % of initial intensity can be read. When the light output falls below a pre-defined level, an alarm will be set.

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

5.5. Event-log

The lantern can be configured to also store main events which can be retrieved by service technician using the Sabik PDA programmer. 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 a about three years of events. The data is stored in a non-volatile memory independent on external power supply.

5.6. Shock and Tilt Sensor

When equipped with the LightGuard remote monitoring unit, this optional shock- and tilt sensor can be enabled. The sensor comprises of a three axis G-sensor that has three main functions:

- **Tilt switch function** – switches off the light if it stays outside the programmed tilt angle more than one minute. If value set to 0° the function is disabled. The power consumption is not affected with this setting.
- **Tilt angle monitor** – registers the max and average tilt angle (absolute value) the buoy has experienced during the last 24h. When this function is enabled it will register the tilt angle once per second.
- **Shock sensor** – when enabled the G-sensor is activated all the time and will generate an alarm if the preset shock value (G-value) is exceeded.

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5.7. SMC AUX board RS485 +I/O

5.7.1. INTRODUCTION

The SMC AUX board is an add-on card compatible with SMC generation1 and 2. It can be supplied as a combined MODBUS RS485 communication module including an I/O port or it can be ordered as an I/O port only.

With the communication module it is possible to read the basic SMC EEPROM area and the basic SMC RAM area. The supported MODBUS function codes are limited to Read Holding Registers and Write Multiple Registers. The other functions are available only through the IR serial port. Please refer to the SMC Serial Protocol Documentation for a full description of the MODBUS implementation and the available registers.

5.7.2. MODBUS

Of the different transmission modes, RTU mode transmission over serial line is supported.
The format (10 bits) for each byte in RTU mode is:
Data rate 19200 bit/s, 1 start bit, 8 data bits, 1 stop bit
Coding System: 8–bit binary, least significant bit sent first.
The bitrate can be switched to 9600bps using the first channel at the DIP switch.

ADDRESSING
The RS485 AUX card provides two ways of selecting the MODBUS id.
In systems where the maximum numbers of slaves is not more than 15, the MODBUS address can be selected from id=61 to id=75 using the lines 4 through 7 at the DIP switch on top of the AUX card.
If another address range is desired or the total number of slaves in one network is higher than 15, the DIP switch settings should be disabled and the Modbus id selected by programming the Modbus id to the SMC. This requires a special programming tool and is preferable done in the factory prior to shipment.
All SMC are configured to answer to the MODBUS id 55. The id can be changed by editing the MOBBUS id at address 0x1011 (4113). Please note that the SMC will always still answer to the default MODBUS id 55. To avoid collisions, his default number must therefore never be used in a RS485 network.

DIP SWITCH Settings

Pin No	OFF	ON	NOTE
1	9600	19200	Only applicable in buffered mode
2	Transparent mode	Buffered mode	
3	N/A	N/A	Reserved for future use
4	ADDR#1 off	ADR#1 on	
5	ADDR#2 off	ADR#2 on	
6	ADDR#3 off	ADR#3 on	
7	ADDR#4 off	ADR#4 on	
8	No termination	120Ω line termination	

1. MODBUS bitrate (9600/19200 bps)
2. Buffered mode Transparent-Mode (reserved for future use) Transparent mode:
   All MODBUS requests from the RS485 side will be forwarded to the SMC. This mode can be used in cases where it isn´t necessary to stay within a strict MODBUS protocol timing and where the traffic density on the RS485 network is very low.
   Buffered mode:
   The SMC AUX RS485 driver will keep a copy of the SMC memory map and will thus be able to respond directly to the MOBUS request on the RS485 network within the maximum allowed delay. The copy will be refreshed every 30s.
   This mode should be used when the MODBUS master in the network don´t allow for transmitting delays and in networks with high traffic.
3. ECO-Mode (reserved for future use)

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4. ADDRESS#1…#4: MODBUS Node Address setting:
-Sets Modbus address range from 61 to 75
-If all are set to 0 the Modbus address will be copied from SMC settings (default 55)

#4	#5	#6	#7	Modbus slave id
0	0	0	0	id selected at 0x1011
0	0	0	1	61
0	0	1	0	62
0	0	1	1	63
0	1	0	0	64
0	1	0	1	65
0	1	1	0	66
0	1	1	1	67
1	0	0	0	68
1	0	0	1	69
1	0	1	0	70
1	0	1	1	71
1	1	0	0	72
1	1	0	1	73
1	1	1	0	74
1	1	1	1	75

8. Termination: Passive RS485-termination

DIGITAL I/O -port

The digital I/O-port consists of one isolated digital output and one isolated digital input. In the default configuration the digital output will provide an ALARM output to a third party monitoring system. It can also be configured to toggle between lantern idle- and flashing-mode.

The state of the digital input can be used to monitor an alarm output from a third party device. The state of the input is included in the MODBUS RAM table.

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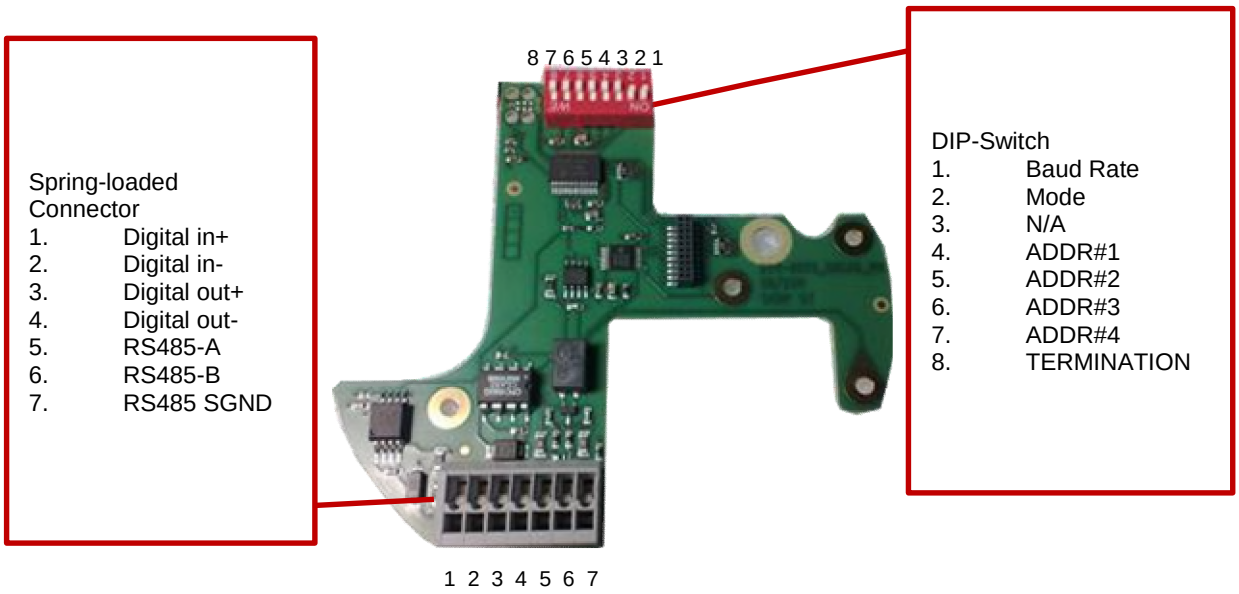
Electrical specification

Port	Parameter	Min	Nom	Max	Unit	Condition
Digital Input	Input Voltage	-36,0		36,0	V	
	Switch on Voltage	5,5	7	8,5	V	
	Switch off Voltage	3,0	4,5	5,0	V	
	Input Current	2		7	mA	@ Vin=12V/24V
	Isolation Voltage			100,0	V	
Digital Output	Switching Voltage	9,0		36,0	V	
	Load Current	0,0		0,6	A	

5.8. DIP Switch AND IO Connector



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5.9. Secondary Battery Interface

In some installations, a dual battery system may be desired. One main battery acting as the primary power supply source and a secondary battery, only to be utilized in case of main battery failure.
For these applications an optional Secondary Battery interface unit is available, enabling the connection of a second battery to the lantern.

With the secondary battery module inserted, the lantern controller will automatically switch to the secondary battery when the main battery fails or voltage drops below preset value. If powered by solar system, the controller will still keep on charging the main battery while consuming from the back-up battery. As soon as battery voltage in the main battery has recovered or the battery has been replaced, the controller will switch back to the main battery. The lantern also logs separately how many hours of operation have been consumed from the secondary battery, in order to determine if the secondary battery needs to be replaced. By using for example Lithium primary batteries with a very low self-discharge rate the secondary battery can have a useful lifetime of many years, if no power is consumed by the light.

A second cable entry or a 5 core cable needs to be fitted to the lantern for this functionality. The lantern detects when the module is present and enables this functionality automatically.

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6. COMMISSIONING

This chapter describes how to install, configure and test the lantern.

6.1. Product Identification

Reading the product label will provide information about the type of lens (Narrow/wide) as well as which of the optional modules are provided with the product.

The product identification label may wary with customer requirement.

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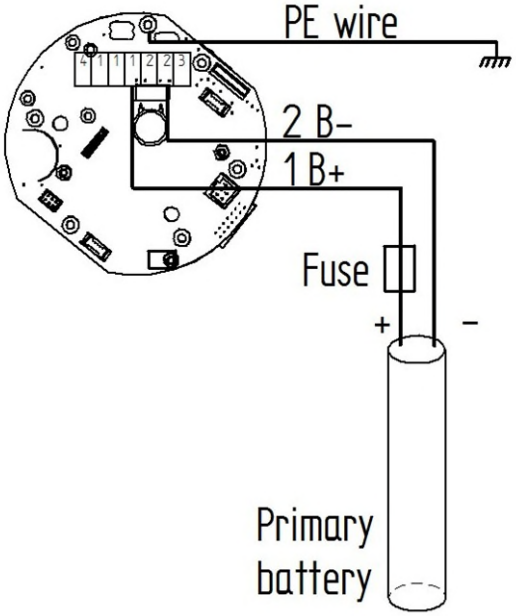
6.2. Various Power Supplies

In this section a number of application examples are provided to assist choosing the right configuration.

6.2.1. Primary Battery

Even though the minimum operating voltage of the lantern is 9V, it should not be connected to a primary 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.



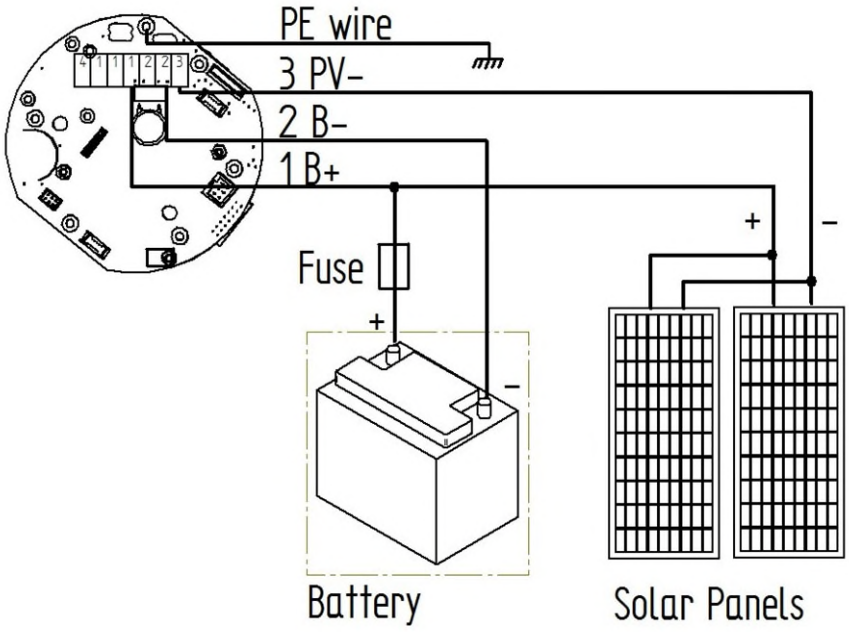
6.2.2. Solar Battery with Photovoltaic

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.

For correct charging functionality, the corresponding solar panel charging parameters should be set in the lantern as described in section 3.4 of this document.



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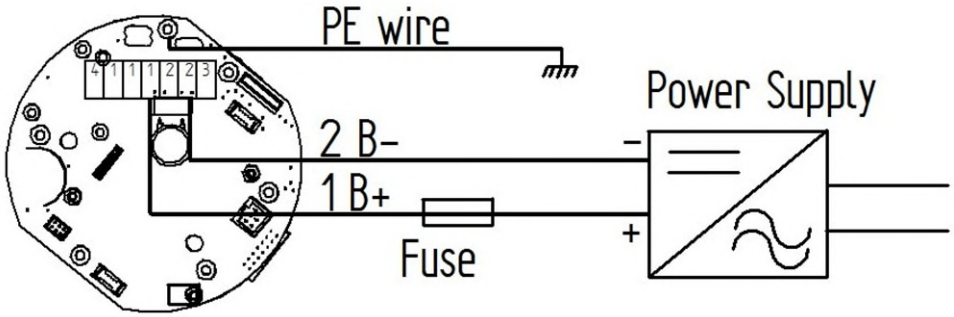
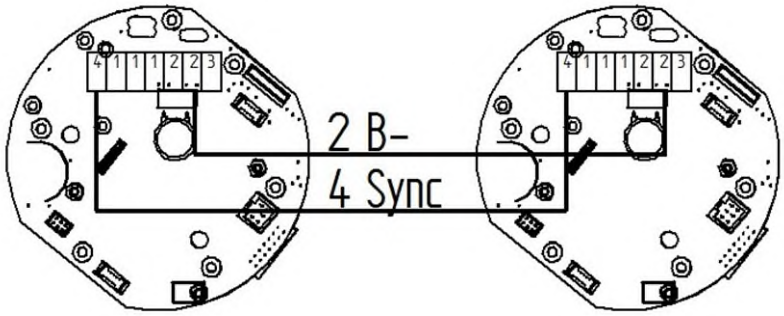
6.2.3. Other DC power supply

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.



6.2.4. Wire Synchronisation



Even though the sync signal is a single wire solution, the units need to be connected to common battery minus in order for the units to work. If the lanterns are running on the same power system then the second battery lead (B-) is not required.

6.3. Insert SIM Card (only lanterns with GSM Module)

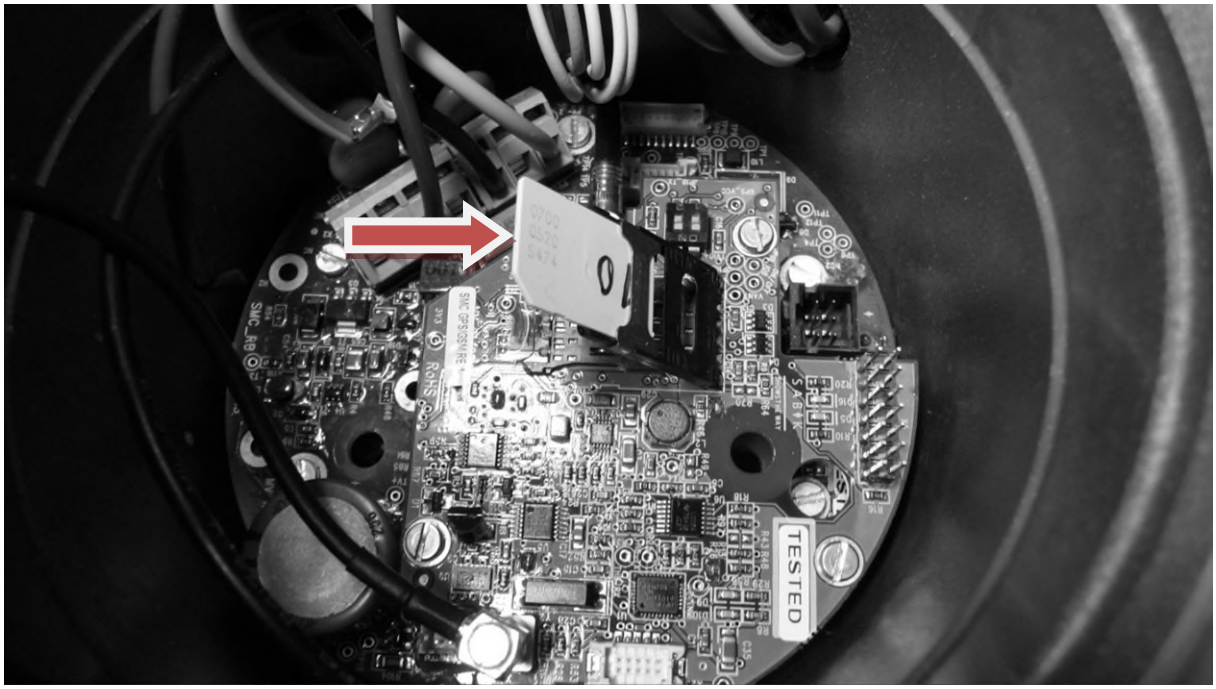


Figure 3 - Lift up the SIM card holder and place the SIM card in the holder

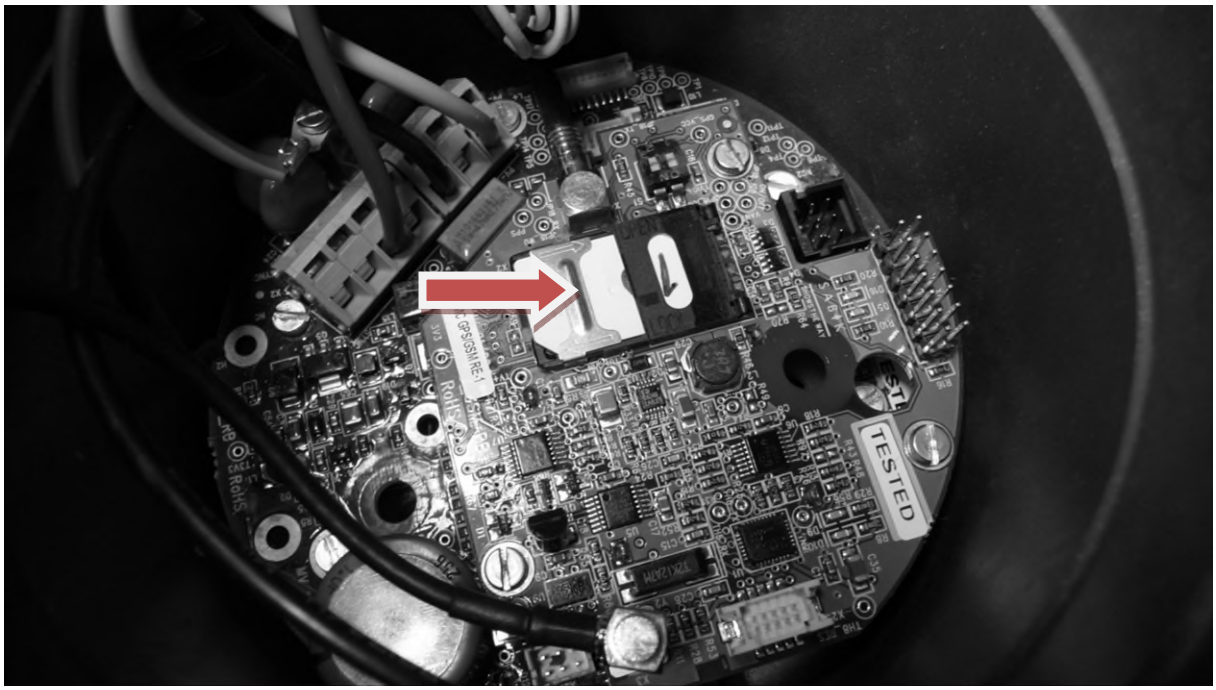


Figure 4 – Slide the SIM card lock to the left in order to secure the SIM card

6.4. Configuration Step by Step Instruction

Before programming the lantern the following basic data must be available:

Data	Description		☑
Flash Character	The flash code for the location.		☐
Intensity Setting (and/or) **Range**	The Intensity in % of the nominal max. intensity The range in nautical miles, normally defined at T_c=0.74 or T_c=0.85		☐
Photocell Threshold Level	The daylight level in Lux at which the light will turn on or off. Default Value is 15 Lux for turning on the light and 60 Lux for turning off the light.		☐
Parameter Profile	The lantern has many settings to control the built-in functions. In order to simplify the configuration, most of these can be pre-set and grouped into a Parameter Profile. One profile will normally represent a specific application, like a 5 M buoy lantern. The user can store his own parameter profiles to suit his needs. ▪ Primary Battery ▪ Solar VRLA ▪ Solar NiCd ▪ Solar NiMH Other profiles can be made available or configured directly by the end user. For further description of the profiles please refer to the “SABIK Programmer Manual”		☐

6.4.1. STEP 1 - Apply Power

Install and wire the lantern as described in one of the application examples above and apply power.

6.4.2. STEP 2 – Identify IR Interfacing point

The figure (right) shows the location of the IR-Interfacing Point, which is located inside the lens in the same direction as the colour marking stud in the hat.
When working with the-Programmer, always point the IR-Sender of the Programmer at the IR-Interfacing Point and make sure that the distance between the PDA and the lantern is never more than one meter indoors and directly at the IR-sensor when outdoors.

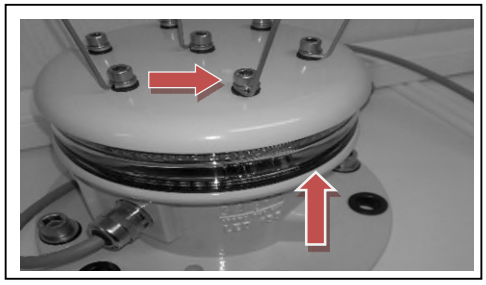


Figure 5 - Position of IR and Photo sensor

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6.5. Programming using the 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.

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6.5.1. EasyProgrammer Quick Guide

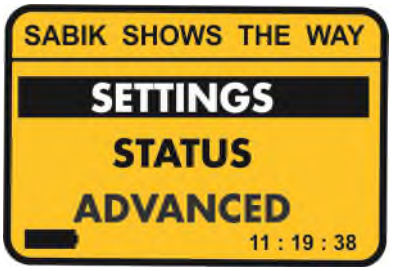
Start/Shut Down
To start the programmer, press and hold down the green (Enter) button.
To shut down, press and hold down the red X (Cancel) button.
Please refer to the EasyProgrammer manual for more detailed information.

6.5.2. Interface and buttons

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)

6.5.3. Getting Started

Refer to the easyProgrammer **Menu Structure Flowchart** (Chapter4.6.7)
Press the green ENTER button until you see the main page. The SETTINGS menu is selected by default. Point the programmers IR window at the Infrared point and press the green ENTER button to read data from lantern.



The programmer beeps once and the READING status bar appears, and twice, when the reading was successful.
If the programmer can't read the data from the lantern you get a time-out and TRANSMISSION ERROR is displayed. Press CANCEL to get the main menu.
If you cancel the reading by pressing the red CANCEL button, TRANSMISSION CANCELED is displayed. Press CANCEL again to get the main menu.
Note: Pressing CANCEL in all menus will get you to the main menu.

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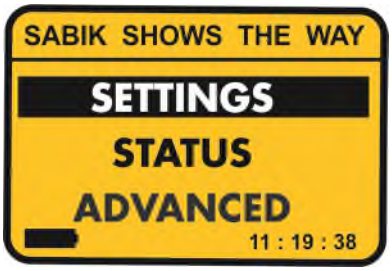
6.5.4. SETTINGS

Select SETTINGS, point at lantern and press ENTER. Now the programmer reads the settings from the lantern. Select the flashcode, Intensity or Photocell mode to send to lantern. In the Flashcode page press Enter and arrow up/down to select a flash code from the built-in list (press and hold button down for faster scrolling). Your easyProgrammer is pre-programmed with a standard character list, see appendix , or a custom list. If you want to change the list you have to use the Sabik easyProgrammer Manager PC software and IR-interface (sold separately). Select SETTINGS -> SAVE SMC if you want to retrieve information about your lantern later. Saved SMC can be read to a PC file by the easyProgrammer Manager PC software.



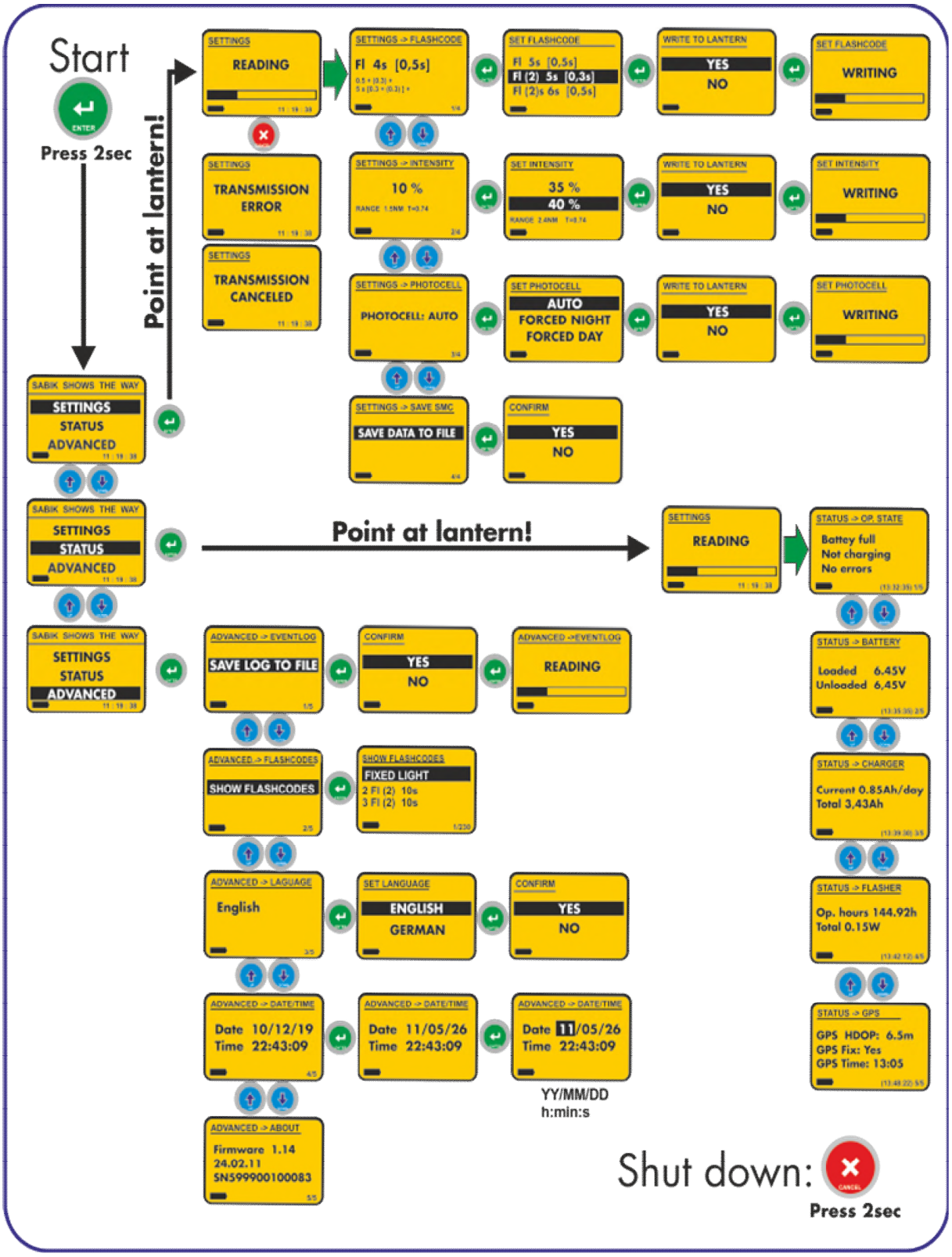
6.5.5. STATUS

Select STATUS, connect to lantern and press ENTER. Now you can read the current status of the lantern. Select pages by pressing the blue DOWN and UP buttons.

6.5.6. ADVANCED

Select ADVANCED and press ENTER. In the ADVANCED menu, you can read and Save status log to the programmer. Note, that if the log file is big, it will take up to minutes for the transfer to complete.

Refer to the EasyProgrammer Menu Structure Flowchart and EasyProgrammer product manual for more details. On the next page you will find the SABIK easyProgrammer Flow Chart.



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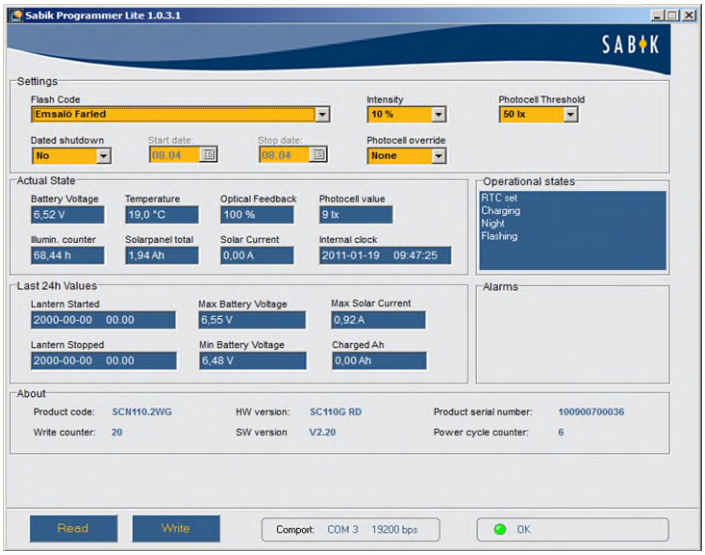
6.6. Configuration using PC USB-interface and SABIK Programmer Lite



Installation of application

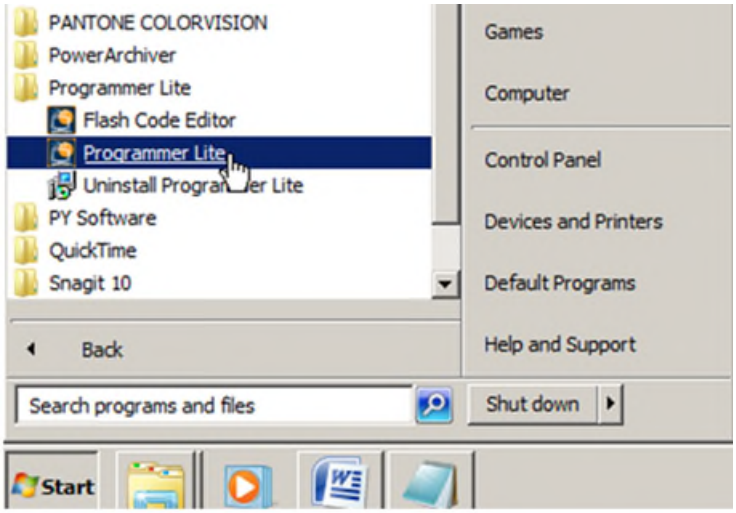
Refer to Programmer Lite manual for installation of drivers and application.

Launching the application

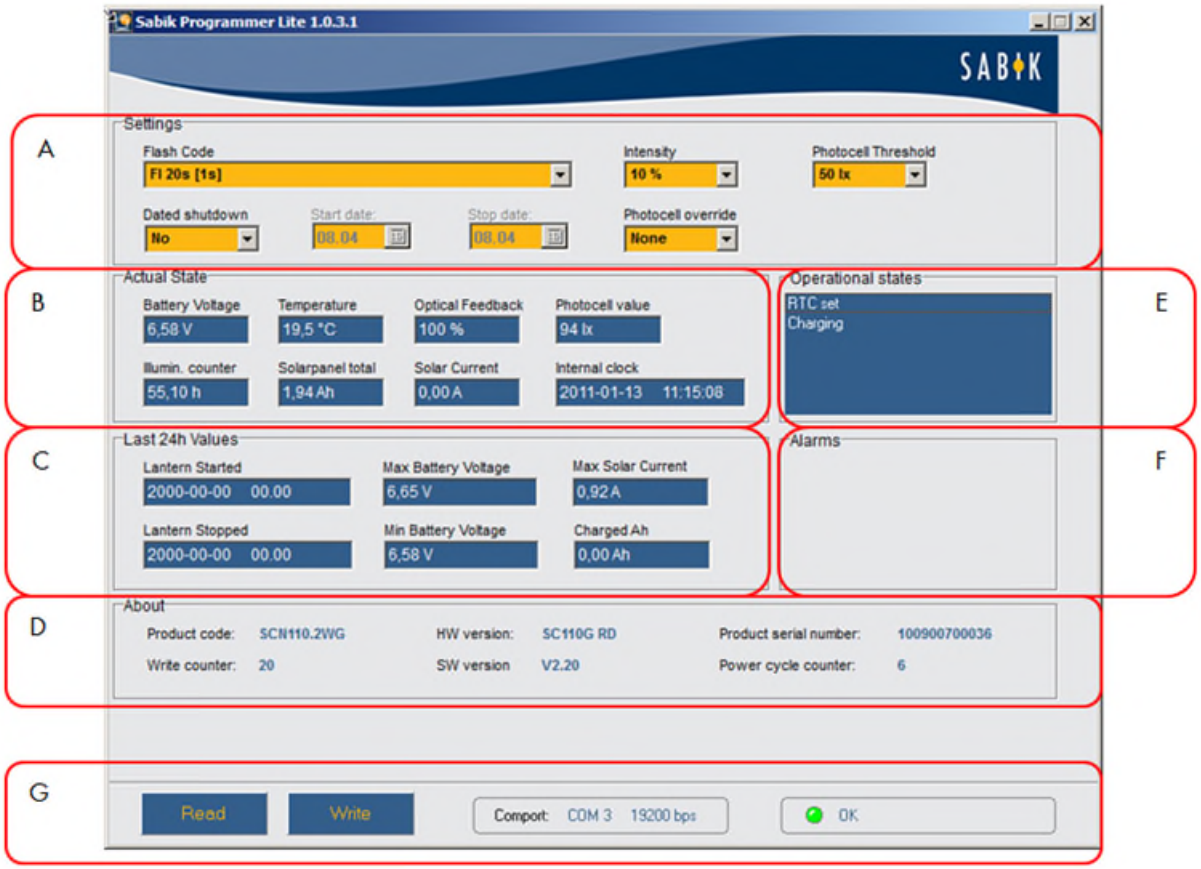
Sabik programmer software can be launched in two ways:

1. Select Programmer Lite from your Start menu

2. If you created a shortcut in your desktop, double click the Programmer Lite icon.



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.

*The Flash Code Editor is a separate application. See the Flash Code Editor chapter.

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. ℃

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

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)

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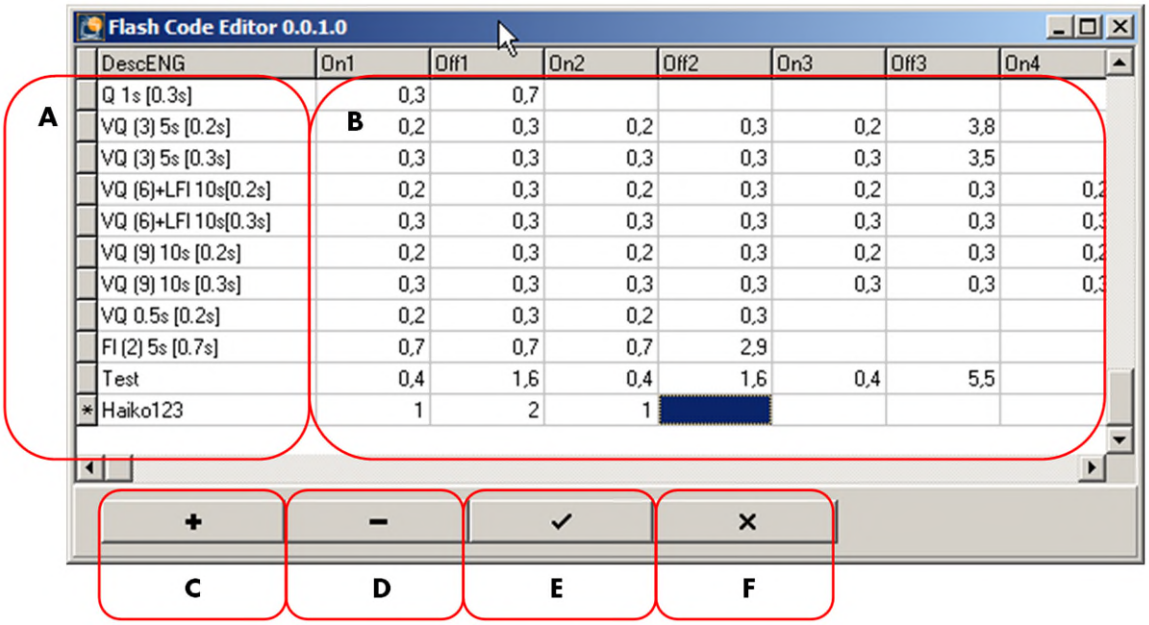
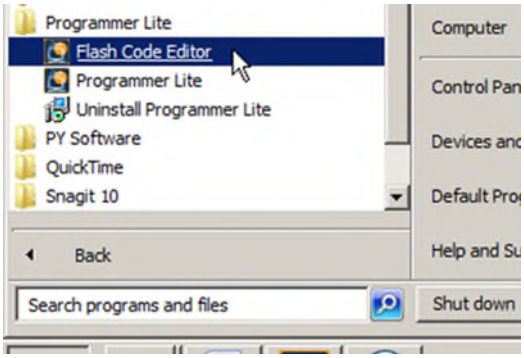
6.7. The Flash Code Editor



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.

6.7.1. 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 on your desktop).

6.7.2. Using the Flash Code Editor

The interface is a simple editable table where:

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 a 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 √ (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 Sabik Programmer Lite application.

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6.8. Sabik PDA Programmer for WM

This chapter describes the main menus and tabs used to program Sabik lanterns.

Find more detailed information by reading the Sabik PDA Programmer manual

Basic functions and parameters

Main Tab

A. Read from/write to lantern buttons. The Programmer will respond with “Device write success” when the new setting has been stored successfully in the lantern. In case of error or timeout you will get the message “Device write failure”.

B. Flash character presets list box. To see flash character time pairs tap and hold Flash Character label, Show Time pair context menu will appear, tap on it to see the time pairs.

C. SMC parameters presets list box. To save configured presets or rename existing ones, tap and hold Parameter Profile Label and the Parameters presets menu will appear:

Change – Rename preset
Save as new – Save parameters as a new preset
Delete – Delete preset

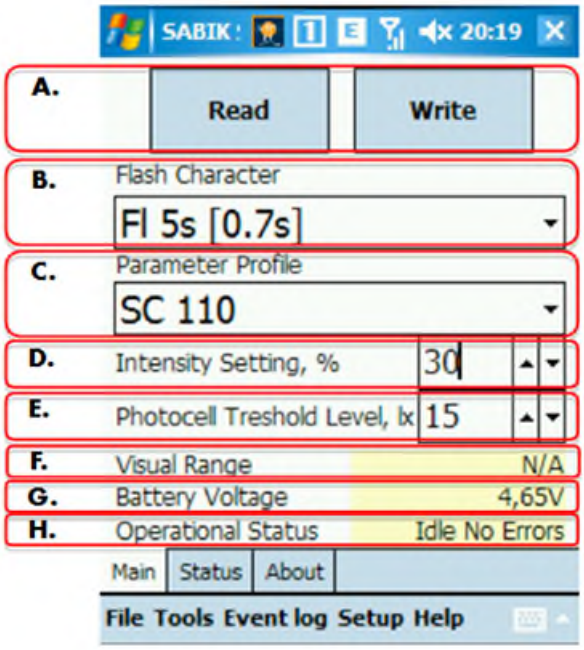
D. Set intensity of light in percent of maximum intensity. Minimum value is 5%.

E. Set photocell threshold level in Lux.

F. Visual Range field displays actual visual range of the lantern in nautical miles according to current intensity settings. NOTE: The range is calculated using TC factor set in Main Menu -> Setup -> Config.

G. Battery Voltage field displays actual battery voltage level.

H. Operational status field indicates current SMC operation mode: Idle / Flashing and No Errors / Errors.



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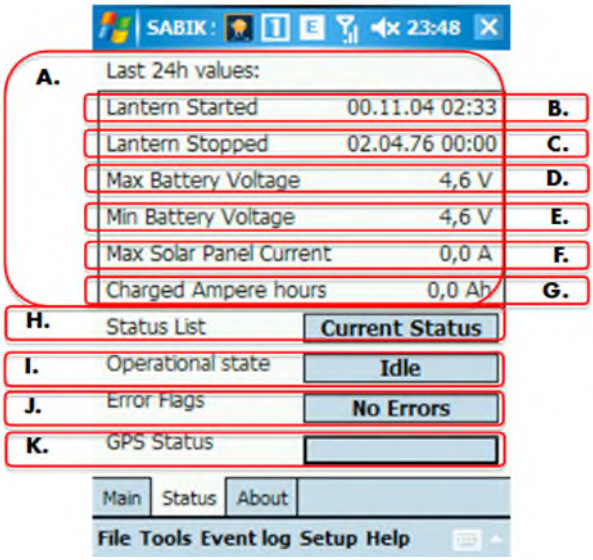
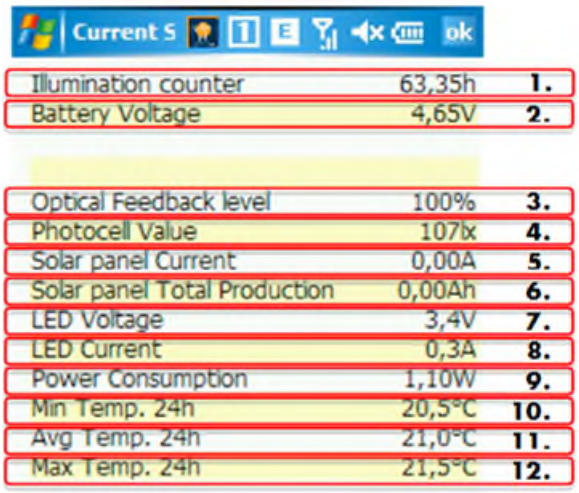
Status Tab

A. Main values over the past 24 hours
B. Date and time lantern switched On
C. Date and time lantern switched Off
D. Maximum battery voltage over the past 24 hours, Volts
E. Minimum battery voltage over the past 24 hours, Volts
F. Maximum solar panels Current over the past 24 hours, Amperes
G. Total ampere-hours charged over the past 24 hours.



H. To access Current status list, tap the Current Status button and the following window will appear:

1. Total time of lantern illumination
2. Main battery voltage
3. LED performance, percent
4. Environment illumination, Lux
5. Solar panel current, Amperes
6. Total production from solar panels, Ampere-hours
7. Voltage on LEDs, Volts
8. Current on LEDs, Amperes
9. Lantern power consumption, Watt
10. Min. temperature over the past 24h
11. Average temperature over the past 24h
12. Max. temperature over the past 24h

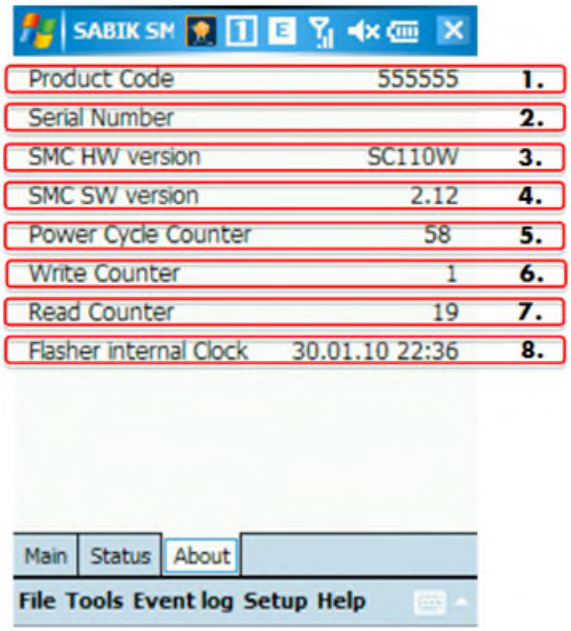


I. To access detailed operational status, tap the button to the right of “Operational state” label
J. To access detailed error flags layout, tap the button to the right of “Error Flags” label
K. To access detailed GPS Status, tap the button to the right of “GPS Status” label

About Tab

The About tab provides general info on lantern.

1. Lantern product code
2. SMC serial number
3. SMC hardware version
4. SMC software version
5. Number of power cycles
6. Number of times written to SMC*
7. Number of times read from SMC*
8. SMC internal clock



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* Can be reset in Main Menu -> Tools -> Clear Counters

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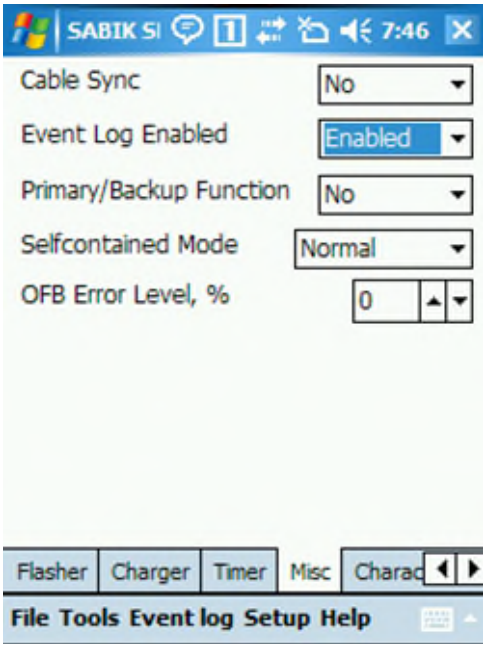
Event log Menu (Misc Tab)

Enable the event log from the Misc. Tab window. If the event log is enabled, every day/night transition and any malfunction will be stored in the lantern and can be downloaded over the infrared port. The lanterns have a storage capacity for up to three years of events. The data is stored in a non-volatile memory.

A. Flash character presets list
B. Flash character list displays flash pairs of the preset or programmed by user. Up to ten pairs of flashes can be programmed.



Configuration menu & Enabling advanced mode

This mode is only for advanced users.
Consult the Sabik Programmer for WM manual to access this mode.

7. Maintenance

The LED 155 is a robust lantern designed to withstand heavy abuse and requires no maintenance, except for periodical lens cleaning and possible replacement of bird spikes. To maintain a good light output and achieve a long service life, it is advisable to inspect the lantern whenever visiting the buoy.

7.1. Mechanical inspection and maintenance

- Clean the metal parts on the lantern
- Check the lens and clean it with a damp cloth (Do NOT use any solvents!)
- Check the mounting bolts and the plastic washers for damage and replace if necessary.
- Check and replace bird spikes if necessary
- Check the lantern for leakage (condensation through the lens) and replace gaskets if necessary

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7.2. Functional inspection and maintenance:

- Check that the lantern turns on by covering the lens (photocell location as in Figure 5 - Position of IR and Photo sensor)
- Check visually that the LEDs are equal and uniform intensity when lit
- Check that the lantern turns off by removing the cover
- Read controller values with the programmer and check the status (note that values can also be saved in the PDA programmer)
- Check battery voltage with the programmer. If battery voltage is low, replace the battery

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8. Troubleshooting

Q: I covered the lens, but the lantern does not turn on.

A1: Read controller values with the 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 lens, 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 lens, 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 on your programmer and on the lantern. Face them against each other. (see Figure 5 - Position of IR and Photo sensor)

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 the PTFE vent is free and not blocked with bird droppings. Replace vent if required.

A2: Open the lantern and check for damage on the mounting flange O-ring and surface. Replace the O-ring if there are signs of damage.

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9. APPENDIXES

9.1. Explosion diagram

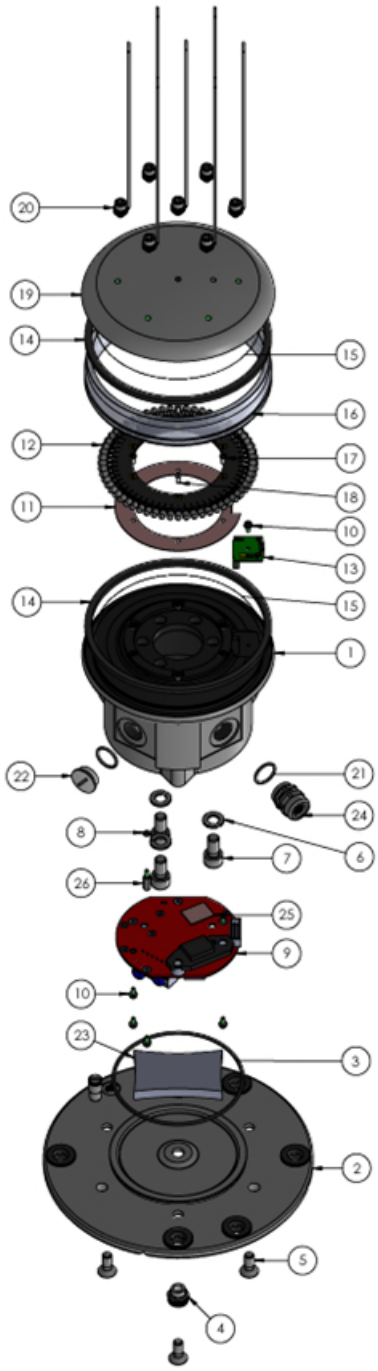

Figure 6 – The lantern assembly exploded into parts

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