Product Catalogue

Marine Signals

2020–2021

SABIK MARINE

SABIK MARINE

Marine Products

Foreword

TO OUR VALUED CUSTOMERS

I am pleased to introduce the 2020 edition of Sabik Marine's new product catalogue. This catalogue showcases an overview of our comprehensive marine product portfolio and represents the best of the industry.

In February 2019 Sabik was acquired by SPX Corporation, headquartered in Charlotte, North Carolina, USA. The acquisition was a strategic move for SPX Corporation to extend and grow its presence in the signal light industry. SPX also owns Flash Technology LLC, Franklin, Tennessee, which is one of the biggest manufacturers of Aviation Obstruction signal lights.

Combining Flash Technology and Sabik Marine, SPX is now the biggest signal light manufacturer in the world, and we can leverage both our manufacturing capability as well as our technology offering, which makes us stronger in both the signal verticals. In addition, our presence in the North American market is now much stronger and we are better equipped to support our growth also in this part of the world.

Each of our product brands that we hold today represents their own unique history in the industry, their own product technology and their own dedicated and loyal customer base. We are strong not only in the segment of high volume, highly competitive self-contained lanterns, but also in the high precision, low volume special lights, such as PEL lights and rotating beacons. Each of these product segments needs a different set of skills and competences, which you normally would not find at a single manufacturer.

Having access to all this technology and knowledge, we can now choose and combine these in our new products. A good example is the VLB-44X, which is an upgraded version of the legacy VLB-44 lantern. This lantern, which has been trusted for years by large infrastructure agencies, now has an improved performance and is much faster to manufacture. I am very proud of the achievements of our team here in Sabik Marine who were able to accomplish this, enabling us to be awarded again by the US Coast Guard.

You can expect to see more new and combined technologies from us in the future. We are also working on our product portfolio roadmap, and this catalogue is an example of this progress. Our objective is to make it easier to choose the best product for each application, and to reduce the potential overlap between the different product brands.

I am very excited for the future of Sabik Marine and about the general development in this special niche industry. Despite all e-Navigation work taking place the industry, the physical Aids to Navigation remain the most valuable infrastructure assets outside the ship, and I do not see this changing in the nearby future. On the contrary, as the ships grow larger and the safety margins in the channels become smaller, the physical Aids to Navigation become more critical for the ship's captain.

I also want to thank you for considering our products and services. We greatly appreciate your continuous active involvement and support, and we will keep working hard to meet and even exceed your expectations.

Lars Mansner
Managing Director
Sabik Marine

WE SHOW THE WAY

Sabik Marine is the world's leading manufacturer of marine signals.

SABIK MARINE is the global leader in the marine aids-to-navigation business with a mission to enhance the maritime safety. We design and manufacture high-quality LED marine signals and solutions with advanced remote monitoring and control. Our products have earned a global reputation for being durable, dependable, efficient and cost-effective solutions. Our products are trusted by coast guards, marine authorities, navies and ports around the world. Together with our global distribution network, we are able to serve customers locally in all longitudes and latitudes. Our global team of marine aids-to-navigation professionals brings extensive knowledge and support to your marine signal projects. We are highly committed to being innovators in the industry and were the first to introduce LED technology and remote monitoring to marine navigation aids. As active members of IALA, we contribute to the development of industry standards and technologies. Today Sabik Marine belongs to SPX Corporation, a global supplier of highly engineered products and technologies, holding leadership positions in the HVAC, detection and measurement, and engineering solutions markets.

Many of the world's most challenging waterways and ports are marked with our marine signals. Our high-quality standards, excellence in technology and extensive testing guarantee that all our products boast outstanding reliability in harsh environmental conditions worldwide. Not to mention, the long service life and the maintenance-free marine applications generate direct cost savings and increased efficiency.

For more details and most recent product updates visit our website Sabik-marine.com, subscribe to our newsletter and follow us on social media.

Our product range includes:

- Self-contained lanterns
- Buoy lanterns
- Heavy-duty ice buoy lanterns
- Range lights
- Beacons
- Sector lights
- Directed sector lights
- Lock and bridge signals
- Remote monitoring and control
- AIS equipment

Our services and solutions offering consists of:

- Ice buoys
- Power supply systems
- Communication systems
- Turn-key solutions
- Installation, training and commissioning

ISO 9001 BUREAU VERITAS Certification

ISO 14001 BUREAU VERITAS Certification

IALA

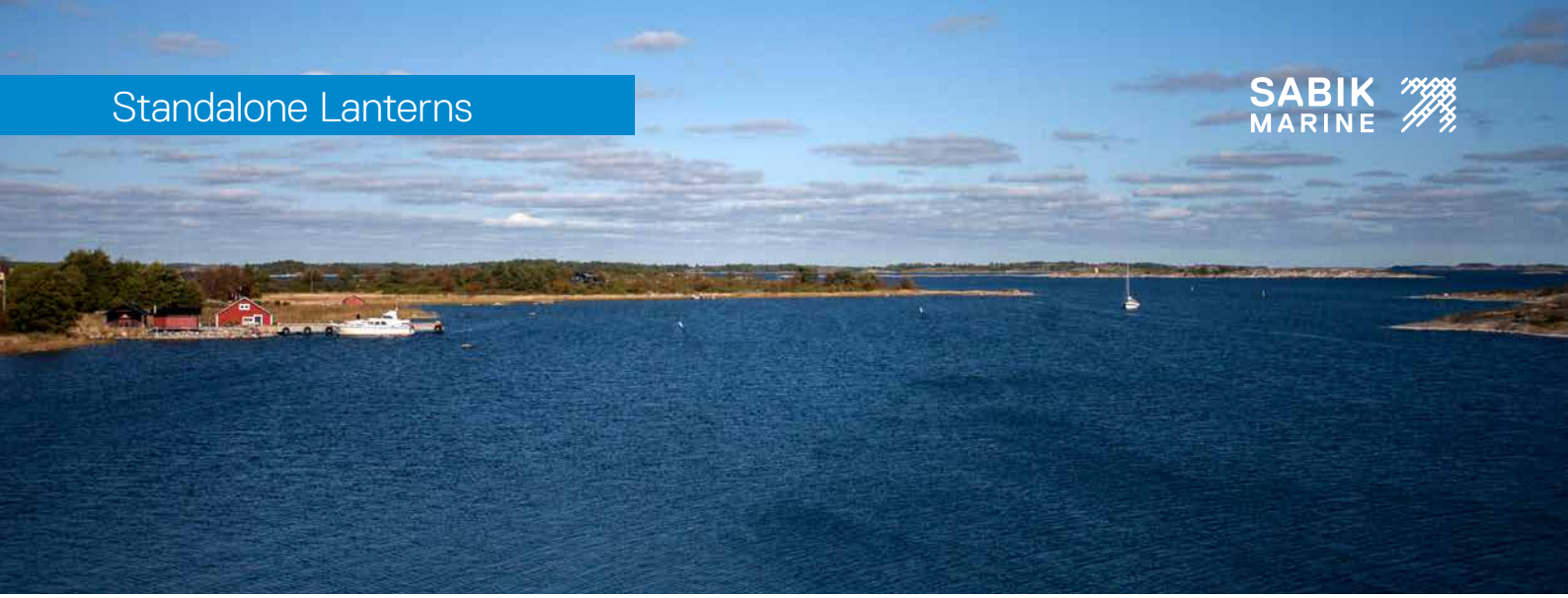
Industrial Member

Standalone Lanterns

Sabik is known as an innovator in the industry and we were the first manufacturer to introduce LED technology and remote monitoring in marine aids-to-navigation. Our products have earned a global reputation for being durable, dependable, efficient and cost-effective solutions in harsh marine environments.

Our selection of omnidirectional standalone lanterns offers flexibility and customization: You can choose either battery, solar panel or mains as power supply to meet different requirements. Additionally, you can choose the right features for example marine AIS, GPS synchronization and LightGuard Monitoring. Our remote monitoring and control is based on open industrial standards which will also ensure easy future integration with other components. Our standalone lanterns with high-class performance cover ranges from small buoy lanterns to long-range beacons.


BORA



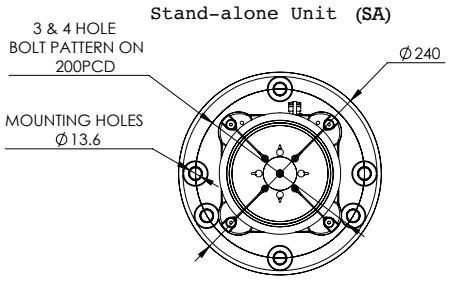
VLB-5X-SA

LED lantern for buoys and minor beacons up to 5,5 NM range

VLB-5X-SA is a compact and durable lantern with an excellent performance. Thanks to the small size and low weight it is a good choice for light fixed structures and buoys.

Benefits include:

- **Optical range – 5.5 NM**
- **Five colours meeting IALA chromaticity requirements**
- **Light intensity automatically adjusts with flash character setting (Schmidt-Clausen)**
- **12 options for day to night transition light levels**
- **More than 256 flash characters**
- **Calendar control of beacon operation**
- **Alarm output (system notification)**
- **Available with GPS synchronization**



Optical Performance

Maximum peak intensity				
7°	177cd	177cd	177cd	157cd

Optical specification

Light source	High Power Light Emitting Diode (LED)
Vertical divergence	7 degrees @ 50% peak
Temperature control	LEDs monitored for constant intensity control and over temperature protection

Main Technical Specification

Nominal Range	Up to 5.5 NM
Lens	Moulded acrylic (PMMA)
Base	Injection Moulded UV Stabilized Nylon 6/6 with 30% glass fill
Designed service life	10 years
Weight	1.0 kg
Flash character	256 standard characters plus custom character
Temperature range	-40° to +50°C
Voltage	12 VDC (9-18 VDC)
Solar charger	Integrated 2 amp * (no output cable supplied without order request)
Degree of protection	IP 68
Cable length	2 m / 6 m

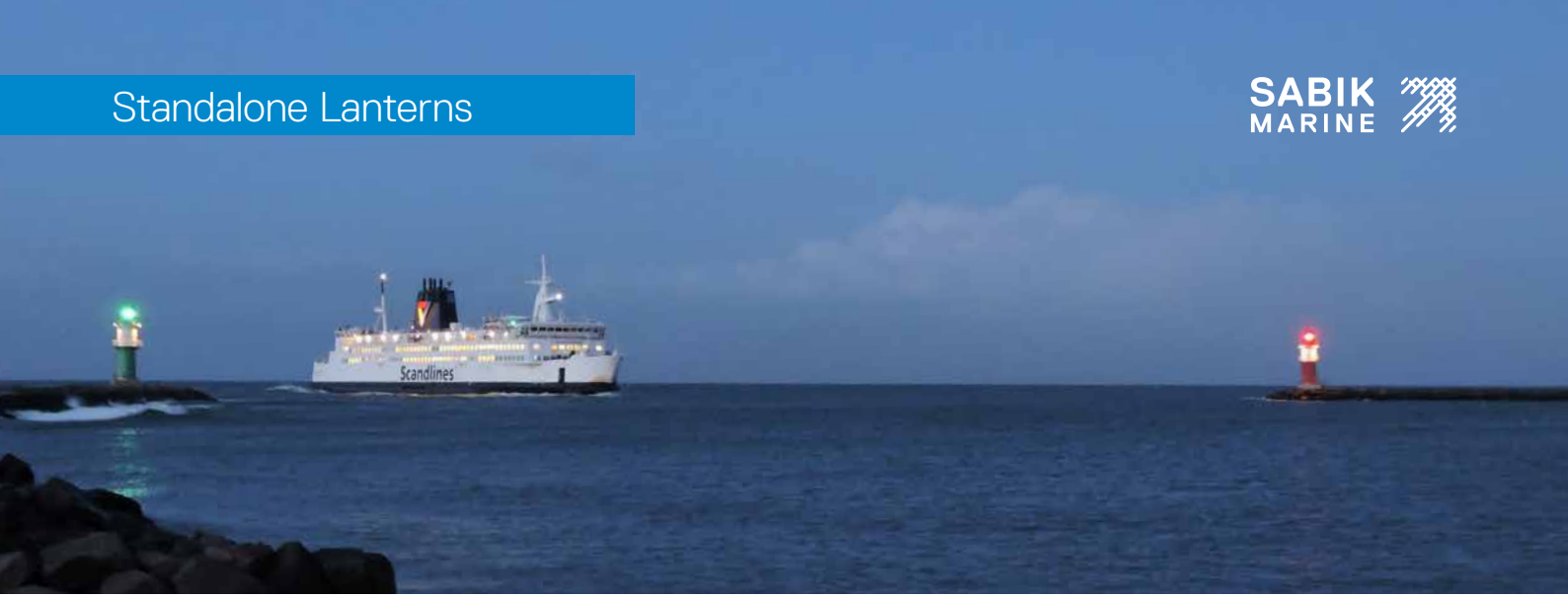
Order Overview VLB-5X-SA

Product code

Code	Note
VLB-5X-c07-SA(-GS)	
c	Color (R, G, W, Y)

Option matrix

DP-AL-SW	Dataport, alarm/monitor & wire synch factory option
GS	Internal GPS sync module as factory option

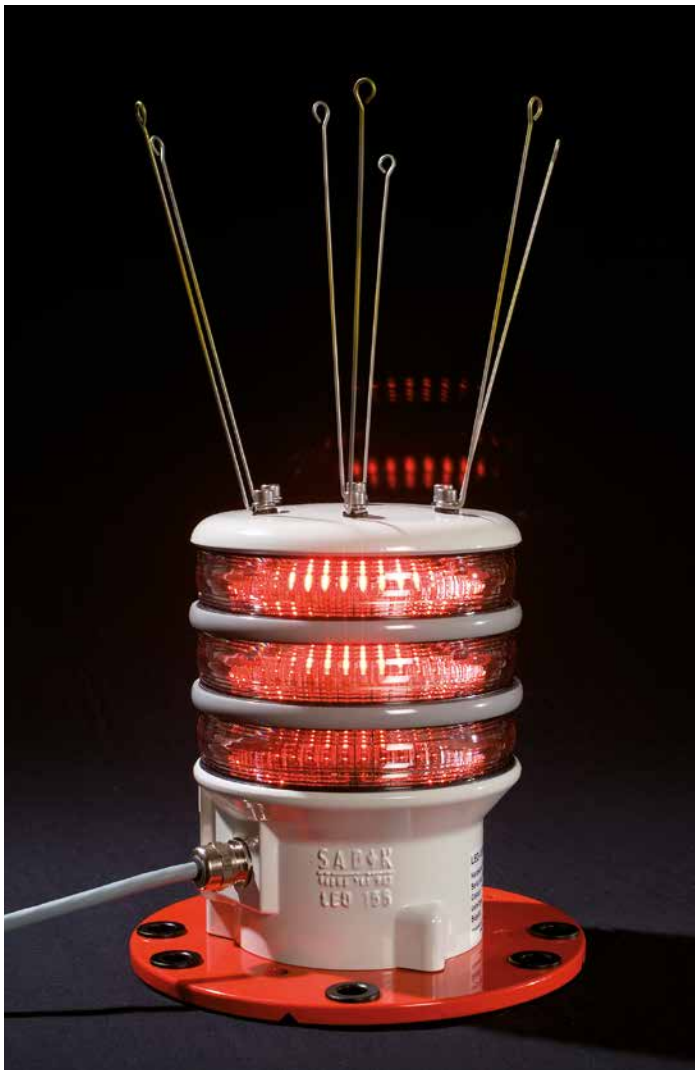


LED 155

Marine LED lantern for buoys and minor beacons

LED 155 is a general purpose LED lantern commonly used on both fixed and floating structures. The lantern is modular in design. It can be configured with two different vertical divergencies and 1-3 tiers depending on operational requirements.

- **Range up to 8 NM at Tc = 0,74 (12 NM at Tc = 0,85)**
- **Standard IALA colours Red, Green, White, Yellow and Blue/Yellow**
- **Rugged aluminium housing for installation in harsh marine environments**
- **Extremely low power consumption, suitable for solar and battery operation**
- **Integrated flasher with day-night switch**
- **Integrated 16A solar panel charger using pulse width modulation**
- **Adjustable intensity and range**
- **Available with narrow (6°) or wide (10°) vertical divergence**
- **Programmable with Sabik standard IR programming devices**
- **Integrated event log for 365 days**
- **Optional integrated GPS synchronization**
- **Optional integrated GSM Remote monitoring**
- **Optional Bluetooth control**



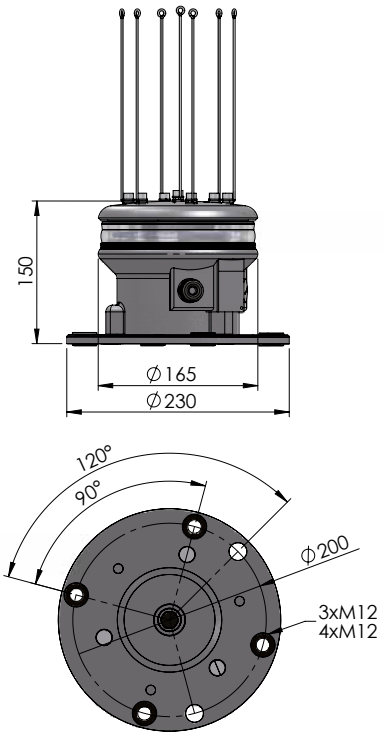
Optical performance LED 155

Maximum fixed intensity, narrow lens (fixed structures)				
Simplex, 6 W	200 cd	240 cd	380 cd	200 cd
Duplex, 12 W	380 cd	450 cd	720 cd	380 cd
Triplex, 18 W	560 cd	660 cd	1060 cd	560 cd

Maximum fixed intensity, wide lens (floating structures)				
Simplex, 6 W	120 cd	160 cd	240 cd	120 cd
Duplex, 12 W	230 cd	300 cd	450 cd	230 cd
Triplex, 18 W	340 cd	440 cd	670 cd	340 cd

Optical performance LED 155 B/Y

Maximum fixed intensity		
Nominal 6 W	45 cd	45 cd



Product code example: LED-155-3-NR-9

- ***LED-155-3*** is Sabik code for a three-tier LED 155
- ***NR*** is the code for a Narrow Red lens
- ***9*** is a selection of option 9 GSM monitoring together with GSM/GPS antennas

Order Overview LED-155-2-WBY

Wreck marking lantern blue/yellow

Main Technical Specification LED 155

Lens visual/Mechanical diameter	160 mm
Lens material	UV stabilized Polycarbonate
Light source	Light Emitting Diodes (LEDs)
Vertical divergence	6° or 10° @ 50% (±1°)
Unit lifetime	Up to 10 years
Weight	3,9 kg for single tier unit
Temperature range	-40°...+60°C
Supply Voltage	10– 32 VDC
Solar Panel Charger	16 ampere PWM charger
Power consumption	Max 6 watts / tier
Degree of protection	IP68

Main Technical Specification LED 155 Blue/ Yellow wreck mark

Lens visual/Mechanical diameter	160 mm
Lens material	UV stabilized Polycarbonate
Light source	Light Emitting Diodes (LEDs)
Vertical divergence	10° @ 50 % (± 1°) of peak intensity
Unit lifetime	Up to 10 years
Weight	4,2 kg
Temperature range	-40°...+60°C
Supply Voltage	10 – 32 VDC
Power consumption	Max 6 watts / tier
Cable length	2 m / 6 m

Order Overview LED 155

N = Narrow (6° @ 50 % of peak intensity) single tier (standard)		Two tiers (duplex)		Three tiers (triplex)	
Red	LED-155-1-NR	Red	LED-155-2-NR	Red	LED-155-3-NR
Yellow	LED-155-1-NY	Yellow	LED-155-2-NY	Yellow	LED-155-3-NY
Green	LED-155-1-NG	Green	LED-155-2-NG	Green	LED-155-3-NG
White	LED-155-1-NW	White	LED-155-2-NW	White	LED-155-3-NW

W = Wide (10° @ 50 % of peak intensity) single tier (standard)		Two tiers (duplex)		Three tiers (triplex)	
Red	LED-155-1-WR	Red	LED-155-2-WR	Red	LED-155-3-WR
Yellow	LED-155-1-WY	Yellow	LED-155-2-WY	Yellow	LED-155-3-WY
Green	LED-155-1-WG	Green	LED-155-2-WG	Green	LED-155-3-WG
White	LED-155-1-WW	White	LED-155-2-WW	White	LED-155-3-WW

Option matrix

OPT 4: GPS sync	Integrated GPS sync including GPS antenna
OPT 9: LightGuard GSM + GPS	Integrated GSM based monitoring including GSM/ GPS antennas
OPT 10: LightGuard GSM	Integrated GSM based monitoring including GSM antenna
OPT 11: Control card	Control card for secondary battery
OPT 12: Aux card with I/O	Aux card including I/O ports
OPT 13: Aux card with RS485 and I/O	Aux card including RS 485 and I/O port
OPT BT	Bluetooth control
Shock & Tilt Sensor	Integrated 3-axis G sensor for tilt and shock sensing

LED 160

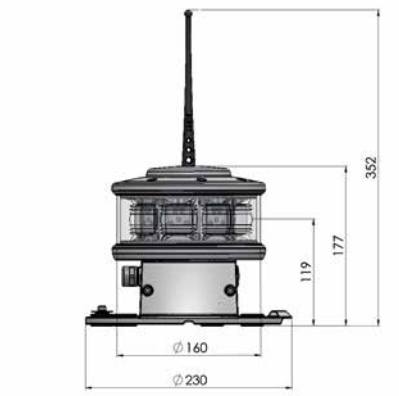
Full range lantern for fixed and floating installations

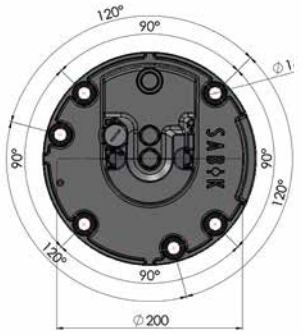
This all-round LED 160 lantern has world-class optical performance with options for buoys and fixed installations. Three different lens options available covering a range from 3 NM up to 12NM (Tc = 0,74)

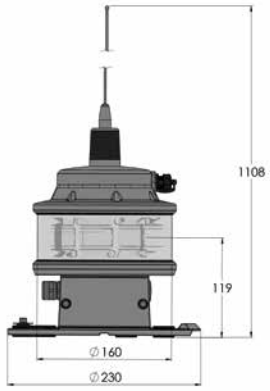
- Standard IALA colours red, green, white, yellow and blue
- Best in class optical performance
- New designed rugged injection moulded aluminium housing
- Easy fiel installation thanks to the integrated junction box with 3 cable entries
- Extremely low power consumption, suitable for solar and battery operation
- Integrated 16A solar panel charger
- Adjustable intensity and range
- The lantern is available in three different versions. LED 160 with Narrow 5° and with Wide 10° vertical divergence, and the LED 160H with a 2,5° vertical divergence
- Programmable with Sabik IR programmer or with Bluetooth® control from up to 50m distance
- Optionally integrated GPS synchronization
- Optionally integrated GSM/GPS remote monitoring
- Available with integrated AIS

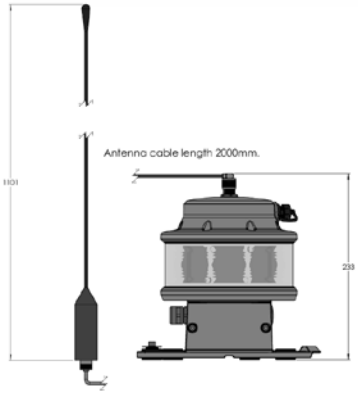
Integrated AIS

- Available in two models: Type 1 (FATDMA) and Type 3 (RATDMA)
- AIS transponder integrated in the top part of the lantern
- Integrated GPS antenna and external VHF antenna included in the delivery
- Extremely low power consumption when used as Type 1 <45mW with 1 message/ 3 minutes (about 0,09 Ah/day)
- Support messages: 6 and 21
- Supports up to 10 virtual Aton:s









Product code example: LED-160-NG-9L

- ***LED-160-NG*** is Sabik code for LED 160 with narrow lens in green
- ***9L*** is a selection of option 9 integrated GSM/GPS monitoring

Optical performance

Maximum fixed intensity LED 160H	
Max power 36 W	4300 cd

Maximum fixed intensity LED 160N				
	1150 cd	1200 cd	1000 cd	1850 cd
Power consumption	13 W	16 W	16 W	16 W

Maximum fixed intensity LED 160W				
	550 cd	850 cd	550 cd	1100 cd
Power consumption	12 W	16 W	16 W	16 W

Main Technical Specification

Lens visual/Mechanical diameter	160 mm
Lens material	UV stabilized Acrylic
Light source	High Power Light Emitting Diodes
Vertical divergence	2,5°@50% of peak intensity (FWHM) 5°@50% of peak intensity (FWHM) 10°@50% of peak intensity (FWHM)
Weight	3,3 kg
Temperature range	-40° – +60°C
Supply Voltage	10 – 32 VDC
Solar Panel Charger	16 ampere PWM charger
Power consumption	13W – 16W
Power consumption LED 160H	36 W
Degree of protection	IP 67
Cable length	2 m / 6 m

Order Overview LED 160

Product codes

LED 160H High intensity lantern	LED 160N Lantern with narrow lens designed for fixed structures	LED 160W Lantern with wide lens designed for buoys	Colour
LED-160-HW	LED-160-NW	LED-160-WW	white
	LED-160-NR	LED-160-WR	red
	LED-160-NG	LED-160-WG	green
	LED-160-NY	LED-160-WY	yellow
	LED-160-NB	LED-160-WB	blue

Option matrix

GPS sync **OPT 4L**	Integrated GPS sync including GPS antenna
LightGuard GSM + GPS **OPT 9L**	Integrated GSM/GPS based monitoring including GSM/GPS antennas
Battery control card **OPT 11L**	Control card for secondary (emergency) battery
Automatic Identification System **OPT AIS**	OPT AIS 1: Lantern with integrated AIS type 1 OPT AIS 3: Lantern with integrated AIS type 3

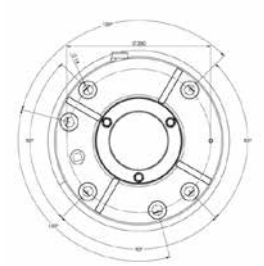
VLB-44X

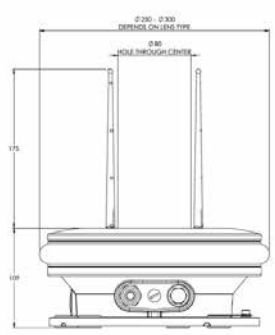
Long range lantern 6-14 NM (1-3 tiers)

The VLB-44X lantern forms part of the LED marine lantern family. The use of highly efficient optics and electronics has resulted in state-of-the-art energy efficiency.

This level of efficiency significantly reduces the solar panel and battery requirements in standalone applications.

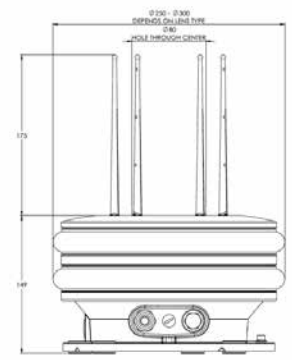
- **Comes in 3 different vertical divergences to cover both fixed and floating applications: 10° (ideal for buoys), 5° (for land/pole use), 2.5° (for lighthouses)**
- **With 1 to 3 tiers, can be sized to match the range requirement of a particular application. Multiple units can be used to extend the range to 16 NM**
- **Available colours are red, green, white and yellow**
- **The unique optical system utilises an acrylic lens to maximise the light captured from the LED's**
- **The LED's are precisely graded and placed to produce a light beam with minimum variation in intensity**
- **A switch mode regulator maintains the light output of the LEDs independent of input of voltage and temperature**





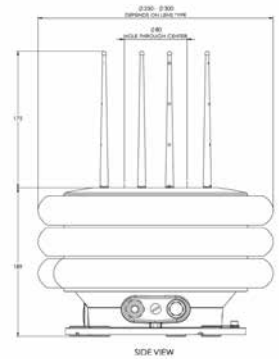
SIDE VIEW

Weight 4.5 kg



SIDE VIEW

Weight 7.2 kg



SIDE VIEW

Weight 9.9 kg

Optical Performance

Maximum intensity (Single tier)				
10°	920 cd	1300 cd	1050 cd	1650 cd
5°	1400 cd	1800 cd	1500 cd	2610 cd
2.5°	2060 cd	2610 cd	2190 cd	3730 cd
Maximum intensity (Two tier)				
10°	1840 cd	2600 cd	2100 cd	3300 cd
5°	2800 cd	3600 cd	4260 cd	5220 cd
2.5°	4120 cd	5220 cd	4380 cd	7460 cd
Maximum intensity (Three tier)				
10°	2760 cd	3900 cd	3150 cd	4950 cd
5°	4200 cd	5400 cd	4500 cd	7830 cd
2.5°	6180 cd	7830 cd	6570 cd	11190 cd

Main Technical Specification

Light source	High-Intensity LEDs
Colours available	Red, Green, White, Yellow
Vertical divergence	2,5°@50% of peak 5°@50% of peak 10°@50% of peak
Weight	4.5 kg + 2.7 kg each additional tier
Temperature	-30° – +50°C
Voltage	12 VDC (10-18 VDC)
Intrusion protection	MIL-STD-202G Method 104A, Cond A P68, 1.5m for 60 minutes
Lens	Machined cast acrylic; UV-protected
Base	Marine grade aluminium
Degree of protection	IP 67
Cable length	2 m / 6 m

Order Overview VLB-44X

Product code

Code VLB44X-xT-cddd(-GS)	Note
c	Colour (R, G, Y, W)
ddd	Vertical divergence (2D5, 05D, 10D)
x	Tiers (1 to 3)

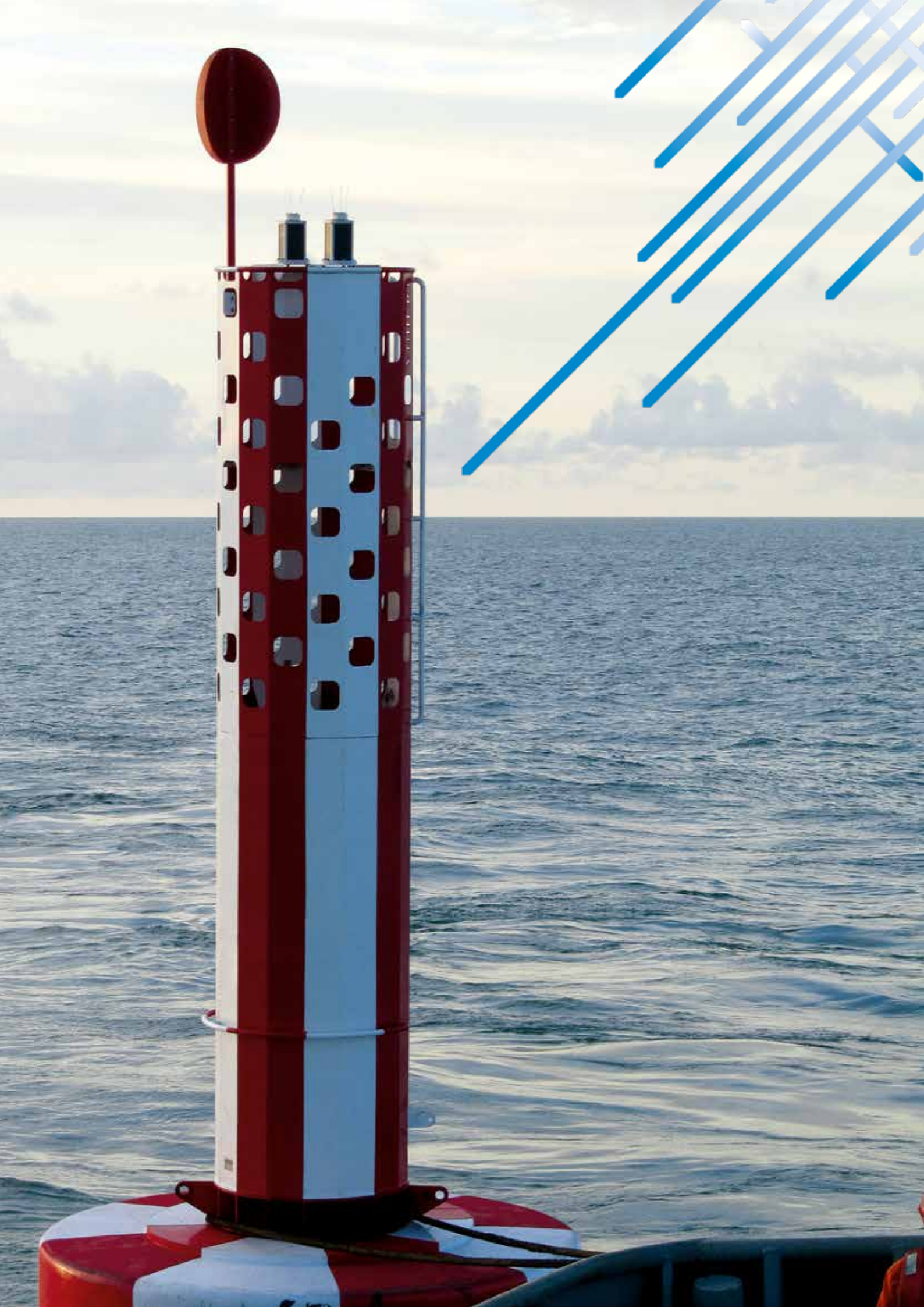
Option matrix

GS	GPS synchronization
VLB-44XE	Extended I/O

Self-Contained Lanterns

Our product range of self-contained lanterns is even more comprehensive than before thanks to the constant development of LEDs, solar panels and battery technologies. Self-contained lanterns with an integrated light and solar power supply are an ideal solution for the operator as it is an easy and fast solution to install. Our self-contained lanterns boast outstanding reliability in harsh environmental conditions worldwide from tropical hurricanes to boreal ice and snow. The larger the energy package, the higher the latitude where the solution can be used. These long service life and maintenance-free solutions generate direct cost-savings and increased efficiency combined with the highest environmental sensitivity.

Our self-contained lanterns for fixed and floating marine applications cover visual ranges even to 14NM (directional light). Today the product line of small self-contained lanterns (visual range up to 7NM), originally manufactured by Carmanah, belong to our marine brand portfolio. Our clients and partners can rest assured that we continue to nurture and develop this legacy with our state-of-the-art solar-energy and LED solutions also in the future.

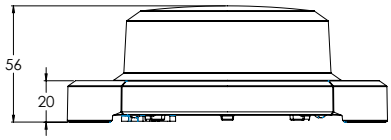


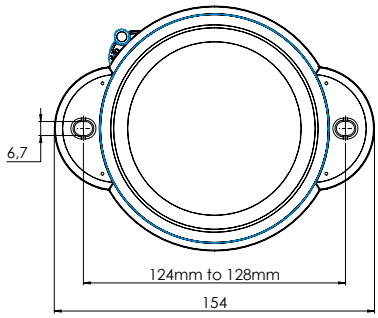
M550

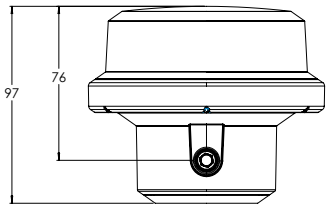
Self-contained LED lantern, 1 to 2 NM range

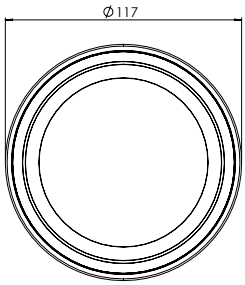
This miniature solar LED marine lantern offers leveraging custom optics, high-efficiency solar panels and premium materials. Now with replaceable, recyclable batteries this lantern provides excellent value and reliable operation over the long term. Battery life expectancy is five years with product life up to 10 years and a three-year warranty. Ideal for marine aids-to-navigation, marina lighting, dock lighting, and port lighting. To view performance in your installation location, visit www.sabik-marine.com ->Marine Selector Tool

- **40 user-adjustable flash patterns and programmable intensities**
- **Replaceable, recyclable, high-temperature-rated NiMH AA batteries**
- **Automatic Light Control (ALC) 2.0; achieve optimal intensities throughout the year**
- **Premium grade, UV resistant polycarbonate body and lens material**
- **IP 68 rated**
- **Ventilated battery compartment**









Optical performance

Maximum fixed intensity				
18 cd	23 cd	29 cd	25 cd	8 cd

Main Technical Specification

Construction	Premium grade, UV resistant polycarbonate lens/ head and polycarbonate/polysiloxane co-polymer base.
Lens visual/Mechanical diameter	102 mm
Lens material	UV stabilized polycarbonate
Light source	High Flux Surface Mount LED
Solar module	High efficiency cells ; 0,6 W
Battery	3 NiMH AA cells; 3.6 V / 1.1 Ah capacity
Degree of ingress protection	IP 68
Weight	Flange Mount: 0.37 kg (0.8 lbs) Pole Mount: 0.40 kg (0.9 lbs)
Overall height	56 mm (flange mount), 97 mm (pole mount)
Overall width	155 mm dia.
Installation	2 x M6 on 128 mm dia.

Order Overview M550

Product codes

Colour	M550 Flange	M550 Flange switched	M550 Pole
red	M550RF	M550RF-S	M550RP
green	M550GF	M550GF-S	M550GP
white	M550WF	M550WF-S	M550WP
yellow	M550YF	M550YF-S	M550YP
blue	M550BF	M550BF-S	M550BP

Option matrix

M550 Flange Mount - Switched	2-bolt mount with ON/OFF switch
M550 Flange Mount	2-bolt mount
M550 Pole Mount	Pole mount

Accessories

59935	**Pole Mount Replacement/Conversion Kit**
70943	**Flange Mount Replacement/Conversion Kit**
70937	**Switched Kit (compatible with Flange Mount only)**
70955	**Replacement NiMH batteries**
59934	**Bird Deterrent (single)**

M650H

Self-contained LED lantern for buoys and minor beacons, 2 to 4 NM Range

The M650H is a cost-effective, self-contained, high-performance, low-maintenance and easy-to-install solar LED marine lantern. The M650H features a replaceable battery pack that extends the service life beyond five years, reducing the total cost of ownership. Applications include: marine aids-to-navigation marking, marina lighting, dock lighting, and port lighting. To view performance in your installation location, visit www.sabik-marine.com ->Marine Selector Tool

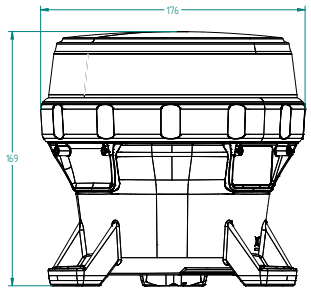
- **Standard IALA colours red, green, white, yellow, blue**
- **High-efficiency solar cells with bypass and blocking diode function. Maximum power point tracking (MPPT) for optimal energy collection**
- **Premium grade UV resistant, polycarbonate/ polysiloxane co-polymer body and lens material**
- **Colour-specific temperature corrected LED drivers provide consistent intensity under all operating conditions**
- **IP 68 rated. Double O-ring sealing with waterproof vent**
- **SLA battery**
- **Ventilated battery compartment**
- **Adjustable intensity and range**
- **Vertical divergence > 8° (FWHM)**
- **Programmable with On-Board User Interface, USB port, or optional wireless IR-Programmer**
- **Integrated event-log**
- **Optional ON/OFF switch**
- **Optional external charger**
- **Optional integrated GPS synchronization**

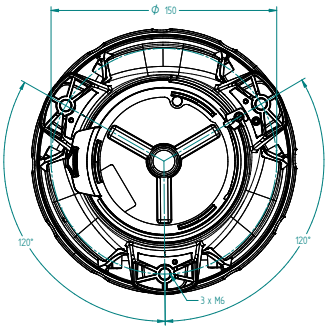
Optical performance

Maximum fixed intensity				
31 cd	45 cd	60 cd	52 cd	15 cd

Main Technical Specification

Lens visual/Mechanical diameter	165 mm
Lens material	UV stabilized Polycarbonate
Light source	High Power Light Emitting Diode (LED)
Vertical divergence	>8° (FWHM)
Solar module	High efficiency cells; bypass and blocking diodes; MPPT; 1.5 W
Battery	AGM sealed lead acid; 4.2 V / 5 Ah capacity
Degree of ingress protection	IP 68
Weight	1.58 kg
Overall height	169 mm
Overall width	176 mm dia.
Installation	3 x M6 on 150 mm dia.





Order Overview M650H

Product codes

Colour	M650H	M650H switched	M650H GPS	M650H switched GPS
red	M650HR	M650HR-S	M650HR-GPS	M650HR-SGPS
green	M650HG	M650HG-S	M650HG-GPS	M650HG-SGPS
white	M650HW	M650HW-S	M650HW-GPS	M650HW-SGPS
yellow	M650HY	M650HY-S	M650HY-GPS	M650HY-SGPS
blue	M650HB	M650HB-S	M650HB-GPS	M650HB-SGPS

Option matrix

M650H	
M650H Switched	ON/OFF switch
M650H Switched GPS	Includes GPS synchronization & ON/OFF switch
M650H GPS	Includes GPS synchronization

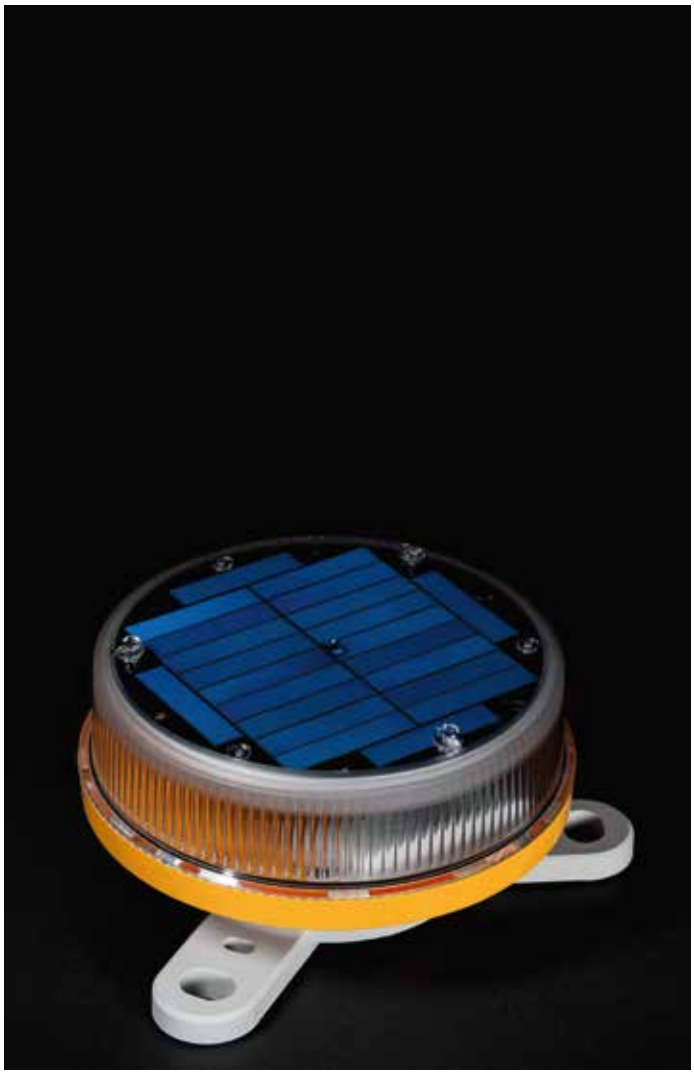
Accessories

57003	**650 Bird Deterrent – Additional (1 ships with each lantern)**
57392	**650 Bottom Cover Replacement Pack Switched**
57393	**650 Bottom Cover Replacement Pack**
59198	**650 Bottom Cover Tool**
72835	**650 Battery Replacement Pack**
59188	**650 International Wall Charger Assembly**
57394	**650 USB Cable**
69899	**IR (Infrared) Programmer**

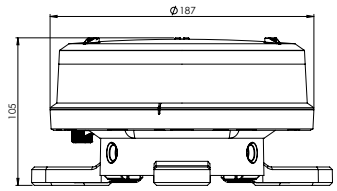
M660

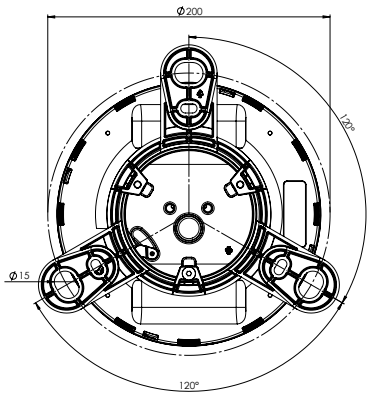
Self-contained LED lantern for buoys and minor beacons, up to 4 NM Range

The M660 is a high-performance, longlife, easy-to-use and cost-effective self-contained solar LED marine lantern. The M660 features a Li-ion battery pack that extends the service life of the lantern up to eight years. M660 has four different mounting options and can be controlled with Bluetooth® Control. To view performance in your installation location, visit Marine Selector Tool in www.sabik-marine.com ->Marine Selector Tool



- **Standard IALA colours red, green, white, yellow, blue**
- **Ventilated battery compartment**
- **Adjustable intensity and range**
- **Vertical divergence > 8° (FWHM)**
- **High-efficiency solar cells. Maximum Power Point Tracking (MPPT) for optimal energy collection**
- **Premium grade UV resistant, polycarbonate/poly siloxane co-polymer body and lens material**
- **IP 68 rated. O-ring sealing with waterproof vent**
- **Li-ion battery, optional dual pack**
- **Programmable with Bluetooth® Control and IR-Programmer**
- **Optional ON/OFF switch, external charger and charging port**
- **Built-in calendar function for automatic deactivation during off-season months**





Optical performance

Maximum fixed intensity				
40 cd	42 cd	71 cd	52 cd	18 cd

Main Technical Specification

Lens visual/Mechanical diameter	177 mm
Lens material	UV stabilized Polycarbonate
Light source	High Power Light Emitting Diode (LED)
Vertical divergence	>8° (FWHM)
Solar module	High efficiency cells; MPPT; 2.5 W
Battery	Li-ion; 3.6 W / 6 Ah capacity; can be ordered with 1 or 2 battery packs
Degree of ingress protection	IP 68
Weight	0.8 kg
Overall height (excl. bird deterrents)	105 mm
Installation (adapter)	3 x M6 on 150mm and 3 x M12 on 200mm
Installation (pole mount)	70 or 72 diameter

Order Overview M660

Product codes

Colour	M660	M660 switched	M660 dual battery	M660 charge port
red	M660R	M660R-S	M660R-2B	M660R-C
green	M660G	M660G-S	M660G-2B	M660G-C
white	M660W	M660W-S	M660W-2B	M660W-C
yellow	M660Y	M660Y-S	M660Y-2B	M660Y-C
blue	M660B	M660B-S	M660B-2B	M660B-C

Option matrix

M660	
M660 Switched	ON/OFF switch
M660 Dual Battery	Dual Battery Pack
M660 Charge Port	With Charge Port

Accessories

69934	**660 Bird Deterrent – Single**
79848	**Spare adapter (incl. screws)**
79273	**Optional switch**
69885	**660 International Wall Charger Assembly**
69899	**IR (Infrared) Programmer**
38334	**660 Standard Bolt Kit**

Product code example: M660RSC2B

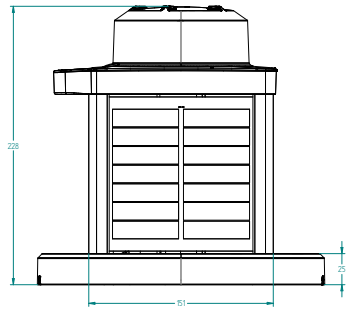
- ***M660R*** is Sabik/Carmanah code for M660 in red
- with a selection of switched with charge port and dual battery

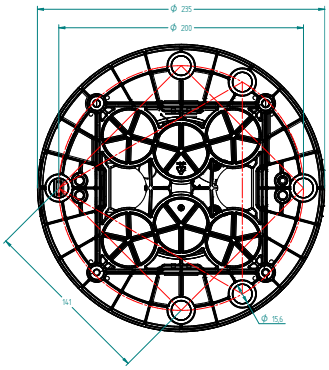
M850

**Self-contained LED lantern,
3 to 6+ NM Range**

The M850 combines a compact, high-efficiency solar engine with premium components and a rugged design for best-in-class performance at an optimal price. This lantern is suitable for use in most solar locations. To view performance in your installation location, visit www.sabik-marine.com ->Marine Selector Tool

- **Option for standard or wide divergences (for fixed or floating applications)**
- **Multiple cost-effective battery pack options suitable for a wide variety of installation locations**
- **Built-in calendar function for automatic deactivation during off-season months**
- **Top-mounted 4-character LED display with simple »tap to activate« functionality**
- **Premium grade, UV resistant polycarbonate lens material**
- **Environmentally friendly, super durable powder-coated aluminium chassis**
- **Adjustable intensity and range**
- **IP 68 rated**
- **GPS synchronized flash option**
- **Remote monitoring options available**





Optical performance

Maximum fixed intensity				
M850	239 cd	290 cd	445 cd	320 cd

Main Technical Specification

Lens visual/Mechanical diameter	111 mm
Construction	Premium grade, UV resistant polycarbonate lens/head and polycarbonate/polysiloxane co-polymer base
Light source	High Flux Surface Mount LEDs with colour-specific temperature-corrected LED driver
Vertical Divergence (FWHM)	8º (standard) or 10º (wide)
Solar modules	High-efficiency cells; MPPT; 4 x 1,7 W
Battery	Two replaceable, recyclable battery options, AMG sealed lead acid; 60 Wh / 6.3 V / 10 Ah capacity and 96 Wh / 6.3 V / 16 Ah capacity
Degree of ingress protection	IP 68 immersion
Weight	4.5 kg M850 60X 5.3 kg M850 96E
Overall height	226 mm
Overall width	235 mm dia.
Installation	3, 4 or 5 x M12 on 200 mm dia.
Charge port	Factory option
GPS sync	Factory option
Remote monitoring	Optional satellite monitoring

Order Overview M850

Product codes

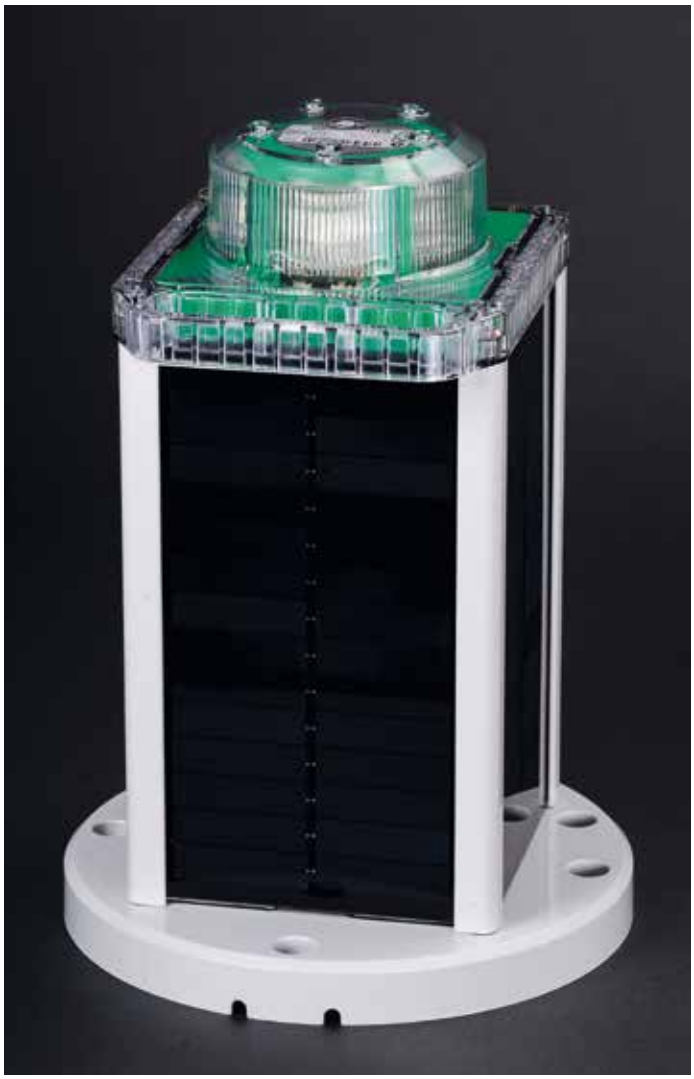
Colour	M850 60X (GPS) (Sat. monitoring)	M850 96E (GPS) (Sat. monitoring)
red	M850R-60X (-GPS)(-MON)	M850R-96E (-GPS)(-MON)
green	M850G-60X (-GPS)(-MON)	M850G-96E (-GPS)(-MON)
white	M850W-60X (-GPS)(-MON)	M850W-96E (-GPS)(-MON)
yellow	M850Y-60X (-GPS)(-MON)	M850Y-96E (-GPS)(-MON)

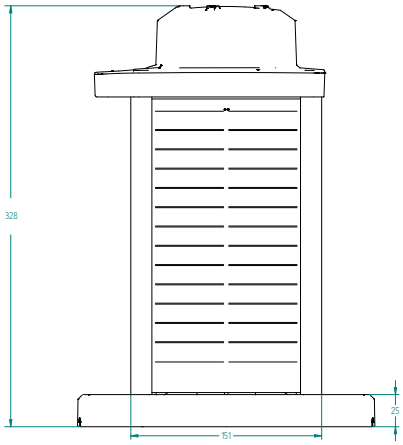
M860

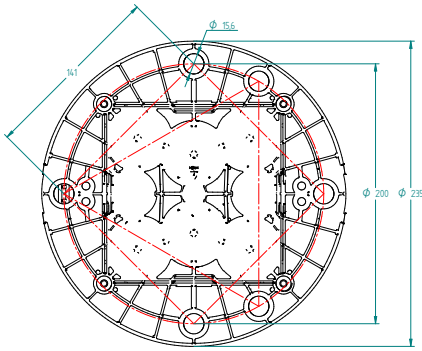
**Self-contained LED lantern,
4 to 7+ NM Range**

With a durable, large-format solar engine, the M860 is engineered for consistent, reliable performance at remote installations and in challenging insolation locations. This is a premium and full-featured lantern that is suitable for achieving longer ranges in challenging insolation locations. To view performance in your installation location, visit
www.sabik-marine.com ->Marine Selector Tool

- **Option for standard or wide divergences (for fixed or floating applications)**
- **Multiple cost-effective battery pack options suitable for a wide variety of installation locations**
- **Built-in calendar function for automatic de-activation during off-season months**
- **Top-mounted 4-character LED display with simple »tap to activate« functionality**
- **Premium grade, UV resistant polycarbonate lens material**
- **Environmentally friendly, super durable powder-coated aluminium chassis**
- **Adjustable intensity and range**
- **IP 68 rated**
- **GPS synchronized flash option**
- **Remote monitoring options available**







Optical performance

Maximum fixed intensity				
M860	239 cd	290 cd	445 cd	320 cd

Main Technical Specification

Lens visual/Mechanical diameter	111 mm
Construction	Premium grade, UV resistant polycarbonate lens/head and polycarbonate/polysiloxane co-polymer base
Light source	High Flux Surface Mount LEDs with colour-specific temperature-corrected LED driver
Vertical divergence (FWHM)	8° (standard) or 10° (wide)
Solar modules	High-efficiency cells; MPPT ; 4 x 3,8 W
Battery	Two replaceable, recyclable battery options, AGM sealed lead acid; 96 Wh / 6.3 V / 16 Ah capacity and 200 Wh / 8.4 V / 25 Ah capacity
Degree of ingress protection	IP 68 immersion
Weight	6.4 kg M860 96E 10.2 kg M860 200BC
Overall height	328 mm
Overall width	235 mm dia.
Installation	3, 4 or 5 x M12 on 200 mm dia.
Charge port	Factory option
GPS sync	Factory option
Remote monitoring	Optional satellite monitoring

Order Overview M860

Product codes

Colour	M860 96E (GPS) (Sat. monitoring) (with 96Wh battery)	M850 200BC (GPS) (Sat. monitoring) (with 200Wh battery)
red	M860R-96E (-GPS)(-MON)	M860R-200BC (-GPS)(-MON)
green	M860G-96E (-GPS)(-MON)	M860G-200BC (-GPS)(-MON)
white	M860W-96E (-GPS)(-MON)	M860W-200BC (-GPS)(-MON)
yellow	M860Y-96E (-GPS)(-MON)	M860Y-200BC (-GPS)(-MON)

VLB-5X-SS

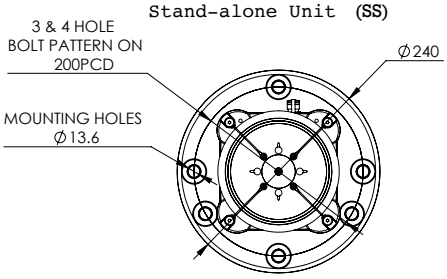
Self-contained LED lantern for buoys and beacons up to 5,5 NM range

The VLB-5X-SS includes the latest LED technology, new battery technology, and an advanced charging algorithm, which supports the battery to perform well in extreme weather conditions.

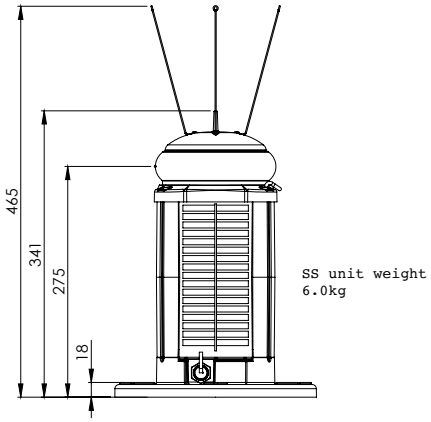
Benefits include:

- **Optical range – 5.5 NM**
- **Battery technology and advanced charging algorithm**
- **Excellent battery life in hot climates**
- **Excellent battery capacity in cold climates**
- **The 5X battery will continue to charge between -40°C and 65°C**
- **Five colours meeting IALA chromaticity requirements**
- **Light intensity automatically adjusts with flash character setting (Schmidt-Clausen)**
- **12 options for day to night transition light levels**
- **More than 256 flash characters**
- **Calendar control of beacon operation**
- **Alarm output (system notification)**
- **Available with GPS synchronization**

Stand-alone Unit (SS)



Self-contained Unit (SS)



Optical Performance

Maximum peak intensity				
7°	177cd	177cd	177cd	157cd

Optical specification

Light source	High Power Light Emitting Diode (LED)
Vertical divergence	7° @ 50% peak
Temperature control	LEDs monitored for constant intensity control and over temperature protection

Main Technical Specification

Nominal Range	Up to 5.5 NM
Lens	Moulded acrylic (PMMA)
Base	Injection Moulded UV Stabilized Nylon 6/6 with 30% glass fill
Body	Injection Moulded UV Stabilized Nylon 6/6 with 30% glass fill
Designed service life	10 years (excluding battery)
Weight	6 kg
Flash character	256 standard characters plus custom character
Temperature range	-40° – +50°C
Battery capacity	12 Ah
Voltage	12 VDC (9-18 VDC)
Degree of protection	IP 68

Order Overview VLB-5X-SS

Option matrix	
DP-AL-SW	Dataport, alarm/monitor & wire synch factory option
GS	Internal GPS sync module as factory option

SC 160 I

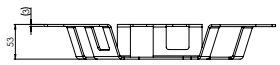
Self-contained LED lantern for buoys and beacons

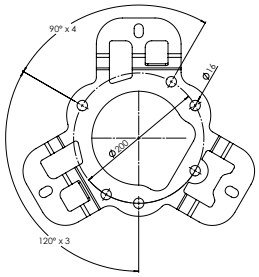
SC 160 I is a self-contained medium range LED lantern with best-in-class optical performance for fixed and floating structures. The lantern includes solar panels, battery and charge controller. This lantern is designed for harsh marine environments and for long uninterrupted operation.

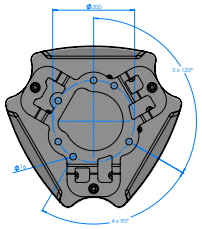
- Range up to 8 NM (Tc=0,74) 11 NM (Tc=0,85) depending on geographical location
- Standard IALA colours red, green, white, yellow
- Lantern made of rugged injection moulded aluminium housing and UV resistant polyethylene body
- Integrated flasher with day-light switch and solar charger
- Standard VRLA battery and ventilated battery compartment , Li-ion battery optional
- Solar modules covered with tempered glass
- Adjustable intensity and range
- Available with narrow (5°) or wide (10°) vertical divergence
- Programmable with Bluetooth® Control mobile app up to 50 m radius
- Other wireless programming options available such as Sabik Easy Programmer or PC/USB interface
- Integrated event log for 365 days
- Optional integrated GPS synchronization and GSM Remote monitoring
- Available with AIS
- External charge port or external solar module

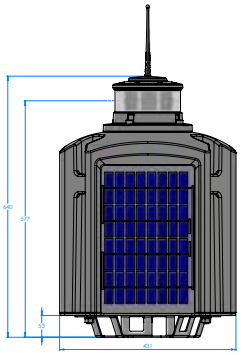
Integrated AIS

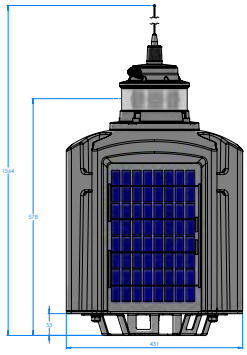
- Available in two models: Type 1 (FATDMA) and Type 3 (RATDMA)
- AIS transponder integrated in the top part of the lantern
- Integrated GPS antenna and external VHF antenna included in the delivery
- Extremely low power consumption when used as Type 1 <45mW with 1 message/3 minutes (about 0,09 Ah/day)
- Support messages: 6 and 21
- Supports up to 10 virtual Aton:s











Optical Performance

Maximum fixed intensity SC 160 IN (5° @ 50% peak intensity FWHM)				
	1150 cd	1200 cd	1000 cd	1850 cd
Power consumption	13 W	16 W	16 W	16 W

Maximum fixed intensity SC 160 IW (10° @ 50% peak intensity FWHM)				
	620 cd	720 cd	620 cd	1100 cd
Power consumption	13 W	16 W	16 W	16 W

Main Technical Specification

Lens visual/Mechanical diameter	160 mm
Lens material	UV stabilized acrylic
Light source	High Power Light Emitting Diodes (LEDs)
Vertical divergence options	5°@50% of peak intensity (FWHM) 10°@50% of peak intensity (FWHM)
Solar modules	3 x 10 W
Battery	VRLA GEL-Type, 32Ah/12V; Li-ion 35Ah/12V
Weight	27 Kg
Overall height	583 mm
Overall width	431 mm dia.
Power consumption	13W - 16W
Installation	3 x M12 on 330 mm dia.

Order Overview SC 160 I

SC160 I with VRLA Battery			
N = Narrow (5° @ 50 % peak intensity)		**W = Wide (10° @ 50 % peak intensity)**	
Red	SC-160-1-NVR	Red	SC-160-1-WVR
Yellow	SC-160-1-NVY	Yellow	SC-160-1-WVY
Green	SC-160-1-NVG	Green	SC-160-1-WVG
White	SC-160-1-NVW	White	SC-160-1-WVW

Example: SC160-1-WVW-4L

- ***SC-160-1-WVW*** is the code for SC160 I with VRLA battery and wide lens in white
- ***4L*** is a selection for option 4L Integrated GPS sync including GPS antenna

Option matrix

GPS sync **OPT 4L**	Integrated GPS sync including GPS antenna
LightGuard GSM + GPS **OPT 9L**	Integrated GSM/GPS based monitoring including GSM/GPS antennas
OPT 11L	Control card for secondary (emergency) battery
Automatic Identification System **OPT AIS**	OPT AIS 1: Lantern with integrated AIS type 1 OPT AIS 3: Lantern with integrated AIS type 3

SC 160 II

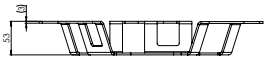
Self-contained LED lantern for buoys and beacons

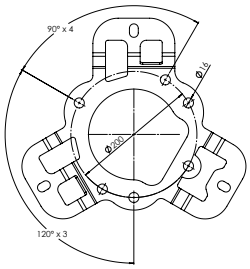
SC 160 II is a self-contained LED lantern with best in class optical performance for fixed and floating structures with longer range. The lantern includes solar panels, battery and charge controller. This lantern is designed for harsh marine environments and for long uninterrupted operation.

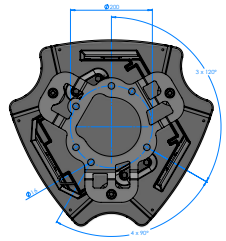
- Range up to 10 NM (Tc=0,74) 14 NM (Tc=0,85) depending on geographical location
- Standard IALA colours red, green, white, yellow
- Lantern made of rugged injection moulded aluminium housing and body of UV resistant polyethylene
- Integrated flasher with day-light switch and solar charger
- Standard VRLA battery and ventilated battery compartment
- Adjustable intensity and range
- Available with narrow (5°) or wide (10°) vertical divergence
- Programmable with Bluetooth Control mobile app up to 50 m radius
- Other wireless programming options available such as Sabik Easy Programmer or PC/USB interface
- Integrated event log for 365 days
- Optionally integrated GPS synchronization and GSM Remote monitoring
- External charge port or external solar module
- Available with AIS option

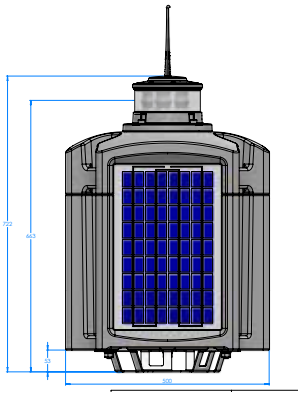
Integrated AIS

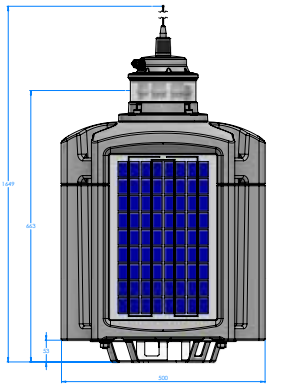
- Available in two models: Type 1 (FATDMA) and Type 3 (RATDMA)
- AIS transponder integrated in the top part of the lantern
- Integrated GPS antenna and external VHF antenna included in the delivery
- Extremely low power consumption when used as Type 1 <45mW with 1 message/3 minutes (about 0,09 Ah/day)
- Support messages: 6 and 21
- Supports up to 10 virtual Aton:s











Optical Performance

Maximum fixed intensity SC 160 IIN (5° @ 50% peak intensity)				
	1150 cd	1200 cd	1000 cd	1850 cd
Maximum power consumption	13 W	16 W	16 W	16 W

Maximum fixed intensity SC 160 IIW (10° @ 50% peak intensity)				
	620 cd	720 cd	620 cd	1100 cd
Maximum power consumption	13 W	16 W	16 W	16 W

Main Technical Specification

Lens visual/Mechanical diameter	160 mm
Lens material	UV stabilized acrylic
Light source	High Power Light Emitting Diodes (LEDs)
Vertical divergence options	5°@50% of peak intensity (FWHM) 10°@50% of peak intensity (FWHM)
Solar modules	3 x 11 W
Battery	VRLA GEL-Type, 60Ah/12V
Weight	35 Kg
Overall height	669 mm
Overall width	500 mm dia.
Power consumption	13W - 16W
Installation	3 x M12 on 330 mm dia.

Order Overview SC 160 II

SC160 II with VRLA Battery			
N = Narrow (5° @ 50 % peak intensity)		**W = Wide (10° @ 50 % peak intensity)**	
Red	SC-160-2-NVR	Red	SC-160-2-WVR
Yellow	SC-160-2-NVY	Yellow	SC-160-2-WVY
Green	SC-160-2-NVG	Green	SC-160-2-WVG
White	SC-160-2-NVW	White	SC-160-2-WVW

Example: SC-160-2-WVR-4

- ***SC-160-2-WVR*** is the code for SC160 II with VRLA battery and wide lens in red
- ***4*** is a selection of option 4L GPS sync including GPS antenna

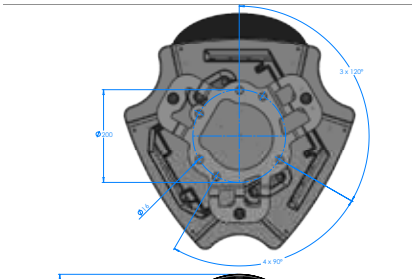
Option matrix

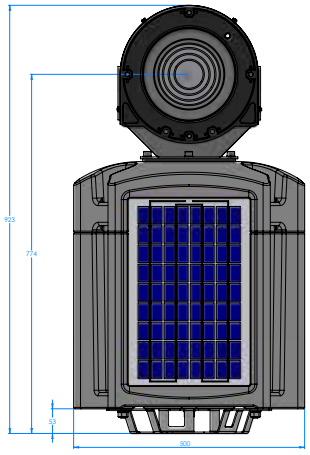
GPS sync **OPT 4L**	Integrated GPS sync including GPS antenna
LightGuard GSM + GPS **OPT 9L**	Integrated GSM/GPS based monitoring including GSM/GPS antennas
Automatic Identification System **OPT AIS**	OPT AIS 1: Lantern with integrated AIS type 1 OPT AIS 3: Lantern with integrated AIS type 3 Refer page 140

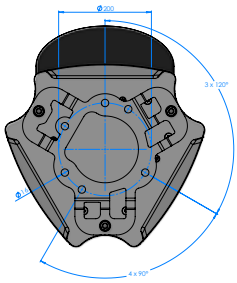
SCLO 200M

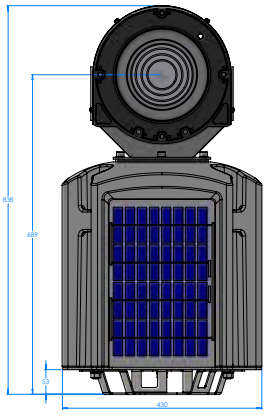
Self-contained range light with 14 NM Range

- Range up to 14 NM (Tc=0,74) 22 NM (Tc=0,85)
- Standard IALA colours red, green, white and yellow
- Light module of rugged aluminium housing and body of UV resistant polyethylene
- Light horizontally and vertically adjustable in the field
- Integrated flasher with day-light switch and solar charger
- Ventilated battery compartment
- Durable solar panels with tempered glass
- Adjustable intensity and range
- Programmable with Sabik standard IR programming devices
- Light can be programmed and controlled up to 50 meter distance with a smart phone using Sabik Bluetooth Control
- Optional integrated GPS synchronization
- Optional integrated GSM/GPS remote monitoring









Optical performance

Maximum fixed intensity				
At full power	7000 cd	7000 cd	7000 cd	13000 cd

Main Technical Specification

	up to 3 Nautical miles	up to 4 Nautical miles
Lens visual/Mechanical diameter	203 mm	
Lens material	UV stabilized Polycarbonate	
Light source	Light Emitting Diodes (LEDs)	
Horizontal divergence	8° @ 50% (±1°) of peak intensity	
Unit lifetime	Up to 10 years	
Weight	39 kg	
Overall height	870 mm	
Overall width	500 mm dia	
Power consumption	max 4 W	
Light unit degree of protection	IP 66	
Solar Modules	3 x 11W	
Battery	VRLA GEL-Type, 60Ah/12V	
Installation	3 x M10 on 330 mm dia	

Order Overview SCLO 200M

Product codes

Product	Colour
SCLO-200-MW	white
SCLO-200-MR	red
SCLO-200-MG	green
SCLO-200-MY	yellow

Product code example: SCLO-200-MR-7-9

- ***SCLO-200-MR*** is Sabik code for SCLO 200M in red
- ***7-9*** is a selection of option 7 with external GPS antenna and option 9 with GSM/GPS monitoring

Option matrix

OPT 4: GPS sync	GPS sync including external GPS antenna
OPT 9: LightGuard GSM + GPS	Integrated GSM based monitoring including GSM/ GPS antennas
OPT 10: LightGuard GSM	Integrated GSM based monitoring including GSM antenna
OPT 12: Aux card with I/O	Aux card including I/O ports
OPT 13: Aux card with RS485 and I/O	Aux card including RS 485 and I/O port
Shock & Tilt Sensor	Integrated 3-axis G sensor for tilt and shock sensing

SABIK MARINE

Sector & Leading Lights

Our product group of leading lights (also referred as range lights) and sector lights mark safe passage for vessels through channels, archipelagos or for example when entering ports. Our omnidirectional and directed sector and leading lights cover long visual ranges from 14NM to 25 NM.

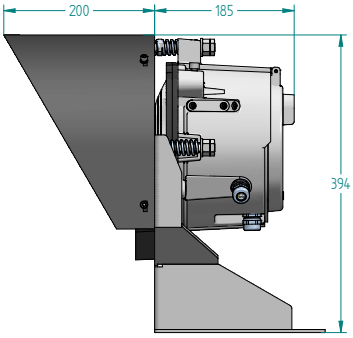
When AtoN light needs to provide extremely precise guidance – for example when navigating along very narrow channels – only projector sector lights, commonly known as PEL lights, can deliver the required accuracy. Over the decades, PEL has come to stand for Port Entry Light within the industry, in spite of being originated by Vega already in the 1970s. Today, these PELs that combine modern technology with decades of experience belong to our comprehensive product portfolio. What is more, we continue to stand on the leading edge of product development within the industry.

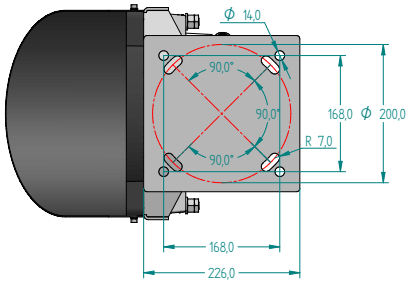
LO 200M

Medium Intensity LED Range Light

The LO 200M signal is designed for applications requiring medium and long range directional light, such as range lights and port entry signals.

- Equipped with a high intensity power LED and especially designed optics
- Robust aluminium IP 66 housing
- Visual range up to 14NM (Tc = 0,74)
- Standard IALA colours red, green, white and yellow
- Extremely low power consumption, suitable for solar and battery operation
- Vertical divergence 8° @ 50% of peak intensity
- Integrated flasher with 16 A solar panel charger
- Adjustable intensity and range
- Programmable with Sabik standard IR programming devices
- Optional integrated GPS synchronization
- Optional integrated GSM remote monitoring
- Equipped with Bluetooth programming





Optical performance

Maximum fixed intensity				
At full power	7000 cd	7000cd	7000cd	13000cd

Main Technical Specification

Lens visual/Mechanical diameter	203 mm (8“)
Lens material	UV stabilized polycarbonate
Light source	Light Emitting Diode (LED)
Lens horizontal divergence	6° @ 50 % (± 1°) of peak intensity
Unit lifetime	Up to 10 years
Weight	11,7 kg
Temperature range	-40°...+60°C
Supply Voltage	9 – 32 VDC
Power consumption	4W at full intensity
Degree of protection	IP 67
Cable length	2 m / 6 m

Order Overview LO 200M

Product codes

Product	Colour
LO-200-MW	white
LO-200-MR	red
LO-200-MG	green
LO-200-MY	yellow

Product code example: LO-200-MR-4

- ***LO-200-MR*** is Sabik code for LO 200M in red
- ***4*** is a selection of option 4

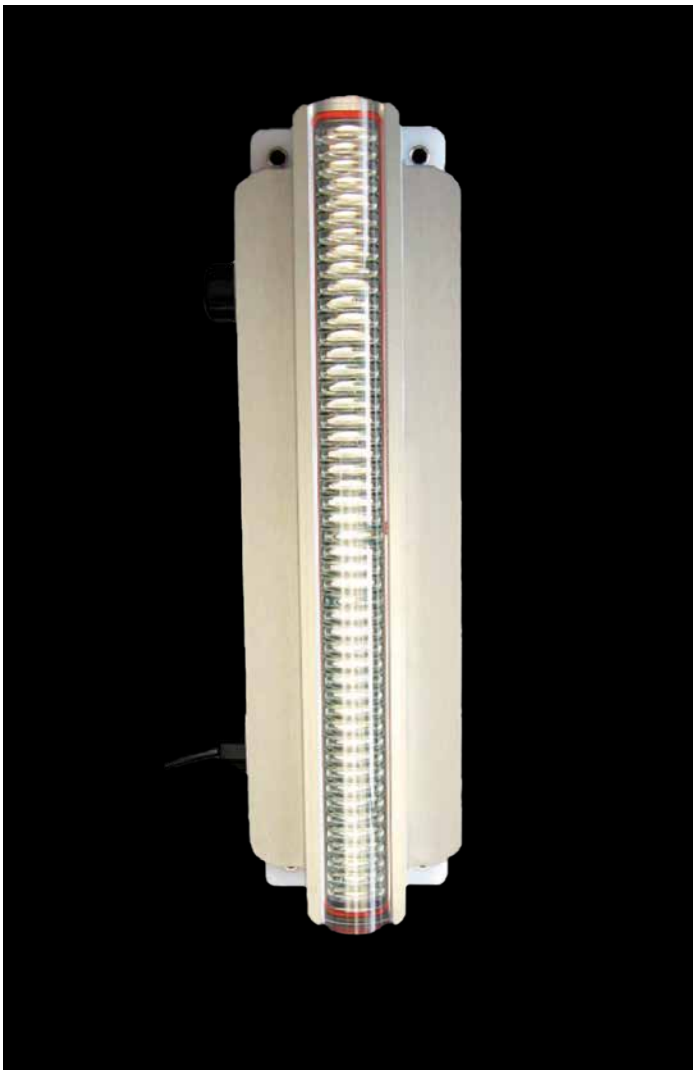
Option matrix

OPT 4: GPS sync	Integrated GPS sync including GPS antenna
OPT 9: LightGuard GSM + GPS	Integrated GSM based monitoring including GSM/ GPS antennas
OPT 10: LightGuard GSM	Integrated GSM based monitoring including GSM antenna
OPT 11: Control card	Control card for secondary battery
OPT 12: Aux card with I/O	Aux card including I/O ports
OPT 13: Aux card with RS485 and I/O	Aux card including RS 485 and I/O port

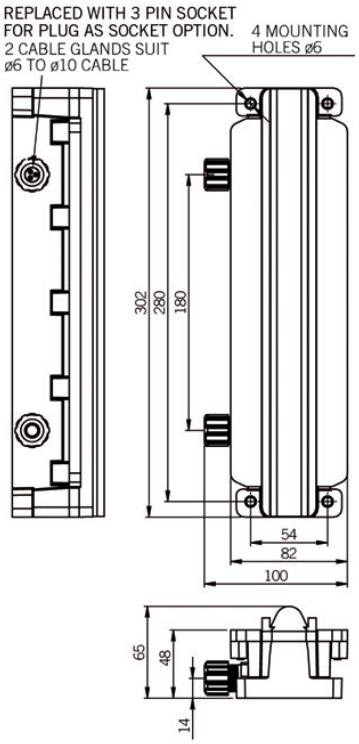
VLL-43

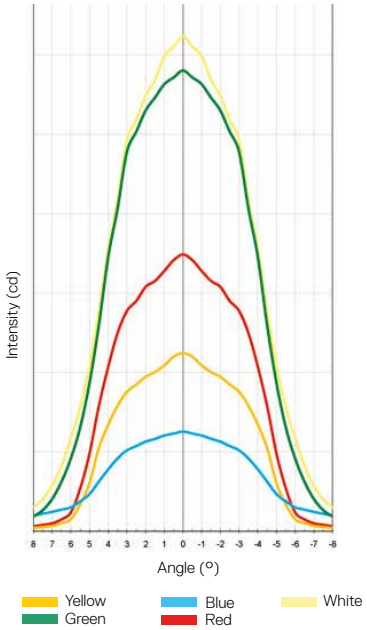
13NM to 22 NM @ 0.74T

The VLL-43 Linear Lead Light is powerful unidirectional light ideal for marking short ranges and obstacles. The optical system utilises an acrylic lens to capture and project the light from the high-powered LEDs. The LEDs are precisely graded and placed to produce a light beam with minimum variation in intensity. Any number of these lights can be used to achieve the desired range. Each unit has its own control board and can be operated individually.



- **Separate intensity settings for day**
- **Nine night/day transition settings**
- **Up to 246 standard flash characters**
- **One programmable custom character**
- **Wired synchronisation with options of master/slave**
- **Synch delay from 0.1 to 9.9 seconds**
- **Battery low voltage cut off**
- **Optional PIN code for programming**
- **External GPS synchronisation using the VSU-29 unit**
- **Automatic Schmidt-Clausen correction for intensity**





Optical Performance

Maximum peak intensity					
8.5°	1740cd	2900cd	1120cd	3120cd	630cd

Optical specification

Light source	High Power Light Emitting Diode (LED)
Horizontal divergence	8.5° @ 50%
Vertical divergence	±20° at 50% peak intensity ±15° at 50% peak intensity ±20° at 50% peak intensity ±7.5° at 50% peak intensity ±15° at 50% peak intensity
Temperature control	LEDs monitored for constant intensity control and over temperature protection

Main Technical Specification

Nominal Range	Up to 16 NM
Lens	Machined cast acrylic
Base	Injection moulded UV stable plastic
Body	Marine grade aluminium anodises
Weight	1,4 kg
Flash character	246 standard characters
Temperature range	-30° to +60°C
Voltage	12 VDC (9-18 VDC)
Solar charger	N/A
Degree of protection	IP 68
Cable length	2 m / 6 m

Order Overview VLL-43

Product code

Code	Note
VLL43-c(-GS)	
c	Color (R, G, Y, W, B)

Option matrix

GS	External GPS synchronization using the VSU-29 unit

VRL-91

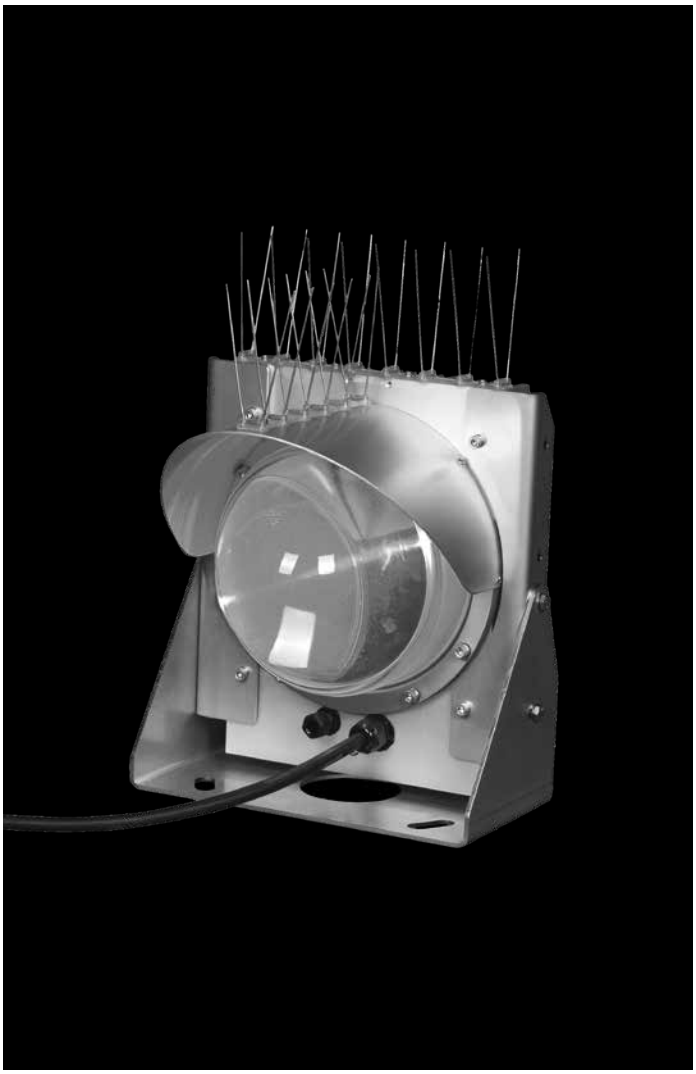
5.4NM by day
23NM by night

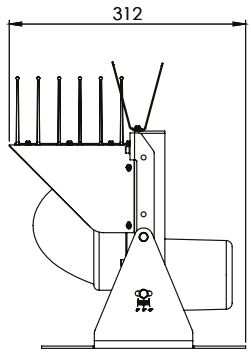
The VRL-91 high power LED range light forms part of the Vega LED marine beacon family and is intended for applications requiring very high intensity.

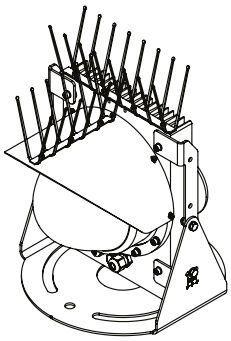
A single white VRL-91 lens using a single LED produces an intensity of up to 403000 candela, which provides a range of 23 NM at 0.74T with no background light.

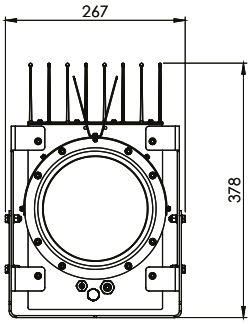
Programming features (with IR remote programmer):

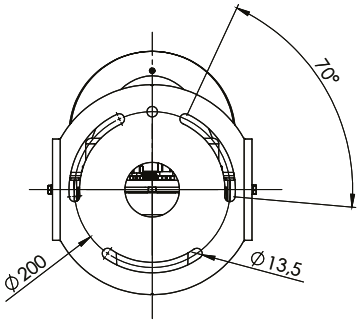
- **Automatic Schmidt-Clausen intensity correction for short flashes**
- **Multiple effective intensity settings for both day and night operation**
- **Day/night transition level settings**
- **Fully programmable flash characters**
- **One programmable custom character**
- **Synchronisation control including master/slave options and sync delay (optional)**
- **Supply voltage monitoring**
- **Programmable low voltage cut out**
- **RS-232 data port compatible (optional)**
- **Optional security code**











Optical Performance

Maximum peak intensity			
±1.5°	136000cd	276000cd	500000cd

Optical specification

Light source	High Power Light Emitting Diode (LED)
Horizontal divergence	±1.5°
Vertical divergence	±1.5°

Main Technical Specification

Nominal Range	Up to 23 NM
Lens	Machined cast acrylic
Body	Anodised marine grade aluminium
Weight	7.5 kg
Flash character	246 standard characters plus 1 custom character
Temperature range	-30° to +50°C
Voltage	12/24 VDC (10-30 VDC)
Degree of protection	IP 67
Cable length	2 m / 6 m

Order Overview VRL-91

Product code

Code	Note
VRL-91-c(-GS)	
c	Color (R, G, W)

Option matrix

GS	Internal GPS as factory option

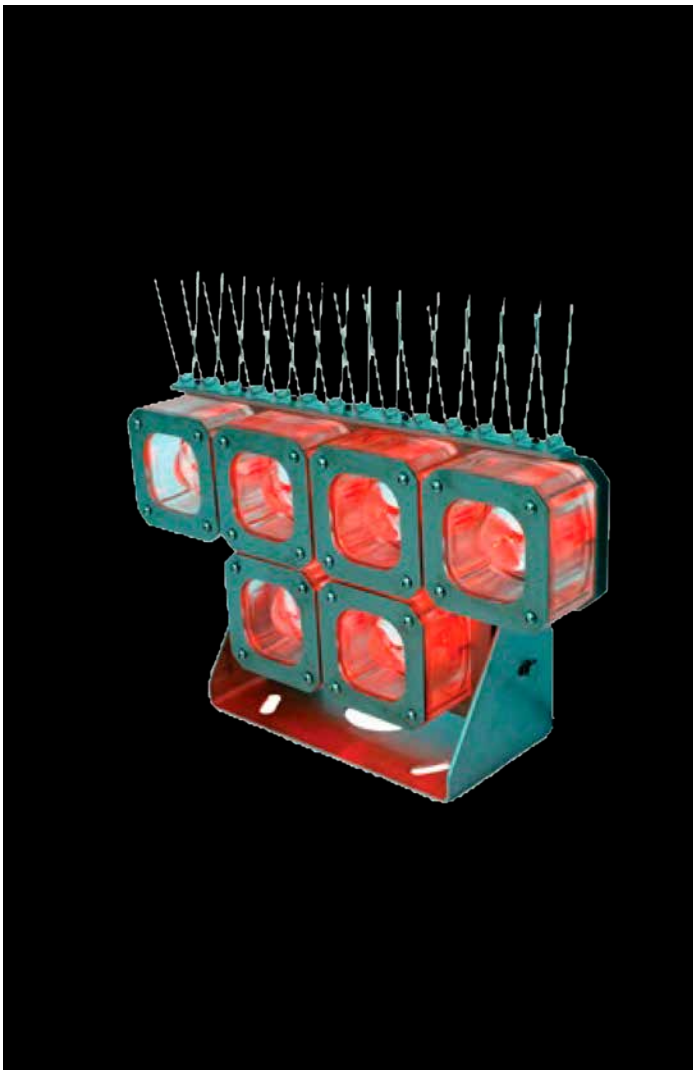
VRL-74

13NM - 22 NM@ 0.74T

The VRL-74 is a LED range light operating through an optical grade acrylic lens. The horizontal and vertical profiles can be widened with the use of spreader lenses.

The standard offering for the VRL-74 comes in 1-6 different lenses and any of 5 colours depending on your requirements.

- **Multiple effective intensity settings for both day and night operation**
- **Day/night transition level settings**
- **Programmable flash characters**
- **Synchronisation control, master/slave options**
- **Low voltage cut out**
- **Optional security code**
- **Automatic Schmidt-Clausen intensity correction for short flashes**



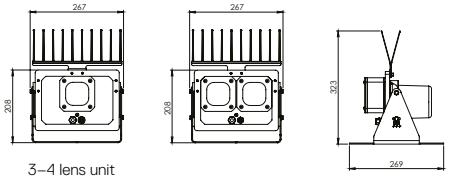
Optical Performance

Maximum peak intensity per optic					
±1.5°	33000cd	37700cd	96000cd	33000cd	13600cd

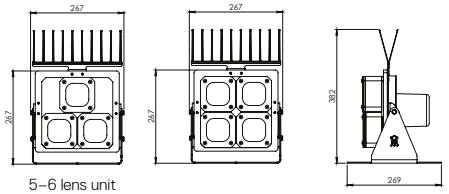
Optical specification

Light source	High Power Light Emitting Diode (LED)
Horizontal divergence	±1.5° (without spreader)
Vertical divergence	±1.5° (without spreader)

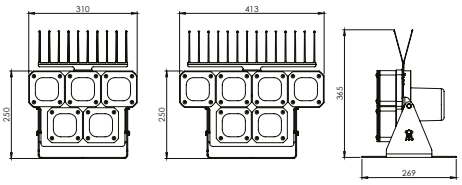
1–2 lens unit

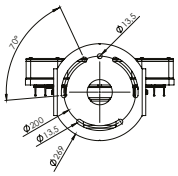


3–4 lens unit



5–6 lens unit





Main Technical Specification

Nominal Range	Up to 24,2 NM
Lens	Machined cast acrylic
Base	304 SS
Body	Anodised marine grade aluminium
Weight	Single lens unit 4 kg Two lens unit 4.2 kg Three lens unit 5.2 kg Four lens unit 5.4 kg Five lens unit 6.1 kg Six lens unit 7.2 kg
Flash character	246 standars characters plus 1 custom character
Temperature range	-30° to +50°C
Voltage	12/24 VDC (10-30 VDC)
Solar charger	N/A
Degree of protection	IP 67
Cable length	2 m / 6 m

Order Overview VRL-74

Product code

Code	Note
VRL-74-cnxy(-GS)	
c	Color (R, G, W, Y, B)
n	Number of lenses
x	Horizontal spreader information
y	Vertical spreader information

Option matrix	
GS	Internal GPS as factory option

ODSL 200

Omnidirectional LED sector light

ODSL 200 omnidirectional sector light is an innovative, compact sector light with accurate sector borders. This light is equipped with a replaceable LED optical unit. The range of the light, depending on colour and flash character, is between 6 and 10 NM (Tc = 0,74).

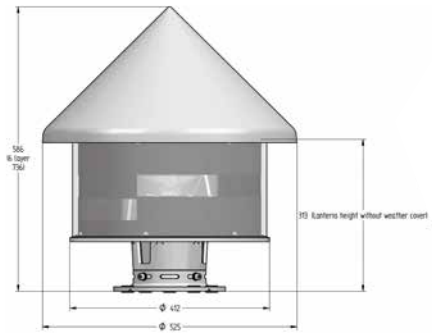
- **Sectors are verified at Sabik's photometric range prior to delivery**
- **Field installation is easy thanks to the adjustable base**
- **Precision alignment, at site, can be done with a gun sight (has to be ordered separately)**
- **After installation sector alignments remain unchanged even if the LED optical unit is replaced**
- **Light can be delivered with an external weather cover**
- **The standard sector light is available as a 3, 6 or 12 layer model**
- **Small area of uncertainty between the sectors, typically less than 0,5 °**
- **Integrated flasher with daylight switch and a 16 A solar panel charger**
- **Programmable with Sabik IR programming devices or Bluetooth Control**
- **This light can be equipped with remote monitoring and synchronization**
- **Patented omnidirectional LED sector light technology**

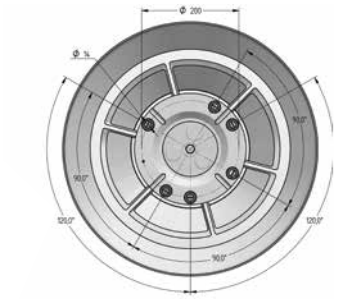
Optical performance

Maximum fixed intensity per tier and colour			
Max power 3,5 W	250 cd	250 cd	600 cd

Main Technical Specification

Lens visual/Mechanical diameter	200 mm
Lens material	UV stabilized acrylic
Light source	High Power Light Emitting Diodes
Vertical divergence	2°@50% of peak intensity (FWHM)
Unit lifetime	Up to 10 years
Weight lantern	3-tier 10,5 kg, 6-tier 13,4 kg, 12-tier 22,4 kg
Weight including weather cover	3-tier 14 kg, 6-tier 17,4 kg, 12-tier 26,4 kg
Height	3-tier 577 mm, 6-tier 727 mm, 12-tier 1027 mm
Temperature range	-40° – +60°C
Supply Voltage	10 – 32 VDC
Solar panel charger	16 A PWM charger
Power consumption	3,5 watts/tier
Degree of protection	IP 67
Cable length	2 m / 6 m





Order Overview ODSL 200

Product codes

ODSL 200
ODSL-200-3, 3 layer lantern
ODSL-200-6, 6 layer lantern
ODSL-200-12, 12 layer lantern

ODSL 200 WEATHER COVER
ODSL-200-3WC, 3 layer weather cover
ODSL-200-6WC, 6 layer weather cover
ODSL-200-12WC, 12 layer weather cover

Gun sight for exact alignment
821035

Option matrix

OPT 4: GPS sync	Integrated GPS sync with external GPS antenna
OPT 9: LightGuard GSM + GPS	Integrated GSM based monitoring with external antennas
OPT 10: LightGuard GSM	Integrated GSM based monitoring with external GSM antenna

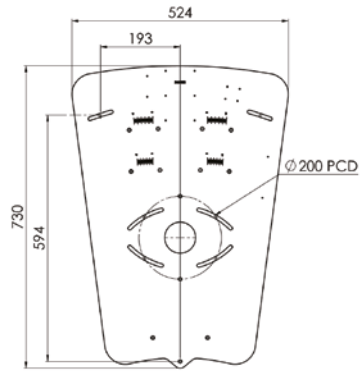
VLS-46

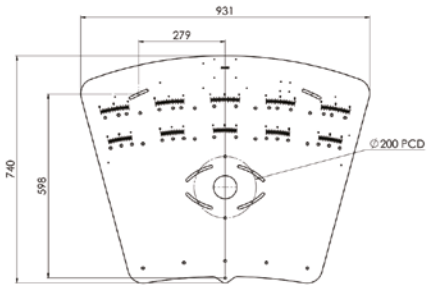
Adjustable LED sector light
15 -19 NM by night
1.6 - 3.0 NM by day

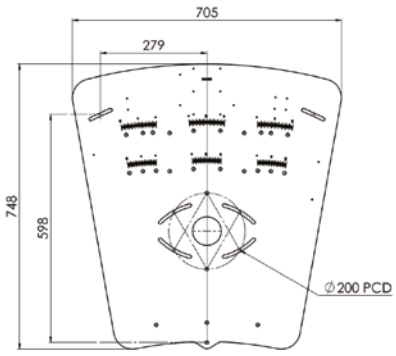
The VLS-46 is ideal for harbours with narrow or difficult approaches. The modular design allows up to seven projectors to be placed side by side. This can be used to create unique sector angles, flash patterns and intensities.

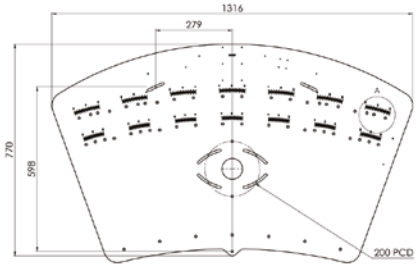
The VLS-46 has been designed to take advantage of the latest LED technology. The key features include:

- **Peak intensity up to 14,800cd**
- **Large vertical divergence for visibility by all types of vessels**
- **Only one tower is required, compared with range lights. This reduces the installation and maintenance cost by half**
- **Each projector can be individually adjusted to the width required for the application, within the limits defined in this brochure and product manual**
- **Energy-efficient LED technology is ideal for solar-powered sites**
- **Maintenance free design (no moving parts) will save money and time**
- **Lightweight marine-grade aluminium construction makes the unit light and easy to handle**









Optical Performance

Maximum peak intensity				
5°	9000cd	8300cd	14800cd	12300cd
10°	2300cd	2140cd	3480cd	3030cd

Optical specification

Light source	High Power Light Emitting Diode (LED)
Horizontal divergence	5°, adjustable from 0.5 – 5° (linear adjustment) 10°, adjustable from 1.0° (linear adjustment)
Vertical divergence	±1.8° @ 50% intensity & ±1.9° @ 10% intensity ±3.6° @ 50% intensity & ±3.7° @ 10% intensity
Temperature control	LEDs monitored for constant intensity control and over temp protection

Main Technical Specification

Nominal Range	5 degrees, up to 15 NM 10 degrees, up to 12 NM
Lens	Acrylic and glass
Base	Marine grade aluminium
Body	Marine grade aluminium and injection moulded UV stable plastic
Designed service life	10 years
Weight	2.4 - 19.1 kg
Temperature range	-30° – +50°C
Voltage	10-30 VDC
Solar charger	N/A
Degree of protection	IP 67
Cable length	2 m / 6 m

Order Overview VLS-46

Product code

Code	Note
VLS-46-D-Cc(-Cc)(-Cc)(-Cc)(-GS)-BPY	
D	Divergence
C	Color (R, G, W, Y)
c	Quantity of projectors in that colour (1-7)
BP	Base plate ((BP2, BP3, BP5, BP7)

Option matrix

GS	Internal GPS sync module as factory option

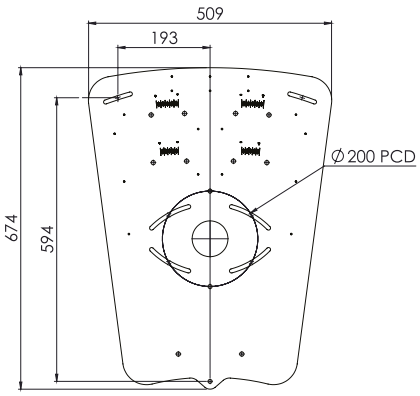
VLS-46 Ultra

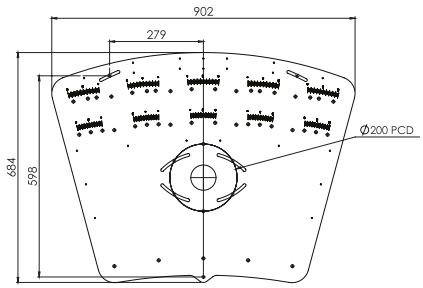
21 - 25NM by night @ 0.74T
3.9 - 6.2NM by day @ 0.74T

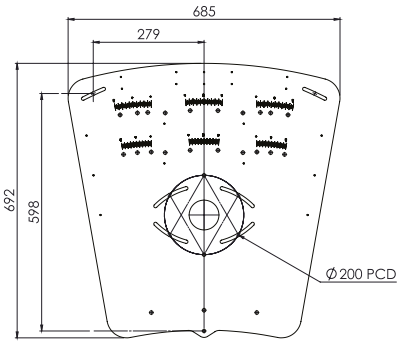
The VLS-46 Ultra is ideal for harbours with narrow or difficult approaches. The modular design allows up to seven projectors to be placed side by side. This can be used to create unique sector angles, flash patterns and intensities.

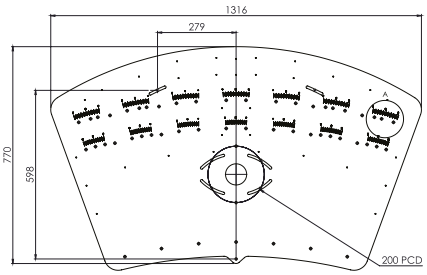
The VLS-46 Ultra has been designed to take advantage of the latest LED technology. The key features include:

- **Peak intensity up to 169000cd**
- **1 minute of arc boundary precision when viewed from 5,000 metres**
- **Large vertical divergence for visibility by all types of vessels**
- **Only one tower is required, compared with range lights. This reduces the installation and maintenance cost by half**
- **Sectors are adjustable. Each projector can be individually adjusted to the width required for the application, within the limits defined in this brochure and product manual**
- **Energy-efficient LED technology is ideal for solar-powered sites**
- **Maintenance-free design (no moving parts) will save money and time**
- **Lightweight marine-grade aluminium construction makes the unit light and easy to handle. For example, three 5º projectors including mounting plate weigh approximately 21.8kg**









Optical Performance

Maximum peak intensity			
5°	40000cd	169000cd	167000cd
10°	10780cd	47000cd	45500cd

Optical specification

Light source	High Power Light Emitting Diode (LED)
Horizontal divergence	5°, adjustable from 0.5° – 5° (linear adjustment) 1°, adjustable from 1.0° (linear adjustment)
Vertical divergence	±1.8° @ 50% intensity ±1.9° @ 10% intensity ±3.6° @ 50% intensity ±3.7° @ 10% intensity
Temperature control	LEDs monitored for constant intensity control and over temperature protection

Main Technical Specification

Nominal Range	5 degrees, up to 21.0 NM 10 degrees, up to 17.8 NM
Lens	Acrylic and glass
Base	Marine grade aluminium
Body	Marine grade aluminium and injection moulded UV stable plastic
Designed service life	10 years
Weight	2.4 - 19.1 kg
Temperature range	-30° – +50°C
Voltage	10-30 VDC
Solar charger	N/A
Degree of protection	IP 67
Cable length	2 m / 6 m

Order Overview VLS-46 Ultra

Product code

Code	Note
VLS-46U-D-Cc(-Cc)(-Cc)(-Cc)(-GS)-BPY	
D	Divergence
C	Color (R, G, W)
c	Quantity of projectors in that colour (1-7)
BPY	Base plate (BP2, BP3, BP5, BP7)

Option matrix

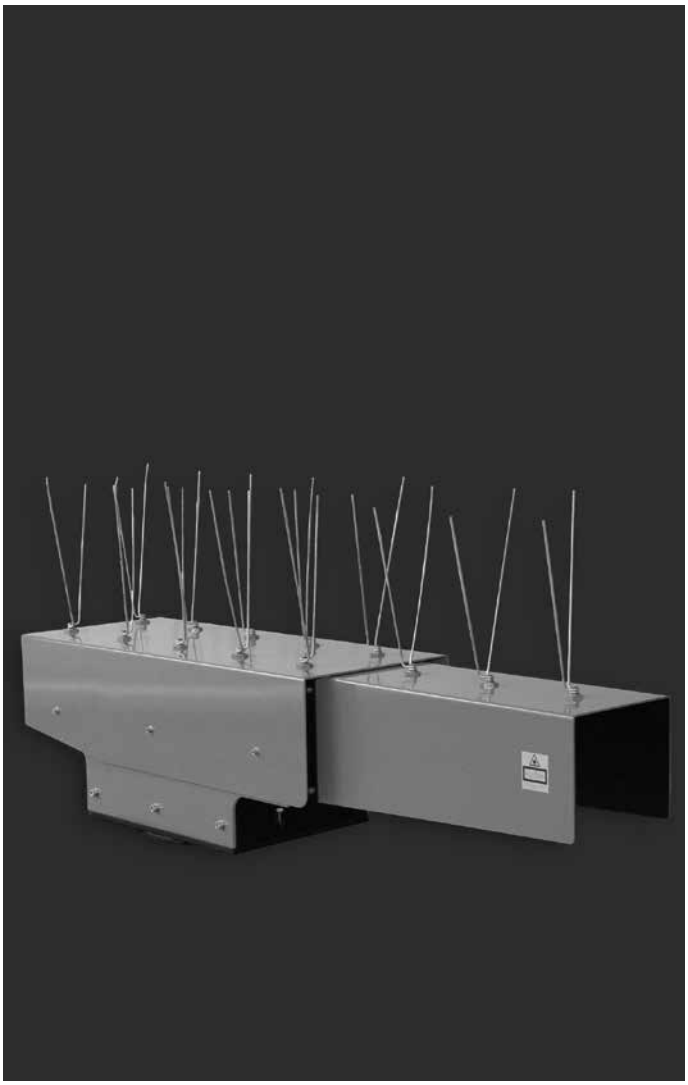
GS	Internal GPS sync module as factory option

E8593

**LED Projector sector light,
up to 21 M / 4 M daytime range**

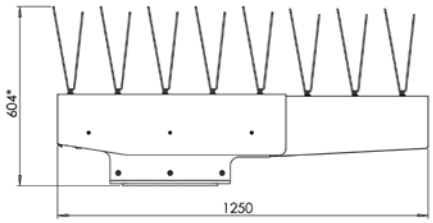
The E8593 is a high-performance, power efficient high intensity marine LED Projector sector light with beam configuration tailored to customer requirements at the factory. All E859X Lanterns feature factory configured Day and Night mode, luminous intensity, fast PWM control generating reduced intensities, as well as Fixed-and-Flashing (FFL) rhythmic characters or Slow Flash Front (SFF). The field proven E8593 supports Opposite-Isophase sector signal control reducing the latency of spatial awareness update for the mariners: the white sector signal is active during the eclipse of coloured sectors and vice versa, resulting in immediate awareness about leaving the white sector without the delay caused by the common eclipse.

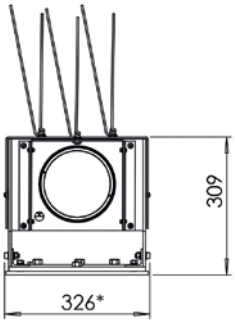
- **Power efficient Day/Night light signalling system for port entry lights or leading line systems replacement**
- **Factory-customized sector configuration with precision of ≤ 0.05° (3')**
- **Day and Night mode luminous intensities down to 10%**
- **Internal LED diagnostics with condition output**
- **Optional Opposite-Isophase sector signal control**
- **Available with triaxial acceleration sensor for Structural Health Monitoring of the AtoN mast**
- **Easy to install – requires only aiming the composite beam vertically**
- **No planned maintenance needed**



Optical performance

Number of sectors	3 (R, W, G)		
Typical luminous intensity of the light signal per colour	250,000 cd		
Nominal range, Night / Day (T=0.74)	up to 21 M / 4 M		
Subtense angle per sector (total approximately 7.5°)	≤ 1.2°	≤ 1.2°	≤ 2.5°
Vertical divergence angle	1.2°	2.5°	1.2°
Power consumption in flash	≤ 45 W	≤ 90 W	≤ 90 W
Achievable boundary resolution	~ 0.1° (6'... 9')		
Beam direction adjustment in field conditions, Hor/Vert	± 180° / ± 2°		





Main technical specification

Light source	High Power Light Emitting Diode (LED) clusters
Vertical divergence	1.2° or 2.5° (FWHM)
Lens material	optical glass
Enclosure material	polycarbonate optical unit potted in resin on aluminium bottom plate, marine grade aluminium sides and protective cover, painted steel mounting plate
Weight	< 50 kg
Operating environment	-40 °C to +55 °C
Power supply voltage	12 VDC (10–24 VDC)
Power consumption in flash	up to 90 W depending on configuration
Degree of ingress protection	IP 67
Overall height (excl. bird deterrents)	309 mm, width 326 mm, depth 1250 mm
Focal plane height	205 mm
Installation	3 x 14mm on 200 mm circle
Cable length	2 m / 6 m

Order Overview E8593

Product codes

Since this product is usually ordered in AtoN site specific configuration, simple ordering codes covering all possible alternatives are not available.

Product code example: E8593.GWR.F2.G1

- **Projector sector light for IALA Region B with integrated Flasher E8672 and GPS capability**

Option matrix

Sector lights for IALA Region A	E8593.RWG
Sector lights for IALA Region B	E8593.GWR

Accessories

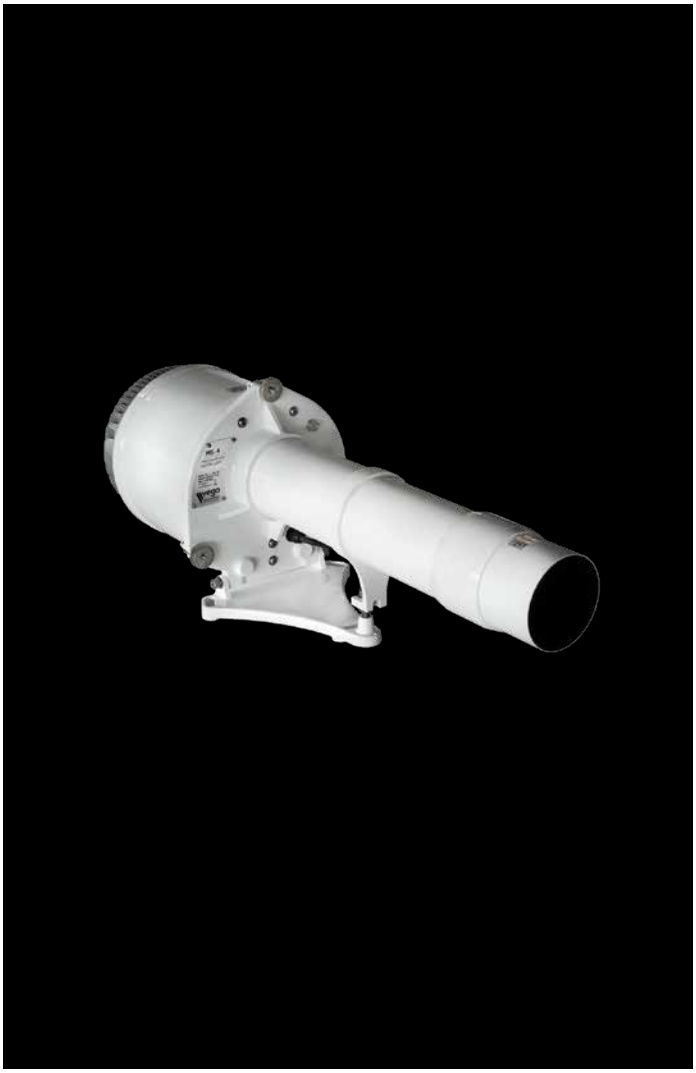
Bird deterrent rod set (incl. screws)	8264.050
Cable Connector, 90deg, female 6 + PE-position	C016 30F006 100 10
Programmable Flasher, integrated	E8672
Programmable Flasher with GPS, integrated	E8672.G
TelFiCon™-Flasher for complete AtoN telematics, integrated	E9272

PEL-4

3.5°, 5° and 10° horizontal divergences

The PEL-4 is a precise aid to navigation. When sailing through hazardous waters, the PEL-4 will provide sharp visual feedback whether you are inside or outside a sector. If combined with oscillating boundary, the exact position within the sector will also be known.

The PEL-4 is equipped with LED technology and is bright enough to be used day and night. It is energy efficient and maintenance free as well. This makes it solar-power friendly and removes costly re-lamping visits.



- **Horizontal divergence available from 3.5° to 10°**
- **Weatherproof enclosure suitable for external mounting**
- **Maintenance-free LED (easy to replace if needed)**
- **Constant-current LED drivers**
- **Fully programmable IALA flash characters**
- **Adjustable day and night intensity from 0.3% to 100%**
- **Automatic day/night detection and change-over**
- **Optional security code**
- **Programmable low-voltage cut-out**
- **Selectable master/back-up operation mode**
- **Digital input/output**
- **Optional oscillating boundary**

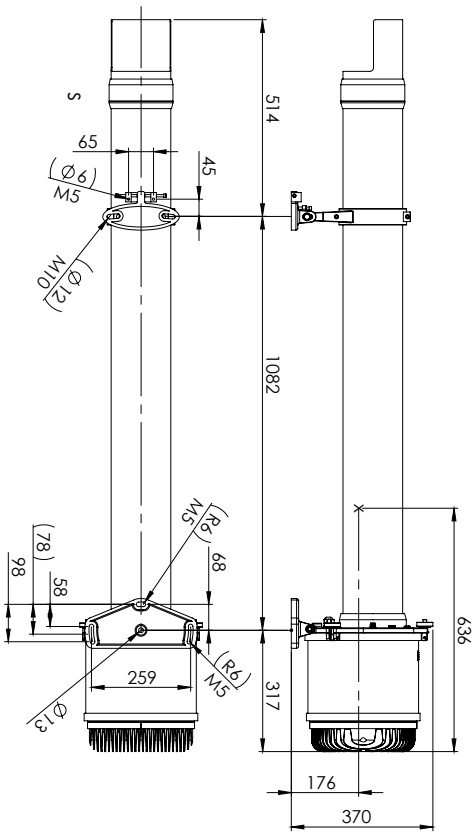
Optical Performance

Maximum peak intensity			
3.5D	77500cd	77500cd	350000cd
5D	50000cd	50000cd	225000cd
10D	20200cd	20200cd	91000cd

Optical specification

Light source	High Power Light Emitting Diode (LED)
Horizontal divergence	3.5D: 3.5° 5D: 5° 10D: 10°
Vertical divergence	3.5D: 2° 5D: 3° 10D: 5.3°

x = Center Of Mas
- Total Mass 47kg



Main Technical Specification

Lens	Acrylic and glass
Base	Bronze
Body	Bronze, stainless steel, marine-grade aluminum
Weight	47 kg
Flash character	256 flash characters
Temperature range	-35° to +85°C
Voltage	12/24 VDC (10 to 30 VDC)
Degree of protection	IP 67
Cable length	2 m / 6 m

Order Overview PEL-4

Product code

Code	Note
PEL-4-D-S	
D	Horizontal subtense (3.5°, 5°, 10°)
S	Sector OB = Oscillating boundary FX = Fixed boundary

Option matrix	
GS	Only available with VSU-29

PEL-6

6 NM by day @ 0.74T
25 NM by night @ 0.74T

The PEL-6 is a part of Sabik Marine flagship precision sector light offering. It combines modern optical design techniques with decades of experience to provide very sharp sector boundaries and impressive range day or night.

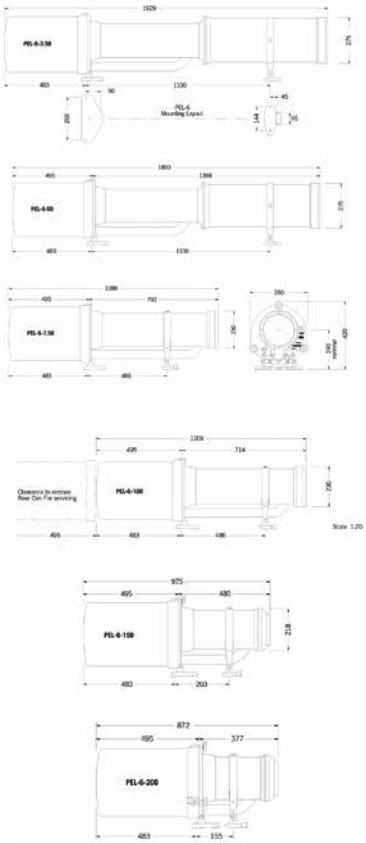
- **Market leading boundary definition and sector accuracy**
- **Up to 6 NM range in daylight**
- **Over 21 NM night range in coloured sectors and 25 NM in white**
- **Automatic intensity reduction for night use**
- **Oscillating boundary option provides up to four extra sectors**
- **Rugged construction and sealing – proven life exceeds 20 years in typical harsh marine environment**

Optical Performance

Maximum peak intensity			
3.5°	196164cd	174368cd	726532cd
5°	96151cd	85468cd	356116cd
7°	37985cd	37985cd	158273cd
10°	24084cd	21408cd	89199cd

Optical specification

Light source	250W TH Lamp
Horizontal divergence	Available: 3.5, 5, 7, 10°
Vertical divergence	3.5°: 2.1° 5°: 3° 7°: 3.9° 10°: 4.3°



Main Technical Specification

Nominal Range	Up to 24.8 NM
Lens	Precision ground glass
Base	Bronze
Body	Gunmetal, stainless steel, copper tube
Designed service life	20 years
Temperature range	-40° – +50°C
Voltage	24 VDC to 28 VDC
Degree of protection	IP 66
Cable length	2 m / 6 m

Order Overview PEL-6

Product code

Code	Note
PEL-6-D-S	
D	Horizontal subtense (3.5°, 5°, 7°, 10°)
S	Sector OB = Oscillating boundary FX = Fixed boundary

Option matrix

GS	Only available with VSU-29

Lighthouse Beacons

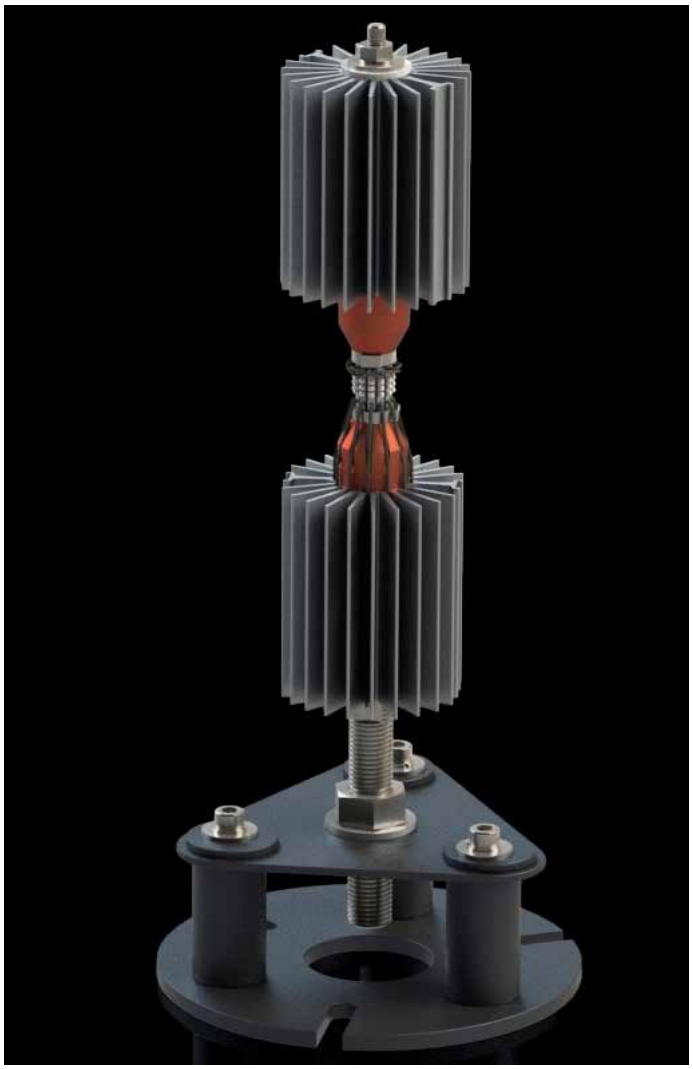
Our lighthouse beacons are designed to applications requiring very high intensity and long range. Our selection of lighthouse beacons includes for example rotating LED beacon and Sabik Lighthouse Unit, which is a LED light source to replace traditional lamp inside historical lighthouses.

Our lighthouse beacons minimize costs and extend the service life of traditional lighthouses as they are power-efficient, maintenance-free and can be monitored remotely.

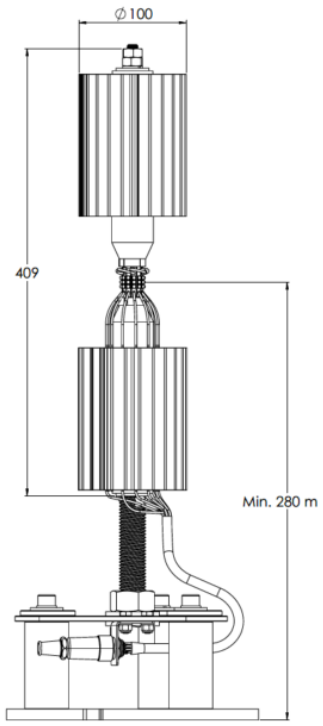
SLU-24 / SLU-36

LED light source to replace traditional lamp inside historical lighthouses

Sabik Lighthouse Unit (SLU-24 / SLU-36) is a reliable and efficient solid-state light source to replace traditional lamps in rotating or fixed classical lighthouse optics. It extends the service life of traditional lighthouses without expensive and complicated re-work or decommissioning activities. The product also offers many other additional benefits, such as the option for remote monitoring, lower maintenance costs and the possibility to utilize solar or other renewable power sources. All of this, while maintaining the traditional look, existing optics, rotating beam, flash characteristics, and heritage value of traditional lighthouses.

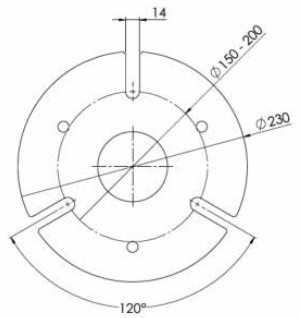


- **Rugged copper/aluminium body with special emphasis on heat management to ensure LED longevity**
- **Range up to 24 NM at Tc = 0,74**
- **Colors cool white and warm white**
- **Extremely low power consumption, suitable for solar and battery operation**
- **Integrated 16A solar panel charger using pulse width modulation**
- **Integrated flasher with automatic day-night switch**
- **Adjustable intensity and range**
- **Programmable with Sabik standard IR programming devices**
- **Integrated event log for 365 days**
- **Optional integrated GSM Remote monitoring**



SIDE VIEW

Weight approx 7 kg



Electrical Specification SLU-24 / SLU-36

Nominal voltage	24 VDC
Input voltage range	20 to 30 VDC
Reverse polarity protection	Yes
Current consumption at peak intensity	max 4.6 A (SLU-24) / 6.9 A (SLU-36)
Current by day	< 5 mA
LED over current protection	Yes
Battery cut off voltage	Programmable

Output characteristics

Color	Cool white (5000K - 6000K)	Warm white (2700K - 3000K)
Power consumption at peak intensity (W)	110W (SLU-24) / 165W (SLU-24)	110W (SLU-24) / 165W (SLU-24)
Power consumption at max avg. intensity (W)	65W (SLU-24) / 100W (SLU-24)	65W (SLU-24) / 100W (SLU-24)
Flash characteristic control	246 standard characters plus custom character	

Mechanical withstand and protection

Ingress protection	Equivalent to IP 10
Ambient temperature range	-30°C to +50°C

Other

Designed service life	>10 years
Maintenance	Only periodic cleaning of external surfaces required
Day / night transition	Programmable, default turn on at 15 lux / turn off at 60 lux

Standards

EMI/EMC	EN 55015:2006 +A1:2007, +A2:2009 radiated and conducted emissions EN 61000-4-2:2008, Electrostatic Discharge Immunity EN 61000-4-3:2006/AMD2:2010, Electromagnetic Compatibility EN 61000-4-5:2005 Class 3 Surge Immunity FCC 47 CFR Section 15 Class A EN 61000-4-5:1995 Class 3 Surge Immunity
Colour	IALA Recommendation E-200-1 “Marine Signal Lights - Colours” Edition 3 (December 2018)
Quality assurance	ISO 9001, ISO 14001, FAT upon request

- **Will be customized to meet project specific needs**
- **Sabik team will support you from project definition to commissioning and operation as needed**

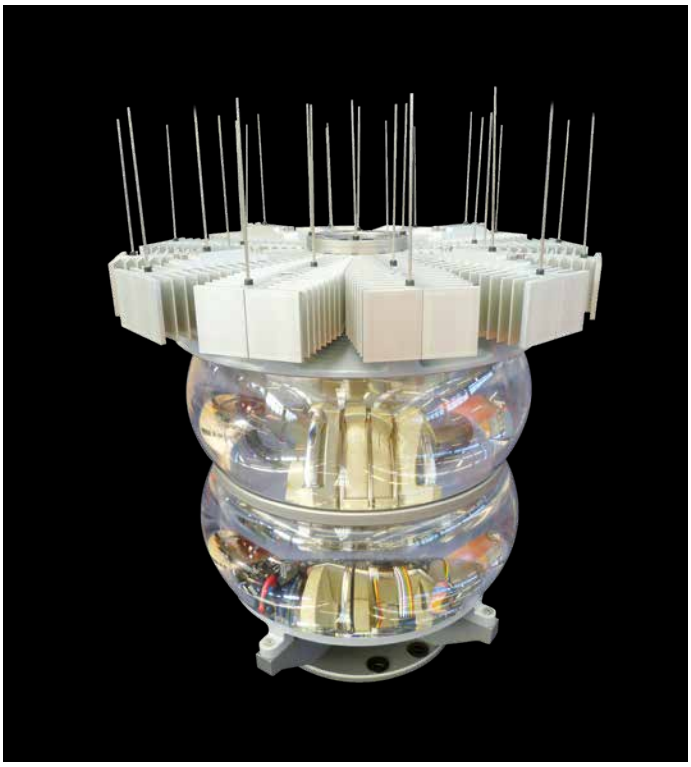
VLB-92

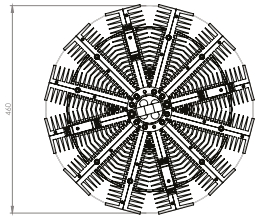
13NM - 22NM @ 0.74T

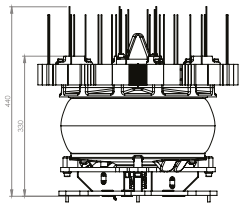
The VLB-92 is state-of-the-art long range LED beacon. It is intended for applications requiring very high intensity.

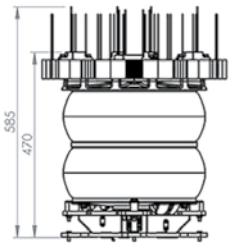
Depending on the configuration, the beacon is able to produce a range from 13-22NM at a transmissivity of 0.74T.

- **Effective intensity settings (5,800-240,000cd)**
- **Day/night transition level settings (40-250 lux range)**
- **Programmable flash characters, including IALA recommended characters**
- **Programmable custom character**
- **Synchronisation control including master/slave options and sync delay**
- **Synchronising delay can be set from 0 to 9.9 seconds**
- **Low voltage cut-out setting**
- **Optional security code**

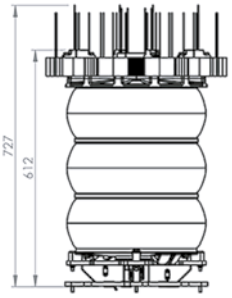




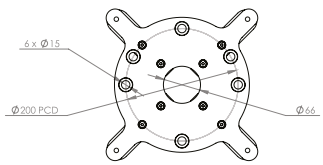




2 TIER
NET MASS: APPROX 38 KG



3 TIER
NET MASS: APPROX 47 KG



Optical Performance

Maximum intensity / layer	80000cd

Optical specification

Light source	High Power Light Emitting Diode (LED)
Vertical divergence	±1.6° @ 50% peak ±0.8° @ 10% peak
Temperature control	LEDs monitored for constant intensity control and over temperature protection

Main Technical Specification

Nominal Range	Up to 22 NM
Lens	Machined cast acrylic
Base	2 part painted cast marine grade aluminium
Body	Anodised marine grade aluminium
Designed service life	10 years
Weight	1-tier 31,8kg 2-tier 38kg 3-tier 47kg
Flash character	246 standard characters plus 1 custom character; 20 factory set custom characters
Temperature range	-30° – +50°C
Voltage	24 VDC (20-36 VDC)
Solar charger	N/A
Degree of protection	IP 67
Cable length	2 m / 6 m

Order Overview VLB-92

Product code

Code	Note
VLB-92-W-1.6-24-Y	
Y	Tiers (1 T, 2 T, 3 T)

Option matrix

VSU-29	Optional integrated GPS synchronization using the VSU-29 GPS Sync Unit. VSU-29 requires 12 V operating voltage.
REMOTE-02	Infrared remote

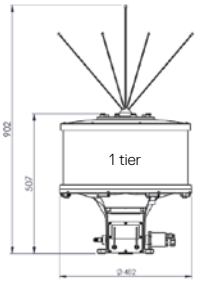
VRB-25 LED

25NM @ 0.74T

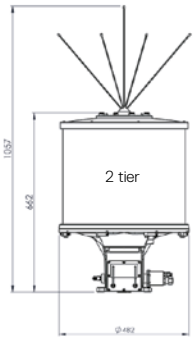
The VRB-25 LED is a high intensity rotating beacon suitable for ranges up to 25 nautical miles. Being an LED beacon, it is extremely energy efficient and can be monitored digitally.

It is an ideal replacement for beacons with Fresnel lenses in historic lighthouses, or locations requiring intensities greater than what can be achieved with typical stationary beacons.

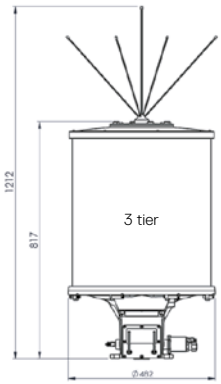
- **Weatherproof enclosure suitable for external mounting**
- **Maintenance-free LED**
- **Constant-current LED drivers**
- **Direct-drive brushless motor**
- **0.6 to 15.9RPM rotation speed with 240 increments**
- **Day and night intensity is adjustable from 0 to 100%**
- **Automatic day/night detection**
- **Optional security code**
- **Programmable low-voltage cut-out**
- **Selectable master/back-up operation mode**
- **Digital inputs/output**
- **RS232 port**



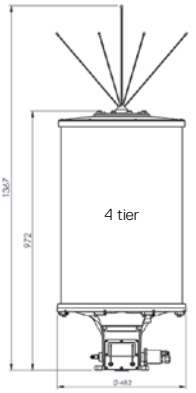
EST Weight: 43KG
Focal Height: 390mm



EST Weight 58KG
Focal Height: 467mm



EST Weight: 73KG
Focal Height: 545mm



EST Weight 87KG
Focal Height: 622mm

Optical Performance

Maximum peak intensity				
1.5°	520000cd	520000cd	520000cd	520000cd

Optical specification

Light source	High Power Light Emitting Diode (LED)
Horizontal divergence	1.5° @ 5% of specified intensity
Vertical divergence	1.5° @ 5% of specified intensity
Temperature control	LEDs monitored for constant intensity control and over temperature protection

Main Technical Specification

Nominal Range	Up to 25 NM
Lens	Machined cast acrylic
Base	Cast marine grade aluminium, anodised and painted
Body	Anodised marine grade aluminium
Designed service life	10 years
Weight	1 tier: 43 kg 2 tier: 58 kg 3 tier: 73 kg 4 tier: 87 kg
Flash character	Dependent on configuration
Temperature range	-35° – +50°C
Voltage	12 VDC
Solar charger	N/A
Degree of protection	IP 65
RPM range	0.66-15.9
Cable length	2 m / 6 m

Order Overview VRB-25 LED

Product code

Code	Note
VRB25-xP-nT-LED	
x	Number of panels (6 or 8)
n	Number of tiers (1, 2, 3, 4)

Option matrix

LPD-02	Lightening protection device factory option

Integrated Buoy Lanterns

Our range of integrated buoy lanterns are designed to excel in demanding marine environments. Almost all our lanterns can incorporate GPS synchronization and advanced connectivity solutions such as remote monitoring and controlling.

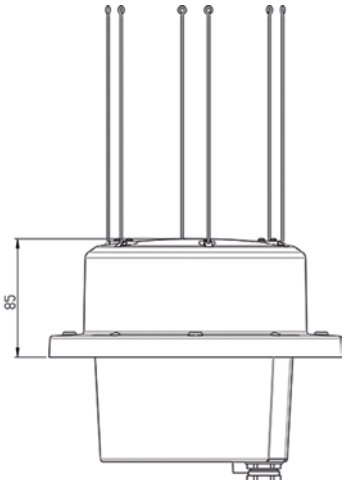
Our ice-buoy lanterns have a proven record of surviving the crushing pressure and dynamic forces of ice in demanding winter conditions. We offer also marker lights to protect aquaculture farms. Our integrated buoy lanterns together with e.g. AIS offer flexible solutions to protect fish farms and improve their visibility. Our customizable solutions suit different locations and different sizes of farms fulfilling the regulatory requirements.

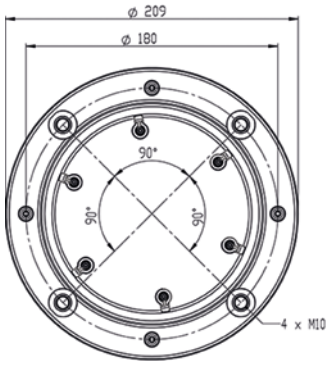
VPL 110

Buoy lantern

VPL 110 is a robust lantern with an outer polycarbonate cover to be used integrated into buoy applications. This lantern has very low power consumption and is equipped with GPS synchronization. LightGuard remote monitoring can be added as an option and advanced Bluetooth® Control app is also available for android and iOS mobile phones.

- **Adjustable intensity and range**
- **Integrated flasher with day and night switch**
- **Standard range: 4 NM at Tc = 0,74 (5 NM at Tc = 0,85)**
- **Available in standard IALA colours**
- **Vertical divergence 8° @ 50% (±1°) of peak intensity**
- **GPS synchronization as standard**
- **Remote monitoring with LightGuard Monitor**
- **Programmable with Sabik standard IR programming devices**
- **Advanced Bluetooth® Control up to 50m available for android and iOS smart phones**





Optical Performance

Maximum fixed intensity				
VPL 110	40cd	40cd	50cd	45cd

Optical specification

Light source	High Power Light Emitting Diode (LED)
Vertical divergence	8° @ 50% (±1°) of peak intensity

Main Technical Specification

Nominal Range	up to 4 NM
Lens	Uv stabilized polycarbonate
Designed service life	Up to 10 years
Weight	2,8 kg
Temperature range	-40° to +60°
Solar charger	1,5 W
Degree of protection	IP 67
Cable length	2 m / 6 m

Order Overview VPL 110

VPL 110 (GPS sync as standard)	Colour
VPL-110-W4	white
VPL-110-R4	red
VPL-110-G4	green
VPL-110-Y4	yellow

Product code for Programmer

980332	Sabik Easy Programmer
	Bluetooth mobile app for android and IOS available

Option matrix

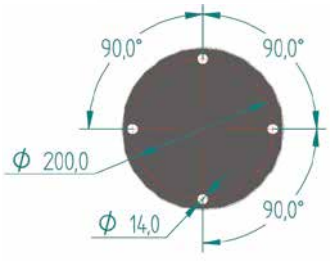
LightGuard GSM + GPS OPT 9H	Integrated GSM based monitoring including GSM/GPS antennas
Optical Feedback System OPT 1H	Integrated LED performance measurement
Shock & Tilt Sensor	Integrated 3-axis G sensor for tilt and shock sensing

SBFL 160

Marker Light for Aquaculture Farms

SBFL 160 is a marker light especially developed for aquaculture farms. The unit is designed to meet the requirements regarding night and day time visibility as well as radar visibility. It can also be installed directly on floats for aquaculture farms. The marker light consists of a yellow buoy tube with integrated alkaline battery, LED lantern, light reflectors along with internal radar reflector. The partly integrated, robust lantern has very low power consumption and is equipped with GPS synchronization.

- **Adjustable intensity and range**
- **Standard range 3 NM at Tc = 0.74 (4,5 NM at Tc = 0,85)**
- **Default IALA yellow colour light**
- **Equipped with internal radar reflector**
- **Energy sources: Alkaline main battery**
- **Vertical divergence 8° @ 50% (±1°) of peak intensity**
- **GPS synchronization as standard**
- **Optional integrated GSM/GPS remote monitoring**
- **Remote monitoring with LightGuard Monitor can be added as an option**
- **Mounting mechanism can be customized for different floats**
- **Sabik Easy programmer can be used for programming the lantern and for reading the status of the lantern and battery**
- **Advanced Bluetooth® Control up to 50m available for android and iOS smart phones**



Main Technical Specification

Lantern intensity setting	17 cd
Max lantern intensity	40 cd
Vertical divergence	8° @ 50% (±1°) of peak intensity
Buoy material	UV resistant Polyethylene
Lantern material	UV resistant Polycarbonate
Weight without adapter plate	33 kg
Degree of protection, lantern	IP 67
Lantern programming	Wireless with Sabik Easy programmer or with an advanced Bluetooth android mobile app
Primary battery 220 Ah	Changing interval > 1,5 years
Cable length	2 m / 6 m

Product codes

SBFL-160-1-7YBS	Marker light with 220Ah primary battery + sync
SBFL-160-1-7YTS	Marker light with 230/12V power supply and 12Ah back-up battery + sync

Product code for mechanical fixing

841011	Mechanics for buoy installation

Product code for lanterns

VPL-110-Y4	Lantern for SBFL marker light with synchronization

Product code for battery

950168	220 Ah primary battery

Product code for Programmer

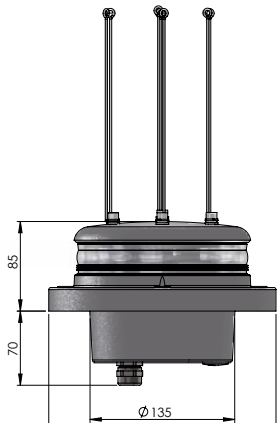
980332	Sabik Easy Programmer
	Bluetooth® app for android and IOS mobile phones available

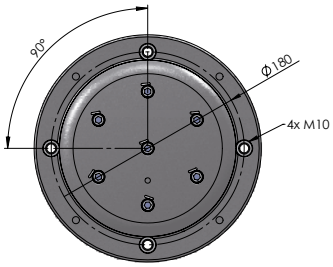
VP LED

Buoy LED lantern

The VP LED is an LED lantern designed to be used in moderate ice conditions. It has a proven record of surviving the crushing pressure and dynamic forces of ice. VP LED is mainly used on plastic ice spars and buoys when a lightweight unit is important.

- Marine grade aluminium housing
- Designed to be fully waterproof, can sustain extensive submersion
- Integrates firmly onto buoy top and presents a very low profile to lateral forces from ice
- Lantern can be removed for battery replacement
- Range up to 6 NM (Tc = 0,74)
- Standard IALA colours red, green, white and yellow
- Extremely low power consumption, ideal for primary battery operation
- Integrated flasher with day light switch
- Adjustable intensity and range
- Programmable with Sabik standard IR programming devices
- Integrated 365 day event log
- Optional integrated GPS synchronization
- Optional integrated GSM Remote monitoring
- Optional Bluetooth control





Optical performance

Maximum fixed intensity				
At full power 6 W	120 cd	160 cd	240 cd	120 cd

Main Technical Specification

Lens visual/Mechanical diameter	160 mm
Lens material	UV stabilized Polycarbonate
Light source	Light Emitting Diodes (LEDs)
Vertical divergence	10° @ 50 % (±1°) of peak intensity
Unit lifetime	Up to 10 years
Weight	3,2 kg
Temperature range	-40°...+60°C
Supply Voltage	10 – 32 VDC
Solar Panel Charger	16 ampere PWM charger
Power consumption	Max 6 watts
Degree of protection	IP 68
Cable length	2 m / 6 m

Order Overview VP LED

W = Wide (10° @ 50 % of peak intensity)	
Red	VP-LED-WR
Yellow	VP-LED-WY
Green	VP-LED-WG
White	VP-LED-WW

Product code example: VP-LED-NW-13

- ***VP-LED*** is Sabik code for a buoy lantern
- ***NW*** is the code for a Narrow lens in white
- ***13*** is a selection of option 13 Aux card with RS485 and I/O

Order Overview VP LED B/Y

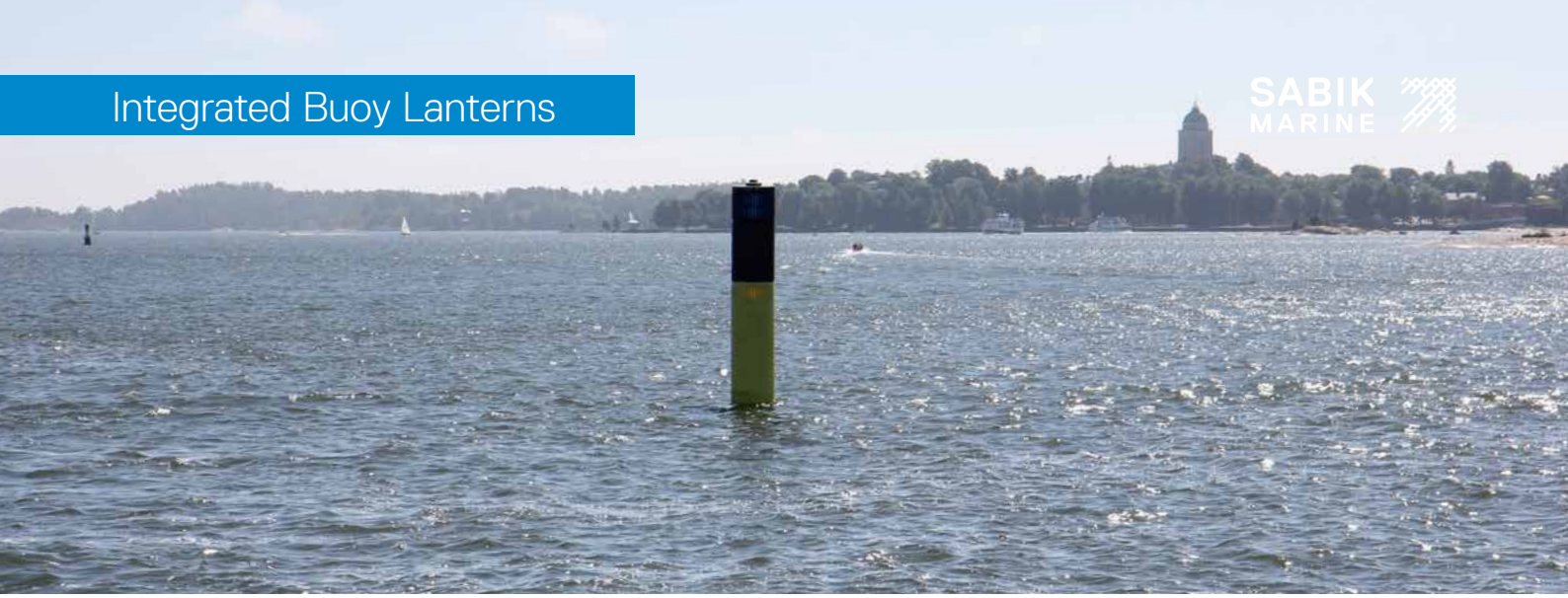
Wreck marking buoy lantern blue/yellow

Product codes

VP LED BLUE/YELLOW WRECK MARK	VP-LED-2-WBY

Option matrix

OPT 4: GPS sync	Integrated GPS sync including GPS antenna
OPT 9: LightGuard GSM + GPS	Integrated GSM based monitoring including GSM/ GPS antennas
OPT 10: LightGuard GSM	Integrated GSM based monitoring including GSM antenna
OPT 11: Control card	Control card for secondary battery
OPT 12: Aux card with I/O	Aux card including I/O ports
OPT 13: Aux card with RS485 and I/O	Aux card including RS 485 and I/O port
OPT BT	Bluetooth control

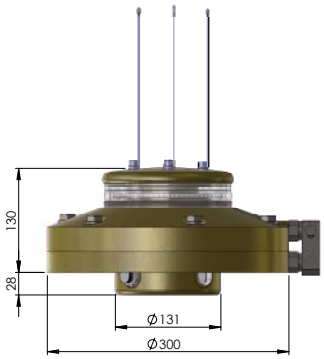


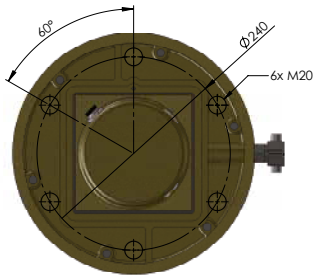
MPV LED

Heavy duty ice buoy LED lantern

The MPV LED is an LED lantern designed to be used in most severe ice conditions, and is capable of surviving the crushing pressure and dynamic forces of ice in winter conditions.

- **Rugged bronze alloy housing for installation in harsh marine environments**
- **Designed to be fully waterproof – can withstand submersion down to 100 meters**
- **Integrates firmly onto buoy top – presents a very low profile to lateral forces from ice**
- **Enables battery replacement through lantern without removing the lantern from buoy**
- **Visual range up to 6 NM (Tc = 0,74)**
- **Standard IALA colours Red, Green, White and Yellow**
- **Extremely low power consumption; ideal for primary battery operation**
- **Integrated flasher with day light switch**
- **Adjustable intensity and range**
- **Programmable with Sabik standard IR programming devices**
- **Integrated 365 day event log**
- **Optional integrated GPS synchronization**
- **Optional integrated GSM Remote monitoring**





Optical performance

Maximum fixed intensity				
At full power 6 W	120 cd	160 cd	240 cd	120 cd

Main Technical Specification

Lens visual/Mechanical diameter	160 mm
Lens material	UV stabilized Polycarbonate
Light source	Light Emitting Diodes (LEDs)
Vertical divergence (wide lens)	10° @ 50% (±1°) of peak intensity
Unit lifetime	Up to 10 years
Weight	25 kg
Temperature range	-40°...+60°C
Supply Voltage	10 – 32 VDC
Power consumption	max 6 watts
Degree of protection	IP 68
Cable length	2 m / 6 m

Order Overview MPV LED

W = Wide (10° @ 50 % of peak intensity)		
Red	MPV-LED-WR	H = with hinge
Yellow	MPV-LED-WY	J = without hinge
Green	MPV-LED-WG	
White	MPV-LED-WW	

Product code example: MPV-LED-WG-4

- ***MPV-LED*** is Sabik code for a MPV LED
- ***WG*** is the code for a wide lens in green
- ***4*** is a selection of option 4 GPS syncronization

Option matrix

OPT 4: GPS sync	Integrated GPS sync including GPS antenna
OPT 9: LightGuard GSM + GPS	Integrated GSM based monitoring including GSM/ GPS antennas
OPT 10: LightGuard GSM	Integrated GSM based monitoring including GSM antenna
OPT 11: Control card	Control card for secondary battery
OPT 12: Aux card with I/O	Aux card including I/O ports
OPT 13: Aux card with RS485 and I/O	Aux card including RS 485 and I/O port

Structure & Crane Lights

Our lanterns have proven their durability over decades and we are constantly developing our product portfolio to fulfill the expanding demand of marking different marine applications.

Our lights for illumination of marine structures and facades are energy-efficient and maintenance-free. Our enduring solutions for industrial crane applications span from access control to equipment status visualization in ports and harbors.

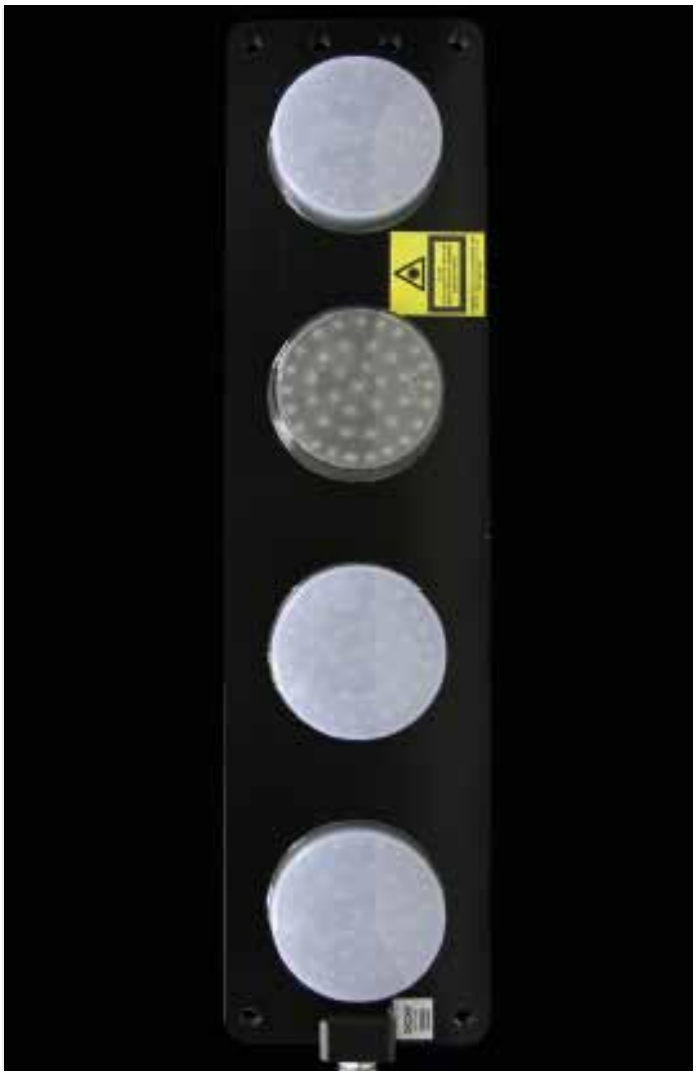

NLE
NLE
01 421

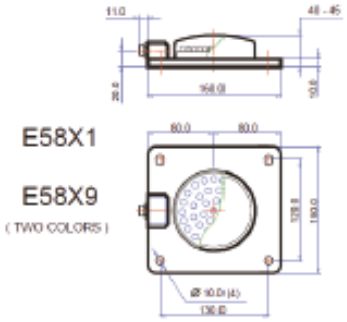
E58XX

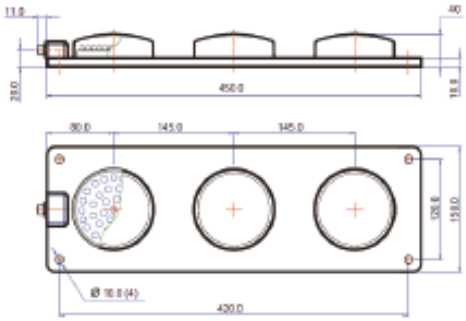
LED Indicator Panel

E58XX is a robust LED indicator panel for demanding industrial applications ranging from access control to equipment status monitoring. The design and manufacturing of the E58XX benefit from our years of experience in delivering LED based marine signaling, aviation obstruction, as well as road and railway traffic signals. While widely popular as a crane light, the E58XX is a superior choice for any signaling application requiring high reliability, resiliency and high quality optoelectronics.

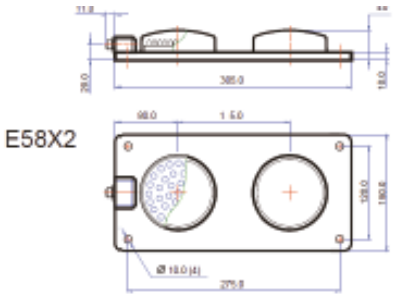
- **"Fit and forget" maintenance-free lifetime exceeding 10 years, guaranteeing excellent reliability and dependability**
- **Low power consumption: approximately 0.5 to 4W per LED signal module**
- **No "phantom colour" effect: sunlight reflections from the unpowered modules are colourless**
- **Superior shock and vibration tolerance, ensuring trouble free use on mobile platforms**
- **Superslim form factor: overall dimensions of a panel with 3 lights are 150x465x40 mm, male 5-pole M12 receptacle typical for power supply; optional visors are available (75 x 90 mm)**
- **Any combination of LED modules emitting red, green, yellow, blue and white can be ordered**

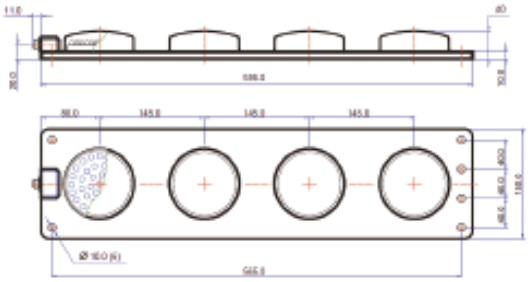






E58X3





E58X4

Optical Parameter (DC/AC)

Clear lens (Standard)					
Viewing angle 2θ½	25°	30°	30°	15°	20°
Luminous intensity @ centre of light beam	50cd	50/40cd	50/45cd	100/90cd	40cd
Luminous intensity @ ±45°	1.9cd	1.6cd	2.4cd	0.9cd	0.3cd

Clear-erosion patterned					
Viewing angle 2θ½	25°	35°	35°	20°	35°/ 30°
Luminous intensity @ centre of light beam	30cd	30/25cd	30cd	50/40cd	25cd
Luminous intensity @ ±45°	1.5cd	1.5cd	2.0cd	1.0cd	0.5cd

Semi-transparent					
Viewing angle 2θ½	25°	30°	30°	15°	30°
Luminous intensity @ centre of light beam	25/20cd	25/10cd	25/20cd	40/30cd	15cd
Luminous intensity @ ±45°	1.5cd	2/1.5cd	2cd	1.5cd	1.0cd

Environmental	
Intrusion protection	IP67 or IP68
Temperature	-40°C to 70°C
Salt	Allow application in salt mist condition
Lens protection	IK08 (EN 50102)
Mechanical vibration	10-500Hz acceleration up to 2.2g

Technical Specification	
Power requirement	E581X (DC): 21-28V E582X (50/60Hz): 100 - 200V
Power consumption	DC light module: 0.5 - 1.0W AC light module: 2.3 - 6.5W
Weight (w/o hard-wired power cable)	0.8kg - 3.2kg
Cable length	2 m / 6 m

Order Overview E58XX

Product code	
E58XN-CCCC-OOO	Note
X	Power supply (1 = 24VDC, 2 = AC, 3 = 12VDC)
N	Number of lights (1-4)
CCCC	Colour group (R, W, G, Y, B)
OOO	Option group (S, E, Cx, V) S = Semi-transparent E = Clear lens w/ erosion-patterned Cx = Hard-wired power supply cable; x = cable length V = VH (horizontally installed) or VV (vertically installed)

Product code example: E5814-RYGB-EC6

- ***E5814-RYGB-EC6*** is a LED Indicator Panel for 24 V DC operation
- Red, yellow, green and blue LED modules
- Erosion-patterned lens and a 6 m hard-wired power supply cable.

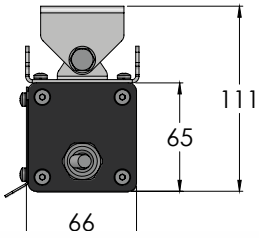
LTF 400

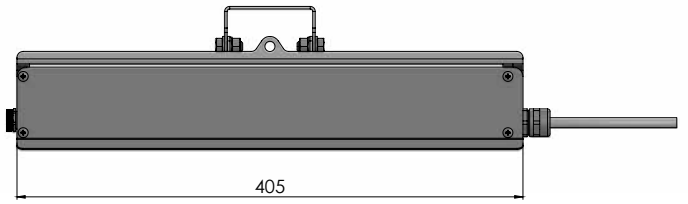
Floodlight

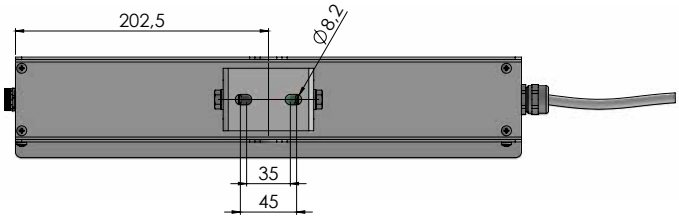
Sabik LTF 400 is a floodlight for illuminating fixed structures and auxiliary signs. Designed to excel in demanding marine environment, it is also a robust choice for inland installations.

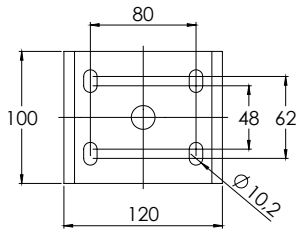
LTF 400 comes in different opening angles and brightness options to match your illuminating and power consumption requirements. The integrated high efficiency controller and maintenance-free LED-based design make this product ideal for remote and solar-powered installation.

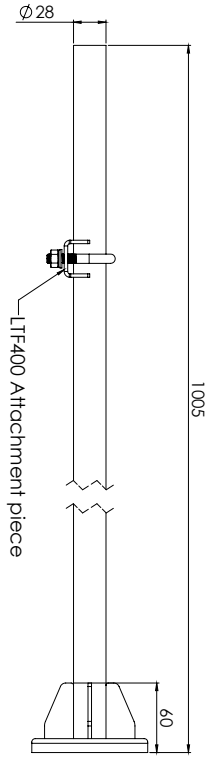
- **Very low power consumption ideal for solar-powered sites**
- **Rugged, sealed, maintenance-free construction**
- **Automatic day/night switching**
- **Beam profile optimized for even distribution on luminated structures**

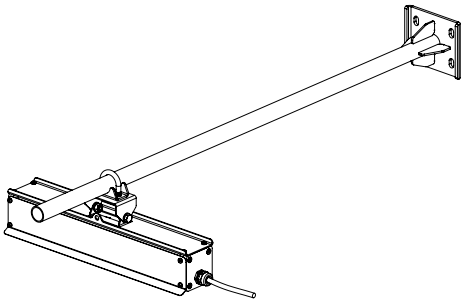


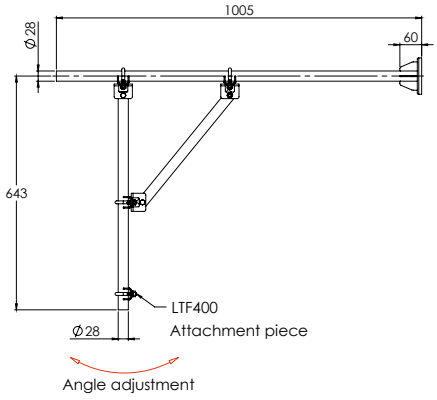












Optical specification

Light source	High Power Light Emitting Diode (LED)
Divergence	8° / 50° / 120° FWHM (Narrow, Wide, Ultra Wide)

Main Technical Specification

Lens	UV stabilized acrylic
Housing	Aluminium, stainless steel A4, UV stabilized acrylic
Designed service life	More than 10 years
Weight	1.3 kg
Dimension (W x D x H)	440 x 72 x 79 mm
Flash character	Fully programmable (including presets)
Temperature range	-40° to +60°C
Voltage	12 VDC (10-30 VDC)
Solar charger	No
Degree of protection	IP 65
Reverse polarity protection	Yes
Daytime idle consumption	< 0.6 mA @ 12 VDC
Battery cut off voltage	10 VDC
Cable length	2 m / 6 m

Other

Twilight switch	Yes
Water tight equalizing valve	Yes
Mounting	2 pcs M8, Additional mounting arm option

Order Overview LTF 400

Product code

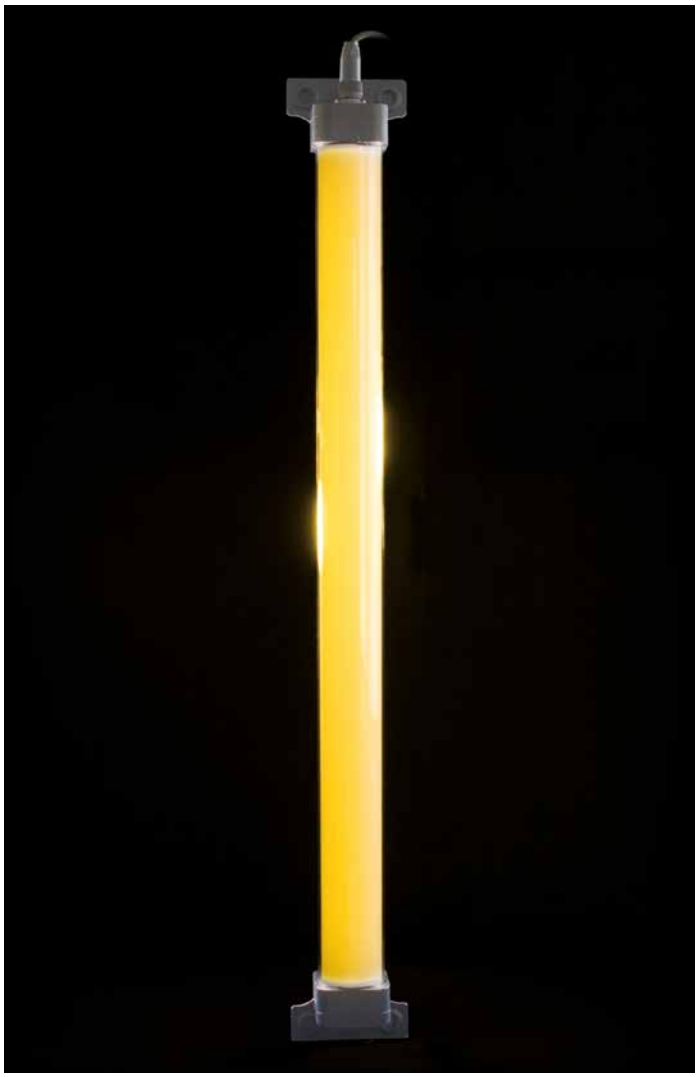
LTF 400 0.9 W	LTF 400 3 W	Beam opening
LTF400-N-W-1	LTF400-N-W-3	8°
LTF400-W-W-1	LTF400-W-W-3	50°
LTF400-UW-W-1	LTF400-UW-W-3	120°

LT 1000

LED Light Tube

LT 1000 LED Light tube is designed to replace traditional floodlights. The light is distributed directly towards the mariner instead of illuminating the structure. Only a fraction of energy is required compared to traditional floodlights.

- **Maintenance-free LED light tubes for illuminating fixed aids to navigation**
- **Housing fully waterproof with PTFE vent for breathing**
- **Standard IALA surface colours Red, Green, White and Yellow in accordance with E-108 Recommendation**
- **Low power consumption, ideal for solar systems**
- **Can be used stand-alone or with control unit**
- **With the control unit the Intensity can be adjusted from 5% to 100% with control unit**
- **Control unit also includes integrated 16 A solar panel regulator and photocell**
- **Programmable with Sabik standard IR programming devices**

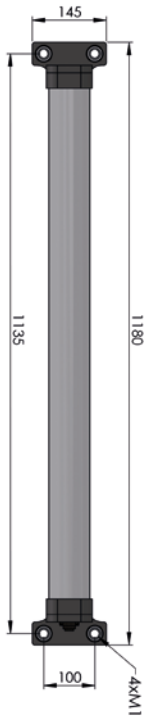


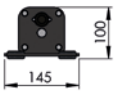
Optical performance

Maximum Illuminance				
At full power 3 W	100 cd/m2	100 cd/m2	100 cd/m2	100 cd/m2

Main Technical Specification

Dimensions	1180 x 145mm
Lens tube material	UV stabilized Acrylic
End terminal material	Marine grade anodized aluminium
Light source	Light Emitting Diodes (LEDs)
Viewing angle	150°
Unit lifetime	Up to 10 years
Weight	2.5 kg
Temperature range	-40°...+60°C
Supply Voltage	10 – 32 VDC
Power consumption	High setting = max 3 watts Low setting = max 0,5 watt





Order Overview LT 1000

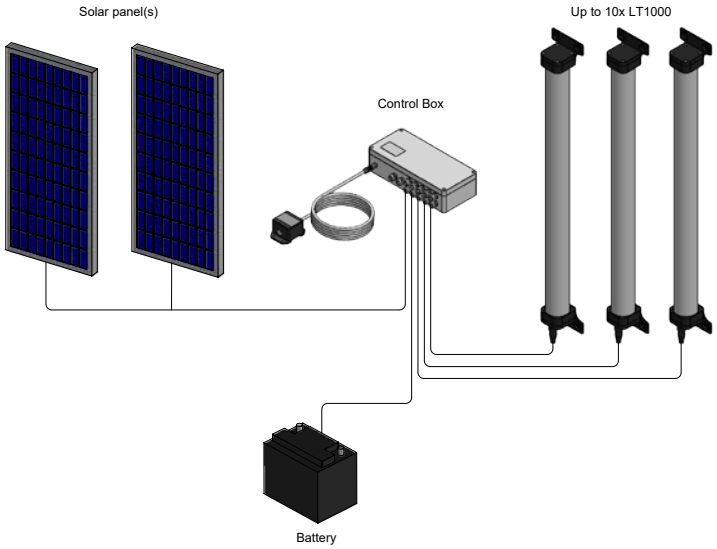
Product codes

LT 1000 0,5W Power 0,5W	LT 1000 3W Power 3 W	Colour
LT-1000-1-W	LT-1000-3-W	white
LT-1000-1-R	LT-1000-3-R	red
LT-1000-1-G	LT-1000-3-G	green
LT-1000-1-Y	LT-1000-3-Y	yellow

Option matrix

Supply cables with connector	2 m 6 m 10 m

CONTROL BOX	980269
LT-1000 CABLE 2M	715620-2
LT-1000 CABLE 6M	715620-6
LT-1000 CABLE 10M	715620-10



Installation Example

Monitoring & Control

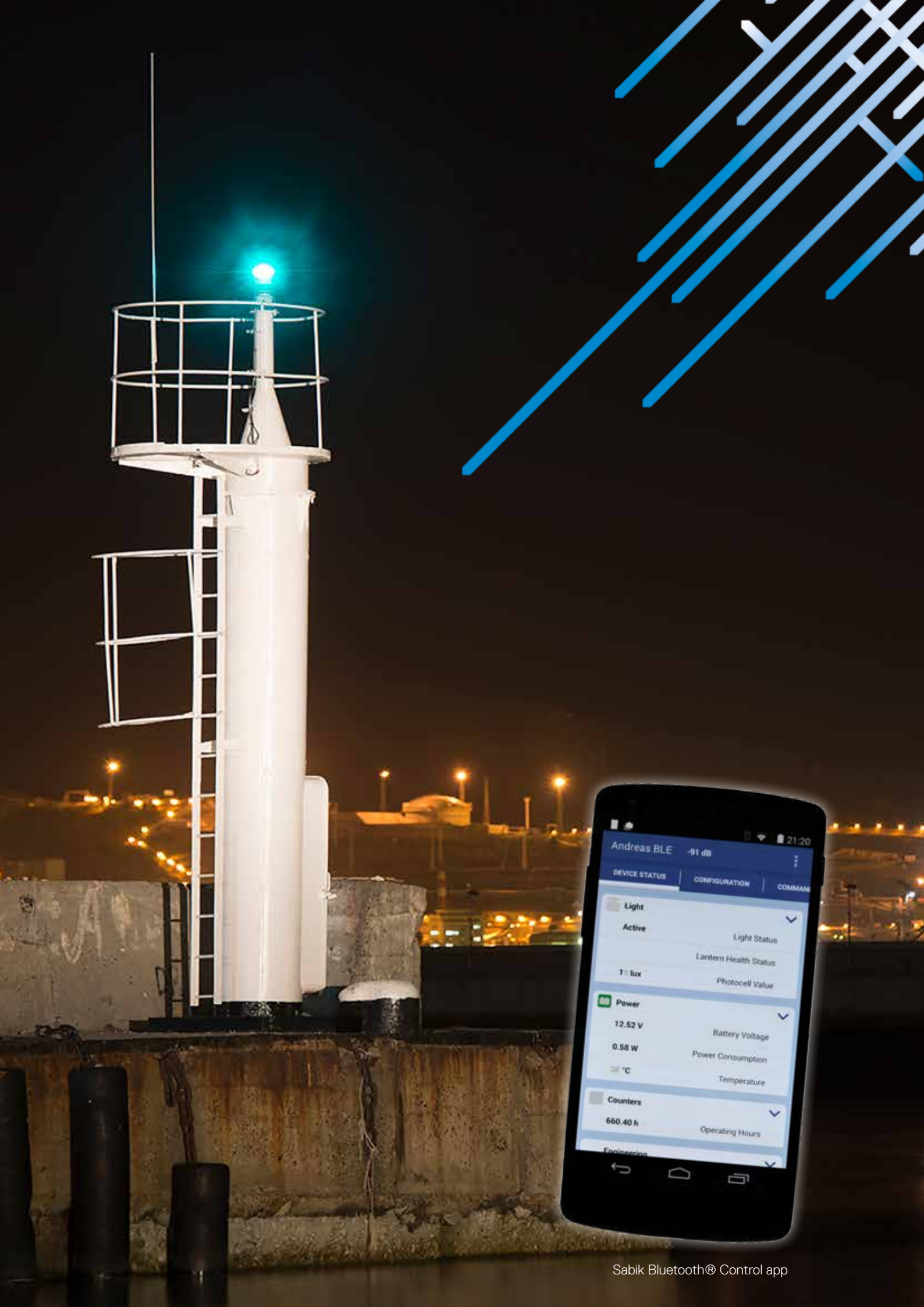
EASY CONNECTIVITY with our advanced LightGuard Monitor and Sabik Bluetooth® Control app

Remote monitoring has become a standard and new communication technologies make integration of reliable remote monitoring and controlling possible even on minor aids-to-navigation. Real-time information about the operation increases safety and enables more efficient planning of maintenance resources.

The ability to remotely monitor and control your LED lanterns and signals also saves costs and time as unnecessary maintenance trips can be avoided.

Our advanced Monitoring and Programming tools are LightGuard Monitor and Sabik Bluetooth Control® app. They can be supplied intergrated in Sabik lights.

LightGuard Monitor Responsive Web App desktop



Sabik Bluetooth® Control app

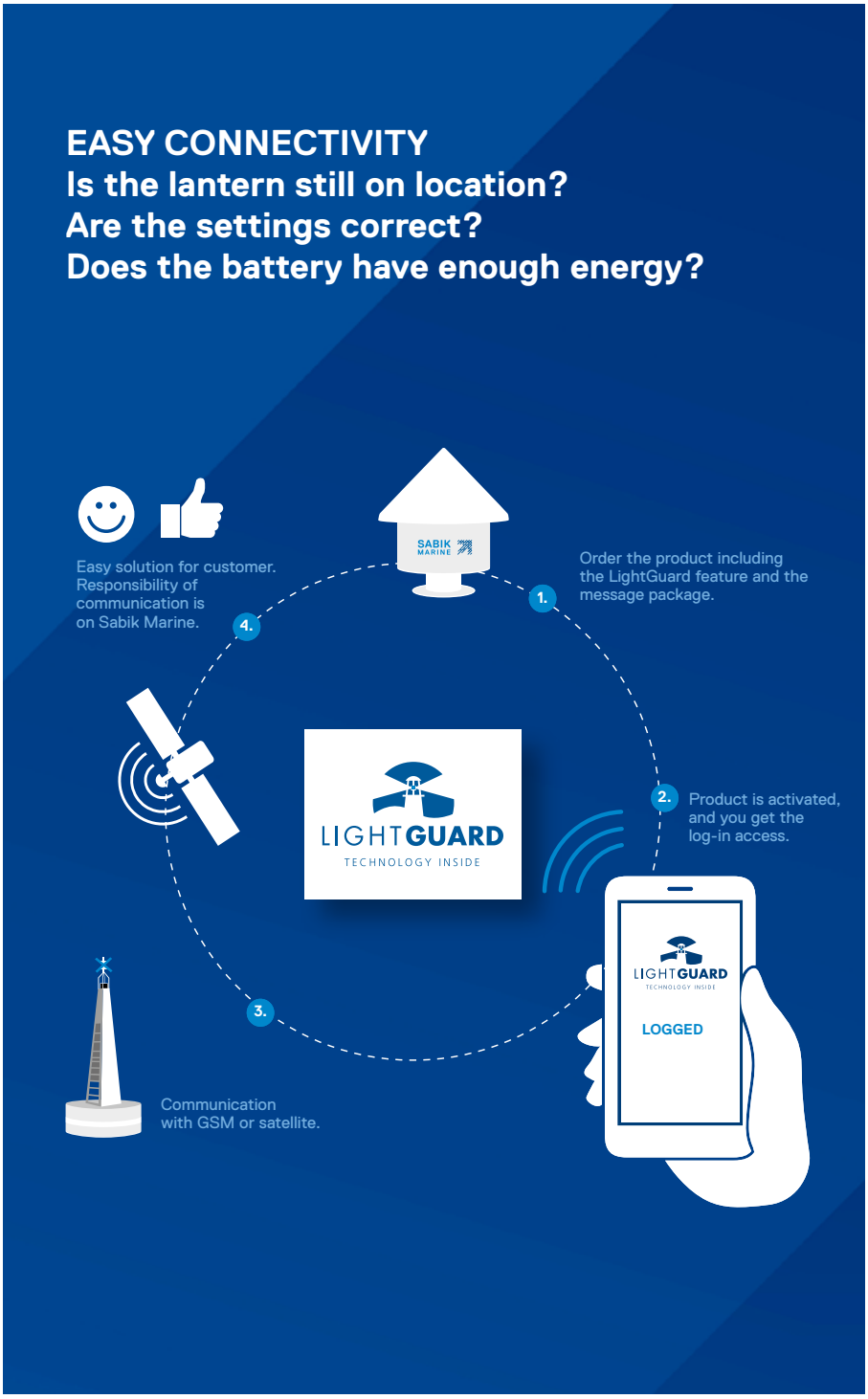
LightGuard Monitor

LightGuard Monitor is an intelligent web-based solution for monitoring fixed and floating aids-to-navigation. The responsive online app allows you to use it on any web-enabled computer, tablet or smartphone. Different views provide you detailed status reports on your stations, for example battery voltage and the position of the buoy.

Advantages

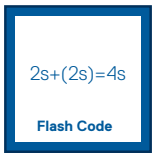
The key advantage of the LightGuard Monitor is peace of mind. Realtime status provides you with valuable information that your marine lantern is in its correct position and operating as planned. In case of a failure, an alarm will be triggered immediately and you will be able to take action proactively to ensure marine safety.

Realtime status also generates cost-savings and increased efficiency with maintenance optimization, for example.



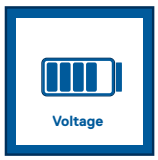
LightGuard Functions (availability depending on LightGuard product)

LightFunction
Basic information about the state of the light; active or inactive



Flash Code
On flashing beacons the LightGuard can report the programmed flash code running based on the measured supply current to the light

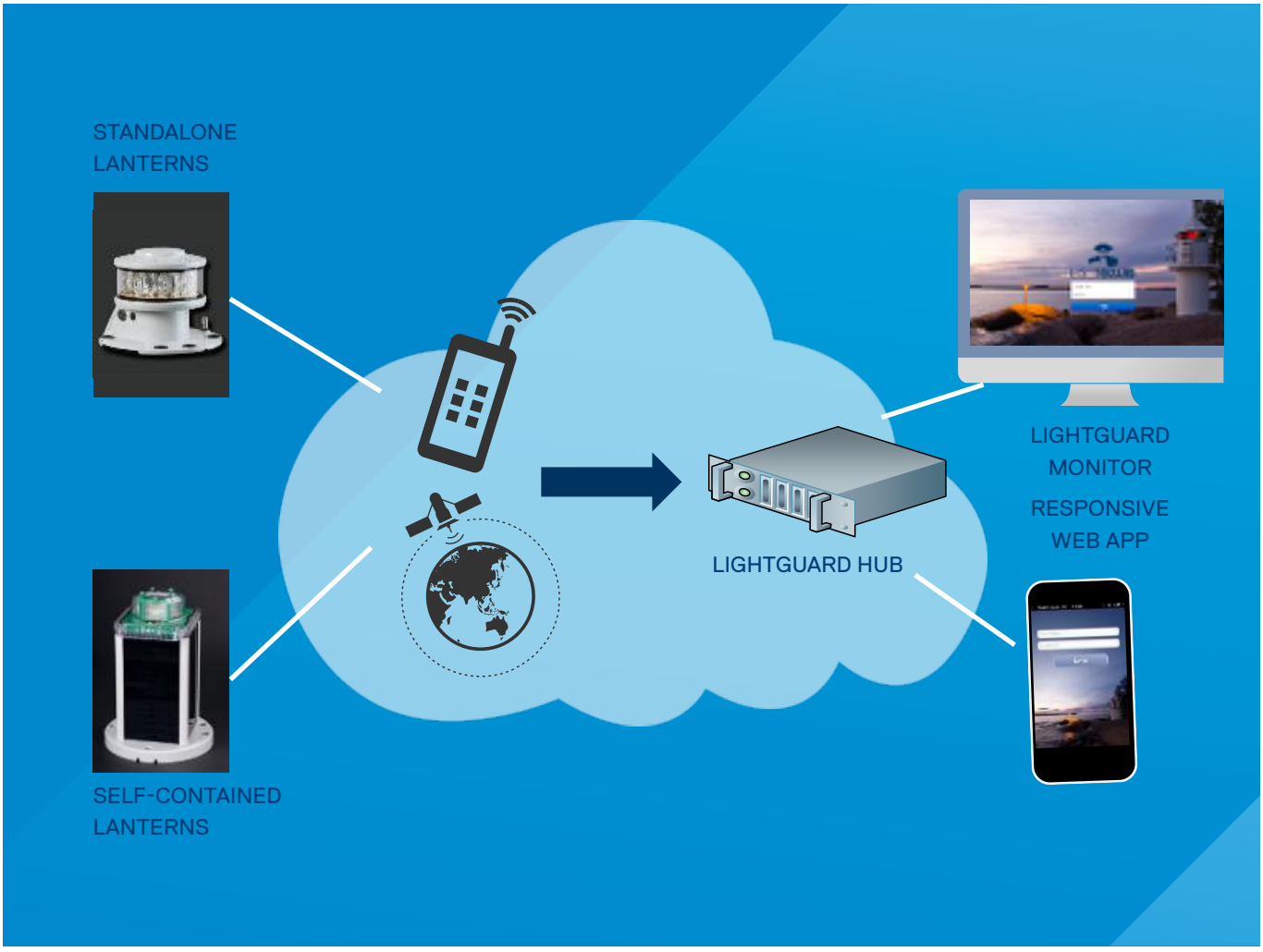
Energy
Ampere-hour counting; lantern consumption and solar system production



Voltage
Battery voltage and temperature

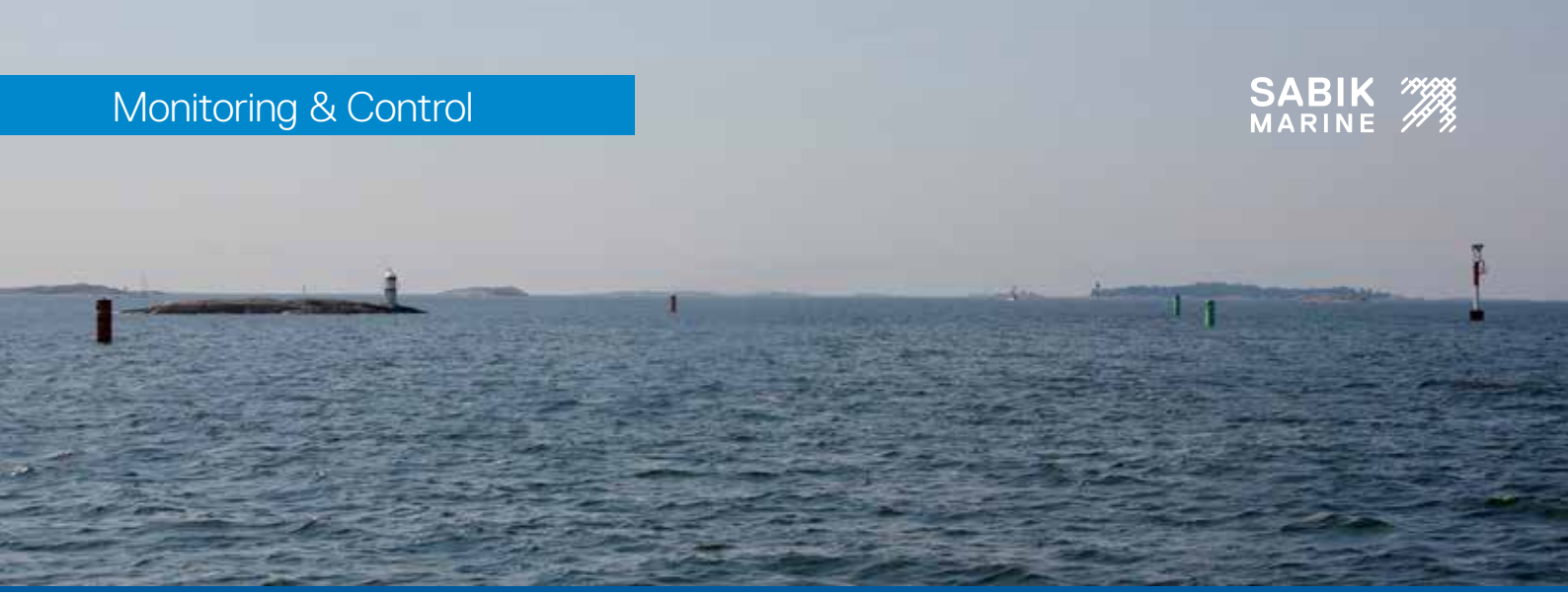
Position
Position of the AtoN

Off Location
Alarm if the AtoN moves outside of the defined boundaries

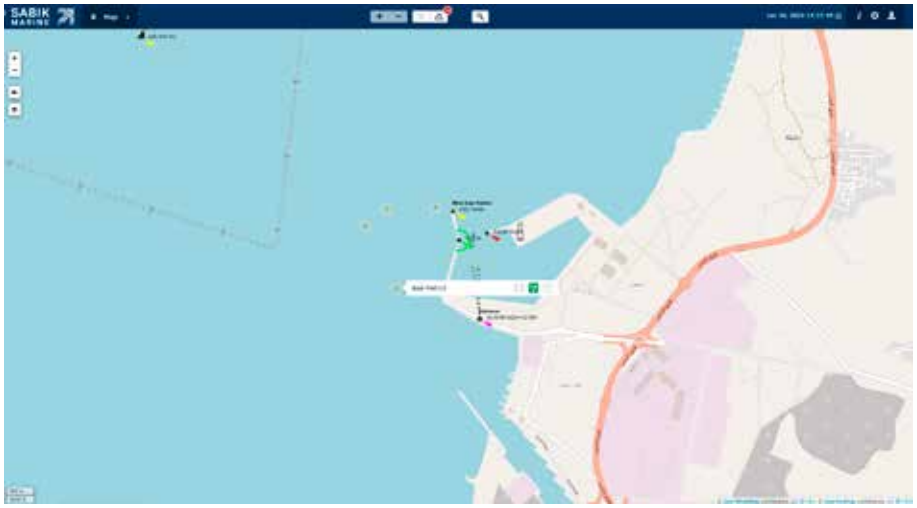


LightGuard Architecture

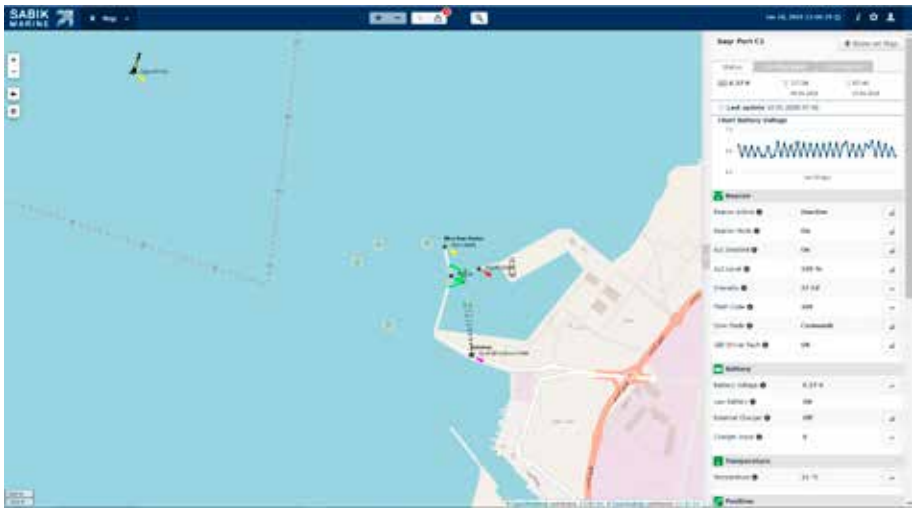
Real-time data is communicated from fixed or floating AtoN to LightGuard cloud based server. LightGuard Monitor displays the data on laptop, smartphone or tablet.



LightGuard Monitor has clear and user-friendly interface



Overview of fixed or floating AtoNs on a map view



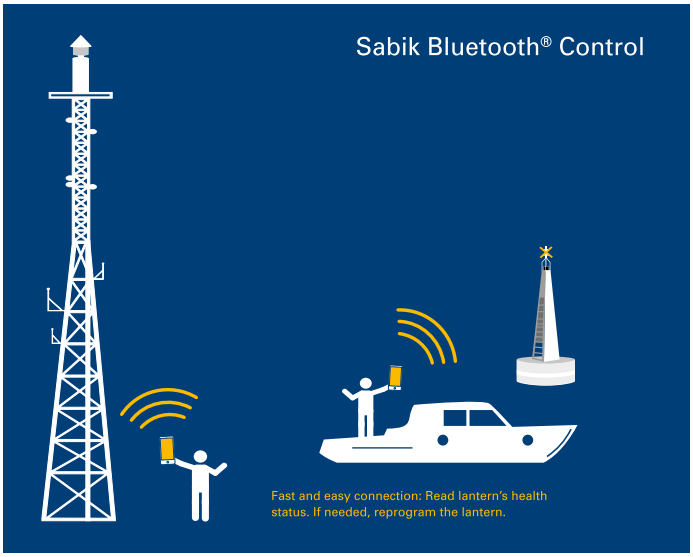
Status information of a specific AtoN

Sabik Bluetooth® Control

Mobile application for programming of marine lanterns

SABIK BLUETOOTH® CONTROL
is an advanced mobile app for programming and monitoring of the marine lantern. You can read and program from the distance of 50 meters.

- **Shortens time and saves costs of the maintenance trips.**
- **Easy and safe to check the status of the lantern from the vessel or quay**
- **Convenient and fast to check the battery status of the products in the warehouse**
- **No need for a separate programmer, only a smartphone with the app**

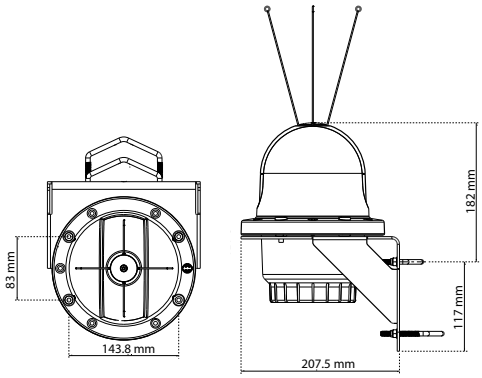


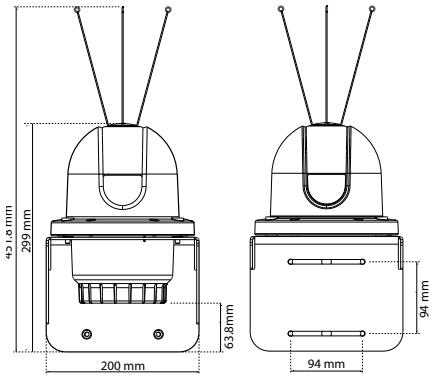
LightGuard AIS for AtoN

The LightGuard AIS (LGA) unit is a fully compliant AIS transponder suitable for all aids-to-navigation installations. Housed in a rugged triple protected housing suitable for the harsh marine environment, it can be deployed on exposed location on buoys and fixed structures. The unit comes with GPS antenna integrated in the housing, but an external GPS antenna can be connected if required.

The unit is supplied with a standard stainless steel mounting bracket making the installation to a buoy or a beacon structure easy.

- **Rugged enclosure with IPx6 and IPx7 degree of protection**
- **Integrated GPS antenna in enclosure**
- **Lowest power consumption on the market in both Type 1 and Type 3 configuration**
- **Integrated interface to lantern (health and ON/OFF) and racon (health)**
- **Optional sensor board for met/hyd sensors**
- **Support messages #6, #7, #8, #12, #13, #14, #20, #21, #25**
- **Support up to 10 messages**
- **Wide voltage range from 10 to 32 VDC**
- **Approved by the Federal Maritime and Hydrographic Agency (BSH)**





Main Technical Specification

PHYSICAL		
Height	284 mm	
Diameter	180 mm	
Weight	1.3 kg without cables and mounting bracket	
ELECTRICAL		
Supply voltage	10 to 32 VDC (absolute min and max)	
Average Power consumption @ 12 VD	**Type 1 (FATDMA channel access)**	< 45 mW (0,09 Ah/day) with 1 msg/3 minutes
	Type 3 (RATDMA channel access)	< 400 mW (0,8 Ah/day) with 1 msg/3 minutes
	typical added consumption for optional sensor board	+ 50 mW (0,1 Ah/day) with one input active (consumption varies with I/O's and functionality)
Transmission power output levels	1 W, 2 W, 5 W and 12.5 W	
Configuration interface	USB	
Interfaces to external equipment (standard)	Integrated I/O interface (max 3.3 V) for • Light ON/OFF status • Light health status • Racon health status	
Interfaces to external equipment (with sensor board)	10 user configurable input/output signals 2 isolated analogue inputs 2 non-isolated analogue inputs 1 current sense loop (lamp current) 2 relay driver outputs A bi-directional NMEA0183 serial port An input only NMEA0183 serial port	
Environmental		
Degree of protection	IPx6 and Ipx7 for water ingress	
Operating temperature	-25°C to +55°C	
STANDARDS		
Applicable equipment standards	IEC62320-2 ITU-R M.1371-4 IEC61162-1 IEC61162-2 IEC61108-1 IEC60945	
Supported messages	#6 – Binary addressed message #7 – Binary acknowledge message #8 – Binary broadcast message #12 – Addressed safety related message #13 – Acknowledgement of received addressed safety related message #14 – Safety related broadcast message #20 – Data link management message #21 – Aids to Navigation report #25 – Single slot binary message	
Approvals	BSH approved	
Included in package	AtoN transceiver Stainless steel mounting bracket and fixing Bird deterrent components Power and data cable 2 meters Sensor interface cables included for AIS unit with sensor board Product manual and CD with programming software	

Order Overview

LightGuard AIS for AtoN

Product code	Description
LGA T1	LightGuard AIS transponder Type 1 (Transmit only)
LGA T1S	LightGuard AIS transponder Type 1 (Transmit only) with sensor board
LGA T3	LightGuard AIS transponder Type 3 (Transmit and receive)
LGA T3S	LightGuard AIS transponder Type 3 (Transmit and receive) with sensor board

Option code	Description
970211	USB AIS ATON Configuration cable
-	Sensor cable

Power Systems & Accessories

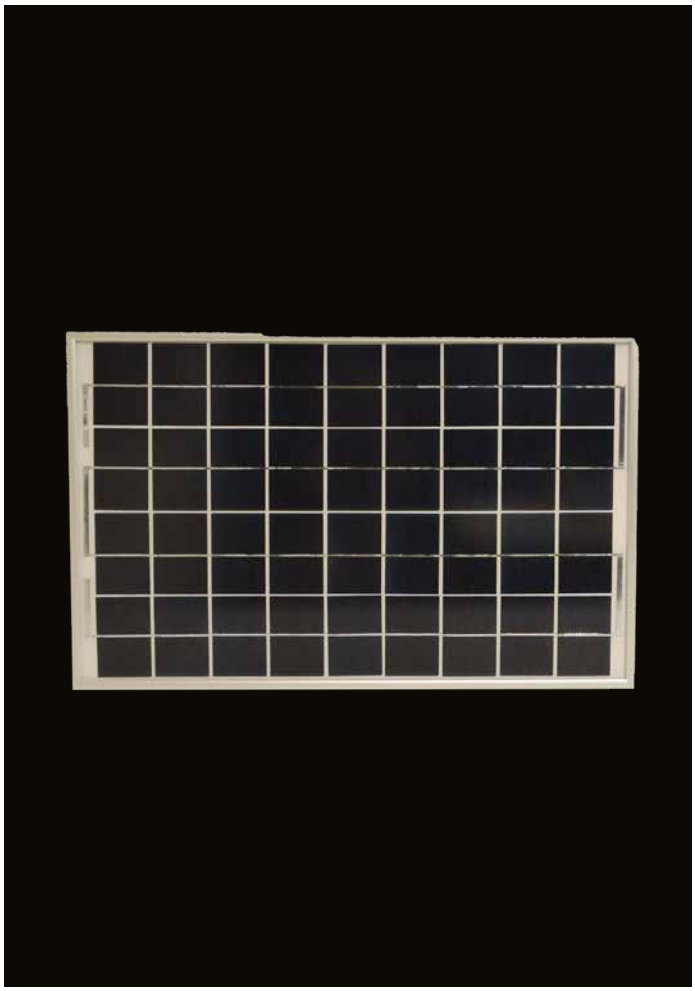
Reliable power supply is essential for lighted aids-to-navigation. We design and deliver power supplies to serve the powering needs of lanterns for almost any location. The energy sources range from primary batteries to solar/photovoltaic, combined with storage batteries and mains electricity. This section presents a careful selection of components needed to build the most reliable power supplies.

Solar Modules

Photovoltaic Modules for Aids-to-Navigation

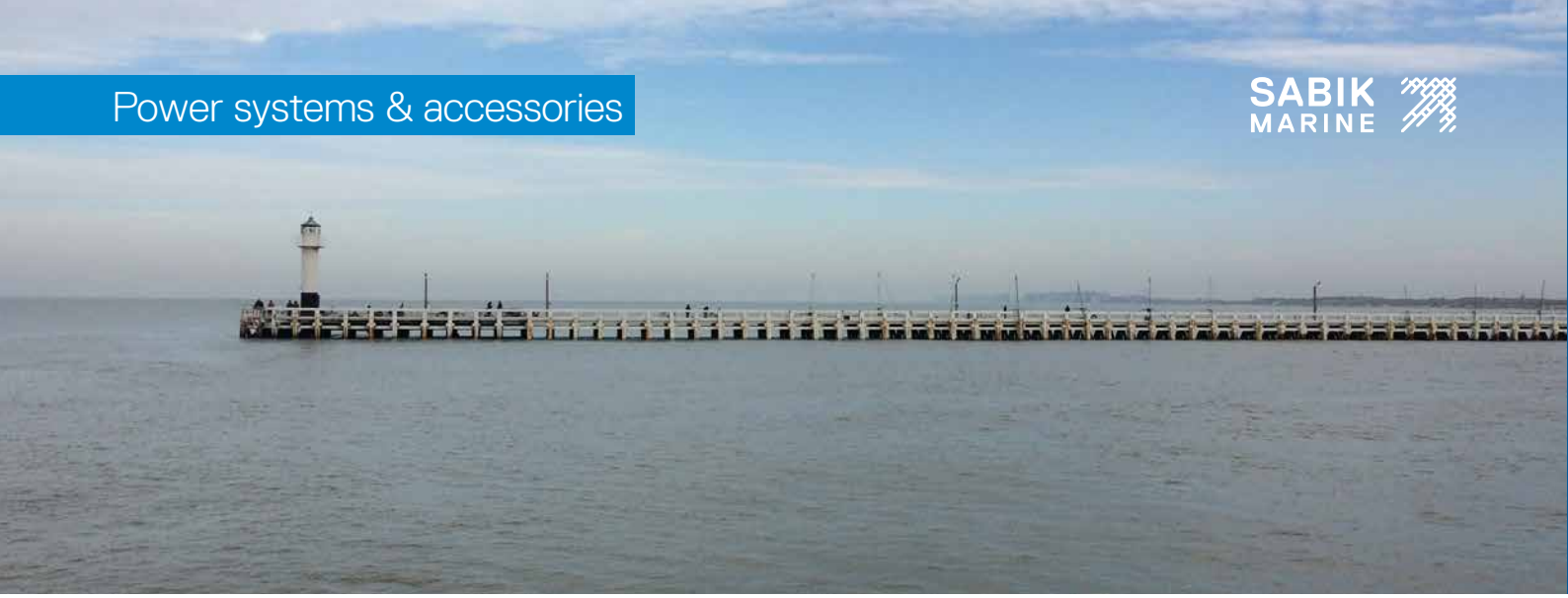
These high performance modules are developed and optimized for off-grid photovoltaic systems. The modules have a proven record of hundreds of AtoN installations from arctic to tropic conditions. They have a high reliability in harsh marine environments.

- **Long-life industrial quality design**
- **Stable frame construction**
- **Stable aluminium frame with mounting and grounding holes**
- **Carefully selected polycrystalline solar cells to reach top performance**
- **Wired in bypass diodes to reduce potential loss of power and damage from partial array shading**
- **Junction box with installation friendly cable fittings**
- **Designed to meet the environmental requirements of IEC61215**



Polycrystalline Modules

Type/Order Code	SNG40	SNG55	SNG80	SNG160
Nominal Power	40 W	55 W	80 W	160 W
Nominal Voltage	18.4 V	18.4 V	18.3 V	18.2 V
Nominal Current	2.20 A	2.93 A	4.40 A	8.79 A
Open Circuit	22.5 V	22.7 V	22.8 V	22.9 V
Short Circuit	1.78 A	2.38 A	3.57 A	7.13 A
Max. Tolerance of P	+10%/-5 %	+10%/-5 %	+10%/-5 %	+10%/-5 %
Dimensions	420x670 mm	540x670 mm	775x670 mm	1480x670mm
Weight	3.5 kg	4.4 kg	6.0 kg	11.5 kg
Max. System Voltage	1000 V	1000 V	1000 V	1000 V
Module Technology	Glass-foil-laminate with aluminium frame			
Module Design	Cover material: high transparent solar glass (tempered), 4mm Encapsulation: EVA - Solar Cells - EVA Back material: Tedlar - Polyester - Tedlar, white			
No. and Type of cells	36 pcs. Polycrystalline cells			
Cables/Connection	Plus and minus connectors in junction box			
Bypass Diodes	2 pcs.			
Operation Temperature	-40...+60 °C			
Hail Resistance	25 mm hailstones with 83 km/h			
Wind Resistance	Wind speed 130 km/h with safety factor 3 (corresponds 2,400 Pa)			
Qualification	IEC 61215			



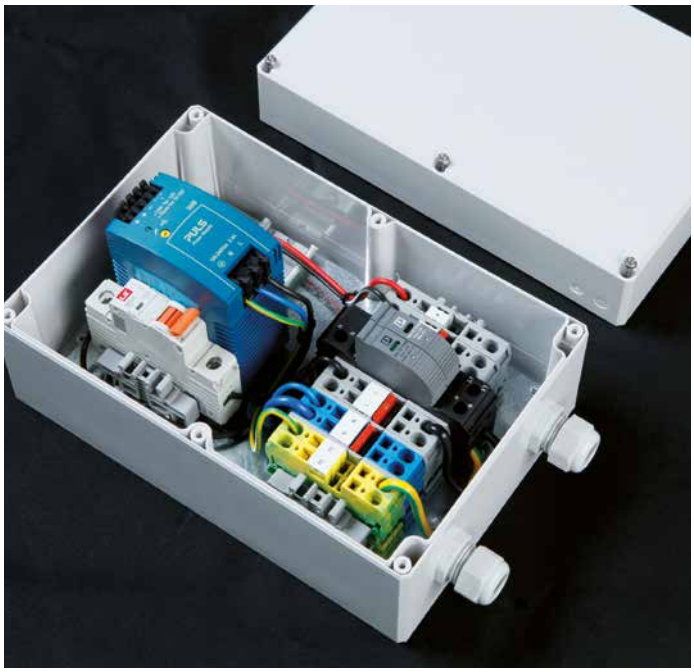
PS 30 and PS 120

Main Power Supplies

Sabik Power Supplies are power converters, which are especially designed to provide high quality DC power for marine lanterns.

The range includes two different sizes, 30 VA and 120 VA, both installed in polycarbonate enclosures.

- **Two different sizes available 30W and 120W**
- **Input voltage 100-240VAC output 12VDC (optionally 24VDC)**
- **Equipped with current and over voltage protection**
- **Enclosure suitable for both indoor and outdoor use**
- **Enclosure equipped with two M20 cable glands**



Main Technical Specification

Type/Order Code	PS 30	PS 120
Input Voltage	100 – 240 VAC	100 – 240 VAC
Output Voltage	12 VDC (optionally 24 VDC)	12 VDC (optionally 24 VDC)
Max Output Power	30 W	120 W
Enclosure	Polycarbonate color RAL 7035	Polycarbonate color RAL 7035
Weight	2,1 kg	2.5 kg
Size of enclosure (WxLxD) mm	160x240x121	175x250x150
Degree of protection	IP 66	IP 66

UPS 12

Uninterruptible Power Supply

Uninterruptible Power Supply installed together with lead batteries (gel, AGM or vent) is a solution that creates a back-up for the lantern in case the mains power fails. The UPS unit is installed in a polycarbonate enclosure.

- **Enclosure equipped with a sophisticated battery charger**
- **Suitable for battery sizes 25-150 Ah**
- **Input voltage 180-250VAC**
- **Output voltage 12VDC (optionally 24VDC)**
- **Equipped with current and over voltage protection**
- **Enclosure suitable for both indoor and outdoor use**

Main Technical Specification

Input Voltage	180 – 250 VAC
Output Voltage	12 VDC (optionally 24 VDC)
Total charge current	10 A (6A/24 VDC)
Max Output Power	120 W
Enclosure	Polycarbonate color RAL 7035
Weight	4,5 kg
Size of enclosure (WxLxD) mm	300x300x130
Degree of protection	IP 66

Batteries

Alkaline Primary Batteries

Sabik's range of alkaline buoy batteries have been developed to be used as a single power supply for a light signal on floating or fixed devices in marine environment.

The battery is made of alkaline cells containing 0 % lead or cadmium, classified as environmentally friendly. The batteries can be disposed off at regular waste disposal stations. A manufacturer's environment certificate available on request.

The housing is made of corrosion free polyethylene. Both the top and the bottom are welded to the pipe, forming a completely waterproof package.

The batteries are supplied with double insulated PVC connection cables. They can even be supplied to be used submerged.

- **Lifting handle**
- **Lifting eye for cranes**
- **Operates in a vacuum**
- **Optional accessories available**

Order Overview Batteries

Standard Batteries in polyethylene tube

Type	AL 14-18	AL 18-15	AL 20-18	AL 23-18	AL 25-15	AL 40-12
Voltage	18 V	15 V	18 V	18 V	15 V	12 V
Capacity	200 Ah 220 Ah	360 Ah	460 Ah	600 Ah	940 Ah	1960 Ah
Weight	20 kg	30 kg	42 kg	54 kg	79 kg	125 kg
L x B	140 x 690 mm 140 x 760 mm	180 x 700 mm	200 x 760 mm	230 x 850 mm	242 x 1100 mm	400 x 512 mm

Other types are available upon request. Technical specifications are subject to changes without prior notice.

Main Technical Specification

Housing	Polyethylene pipe, welded ends
Lifting handle	Plastic, metal handle upon request
Connections	Screw connections or plugs
Cables	Double insulated PVC cable
Temperature Range	From -30° C to +50° C
Environment	For marine environment
Cell type	Alkaline Heavy Metal free Alkaline primary
Self discharge	About 5 % per year
Storage temperature	± 0... + 20° C

Standard Batteries in metal case

Type	AL 26-21
Voltage	21 V
Capacity	160 Ah
Weight	19 kg
L x B	140 x 140 mm

Saft Sun+ NiCd Batteries

Sunica Nickel Cadmium batteries for solar systems

The Sunica Ni-Cd batteries are the first choice for solar systems when performance in cold conditions, a long lifetime, and a low life cycle cost is the target. The battery chemistry is ideal for solar applications with a very low daily discharge and only one major discharge per year in the winter. The modular design offers good flexibility to build battery banks to suit customer needs. The Sunica batteries have a proven track record of performance since the 1970's in demanding industrial applications.

- **Lifetime expectancy in excess of 20 years, up to 8000 cycles to 15 %**
- **Battery design and gas recombination pocket optimised for photovoltaic applications**
- **Limited maintenance, typically once every four years**
- **Excellent performance in temperatures below -20°C (-4°F)**
- **Temperature range -50°C to +70°C (-58°F to 158°F)**
- **Resistant to over- and undercharging and complete discharge**
- **No premature capacity loss (sulphation) when cycled at low state of charge**
- **Large capacity range 50 Ah–1830 Ah**
- **Used batteries are returned to manufacturer for 100 % recycling**

Main Specifications/Order Overview

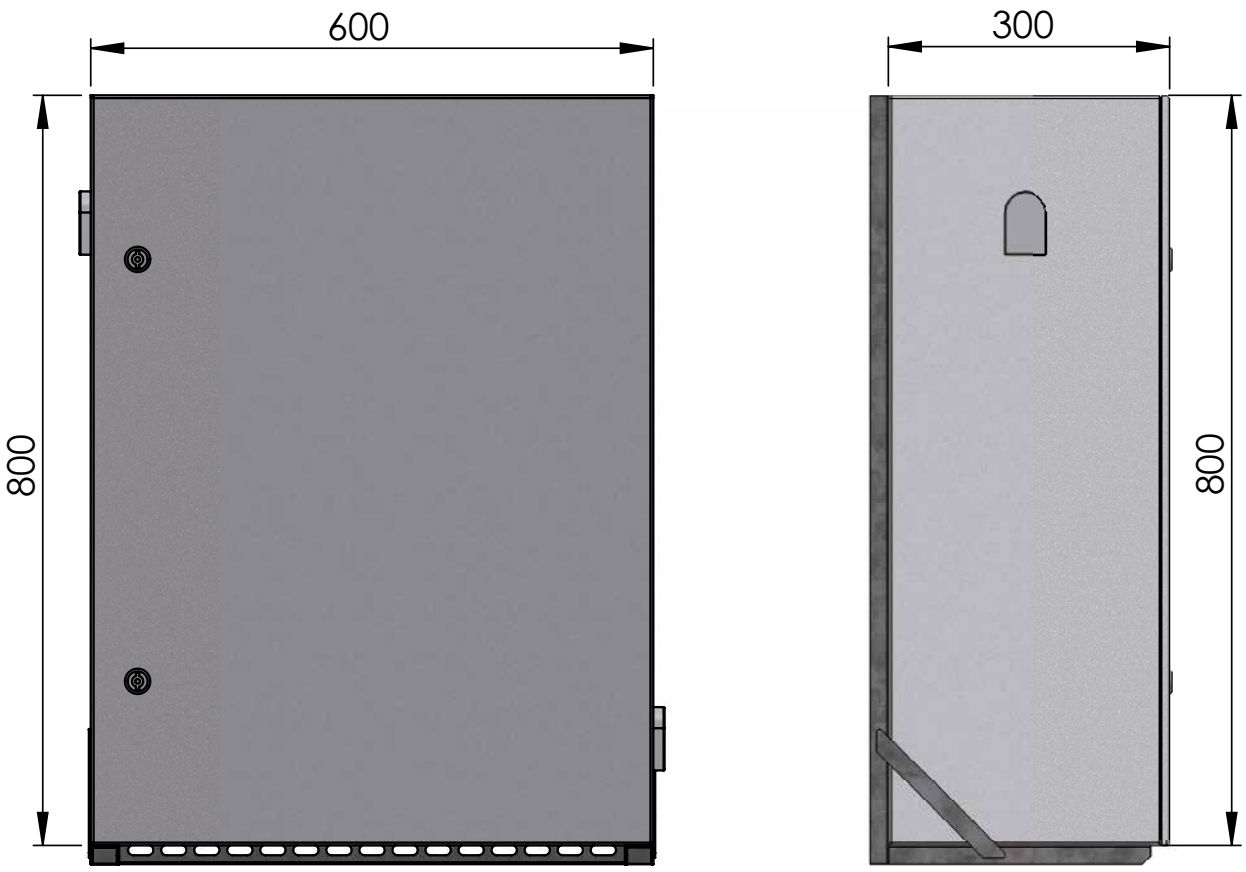
Type/ Order Code	Capacity		Height		Width		Length per block												Weight		Internal resi-stance *	Cell connection bolt per pole
							1 cell		2 cell		3 cell		4 cell		5 cell		6 cell		per cell			
	C_{120} 120 h 1.0 V Ah	C_5 5 h 1.0 V Ah	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	kg	lb	m0hm	
SUN+ 50	50	45	405	15.9	195	7.7			63	2,5	88	3.5	112	4.4	137	5.4	162	6.4	3.2	7.1	5.04	M6
SUN+ 100	100	95	405	15.9	195	7.7			85	3.9	121	4.8	156	6.1	192	7.6	228	9.0	4.9	10.8	2.55	M8
SUN+ 150	150	140	405	15.9	195	7.7			109	4.3	157	6.2	204	8.0	252	9.9	300	11.8	6.2	14.7	1.73	M10
SUN+ 200	200	185	405	15.9	195	7.7			133	5.2	193	7.6	252	9.9	312	12.2	372	14.6	8.4	18.5	1.31	M10
SUN+ 250	250	235	405	15.9	195	7.7			159	6.3	232	9.1	304	11.9	377	14.8	450	17.7	9.9	21.8	1.03	M10
SUN+ 305	305	280	405	15.9	195	7.7			183	7.2	268	10.6	352	13.8	437	17.2	522	20.5	11.5	25.3	0.86	M10
SUN+ 355	355	325	405	15.9	195	7.7			228	9.0	336	13.2							15.1	33.2	0.74	2xM10
SUN+ 405	405	375	405	15.9	195	7.7			252	9.9	372	14.6							16.8	37.0	0.65	2xM10
SUN+ 455	455	420	405	15.9	195	7.7			278	10.9	411	16.1							18.3	40.3	0.58	2xM10
SUN+ 505	505	470	405	15.9	195	7.7			304	11.9	450	17.7							19.8	43.6	0.51	2xM10
SUN+ 555	555	515	405	15.9	195	7.7	171	6.7											21.4	47.1	0.47	2xM10
SUN+ 610	610	560	405	15.9	195	7.7	183	7.2											23.0	50.7	0.43	2xM10
SUN+ 660	660	610	405	15.9	195	7.7	207	8.1											26.5	58.4	0.40	3xM10
SUN+ 710	710	650	405	15.9	195	7.7	219	8.6											28.2	62.1	0.37	3xM10
SUN+ 760	760	700	405	15.9	195	7.7	232	9.1											29.7	65.4	0.35	3xM10
SUN+ 810	830	768	405	15.9	195	7.7	243	9.6											34.5	76.1	0.32	3xM10
SUN+ 860	860	800	405	15.9	195	7.7	256	10.0											32.9	72.5	0.30	3xM10
SUN+ 910	910	840	405	15.9	195	7.7	268	10.5											34.5	76.0	0.29	3xM10
SUN+ 960	960	890	405	15.9	195	7.7	291	11.4											38.1	83.9	0.27	4xM10
SUN+ 1015	1015	940	405	15.9	195	7.7	304	11.9											39.6	87.3	0.26	4xM10
SUN+ 1065	1065	980	405	15.9	195	7.7	315	12.4											41.2	90.8	0.25	4xM10
SUN+ 1115	1115	1030	405	15.9	195	7.7	327	12.8											42.9	94.5	0.23	4xM10
SUN+ 1170	1170	1080	405	15.9	195	7.7	352	13.8											46.3	102.0	0.22	4xM10
SUN+ 1215	1215	1120	405	15.9	195	7.7	352	13.8											46.0	101.0	0.22	4xM10
SUN+ 1270	1270	1170	405	15.9	195	7.7	352	13.8											49.5	109.0	0.21	5xM10
SUN+ 1320	1320	1220	405	15.9	195	7.7	387	15.2											51.3	113.0	0.20	5xM10
SUN+ 1370	1370	1260	405	15.9	195	7.7	400	15.7											52.7	116	0.19	5xM10
SUN+ 1420	1420	1300	405	15.9	195	7.7	412	16.2											54.4	119.9	0.19	5xM10
SUN+ 1470	1470	1350	405	15.9	195	7.7	425	16.7											55.9	123.0	0.18	5xM10
SUN+ 1520	1520	1400	405	15.9	195	7.7	437	17.2											57.5	126.7	0.17	5xM10
SUN+ 1570	1570	1450	405	15.9	195	7.7	462	18.2											61.0	134.0	0.17	5xM10
SUN+ 1620	1620	1500	405	15.9	195	7.7	472	18.5											62.8	138.4	0.16	6xM10
SUN+ 1670	1670	1550	405	15.9	195	7.7	485	19.1											64.2	142.0	0.16	6xM10
SUN+ 1720	1720	1600	405	15.9	195	7.7	497	19.5											65.9	145.2	0.15	6xM10
SUN+ 1775	1775	1650	405	15.9	195	7.7	510	20.1											67.4	149.0	0.15	6xM10
SUN+ 1830	1830	1700	405	15.9	195	7.7	522	20.5											69.0	152.1	0.14	6xM10

SBE 86/SBE 86SS

Battery Enclosure with mechanical support

SBE Battery enclosures with support is a robust solution developed for marine environments. The enclosures are made of hot moulded fiberglass, reinforced polyester or stainless steel (AISI 304). Both enclosures are durable and produced from corrosion resistant materials.

- **The enclosures can carry different battery technologies e.g. lead-acid, nickel-cadmium**
- **The enclosures are ventilated**
- **Support has a hot-dip galvanized surface treatment**
- **The enclosure together with the support makes the design extremely robust**
- **installation-friendly: the support can be pre-installed on the wall**
- **Door equipped with »DIN 3mm« locks, the door can be padlocked**



Main Technical Specification

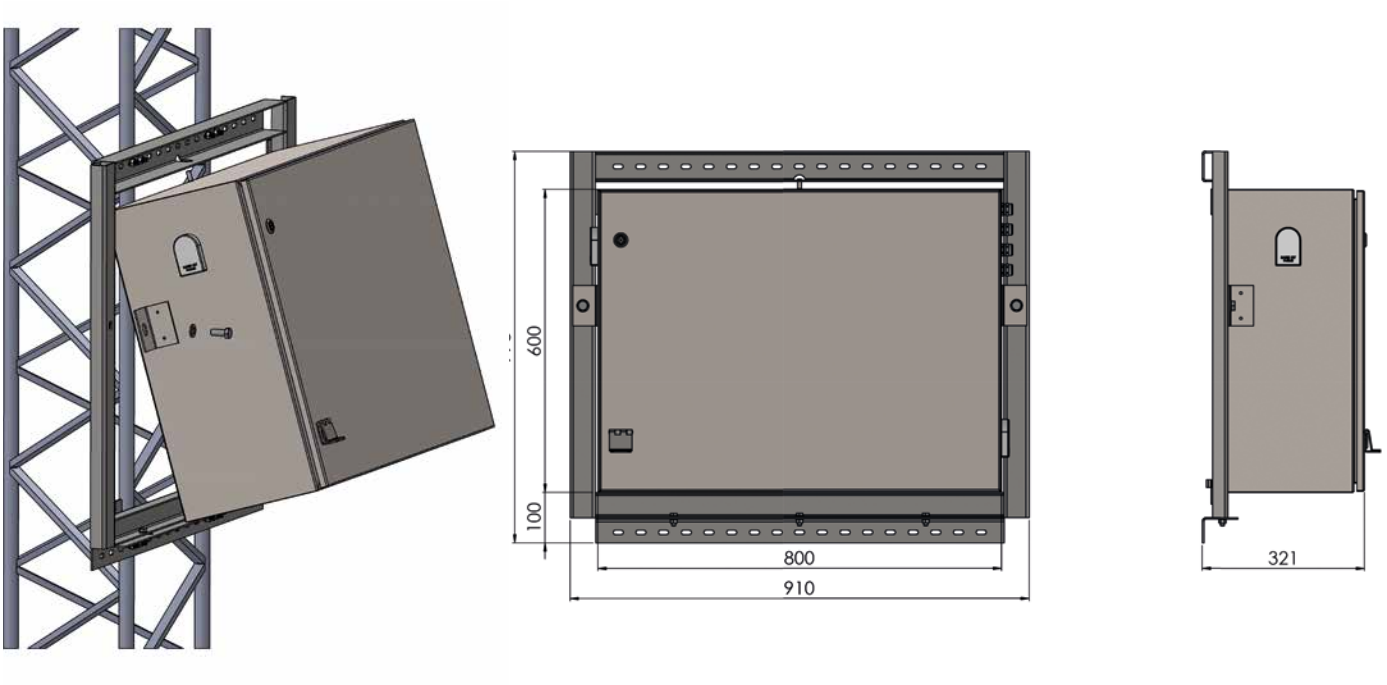
Size of Enclosure	800 x 600 x 300 mm (hxwxd)
Degree of protection	IP 34
Battery installation area	560x250mm
Weight	GRP 27 kg / Stainless steel 43 kg
Temperature range	-40°C...+140°C

SBE 68SS

Battery Enclosure with mechanical support

SBE Battery enclosure with support is a robust solution developed for marine environments. The enclosure is produced from durable and corrosion resistant stainless steel (AISI 304).

- **The enclosure can carry different battery technologies e.g. lead-acid, nickel-cadmium**
- **The enclosure is ventilated**
- **Support made of corrosion resistant stainless steel**
- **The enclosure together with the support makes the design extremely robust**
- **The new detachable support is installation-friendly: The support can be pre-installed on the wall and the enclosure lifted single-handed.**
- **Door equipped with DIN 3-Key locks, the door can be padlocked**
- **New support mechanism enables installing even on uneven surfaces**



Versatile mounting possibilities

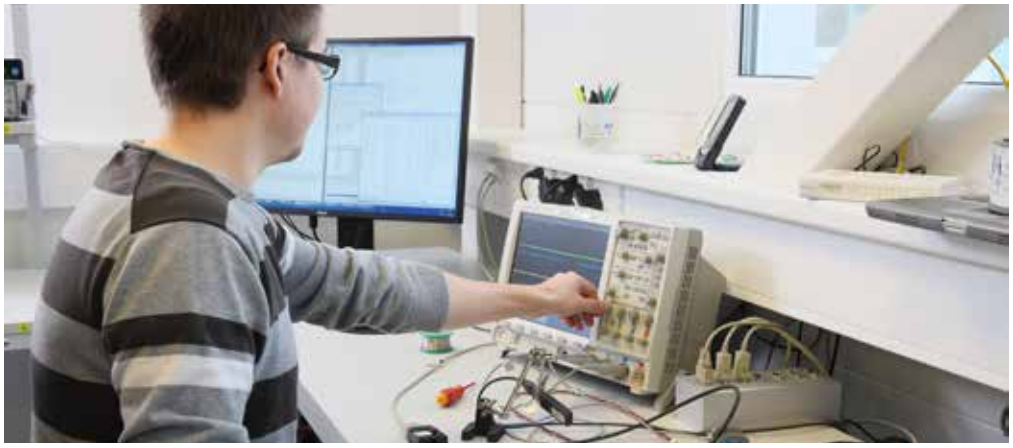
Main Technical Specification

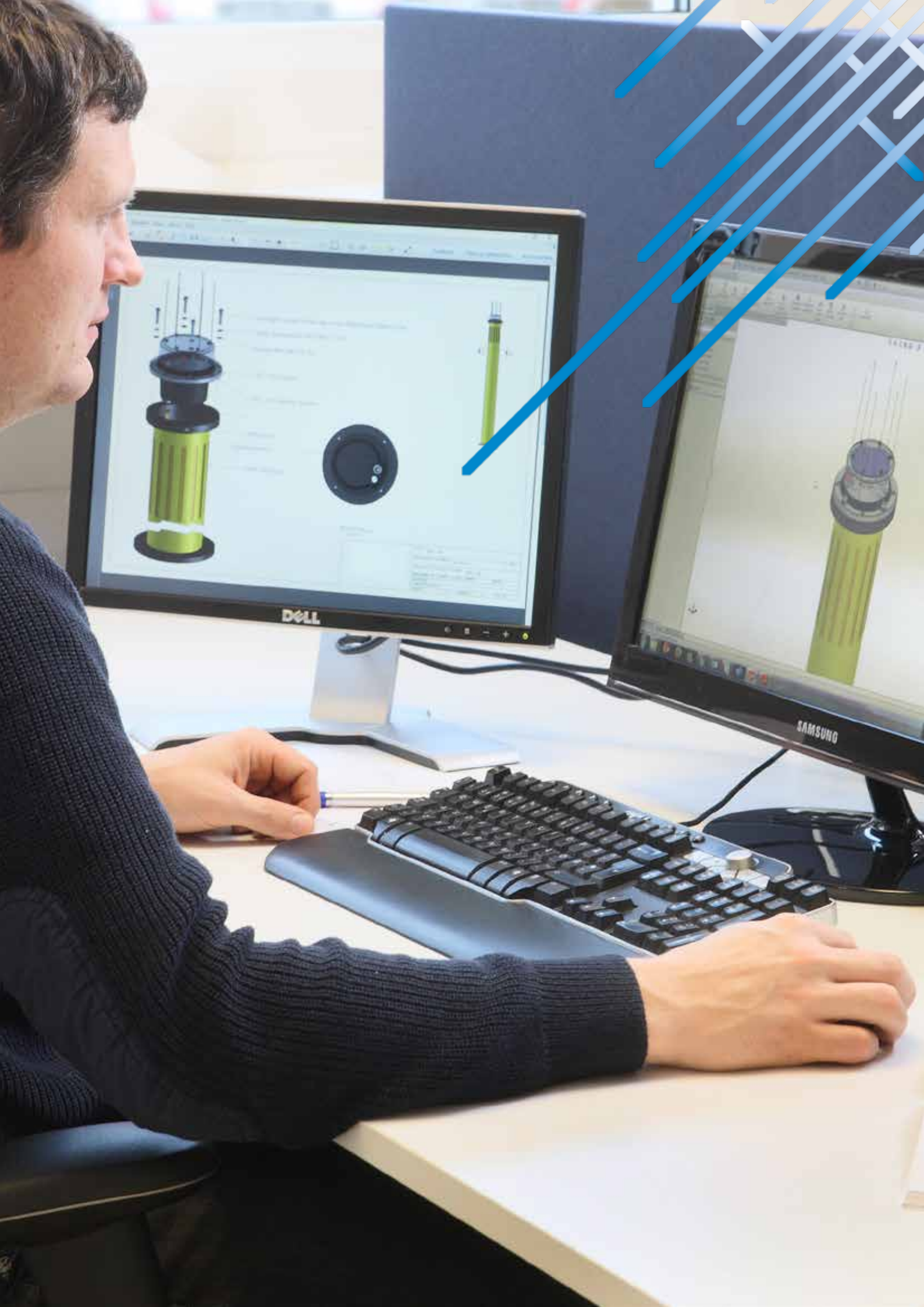
Size of Enclosure	600 x 800 x 300 mm
Degree of protection	IP 34
Battery installation area	760 x 250 mm
Weight	47 kg
Temperature range	-40°C...+140°C

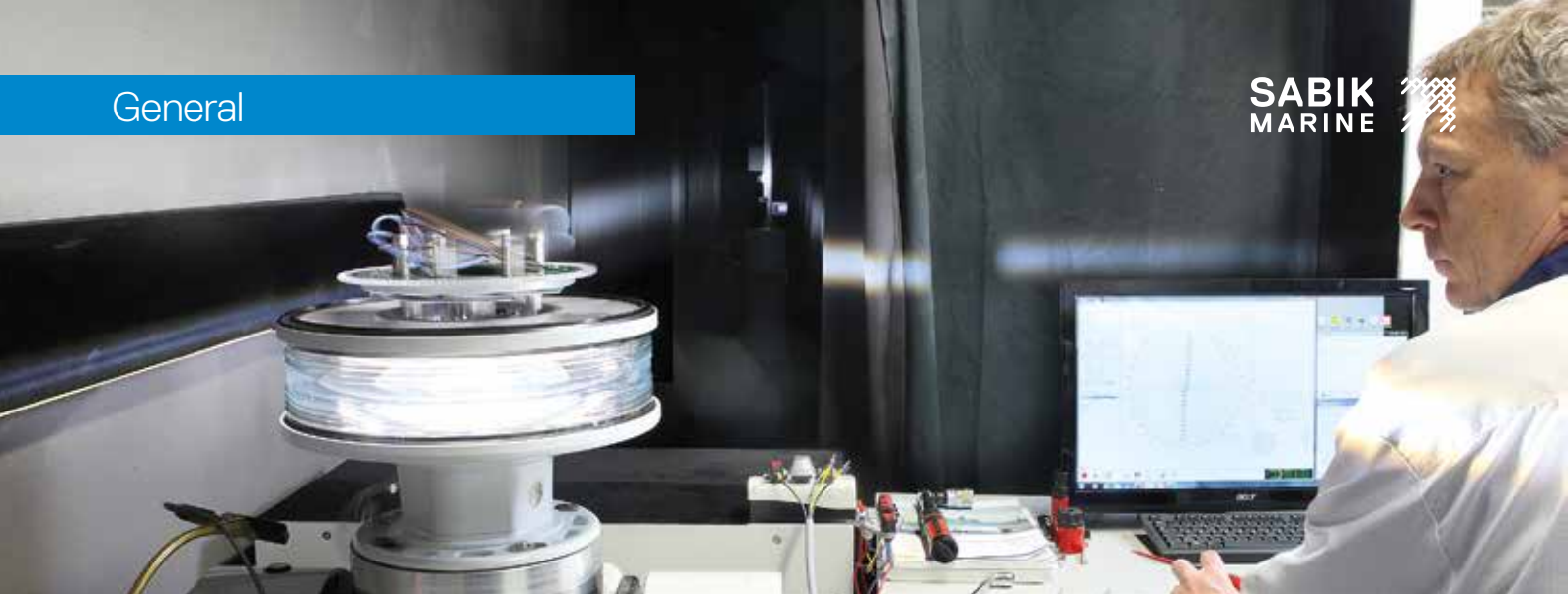
Engineering

We provide tailored solutions by customizing our high-quality lanterns to meet the specific requirements of our customers. In this way, we are able to ensure the correct and simple use of all the components needed for the marking of waterways. Mechanical and electrical interfaces are planned and adapted in close cooperation with our subcontractors and other project partners.

- Project management
- Aids to navigation design
- Electrical design and documentation
- Mechanical design, support structures
- Control systems
- Power management and supply




DELL
SAMSUNG



Quality and Environmental Policy

We are in the business of increasing and maintaining safety at sea. Reliability is at the core of our operations. As such, safety is and remains our main driver. Through our long experience and vigorous testing we provide high quality products made to defy the harshest environmental conditions, such as strong winds and high waves, drifting ice, hail, severe temperature fluctuations and months without daylight, never faltering and thus effectively preventing possible hazards.

Customer satisfaction is our second core value. Our success is only possible if our customers can rely on repeat performance. We continuously develop our products to be technically, functionally and economically competitive and of the highest quality in the industry. We are committed to meeting and even exceeding the expectations of our customers to ensure their satisfaction with our products.

Continuous learning and development underscores our business. We believe that technical skills and knowledge of our staff play a central role in satisfying the ever growing needs of our customers. We highly value personnel who are motivated towards continuous improvement and encourage ongoing career development by training our technical and support staff.


BUREAU VERITAS Certification

Certification

Oy Sabik Ab

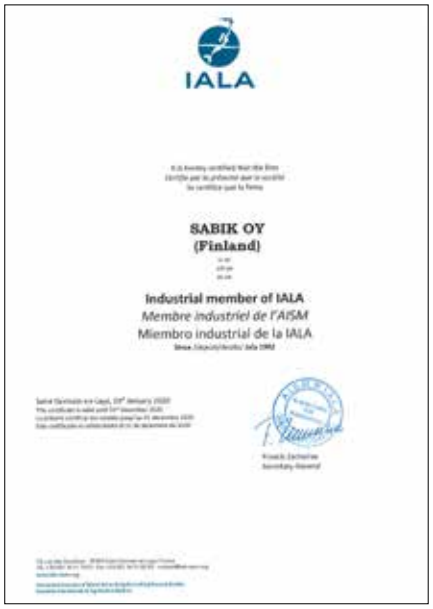
ISO 14001:2004


BUREAU VERITAS Certification

Certificate

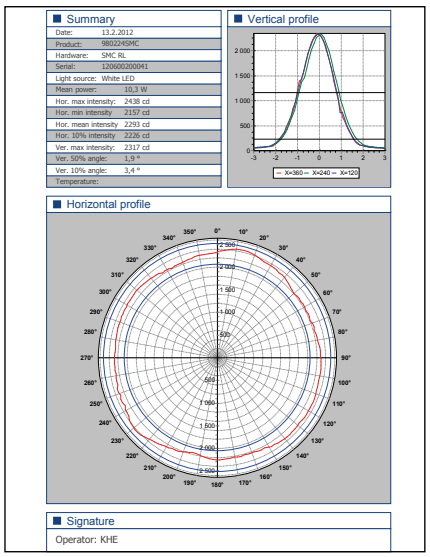
Oy Sabik Ab

ISO 9001:2008



We are able to execute to high standards by rigorously testing all equipment. We test lanterns for their optical performance as well as for the technical requirements set by the customer, by the industry and by our own internal standards. Sabik is an industrial member of IALA and actively contributes to the development of industry standards and technologies.

We are continuously developing our products to be technically, functionally and economically competitive and of the highest quality in the industry. These performance improvements also contribute to sustainability. Lower energy consumption results in longer service and battery replacement intervals, fewer visits to remote sites and smaller power supply components. All of this leads to a lower life-cycle cost.



Sabik Optical measurement range

Our commitment to quality is demonstrated by the fact that we measure the optical performance of all lanterns leaving the factory. Our optical measurement ranges are used for quality control but also as tools for continuous improvement. Data of each measured lantern are stored and can be retrieved for control and development purposes.

Appendixes

NOMINAL RANGE FOR NIGHT TIME

Table 1 Night time nominal range table (rounded off to the nearest nautical mile)

Range	Intensity	
	T=0,74	T=0,85
(NM)	(cd)	(cd)
1	1	1
2	5	4
3	15	10
4	36	21
5	75	38
6	147	64
7	270	102
8	477	157
9	816	234
10	1361	340
11	2225	484
12	3578	678
13	5675	937
14	8894	1278
15	13797	1726
16	21213	2310
17	32362	3068
18	49029	4046
19	73821	5304
20	110535	6914
21	164682	8968
22	244243	11580
23	360745	14890
24	530806	19074
25	778327	24349

NOMINAL RANGE FOR DAY TIME (Bright, overcast weather condition)

Table 2 Day time nominal range table (rounded off to the nearest nautical mile)

Range (NM)	Intensity (cd)
1	4650
2	25050
3	76200
4	182000
5	386000
6	752000
7	1383000
8	1383000
9	4180000
10	6970000

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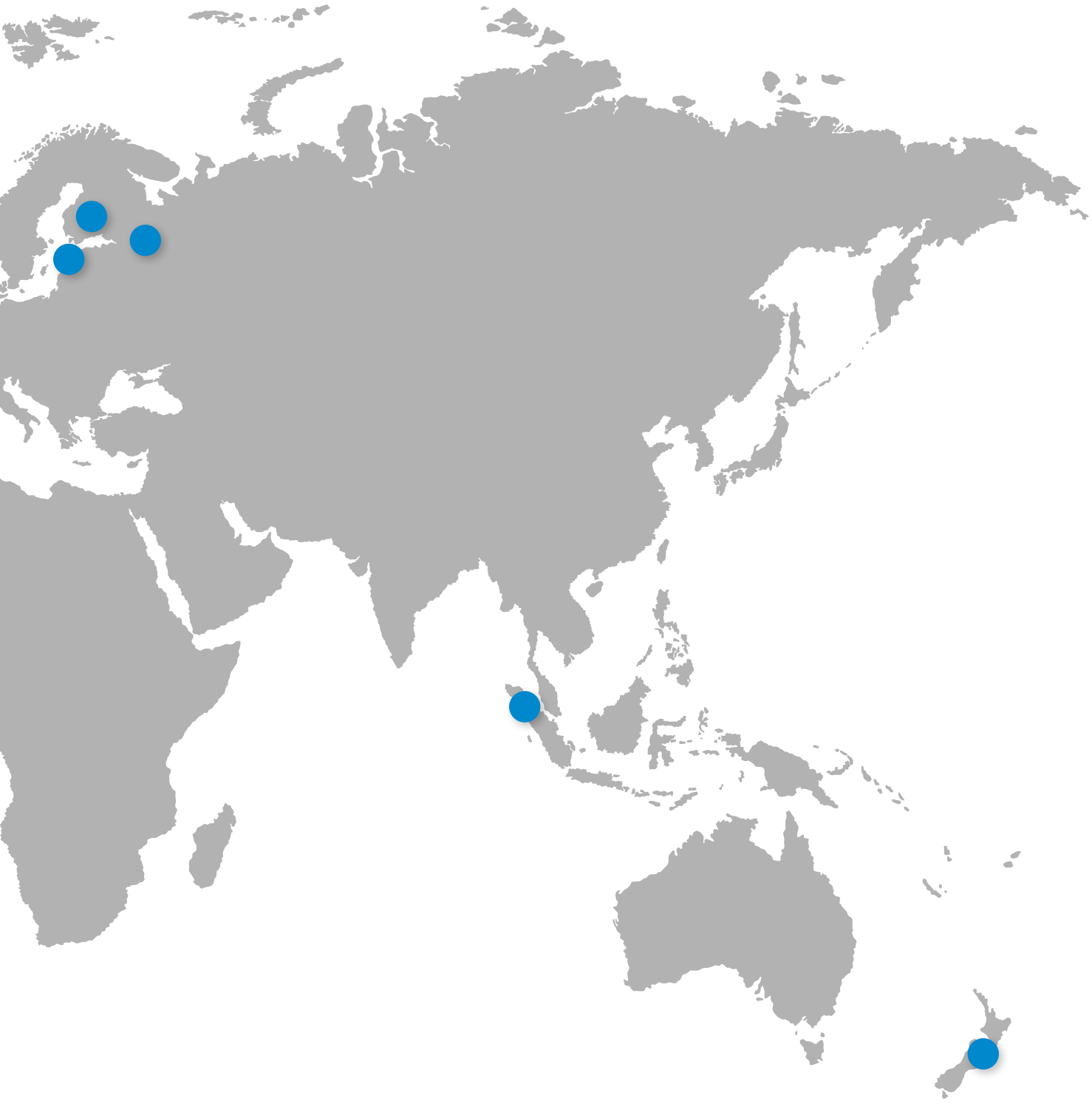

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