



JULIUS MARINE

User Manual

LED LOCK AND BRIDGE SIGNAL LANTERN

S145 LED

Version 07 / 2023

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Every person who is commissioned with the commissioning, operation, maintenance and repair of the signal lantern must have read and understood the operating instructions.



FOREWORD

With these operating instructions, we would like to give the user useful instructions for the safe and proper operation of the signal lantern S145 LED and enable professional maintenance.

LIMITATION OF LIABILITY

All technical information, data and instructions for the operation and maintenance of the signal lantern contained in these user manual are correct at the time of printing and are given to the best of our knowledge, taking into account our experience and knowledge to date.

We reserve the right to make technical changes as part of the further development of the signal lantern covered in this user manual.

Therefore, no claims can be derived from the information, illustrations and descriptions.

We accept no liability for damage and malfunctions caused by operating errors, non-observance of this user manual or improper repairs. We strictly point out that spare parts and accessories not supplied by us have not been tested and approved. Any liability for damage resulting from the use of non-original spare parts and accessories is excluded.

Opening sealed surfaces will invalidate the warranty / guarantee claims against the manufacturer. Furthermore, any unauthorised conversions and modifications to the signal lantern are not permitted for safety reasons and exclude any liability for resulting damage.

Claims for damages, regardless of the legal grounds on which such claims are derived, are excluded.

TERMS

Operator

The term "operator" refers to anyone who owns or is entrusted by the operator of the signal lantern with specific tasks relating to operation, running, maintenance, repair and other tasks.

Skilled person (specialist)

A "specialist" is defined as someone who, due to his technical training, has expert knowledge and experience as well as knowledge of the relevant regulations, accident prevention regulations and operating conditions and who can assess the work assigned to him and recognise and avoid possible hazards.

SAFETY

Safety instructions for maintenance, assembly and repair work

Before cleaning, maintenance and repair work, switch off the units and secure them against unintentional restarting.

Regularly check loose cables for damage. Have damaged cables replaced immediately. Connecting cables must be laid in such a way that they are protected against mechanical, chemical and thermal influences.

Selection of personnel and qualification

The personnel for operation and maintenance must have the appropriate qualifications for this work.

The area of responsibility, competence and supervision of the personnel must be regulated by the supervision of the operators.

Connection and repair work may only be carried out by qualified personnel.

SAFETY INSTRUCTIONS

Safety instructions classify situations as well as their type and severity of consequences if the measures to avoid the danger are not followed.



Warning

Warnings signal immediate hazards that may result in serious injury or death.



Caution

Cautions signal potential hazards that may result in minor injury or damage to the product.



Note

Notes provide relevant instructions for better and easier handling of the product. Furthermore, supplementary information on the product may be explained here.



TECHNICAL DATA

DIMENSIONS, WEIGHT AND ENVIROMENT

Dimension without lens hood	220 mm x 281 mm
Operating temperature	-25 °C – +50 °C
Storage temperature	-30 °C – +70 °C
Relative humidity	max. 98 %
Degree of protection	IP54 (according to DIN EN 60529)
Housing	seawater resistant
Weight	8 kg

LIGHT / ELECTRICAL DATA

Operating voltage	12-30 V _{DC}
Power consumption	4-20 W depending on the color and intensity
Standby current	1 mA
Light colour	red, green white (IALA optimum according to IALA Rec. E-200-1)
Electromagnetic compatibility	DIN EN 60945 DIN EN 50293-200

ELECTRICAL DATA

(Stationary luminous intensity for white light)

Light colour IALA Rec E-200-1	Luminous intensity I_0 (cd)	scattering angle at 50 % of I_0 Horizontal / Vertical (°) / (°)	scattering angle at 10 % of I_0 Horizontal / Vertical (°) / (°)
Red	8.000	8 / 8	20 / 20
Green	8.000	9 / 9	21 / 21
White	7.000	8 / 8	19 / 19

SETUP AND FUNCTION

Functional description

The signal lantern uses the latest LED technology to generate light. The individual high-performance LEDs are thermally and electronically monitored during operation. monitors to ensure optimal function.

When developing the signal, attention was paid to easy integration into control systems. Digital inputs are available for direct control, which can be used to switch on or off the lantern and can be used for dimming the light at night.

The failure of the lantern can be reported via an output, a broken cable can be detected by the system.

The lantern can be powered directly with 12-30 VDC. Expensive current monitoring relays can be omitted.

The intensity of the signal and thus also the power consumption can be adjusted. This allows the signal to be optimally adapted to the task to be performed. The optionally available power resistor, which simulates a higher power of the signal and thus allows evaluation in existing systems, is used for integration into existing systems.

The night reduction of the signal is activated as soon as the supply voltage falls below

≈14.5 VDC. Until then, the intensity of the day mode will be used. The intensity in night mode can be adjusted in four stages. The signal switches back from night mode to day mode when the supply voltage exceeds ≈16.5 VDC.

Day setback

The daytime reduction can be selected in three stages in order to meet the respective requirements of the location of the lock signal.

Night reduction

The night reduction can be selected in four stages in order to meet the requirements for the surrounding scattered light. The night reduction refers to the value of the day reduction, i. H. with a day and night reduction of 50 % each, the intensity of the signal is then reduced to 25 % in nighttime operation.

Digital inputs / outputs

Two digital inputs can be used for control by a PLC. A digital output can be evaluated via a PLC. All I / Os are designed with safety in mind, so that cable breaks can be detected immediately.

Flashing operation - direction indicator

The lantern can be operated flashing via the ON / OFF input signal. It must be noted that with switch-on times < 1s, the LED error detection can no longer work correctly. In this case, defective LEDs may no longer be correctly identified. In flashing mode, the

monitoring switches off the signal after approx. 5.5 minutes in the event of an error. In the de-energized state, error states are not saved.

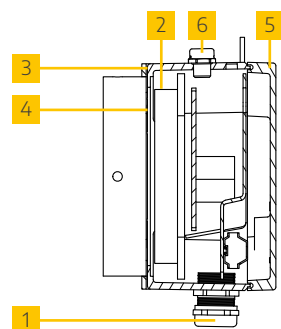
Diagnosis

A microcontroller manage the internal control of the signal and the complete diagnosis of the individual functions. The controller itself is monitored internally by special circuit parts so that an error can be detected.

COMPOSITION

View of the lock signal lantern

- 1 cable entry
- 2 LED insert
- 3 signal lantern
- 4 cover glass
- 5 housing cover
- 6 pressure compensation element

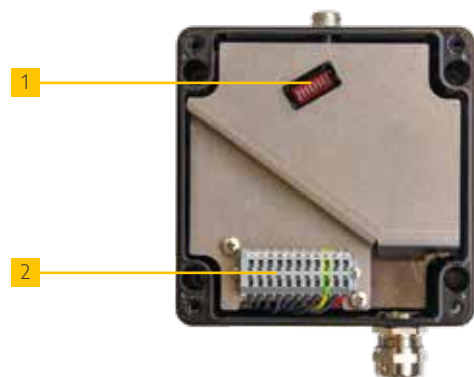


Front view of LED insert



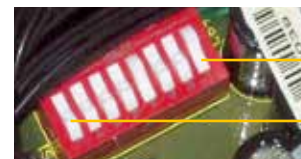
View of LED insert inside

- 1 DIP switch
- 2 Terminal strip for connecting the supply and control voltages



Assignment of DIP switches (standard version S145-LED)

	SETTING	FUNCTION
1	1	lock signal
2	0	Signal shutdown on LED error → disabled
	1	Signal shutdown in case of LED error → activated
3	0	Lantern input ON / OFF inverted (input active → signal OFF)
	1	Lantern input ON / OFF inverted (input active → signal ON)
4,5	0,0	Night mode 1 – 25 %
	1,0	Night mode 2 – 50 %
	0,1	Night mode 3 – 10 %
	1,1	Night mode 4 – 3 %
6,7	0,0	Day mode 1 – 100 %
	1,0	Day mode 2 – 70 %
	0,1	Day mode 3 – 50 %
	1,1	n. b.
8	0	4 strings
	1	8 strings



Switch 2 activates or deactivates the signal shutdown if one or more LEDs fail. If the signal switch-off is activated, if one or more LED strings fail, the signal would switch off and the error output would be activated (behaviour as with a signal with a light bulb). If the signal is deactivated and one or more LED strings fail, the signal would continue to light up and the error output would be set.

Switch 3 is used to set whether the control input signal ON / OFF is operated non-inverting or inverting. Night mode is selected with switches 4 and 5. In night mode 1, the intensity is reduced to a level of 25 % of the day value, mode 2 to 50 %, mode 3 to 10 % and mode 4 to 3 %. Day mode is selected with switches 6 and 7. In day mode 2, the intensity is reduced to a level of 70 % and mode 3 to 50 %. In mode 1 there is no reduction. Switch 8 is used to set the number of power sources used. The setting depends on the configuration of the LED circuit board.

Assignment of DIP switches (special variant S145-LED SW-1.0.5)

	SETTING	FUNCTION
1	1	lock signal
2,3	0,0	1 string defective
	1,0	2 strings defective
	0,1	3 strings defective
	1,1	4 strings defective
4,5	0,0	Night mode 1 – 25 %
	1,0	Night mode 2 – 50 %
	0,1	Night mode 3 – 10 %
	1,1	Night mode 4 – 3 %
6,7	0,0	Day mode 1 – 100 %
	1,0	Day mode 2 – 70 %
	0,1	Day mode 3 – 50 %
	1,1	n. b.
8	0	4 strings
	1	8 strings

Switches 2 and 3 are used to set the number of defective diode strings at which an error in the lantern is reported and the lantern switches itself off. Depending on the configuration of the signal, one or two diodes are operated by one string.

Night mode is selected with switches 4 and 5. In night mode 1, the intensity is reduced to a level of 25 % of the day value, mode 2 to 50 %, mode 3 to 10 % and mode 4 to 3 %.



Note

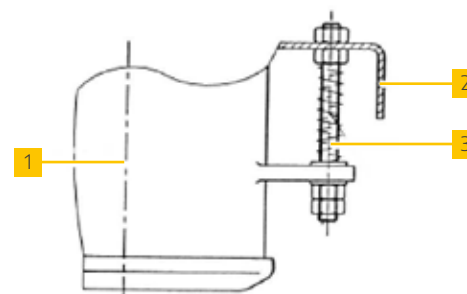
In the S145-LED SW-LB variant, the signal activation can be inverted via the "Signal ON / OFF" input.

Day mode is selected with switches 6 and 7. In day mode 2, the intensity is reduced to a level of 70 % and mode 3 to 50 %. In mode 1 there is no reduction. Switch 8 is used to set the number of power sources used. The setting depends on the configuration of the LED circuit board.

ASSEMBLY

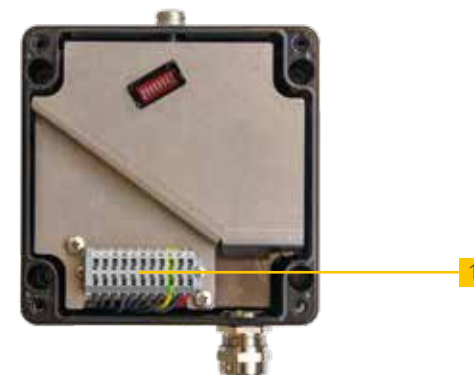
In order to fasten the lock signal lantern (1) to the lock signal group (2), the three supporting bolts (3) must first be mounted in the pre-punched holes in the lock signal group (2). Mount the support bolts (3) on the lock signal group (2) as shown in the sketch.

The signal lanterns (1) are inserted from the back of the lock signal group (2) through the openings of the lock signal group (2) and screwed to the three supporting bolts (3). The barge is fastened to the front of the lantern. The lantern can be moved in the desired direction with the three supporting bolts (3) and fixed.



Electrical connection of the lock signal lantern

The connecting cable must be wired according to the assignment below.



Electrical connection

The supply and control cable is inserted through the screw connection into the lock lantern. The electrical connection is made at the terminal strip. The terminal strip is designed as a spring contact terminal. With a suitable tool, the terminal is opened by pressing from behind, the cable can be inserted from below.



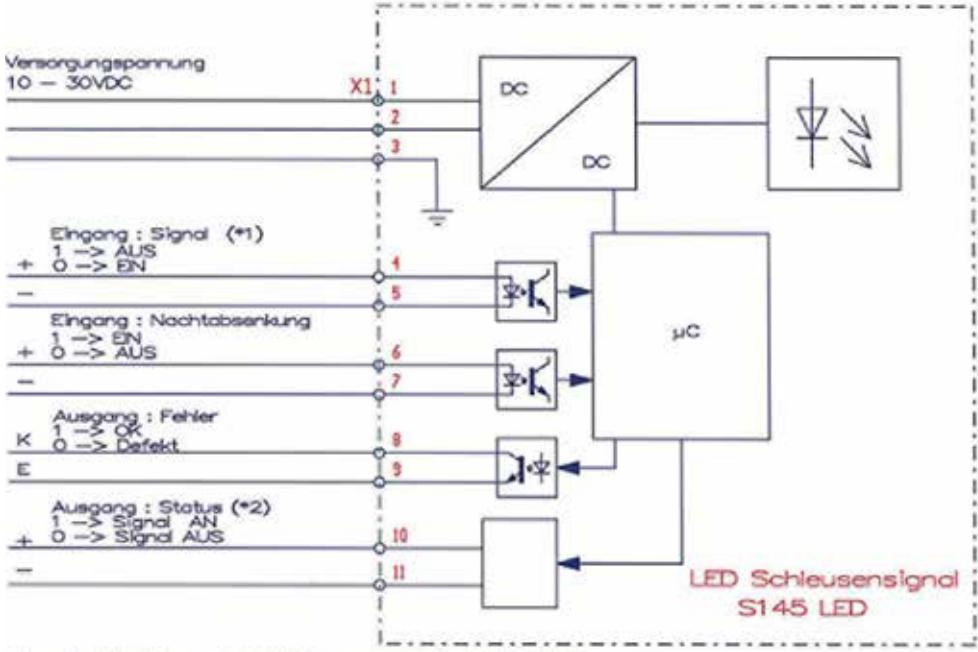
Warning

The electrical connection may only be carried out by a trained specialist! The regulations of the local energy supplier must be observed.

ASSIGNMENT OF THE CONNECTING CABLE

Service number	Function
1	U_{bat} operating voltage +24 V _{DC}
2	U_0 operating voltage 0 V _{DC}
GN / YE (3)	Equipotential bonding
4	Plus signal voltage Lantern On
5	Minus signal voltage lantern on
6	Plus signal voltage night reduction
7	Minus signal voltage night reduction
8	Output error collector
9	Output error emitter
10	load resistor (optional)
11	load resistor (optional)

Electrical connection



Hinweis : Eingänge potentialfrei; spannungsfest bis 30VDC
 (*1) : optional auch invertiert ausgeführt (Sondersoftware bei der Bestellung mit angeben)

The load resistance output is activated at the same time as the LEDs of the S145-LED signal, i. H. this signal can also be connected to a PLC for evaluation purposes. there is

- Terminal 10 plus (power supply +)
- Terminal 11 minus (-)

In order to measure a correct signal, terminal 10 and terminal 11 must be terminated. To do this, a resistor of 10-50k ohms must be fitted between terminals 10 and 11.

INSTALLATION

The lock signal lantern is put into operation by switching on the supply voltage.

MAINTENANCE

The lock signal is based on the latest LED technology. The electronics are therefore completely maintenance-free.

Maintenance refers to regular cleaning of the cover lens. Standard cleaning agents should be used for this. It must be ensured that the protective coating of the housing is not attacked by the cleaning agent.



Note

A simple soapy solution is recommended.

SPARE PARTS

Support bolt group	4-S145LED-MSet
Barge with strap	4-S145LED-SS

TROUBLE SHOOTING

The lock signal lantern is inactive despite correct wiring.

Caused

If the electronics detect more defective strands than specified (DIP switches), it switches the LEDs off. The following measures can then be used to restart:

- Remove power supply for at least 5 minutes and then switch on again.
- Give an OFF signal to "Signal voltage lantern ON" (terminals 4 and 5) for > 5 seconds.

The lock signal lantern does not switch off the lantern despite defective LEDs.

Problem 1

The electronics only switch off the S145 LED when more defective strands than specified (DIP switches) have been detected.

Solution 1

Check DIP switch position.

Problem 2

In flashing mode, in the event of an error, the electronics switch off the lantern after approx. 5.5 minutes. In continuous light operation, the electronics switch off the lantern after approx. 2.5 minutes in the event of an error. The

error states are not saved when the power is off. If the supply of the lock signal lantern is only switched on for a short time, then the switch-on time may be too short for the fault detection to intervene.

Solution 2

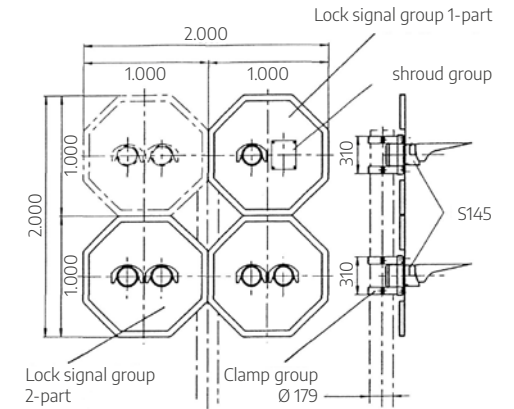
Increase the duty cycle (>2.5 or 5 minutes). Or: Apply the supply permanently and switch the lock signal lantern on and off via the "Signal voltage lantern on" input.

Problem 3

DIP switch S2 not set correctly.

Solution 3

Set DIP switch S2 to 1, remove the power supply for at least 5 minutes and then switch on the signal again.



APPENDIX

Site of installation

The signal system mast for mounting the lock signal lantern must be firmly mounted on a foundation that is designed for these needs. Depending on the requirements, the lock signal groups are fastened to the mast with the clamp groups at the top of the mast. The fastening screws for the clamp group are pre-assembled in the lock signal group.



Warning

The foundation of the signal mast must have sufficient strength.



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