

Piktronik

GD3

Display

User's Manual



GD3 Display

Version 1.3, May 2024

Piktronik d.o.o. is the exclusive holder of the copyright of this document. No part or all of this document may be reproduced, stored, or presented in any form without the prior written consent of Piktronik d.o.o..

Printed in Slovenia

© 2024 Piktronik d.o.o.

Contents

1	Foreword.....	4
2	Introduction	6
3	Explanation of symbols	6
4	Notifications	8
5	Technical Data	9
6	Mounting of GD3.....	10
6.1	GPS antenna	11
7	GD3 connections.....	13
8	Driving mode and charging mode	14
9	Display	15
9.1	Main screen	17
9.1.1	GPS error – speed not measured	18
9.2	Battery screen (Driving mode)	19
9.3	Battery screen (Charging mode)	21
9.4	Power screen (Driving mode).....	22
9.5	Power screen (charging mode)	23
9.6	Setting the brightness of your screen.....	24
9.7	Open the Settings screen.....	24
9.8	Settings screen	25
9.9	Info screen	26
9.10	Calibrate the control lever	27
9.11	Enabling high-power charging.....	28
9.12	Dual system operation	30
9.13	Error / Warning window container	33
9.14	Display – list of errors.....	35
9.15	Display – list of warnings.....	39
10	Contained in the box	42
11	Maintenance	42
12	Disposal	42
13	Warnings.....	43
14	Declaration of conformity	43
15	History.....	44

1 Foreword

Dear Customer,

We are pleased that you have chosen our product, GD3 display. Your GD3 is a cutting-edge device, enabling the control of the power system with a simple touch.

The design and manufacturing were performed carefully and the device was thoroughly tested. User friendliness, reliability and safety are built into the design.

This manual has been compiled to help you to operate your device and craft with safety and pleasure. It contains details of the device and information on its operation, set up, and maintenance.

This owner's manual provides information necessary for the safe use of the craft, equipment and systems. It draws a particular attention to set up, maintenance, regular operation, prevention of risks and risk management with due consideration for the environment.



Please read the instructions carefully and familiarize yourself with the device before first commissioning and keep the instructions for future queries.

This owner's manual is not a detailed maintenance or trouble-shooting guide. In the case of difficulty, refer to the equipment distributor, boat builder or boat builder's representative.



The manufacturer accepts no liability for any consequences resulting from inappropriate, negligent or incorrect installation or adjustment of the device and its parameters.

Always maintain your GD3 properly and consider the deterioration that will occur over time and as a result of heavy use or misuse.

The contents of this guide are believed to be correct at the time of printing. In the interests of a commitment to the policy of continuous development and improvement, the manufacturer reserves the right to change the specification of the product or its performance or the contents of the guide, without notice.

Piktronik is constantly working on the improvement of its products, therefore some features of the device, especially software related ones, can be changed. This product is supplied with the latest version of software at the time of delivery and will fit the rest

of the system without any problems. If this product is to be used in a new or existing system with other drives, there may be some differences between their software and the software in this product. These differences may cause this product to function differently.

In case of any problems with the product, please do not hesitate to contact us. For that purpose, the contact data of our company is on the last page of this document.

Please, for the sake of the environment, once the device is replaced or discarded, dispose it in a safe way obeying the local rules for the disposal of electronic equipment.

Your Piktronik Team.

2 Introduction

These instructions describe the functions of the GD3 display. GD3 is a displaying (monitoring by user) device and not a control device. The touchscreen is used on order to enable the user to observe different parameters of the device and not to alter them. The available settings on the device are only applicable for the alteration of operation parameters of GD3 as well as the changing of modes and units.

3 Explanation of symbols

The following symbols and signs will be used in the user manual.



Warning



Refer to the instruction manual/booklet



Disconnect before carrying out maintenance or repair



Do not spray with water



Not to be serviced by users



Touch screen (color is different based on direction or order of change)



Touch screen and swipe down



Touch the screen and swipe right



Touch the screen and swipe left



Touch the screen and swipe up



Touch the screen and hold for indicated time (4 seconds in presented case)

4 Notifications

- Read this user manual carefully before you operate your GD3
- You must read and apply with the safety and warning information in this manual
- The data indicated on your GD3 device is within the precision required by relevant international standards and rules, but it is only the display and the measurement is performed on other devices. The manufacturer does not give a warranty for the validity of the data indicated nor does it accept any liability for wrong indication in the case of wrong or faulty connection of cables.
- Failure to comply with the instructions in this manual can result in damages on the device. Piktronik accepts no liability for damage caused by actions that are contrary to these instructions.
- The measurement of speed is performed using GPS data, which can be wrong or not displayed if the satellites are not in the range of the antenna. Piktronik accepts no liability for wrong speed data resulting from a wrong or faulty connection between the antenna and GD3.
- Use other than, or going beyond, that defined in the user manual is deemed to be unintended use. The operator bears the sole responsibility for damage arising from unintended use, and Piktronik accepts no liability for such use.



Particular safety regulations may apply to certain activities. Safety and warning information for these activities is to be found in the relevant sections of the instructions.



Disconnect before service and repair!



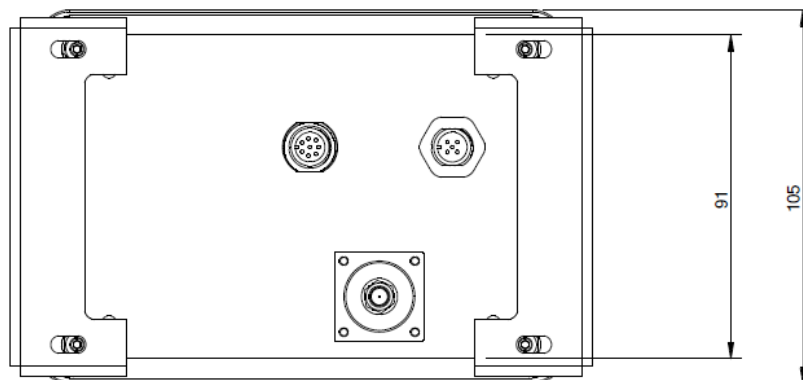
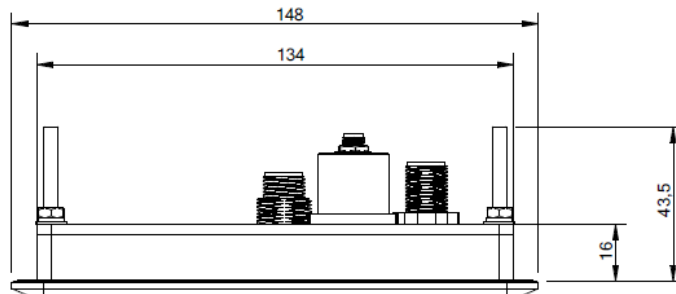
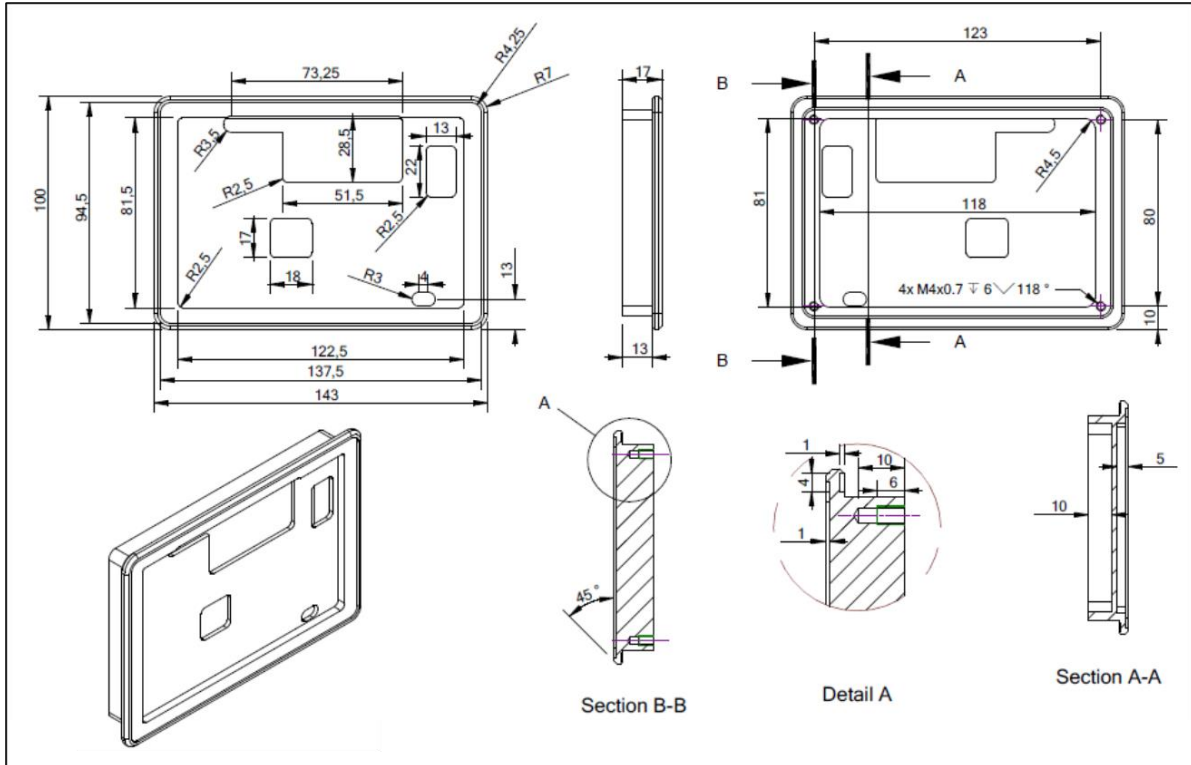
Do not try to service the broken or malfunctioning device yourself, there is nothing you can do! Contact the distributor.

5 Technical Data

Model	GD3
Display type	IPS capacitive touch display
Max. brightness	1000 cd/m ²
Voltage	9 – 18 V
Max. current	250 mA
Ambient temperature range	-20 °C – 50°C
Storage temperature range:	-25°C – 80°C
Dimensions (L x B x H)	148 x 105 x 50 mm
Weight	460 g
Environment protection	IP65

6 Mounting of GD3

The measures of the device are in the figure below. Please consider them when preparing the boat for mounting of GD3.



Dimensions of the GD3 (for mounting)

The following instructions shall be taken into account at the mounting of the GD3:

- GD3 should be securely mounted on a flat surface where it can be clearly observed by the user.
- The position and orientation of the GD3 are not important, but it should be easily accessed and clearly visible for user.
- There should be enough space so that the cables for the boat electronics and antenna can be connected without excessive bending or pulling.
- The GD3 should preferably be mounted in a dry environment.
- Do not drill holes on the housing, as components can be damaged or dust and water sealing breached!



Do not spray the device with water. Cleaning with high pressure is not allowed.

6.1 GPS antenna

Your GPS antenna comes with the SMA connector, with a screw-type coupling mechanism. Connect it to the dedicated connector on GD3. No excessive force is required.

For the best results, the antenna should get a clear view of the sky, with no obstacles in its way, to receive signals from GPS satellites. Ensure that there is a clear path to the sky from your GPS antenna.

Wood in combination with water (wet wood) and steel are good blockers for GPS signals. Fiberglass and glass do not typically block GPS and other signals. Also, the human body is a formidable obstacle for the antenna, so the antenna should be positioned in a position where the direct view of the sky is unobstructed by human bodies.

Do not mount it in the shadow of obstructions, or close to any bars (especially metallic) or radio antennas. Be sure to not have lots of wiring running above the GPS antenna. The antenna should be in an area where it will be minimally affected by multi-pathing; that is receiving unwanted reflected signals from the structure of your boat.

NMEA (USA National Marine Electronics Association) recommends 90 cm of separation between GPS antennas and most other antennas including VHF, cellular and Wi-Fi antennas. In case of radar on the boat place the GPS antenna well above or below the radar beam.

Unlike other antennas, you want to keep your GPS antenna closer to deck level. If it is installed high up on a mast or arch and you are in rough seas, the GPS will give inaccurate readings for the course over ground and speed over ground.



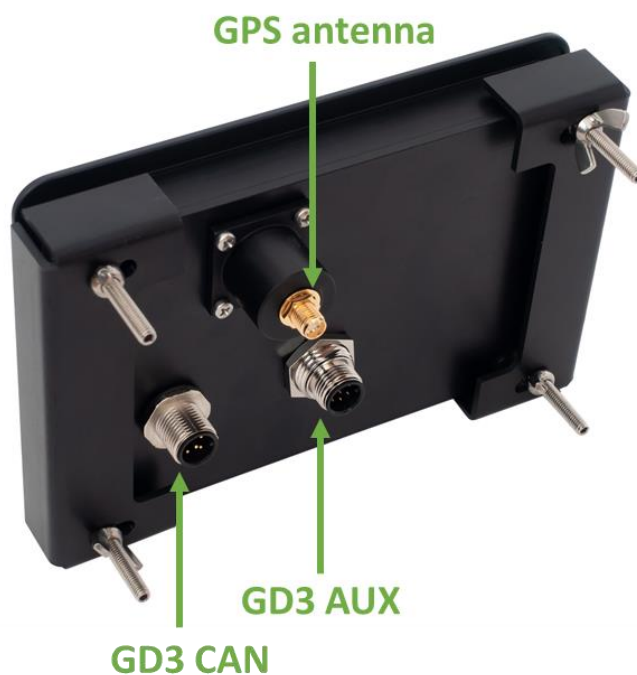
GPS antenna, contained in the box (ANTDOM-05-01-WPM GPS Antenna)

7 GD3 connections

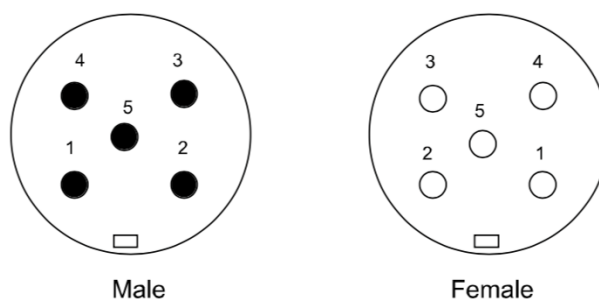
GD3 has three connectors on the backside (see the figure below):

- GD3 CAN – CAN Bus connector
- GD3 AUX – Auxiliary connector
- GPS antenna – Connector for the active GPS antenna

In Piktronik systems you only need to connect GD3 CAN connector, which must be connected to CAN network of your boat and GPS antenna for the GPS data. For faster GPS positioning, it is recommended to connect the GD3 AUX connector as well to permanent 12V power.

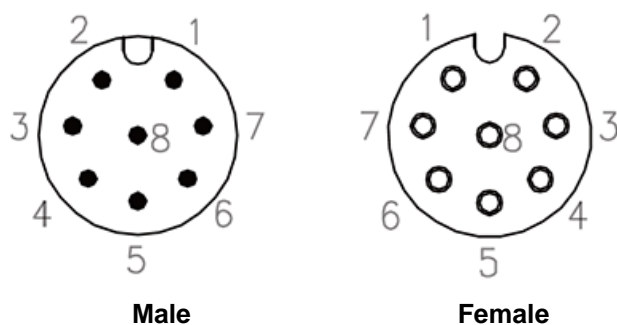


GD3 backside



GD3 CAN, 5-pin connector cable, M12

1. SHLD; optional CAN shield,
2. CAN_V+, NET-S; positive power supply,
3. GND, NET-C; CAN ground,
4. CAN_H, NET_H; CAN_H bus line,
5. CAN_L, NET_L; CAN_L bus line (dominant low).



GD3 AUX, 8-pin connector cable, M12

1. +12VBAT, +12V power supply,
2. +12VOUT, 12V output – switched,
3. ON-OFF input,
4. IO_ECO1, input / output (programmable),
5. IO_ECO2, input / output (programmable),
6. IO_AN1, analog input (programmable),
7. IO_AN2, analog input (programmable),
8. GND, ground.

8 Driving mode and charging mode

Driving mode is displayed when the boat is in normal operation, either driving or at standstill.

Charging mode is displayed when the boat is charging. During that time, the boat shall not be moved. For the high-power charging read the instructions in the following chapters.



Particular safety regulations may apply during charging.



Read the user manual of the charger!

9 Display

There are five screens available for GD3 display. The first screen is what you see at the *Start-up screen*. It is displayed when you turn on the device. The picture below shows the Piktronik logo. The boat manufacturer's logo may alternatively appear on the screen. When this screen is displayed, do not try to use the device, since the display is initializing and it is not programmed to accept any commands in that phase.



Start-up Logo Screen

After few seconds the screen changes to the *Main screen*.



Main screen – default screen after startup

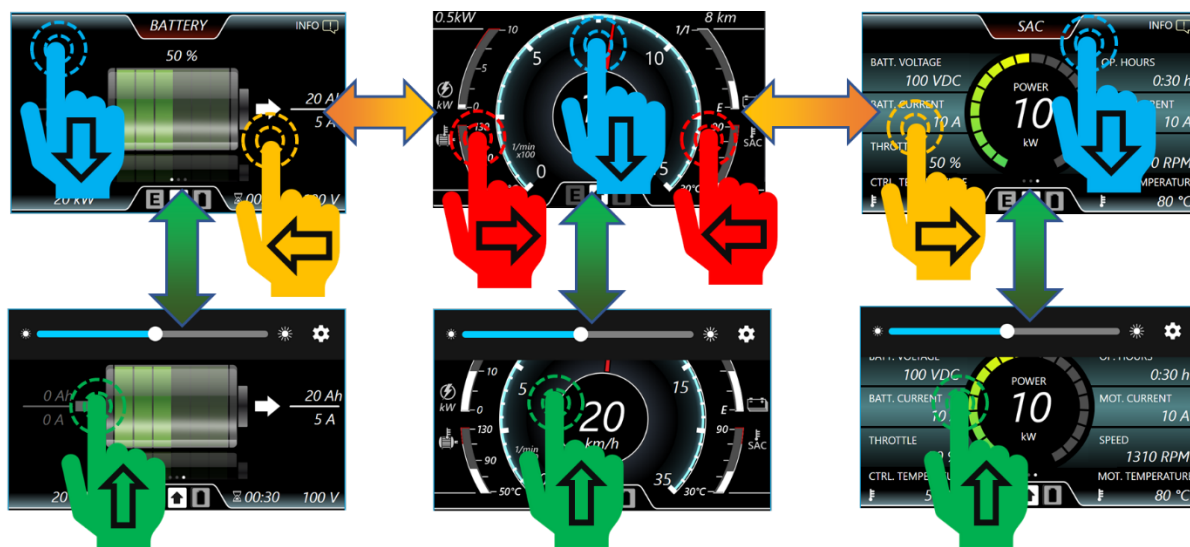
The *Main screen* is not the only screen available. There are three screens describing normal operation and two additional screens enabling changes of screen settings and error handling. Additionally, there are two screens which appear during the charging. Exchanging of the screens is presented below. The touch screen enables it with the swipe of the finger from left to right, right to left, up to down and down to up motion.

In *Driving mode* six (6) screens are available. In fact, these are three (3) screens; with only the top of the screen being changed for the purpose of changing the brightness and settings of the display (you might be familiar to this from your mobile phone where it is called *Quick settings*).

You can move between screens by swiping them left and right. The settings of the display can be changed by touching the top of the screen and swiping down.

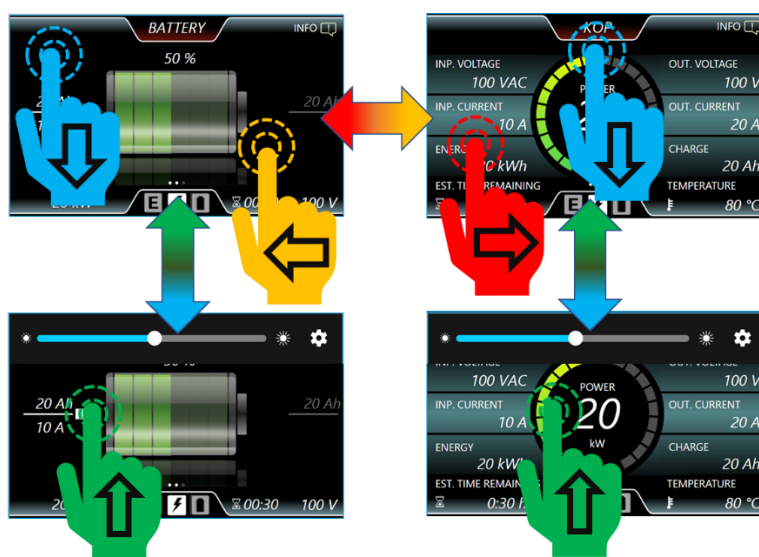
The three main screens in *Driving mode* are:

- Battery screen,
- Main screen, and
- Power screen.



Driving mode - Changing the screen by swiping the finger

In charging mode there are four screens, again two screens with additional changing of settings. You can move between screens by swiping from left to right or right to left and change the settings by touching the top of screen and swiping down.



Driving mode: Changing the screen by swiping the finger (charging mode)

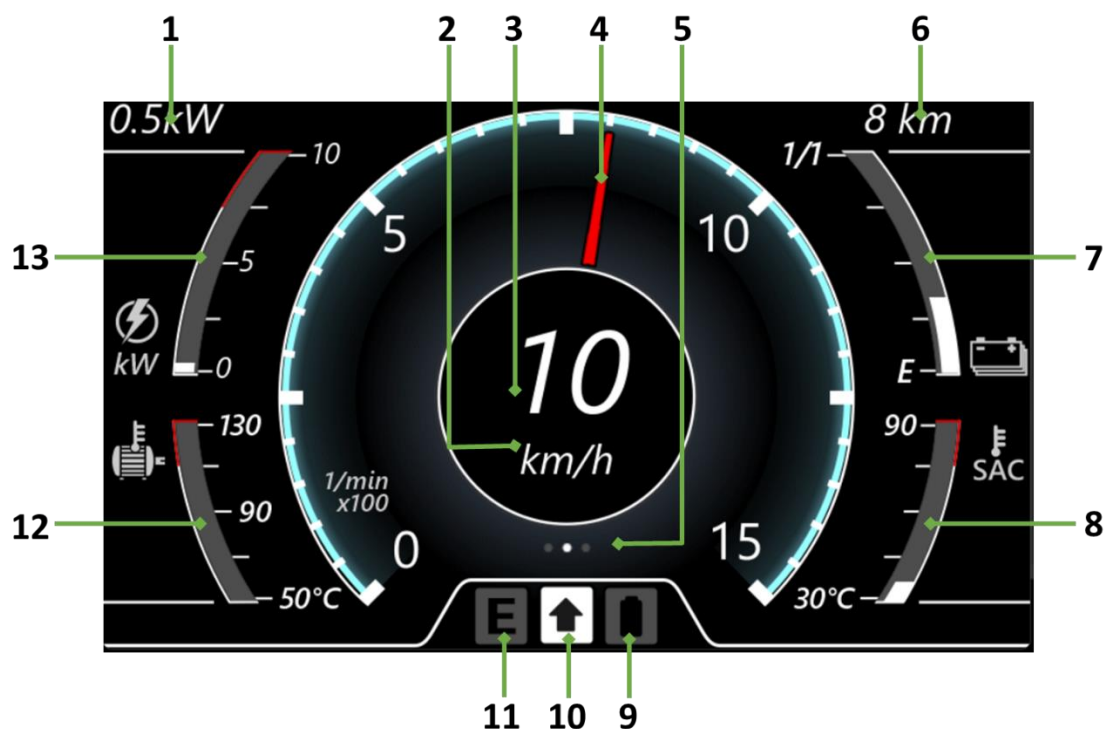
In addition to these screens there are also other screens, which indicate errors or warnings in the operation of your device.

All screens will be described in details in the following text.

9.1 Main screen

Main screen is used in the Driving mode, when the boat is in normal operation, either driving or at standstill.

The data displayed on the screen in this mode is shown below. The units (limits) indicated can be different depending on the boat.





Main screen - data

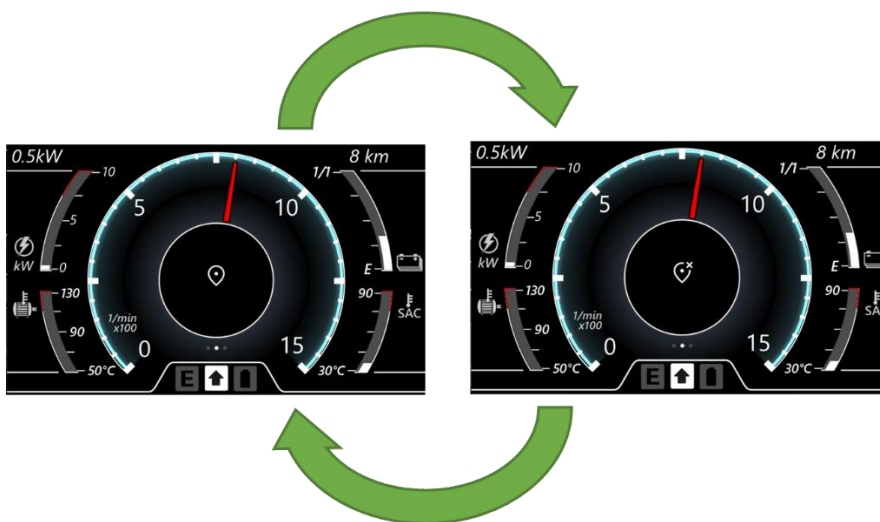
1. Battery power (in kW)
2. Unit for the speed indication (km/h or knots)
3. Speed of the boat (in km/h or knots)
4. Revolutions per minute (rpm) of the motor, gauge
5. Page indicator
6. Remaining range for operation (in km or miles)
7. State of Charge of the battery gauge (in percentage, %)
8. Inverter temperature gauge (in °C)
9. Low battery indicator (lighting when battery is low)
10. Direction of driving indicator (indicates direction forward or backward, N for neutral)
11. Economy mode indicator

12. Motor temperature gauge (in °C)

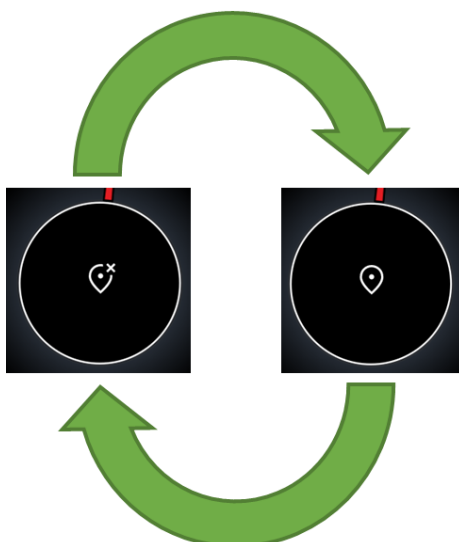
13. Power gauge (in kW)

9.1.1 GPS error – speed not measured

If the antenna is not connected or the signal is obscured, the measurement of speed cannot be performed. This is indicated on the *Main screen* by exchanging of this icons  (GPS data not available) to this  (GPS data available) in the middle of the screen, where the speed value should be. As the GPS-signal can go off and on again and again, the icons are in steady exchange.



Speed display change when the GPS data is not available



Speed display when the GPS data is not available (detail)

Additionally, to the icon the error information is displayed.



Error display in the case of missing GPS signal

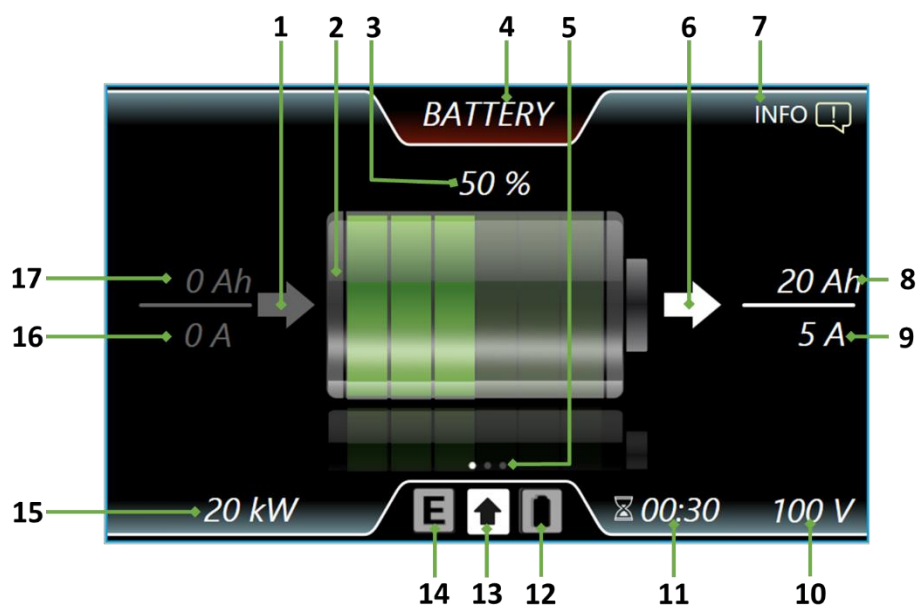
It is possible to exit the screen by clicking "BACK", but the error remains.



In case of *No GPS signal* error check the connection of the antenna. If the receipt from the satellites is not available, this is not a critical error.

9.2 Battery screen (Driving mode)

The *battery screen* shows an overview about the status of the battery. While driving (driving mode is activated) the screen displays data for discharging and charging of the battery. The overall information of the battery such as percentage of charge level and the visualized state of charge gauge (green blocks in the middle of the screen) is still visible. In the *Driving mode* the charging current and power are darkened, because charging while driving the boat is not available.

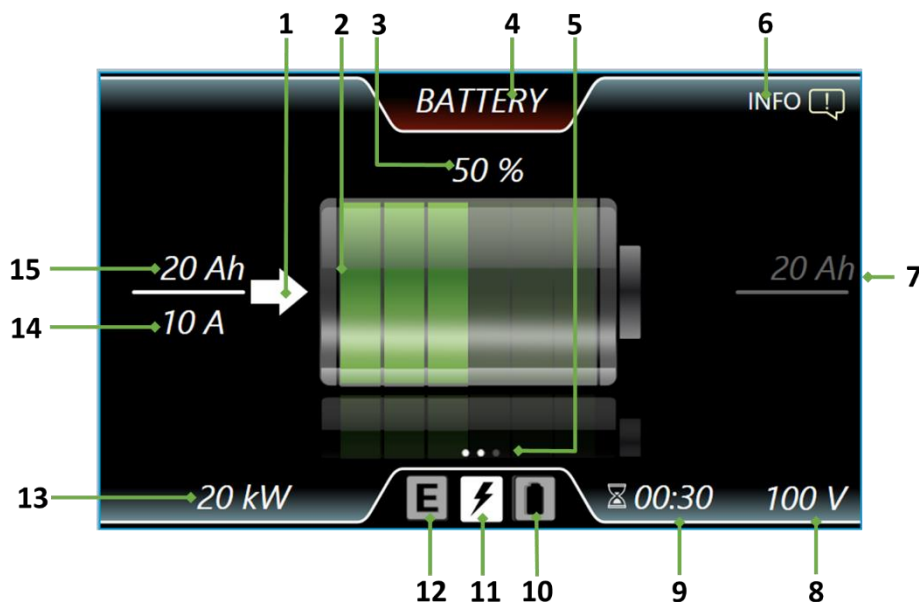


Battery screen in Driving mode – data

1. Charging indicator
2. State of Charge gauge (in percentage, %)
3. State of Charge value (in %)
4. Screen title (BATTERY)
5. Page indicator
6. Discharge indicator
7. INFO field – to be clicked for additional information
8. Remaining battery capacity (in Ah)
9. Discharge current (in A)
10. High Voltage battery voltage (in V)
11. Remaining operation time (in hours:minutes)
12. Low battery indicator
13. Direction of driving indicator (indicates direction forward or backward, N for neutral)
14. Economy mode indicator
15. Battery power (in kW)
16. Charging current (in A)
17. Charged capacity (in Ah)

9.3 Battery screen (Charging mode)

In *Charging mode*, the data for charging of battery as well as the present status of the battery is displayed. The state of the battery like the remaining charge level (percentage) and gauge (green blocks in the middle) is displayed. In the *Charging mode* the discharging current and power are hidden, because charging while driving the boat is not available.



Battery screen in Charging mode - data

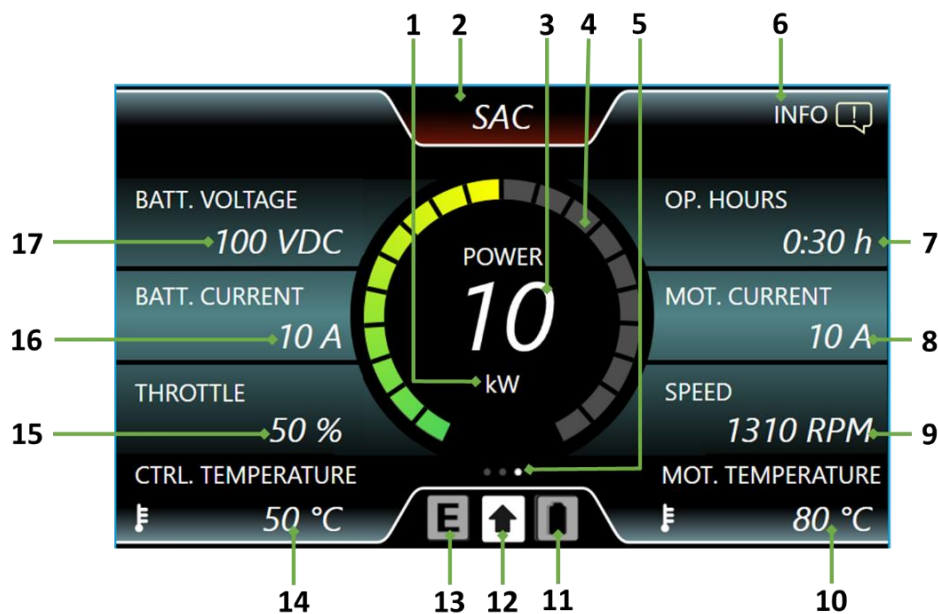
1. Charging indicator
2. State of Charge gauge (in percentage, %)
3. State of Charge value (in %)
4. Screen title (BATTERY)
5. Page indicator
6. INFO field – to be clicked for additional information
7. Remaining battery capacity (in Ah)
8. High Voltage battery voltage (in V)
9. Estimated remaining charging time (in hours:minutes)
10. Low battery indicator
11. Charging indicator (connector to power grid)
12. Economy mode indicator
13. Battery power (in kW)
14. Charging current (in A)
15. Charged capacity (in Ah)

9.4 Power screen (Driving mode)

In the *Power screen* the power data of the electric boat is displayed. Again, the screens differ slightly between driving and charging mode.

In the *Driving mode* the screen title is set to “SAC” and the battery, inverter and motor data, especially the power indicator and power gauge, are displayed.

If the power gauge is in the red area make sure that the motor and inverter do not overheat.



Power screen in Driving mode – data

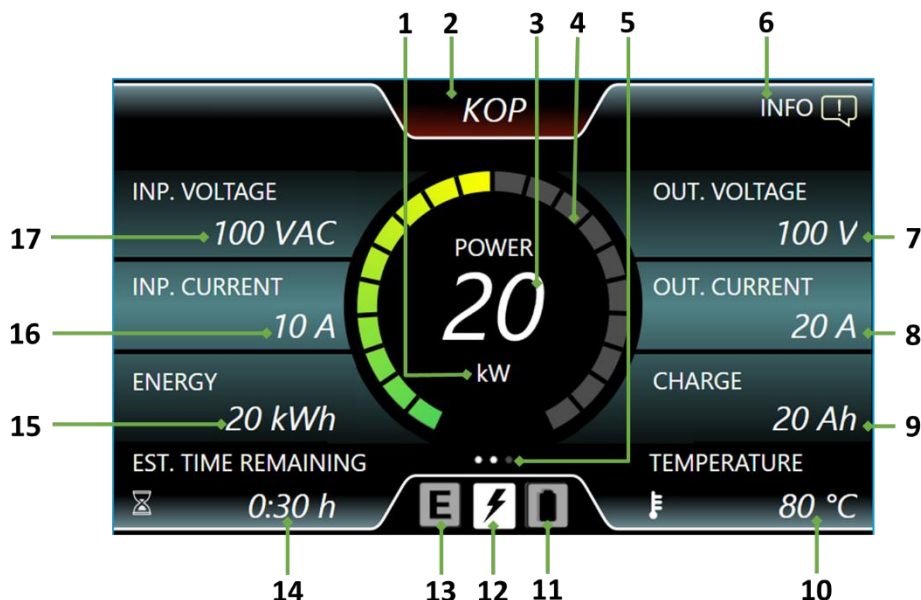
1. Unit for the power indication (kW)
2. Screen title (SAC in *Driving mode*)
3. Power indicator (in kW)
4. Power gauge (indicating the power percentage in relation to maximal power)
5. Page indicator
6. INFO field – to be clicked for additional information
7. Remaining operation time (in hours:minutes)
8. Motor current (in A)
9. Revolutions per minute (rpm) of the motor (in revolutions per minute)
10. Motor temperature (in °C)
11. Low battery indicator
12. Direction of driving indicator (indicates direction forward or backward, N for neutral)
13. Economy mode indicator
14. Controller (inverter) temperature (in °C)
15. Motor throttle (percentage, %)
16. Battery current (in A)
17. High Voltage battery voltage (in V)

9.5 Power screen (charging mode)

In the *Power screen* the power data of the electric boat is displayed.

In the *Charging mode* the screen title is set to “KOP” and the battery and charger data are displayed.

If the power gauge is in the red area make sure that the motor and inverter do not overheat.



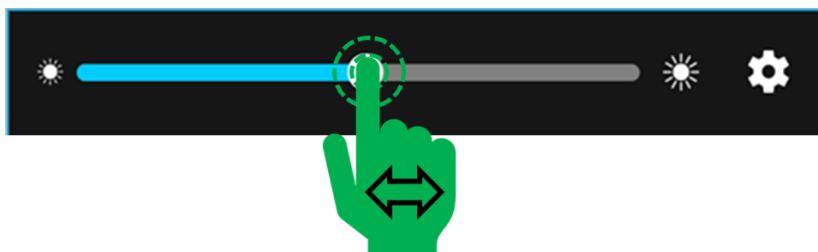
Power screen in Charging mode – data

1. Unit for the power indication (kW)
2. Screen title (KOP in *Charging mode*)
3. Power indicator (in kW)
4. Power gauge (indicating the power percentage in relation to maximal power)
5. Page indicator
6. INFO field – to be clicked for additional information
7. Charger output voltage (in V)
8. Charger output current (in A)
9. Charged capacity value (in Ah)
10. Charger temperature (in °C)
11. Low battery indicator
12. Charging indicator
13. Economy mode indicator
14. Remaining charging time (in hours:minutes)
15. Charged energy (in kWh)
16. Charger input current (in A)
17. Charger input voltage (in V)

Please keep in mind that the input voltage and current of the charger are usually AC (alternating current), thus the RMS value is indicated.


9.6 Setting the brightness of your screen

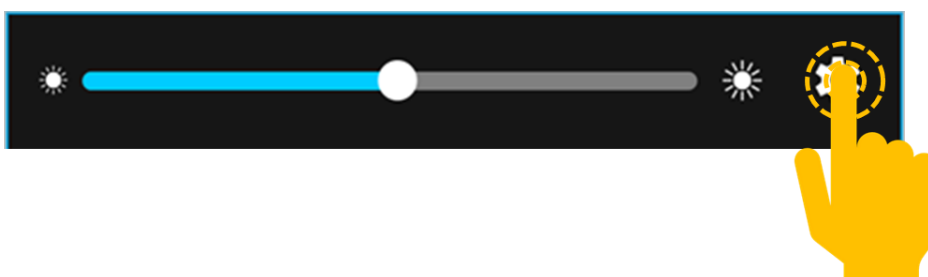
In addition to adaptive brightness available for the screen, the brightness can be adjusted manually – either by touching the screen on the desired spot of the blue/grey slider line or holding the white dot on the slider and moving it left (to reduce the brightness) or right (to increase the brightness).



The setting of the brightness of your screen

9.7 Open the Settings screen

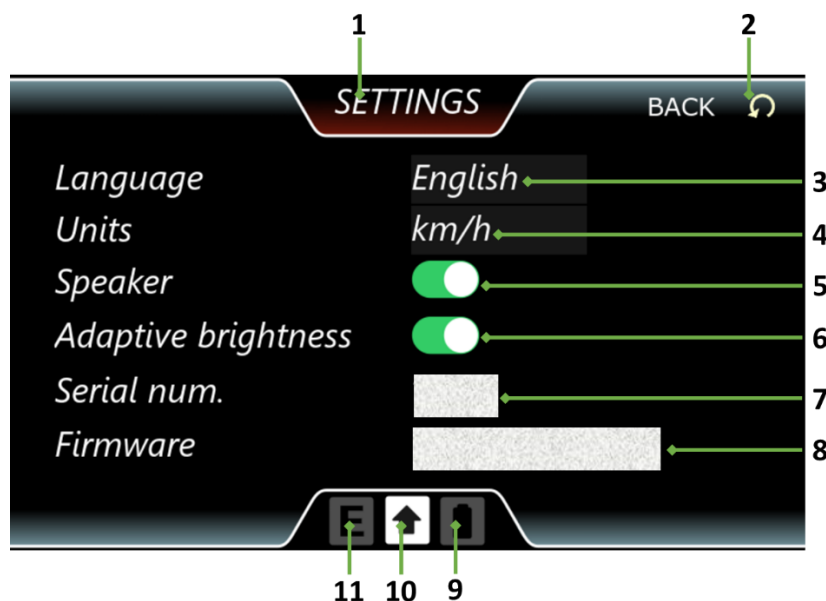
GD3 has several options that can be set by the user. The setting is done in a special display, which can be opened by touching the icon  on the right side of the screen.



Opening the Settings screen

9.8 Settings screen

Settings screen enables you to set the behavior and units of the GD3. You can exit the screen by touching "BACK" in the top right of the screen.



Settings screen – data

1. Screen title (SETTINGS)
2. BACK - click here to return to previous screen
3. Language – set the language of the data on the screen (default is English)
4. Speed unit (*km/h* or *knots*)
5. Sounds on/off (green for on, grey for off)
6. Adaptive brightness (green for on, grey for off)
7. Serial number of your device
8. Firmware number for firmware installed in your device
9. Low battery indicator
10. Direction / Charging indicator
11. Economy mode indicator

The example of *Settings screen* in the case of disabled sound and adaptive brightness is below.

If sound is disabled, no sound alarms or warnings will be generated by your GD3.



Sound alarms are described in manuals of other devices in the boat.

Adaptive brightness enables the screen to adjust the brightness automatically in case of changing light of environment.

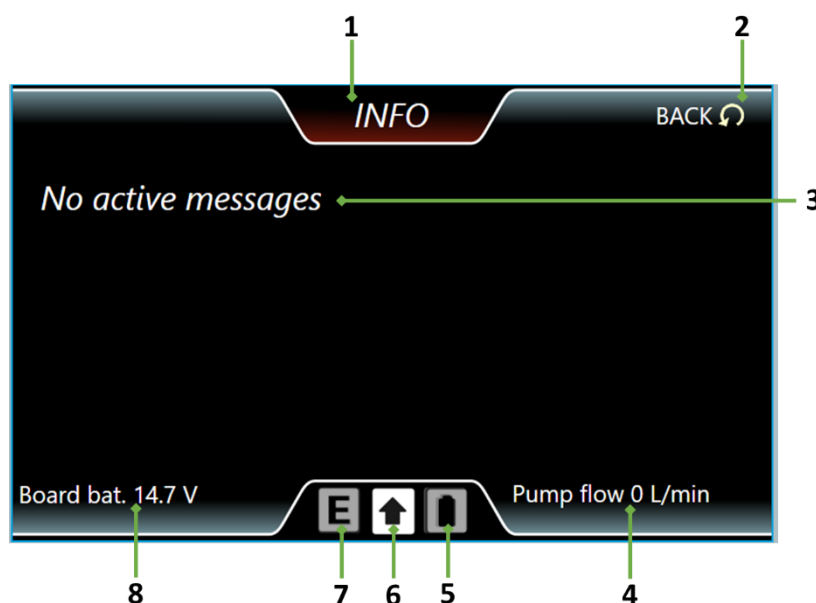


Settings screen – disabled sound and adaptive brightness

9.9 Info screen

In the *Info* screen messages regarding the operation of your system are displayed. Check the *Info* screen from time to time to read the messages as the given information can be very useful for safe and reliable operation!

If a warning (⚠) or error (❗) indicator is shown in the bottom of the container (in place of the battery symbol), the information regarding the problem is indicated in the *Info* screen (see chapter 9.12 *Error/Warning window container*).



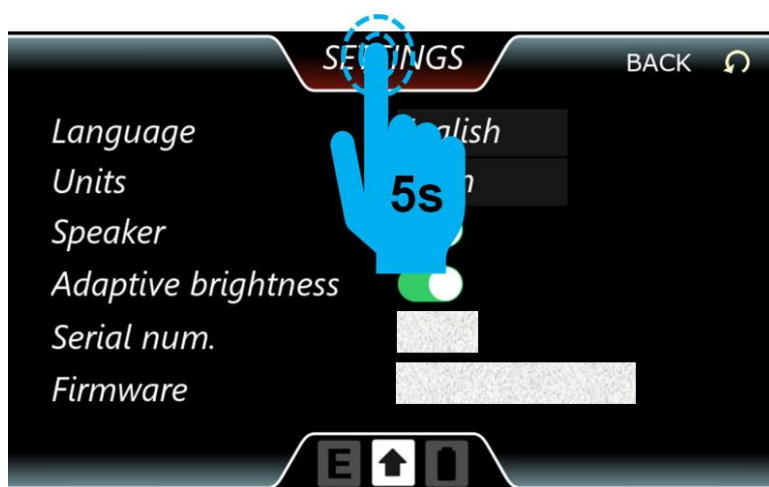
Info screen – description

1. Screen title (INFO)
2. BACK - click here to return to previous screen

3. Messages (“No active messages” if none)
4. Bilge pump flow (in *L/min*)
5. Low battery indicator
6. Direction / Charging indicator
7. Economy mode indicator
8. Board battery (Low voltage battery, 12V battery) voltage (in V)

9.10 Calibrate the control lever

Before use of the newly installed control lever, it needs to be calibrated. The procedure is presented in the figure below. To start calibration press and hold screen title “SETTINGS” for 5 seconds. After the sound beep scroll down and press button “Start GP calib”.



Settings screen – initiation of control lever calibration

The procedure is continued by touching the “Start GP calib.” button on the bottom of the *Settings* screen.



Settings screen – “Start GP calib.”

By simply following the instructions given on your screen the procedure will continue (the order is presented with green arrows). After finished initiating, put the lever in the neutral position and then touch “Ok” button. In the next step put the control lever

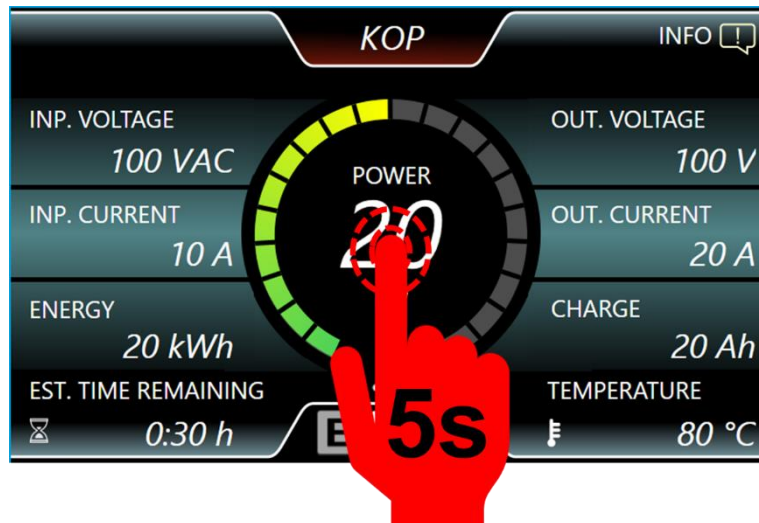
completely forward and again touch “Ok” button. Next put the lever completely backward and touch “Ok” button. A message that the calibration has been successful, will show up. Touch the “Ok” button to finalize the procedure. After that wait for the system to reset. When finished you can use the control lever.



Calibration of the control lever - procedure

9.11 Enabling high-power charging

In some cases, the high-power charging is available. To enable this function, you have to **press and hold for 5 seconds** the number for power on *Power* screen in *Charging mode* (see figure below).



Initiation of the high-power charging

After that a message appears, asking if you want to enable high-power charging.



High power screen – data

1. Message
2. Cancel button
3. Ok button

If *Cancel* button is touched, the high-power operation is cancelled and high-power charging will not be performed. Low power charging will continue.



High power charging canceling

If *Ok* button is touched, the high-power operation is approved and high-power charging will be performed.



High power charging approving



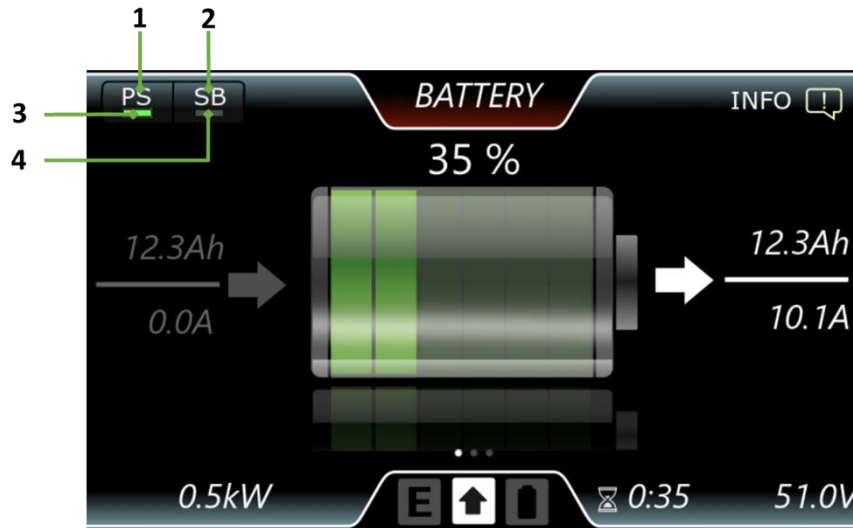
High power charging is performed at the significantly higher power than the low power charging. Special care should be taken regarding the heating of the charger and battery.



High power charging is only enabled for some chargers. See the charger manual!

9.12 Dual system operation

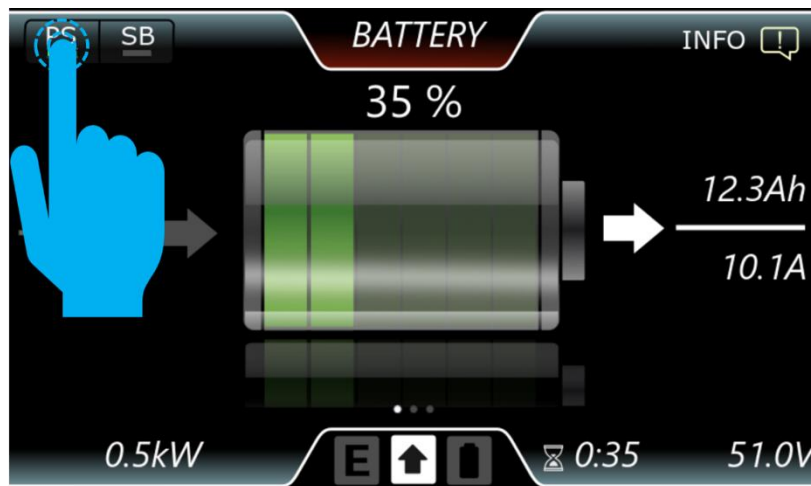
When the GD3 is connected to a dual-system boat (dual motor, controller, batteries), two buttons with indicators are displayed at the top left to select the Starboard or Portside of the *Battery screen* and *Power screen*.



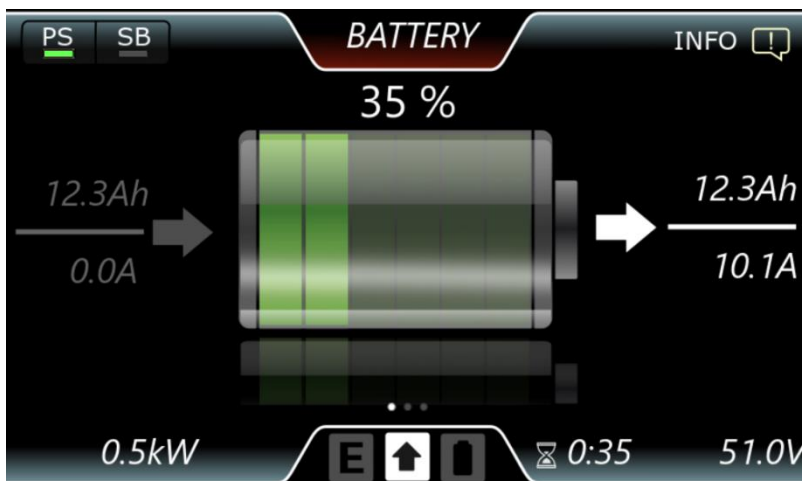
Battery screen in case of dual system – starboard system values displayed

1. Portside button
2. Starboard button
3. Portside button indicator
4. Starboard button indicator

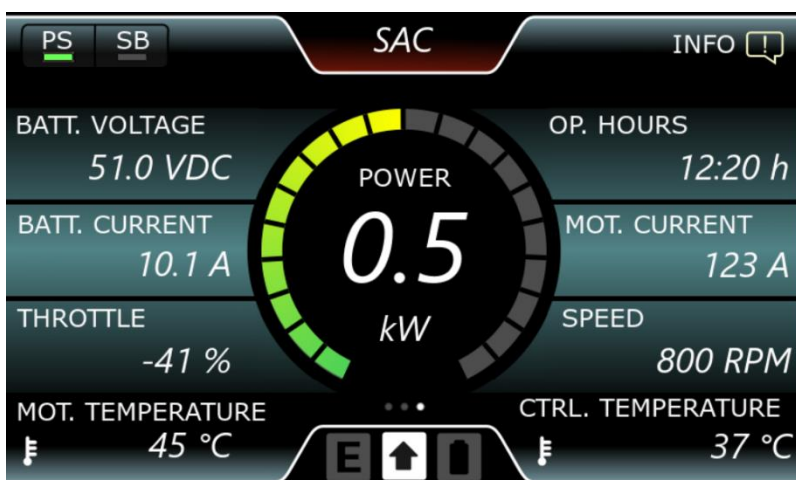
The choice of the system to be displayed (Starboard or Portside system) is made by touching the PS (for Portside) or SB (for Starboard) button. The system, for which the values are displayed, is indicated by the green light on the bottom of the button.



Battery screen – choice of the system to be displayed



Battery screen in case of dual system – port system values displayed



Power screen in case of dual system– port system values displayed

Main screen displays dual gauge for rpm value. Starboard motor rpm value is red whereas Portside rpm value is green.



Main screen in case of dual system



Beware that the values indicated can be different for Portside and Starboard system!

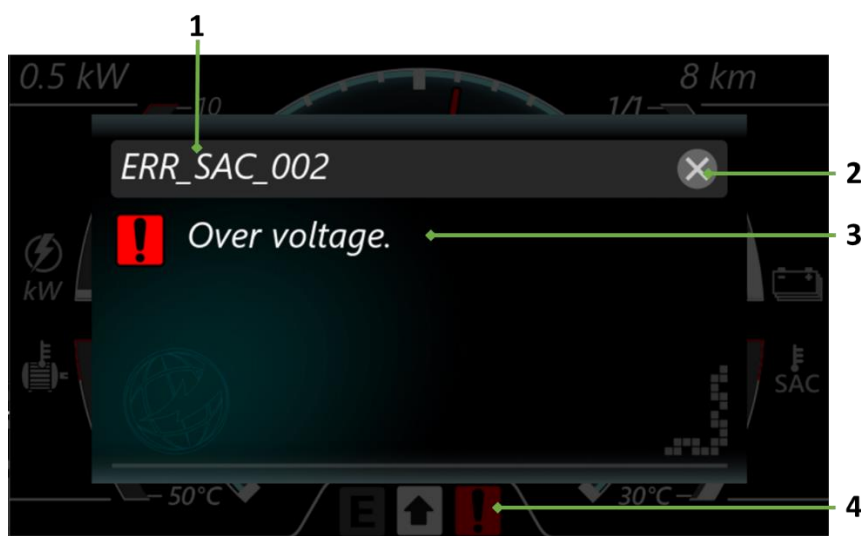


Control lever calibration with GD3 is disabled in case of dual system (it is only possible via CAN Term)!

9.13 Error / Warning window container

In case of malfunctions, either faulty or dangerous operation, the *Error container* or *Warning container* is shown on your GD3.

A warning (⚠) or error (❗) indicator is shown in the bottom of the container (in place of the battery symbol), which remains active for as long as the error/warning is active.



Error/Warning container – data

1. Error/Warning message number
2. Cancel button (by touching this button the message is hidden)
3. Error/Warning messages
4. Error/Warning indicator



Closing the Error/Warning container



Example of Error/Warning container data – Temperature high



Read the Error and Warning messages on the display carefully. The result of disregarding them can result in serious damage and injuries!



By closing the Error/Warning message you confirm that you read and understood its contents. If you continue to use the boat disregarding the message, the manufacturer holds no liability for resulting damage or injuries!

9.14 Display – list of errors

The list of errors that can occur in the *Error container* is given below, together with the possible cause and the actions to check or correct them.

Error code	Description	Cause / Checking / Correction
ERR_SAC_001	Excessive motor current	The motor is either blocked or short circuited. Check the propeller, if it is not blocked, contact your distributor!
ERR_SAC_002	Over voltage	Check the HV battery voltage. Contact your distributor.
ERR_SAC_003	Under voltage	Check the HV battery voltage. Charge the battery.
ERR_SAC_004	Voltage low at start	Check the HV battery voltage. Charge the battery.
ERR_SAC_005	Potentiometer error during operation	Check the control lever. Drive to the shore. Contact your distributor.
ERR_SAC_006	Potentiometer not zero at start	Check the control lever. Perform the control lever initialization.
ERR_SAC_007	Controller over-temperature	The controller has overheated due to the high-power operation. Reduce the speed and power of the boat.
ERR_SAC_008	Controller under-temperature	The controller temperature is low. Check the temperature sensor. Contact your distributor.
ERR_SAC_009	Controller temperature sensor error	The controller sensor is faulty. Contact your distributor.
ERR_SAC_010	Current offset error	The controller sensor is faulty. Contact your distributor.
ERR_SAC_011	DC link charging error	Error in charger or battery. Contact your distributor.
ERR_SAC_012	Contactors error	Contactors are faulty. Contact your distributor.
ERR_SAC_013	Short circuit motor or output stage	Contact your distributor.
ERR_SAC_014	Bad user parameter CRC	Something is wrong with connection cables. Contact your distributor.
ERR_SAC_015	Bad system parameter CRC	Something is wrong with connection cables. Contact your distributor.
ERR_SAC_016	Bad flash CRC	Something is wrong with your software. Contact your distributor.
ERR_SAC_017	Wrong parameter version	Wrong parameters in your system. Contact your distributor.
ERR_SAC_018	Invalid motor type	Wrong motor is applied in your system. Contact your distributor!
ERR_SAC_019	Auto tuning error	The parameters have not been set correctly. Contact your distributor.
ERR_SAC_020	Boost error	Something is wrong with the converter. Contact your distributor.
ERR_SAC_021	Motor over temperature	The motor is either blocked or short circuited. Check the propeller, if it is not blocked, contact your distributor!
ERR_SAC_022	Motor temperature sensor failure	The motor temperature sensor is faulty. Contact your distributor!

Error code	Description	Cause / Checking / Correction
ERR_SAC_023	Stall detected	The motor has stalled. Check if the propeller is out of water. If the message reoccurs, contact your distributor.
ERR_SAC_024	Motor over speed	Motor speed has been exceeded. Reduce the speed. If the error persists, contact your distributor.
ERR_SAC_025	SAC Communication timeout	Communication timeout on SAC. Check the cables. If the error persists, contact your distributor.
ERR_SAC_026	12V supply voltage or internal voltage	Problem with the low voltage battery. Check the 12V board battery! Probably only charging of 12V battery is required, but if this does not help, replacement of 12V battery is needed.
ERR_SAC_027	Over current (Hw)	Motor overcurrent – motor is overloaded, check the propeller, if it is not blocked, contact your distributor. Sometimes it is also enough to reduce the throttle.
ERR_SAC_028	Over voltage (Hw)	Voltage too high. Contact your distributor.
ERR_SAC_029	Excessive motor phase voltage	Motor phase voltage too high. Contact your distributor.
ERR_SAC_030	SW/CPU error	Error in software or controller. Contact your distributor.
ERR_BMS_064	Cell over voltage	Battery cell overvoltage. Stop the charging and contact your distributor.
ERR_BMS_065	Cell under voltage	Battery cell undervoltage. Stop the charging or driving and contact your distributor.
ERR_BMS_066	Temperature high	High temperature in the system. Stop charging or driving. If error persists, contact your distributor.
ERR_BMS_067	Temperature low	Low temperature in the system. Stop charging or driving until it gets warmer. If error persists, contact your distributor.
ERR_BMS_068	Over charging current	Charging current too high. Stop charging. If error persists, contact your distributor.
ERR_BMS_069	Over discharge current	Discharging current too high. Stop charging or driving until it gets warmer. If error persists, contact your distributor.
ERR_BMS_070	SOC low : error	Low battery (state of charge). Charge the battery.
ERR_BMS_071	Start repeated too often	The starting procedure has been repeated too many times. Wait some time before you retry. If the error persists, contact your distributor.
ERR_BMS_072	Case opened	Case opened. If possible, close the case. Contact your distributor.
ERR_BMS_073	Water sensor activated	Water entered the system. Stop operation and contact your distributor.
ERR_BMS_074	External temperature sensor activated	External temperature is high. Stop operation and check the environment for heating sources. If none are found, contact your distributor.
ERR_BMS_075	BMS Slave timeout	Timeout of BMS slave device. Contact your distributor.
ERR_BMS_080	Block over voltage	Battery block overvoltage. Contact your distributor.
ERR_BMS_081	Block under voltage	Battery block undervoltage. Contact your distributor.

Error code	Description	Cause / Checking / Correction
ERR_BMS_082	Internal error current measurement	Faulty current measurement. Contact your distributor.
ERR_BMS_083	BMS master power supply	BMS fault. Contact your distributor.
ERR_BMS_085	CPU error	CPU fault. Contact your distributor.
ERR_BMS_086	Relay error	Relay fault detected. Contact your distributor.
ERR_BMS_087	BMS IC error	BMS circuit fault. Contact your distributor.
ERR_BMS_088	BMS IC timeout error	BMS circuit fault. Contact your distributor.
ERR_BMS_089	CAN bus timeout	CAN bus fault. Check the CAN cables, if the error persists, contact your distributor.
ERR_BMS_090	CAN bus error	CAN bus fault. Check the CAN cables. If the error persists, contact your distributor.
ERR_BMS_091	Charger not responding	Charger is faulty, broken or disconnected, Check the cables. If the error persists, contact your distributor.
ERR_BMS_092	Battery voltage measurement error	Voltage measurement error. Contact your distributor.
ERR_BMS_093	System reset	A system reset occurred. If the error persists, contact your distributor.
ERR_BMS_094	System parameter CRC	Faulty system parameters. Contact your distributor.
ERR_BMS_095	User parameter CRC	Faulty user parameters. Contact your distributor.
ERR_BMS_096	BMS Temp sensor error	Faulty BMS temperature sensor. Contact your distributor.
ERR_BMS_097	BMS Precharge error	Faulty BMS precharge device. Contact your distributor.
ERR_BMS_098	Contactors temperature error	Faulty contactors temperature sensor. Contact your distributor.
ERR_KOP_100	Charger temperature sensor failure	Faulty charger temperature sensor. Contact your distributor.
ERR_KOP_101	Charger cooling fan failure	Faulty cooling fan. Contact your distributor.
ERR_KOP_102	Charging time limit exceeded	Charge limit has exceeded the maximum value. Contact your distributor.
ERR_KOP_103	Battery temperature sensor failure	Faulty battery temperature sensor. Contact your distributor.
ERR_KOP_104	Charger internal temperature too high	The internal charger temperature is too high. Stop the charging and wait until it cools down. If the problem persists, contact your distributor.
ERR_KOP_105	Battery voltage too high	Battery voltage too high. Contact your distributor.
ERR_KOP_106	Battery temperature too low during charging	Battery voltage too low. Wait until it gets warmer in the battery environment. If the problem persists and environment temperature is not too low, contact your distributor.
ERR_KOP_107	Battery temperature too high during charging	Battery temperature is too high. Stop the charging and wait until the battery cools down. If the problem persists, contact your distributor.

Error code	Description	Cause / Checking / Correction
ERR_KOP_108	Battery disconnected during charging	Battery has been disconnected during charging. Check the power cables. The internal charger temperature is too high. Stop the charging. If the problem persists, contact your distributor.
ERR_KOP_109	Faulty parameters in EEPROM	Faulty data in the control system. Contact your distributor.
ERR_KOP_110	Faulty system parameter CRC	Faulty data in the control system. Contact your distributor.
ERR_KOP_111	Bad parameter for power limit	Faulty parameter for power limit. Change the value. If the problem persists, contact your distributor.
ERR_KOP_112	Current firmware not compatible with the charger hardware version	Firmware error. Contact your distributor.
ERR_KOP_114	Faulty internal variable values	Faulty data in the control system. Contact your distributor.
ERR_KOP_115	System error	System error in the control system. Contact your distributor.
ERR_KOP_116	No approval signal from the power electronics	No OK signal from the power electronics. Check the cables, If the problem persists, contact your distributor.
ERR_KOP_117	Charging current control problem (too high value detected)	Faulty value for charging current. Stop the charging. Contact your distributor.
ERR_KOP_118	Problem with the charging current control	There are problems with the controller of the charger. Contact your distributor.
ERR_KOP_119	Input current measurement problem	There are problems with the controller of the charger. Contact your distributor.
ERR_KOP_120	Current not under control	There are problems with the controller of the charger. Contact your distributor.
ERR_ECU_001	Please, move throttle to neutral position	Move the throttle to neutral position. If the problem persists, contact your distributor.
ERR_ECU_002	Throttle error/disconnected	Check the cables. If the problem persists, contact your distributor.
ERR_ECU_003	Communication SAC-ECU error	Check the cables. If the problem persists, contact your distributor.
ERR_ECU_004	Invalid ECU parameters	Faulty parameters. Contact your distributor.
ERR_ECU_006	Reducing motor power	Motor power needs to be reduced. Reduce the power.
ERR_ECU_008	Communication PIKBAT1 - ECU	Check the cables. If the problem persists, contact your distributor.
ERR_ECU_011	Invalid ECU parameters	Faulty parameters. Contact your distributor.
ERR_PUMP_001	Cooling pump malfunction (flow too low)	Check the pump and its inlet and outlet. If the problem persists, contact your distributor.
ERR_GP_001	GP1 undervoltage	Check the cables. If the problem persists, contact your distributor.

Error code	Description	Cause / Checking / Correction
ERR_GP_002	GP1 overvoltage	Check the cables. If the problem persists, contact your distributor.
ERR_GP_003	GP1 overtemperature	Check the GP1 environment. If the problem persists, contact your distributor.
ERR_GP_004	GP1 Voltage Supply Error	GP1 electronics problem. Contact your distributor.
ERR_GP_005	GP1 PWM1 Error	GP1 electronics problem. Contact your distributor.
ERR_GP_006	GP1 PWM2 Error	GP1 electronics problem. Contact the distributor.
ERR_GP_008	Throttle position is out of range	Check the cables. If the problem persists, contact your distributor.
ERR_GP_009	GP1 communication error	Check the cables. If the problem persists, contact your distributor.



Never touch the propeller or high voltage connectors!



By closing the Error message, you confirm that you read and understood its contents. If you continue to use the boat disregarding the message, the manufacturer holds no liability for resulting damages or injuries!



Never try to repair your devices by yourself. There is nothing you can do in most cases. Contact your distributor in a case of error!

9.15 Display – list of warnings

The list of warnings that can occur in the *Warning container* is given below, together with the possible cause and the actions to check or correct them.

Warning code	Description	Cause / Checking / Correction
WARN_BMS_001	Cell voltage high	Overcharged battery. Stop charging.
WARN_BMS_002	Cell voltage low	Battery empty. Charge the battery.
WARN_BMS_003	Temperature high	High temperature. Stop driving or charging and wait until it cools down.

Warning code	Description	Cause / Checking / Correction
WARN_BMS_004	Temperature low	Low temperature. Stop driving or charging and wait until it heats up.
WARN_BMS_005	Charge current high	High charging current exceeding the prescribed value. Stop charging or reduce the power of charging.
WARN_BMS_006	Discharge current high	High discharging current exceeding the prescribed value. Stop discharging or reduce the power of charging.
WARN_BMS_007	SOC high	The battery is charged over the prescribed value. Stop charging.
WARN_BMS_008	SOC low	The battery is discharged below the prescribed value. Stop discharging or driving.
WARN_BMS_009	Flash error	Problem with FLASH memory. Contact the distributor.
WARN_BMS_010	Contact temperature high	High temperature of contactor. Stop charging or discharging and wait until it cools down.
WARN_BMS_011	Output voltage out of range	Output voltage is out of usage range. Check the cables. If the problem persists, contact the distributor.
WARN_BMS_012	Battery not responding	Check the cables. If the problem persists, contact the distributor.
WARN_BMS_016	Block voltage too high	Check the cables. If the problem persists, contact the distributor.
WARN_BMS_017	Block voltage too low	Check the cables. If the problem persists, contact the distributor.
WARN_BMS_018	Cell imbalance high	This may occur if older batteries are used. Charge with a low power charger and allow time for balancing. If the problem persists, contact the distributor.
WARN_BMS_019	Block imbalance high	This may occur if older batteries are used. Charge with a low power charger and allow time for balancing. If the problem persists, contact the distributor.
WARN_BMS_020	Battery blocks - voltage difference high	This may occur if a block has been disconnected from the rest. Charge the block. If the problem persists, contact the distributor.
WARN_BMS_021	Power supply voltage high	High power supply voltage. If the problem persists, contact the distributor.
WARN_BMS_022	Temperature sensor failed	Check the cables. If the problem persists, contact the distributor.
WARN_GD3_001	No GPS signal	This can happen if the boat cannot receive data from satellites. Check the antenna. The problem will probably be resolved once the signal from satellites is received again.
WARN_GD3_002	Cannot drive while charging Disconnect charging cable or turn the start key off.	The charging cable is connected. Disconnect the charging cable or turn the start key off..
WARN_GD3_003	Battery low	Low battery. Drive to the shore and charge the battery.
WARN_GD3_004	Board battery low	Low board battery. Drive to the shore and charge the board battery. The board battery might require replacement.

Warning code	Description	Cause / Checking / Correction
WARN_GD3_005	Communication lost between GD3 and ECU	Check the cables. If the error persists, contact the distributor.
WAR_KOP_050	Charger temperature too high	Charger overheated. Stop charging and wait until it cools down. Reduce the charging power.
WAR_KOP_051	Battery voltage too low	The battery voltage is too low. Charge the battery.
WAR_KOP_052	BMS does not allow charging	BMS does not allow charging. Contact the distributor.
WAR_KOP_053	Battery not connected (battery voltage close to zero)	Check the cables. If the problem persists, contact the distributor.
WAR_KOP_054	Charger connected to KOP-USB interface (communicates with the PC)	This warning occurs when you access the boat controllers with the PC. It will not be shown later.
WAR_KOP_055	Internal power electronic error – power fail	Power electronics error. Contact the distributor.
WAR_KOP_056	Problem with the internal 12V power supply	Check the cables and 12V battery. Maybe 12V battery needs to be replaced.
WAR_KOP_057	Pause between charging phases (programmed with charger parameter)	Pause between charging phases. Should not be a problem.



By closing the Warning message, you confirm that you read and understood its contents. If you continue to use the boat disregarding the message, the manufacturer holds no liability for resulting damages or injuries!



Never touch the propeller or high voltage connectors!



Never try to repair your devices by yourself. There is nothing you can do in most cases. Contact your distributor in a case of error!

10 Contained in the box

Contents of the box are:

- GD3,
- GPS antenna, and
- User's manual.

11 Maintenance

Always take proper care of your GD3 and consider the deterioration that will occur over time and as a result of heavy use or misuse.

Wash the device with water or mild solution of soap. Do not use abrasive equipment or aggressive liquids (e.g. acids) for cleaning. The device is made of aluminum and is waterproof, but when disconnected, the connectors are not water-proof!



Do not spray the device with water. High pressure cleaning is not permitted.

Do not try to open and repair the device in the case of faulty operation. You can do nothing to repair hardware or software of your GD3. Do not change the firmware of GD3, this immediately results in making any guaranty by manufacturer void.



The manufacturer accepts no liability for any consequences resulting from inappropriate, negligent or incorrect installation or adjustment of the device and its parameters.

12 Disposal



GD3 is subject to European Directive 2012/19/EU relating to Waste Electrical and Electronic Equipment - WEEE, and to the corresponding national laws. Here, the WEEE Directive forms the basis for handling waste electrical equipment across the whole of the EU. Therefore, it must not be disposed of as normal household waste.

Dispose of the device in an environmentally friendly way.

13 Warnings



Cooling

Protect the GD3 from heat or direct sunlight.



Water, moisture and salt

The entry of moisture and salt into the GD3 connectors (sockets/inlets) may cause a hazard. Examine carefully and clean the connectors (sockets-inlets) before connecting the supply.



Fuses

The fuse in the GD3 is not sufficient protection for the boat electronics. An appropriate fuse must be installed in the immediate vicinity of the battery terminal.

14 Declaration of conformity

We hereby state that they fulfill the principal requirements specified in the following harmonization legislation:

DIRECTIVE 2013/53/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 November 2013 on recreational craft and personal watercraft and repealing Directive 94/25/EC

Applicable harmonized standards:

- ISO 25197:2012+A1: 2014: Small craft - Electrical/electronic control systems for steering, shift and drive
- ISO 16315:2016: Small craft - Electric drive system
- DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL OF 17 May 2006 on machinery, and amending Directive 95/16/EC (recast)

15 History

Version	Date	Author	Description
0.0	17.10.2022	MR	Initial version
0.1	3.11.2022	MR	Corrections; included high-power mode and connectors
0.2	7.11.2022	MR, BP	Corrections; added mechanical scheme for montage; added contents of the box.
0.3	9.11.2022	MR	Corrections; included instruction for the antenna; change of contacts – manufacturer to distributor.
0.4	10.11.2022	MR, GE	Corrections by Gregor Edelbahr included.
0.5	28.11.2022	DK, MR	Corrections and suggestions by Daniela Kopriva included.
0.6	29.11.2022	DK, MR	Minor corrections by Daniela Kopriva (GPS) included.
0.7	7.12.2022	MR, JK	Included new figure "Dimensions of the GD3 (for montage)"
0.8	14.12.2022	MR, MA	Included photo of GPS antenna
0.9	23.02.2023	MŠ	Corrections of pictures and language
0.10	03.05.2023	MR, MA	Updates, changed figures (dual system, Main display, Battery display)
1.0	31.08.2023	GE	Update of errors and warnings
1.1	19.10.2023	GE	Update of errors and warnings
1.2	21.02.2024	EK, MR	Corrected dual system operation abbreviations and names.
1.3	09.05.2024	MR	Corrected graphics (figures according to changes in SW). Reformatting of the table of contents.

Advanced solutions for battery powered vehicles and boats



Address:

Piktronik d.o.o.
Cesta k Tamu 17
SI-2000 Maribor
Slovenia

Phone:

+386-2-460-2250

Internet:

<http://www.piktronik.com>

E-mail:

info@piktronik.com



www.piktronik.com

