SEACRAFT

MADE TO EXPLORE

Original user manual for the scooter control panel

The manufacturer reserves the right to change the technical specifications of the equipment described in this manual.
The current version of the manual is available for download at www.seacraft.eu

The manufacturer shall not be held responsible for accidents and damage caused by misuse of the product, nor by its use in a manner contrary to or deviating from the rules set forth in this manual.

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About the document

Title: Original user manual for the scooter control panel
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INTRODUCTION

Before use, please read the user manual and other instructions listed below.

An integral part of the underwater scooter's documentation equipment is:
1. Scooter (DPV) user manual
2. User manula for the scooter (DPV) control screen
3. User manual for the charger
4. Battery operating manual
5. Declaration of Conformity (DoC) WE

First read the safety rules, then read the information on how to operate the scooter. Read the control panel manual next to the DPV scooter for better understanding of the screen content.

Three types of designations are used in this manual, the meaning of which is as follows:

WARNING
It indicates a procedure or situation that, if disregarded, can lead to equipment damage or a serious accident. It can also indicate improper and unsafe practices.

DANGER
It indicates a dangerous situation that, if not controlled, inevitably leads to a serious accident, also with the possible result of death or disability.

CAUTION
Indicates a procedure or information that is important to the user.

COMPLIANCE WITH LEGAL REQUIREMENTS

The manufacturer declares that the product meets the safety requirements within the scope of European Union directives:

- **MD Directive 2006/42/EC on machinery.**
- **EMC Directive 2014/30/EU on electromagnetic compatibility.**
- **RoHS Directive 2011/65/EU on restrictions on the use of hazardous substances in electrical and electronic equipment.**
- **and regulations resulting from harmonized standards and other technical standards. The signed and dated declaration of conformity constitutes a separate annex, attached to each SEACRAFT series device. The declaration contains a list of the standards applied.**

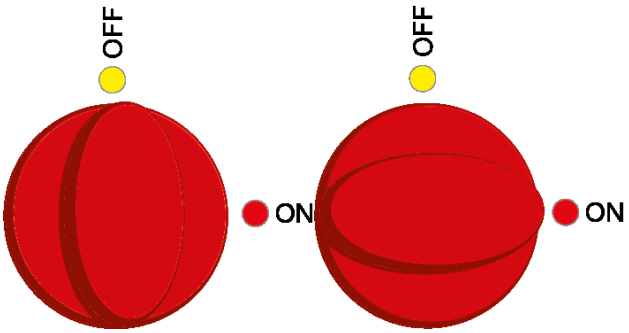
Software version compatible with the manual: 4.2

01
SCOOTER CONTROL ELEMENTS

The following controls are used to operate the scooter:

■ Mainch switch

Non-contact main switch located in front of the nozzle on the scooter body. The main switch has two possible positions - ON (switched on), and OFF (switched off)



■ Handle triggers - left and right

The handle triggers also operate without contact – based on detecting the position of a magnet embedded in the button. This allows for differentiation between short and long presses.

■ Control module buttons - top and bottom

Seacraft buttons are specially designed piezoelectric modules integrated into a thick polycarbonate front panel. The rubber „buttons" are for orientation purposes only (easier to use with thick gloves - the diver knows where the piezoelectric modules are).

During diving, the water pressure around this device is constantly changing slowly. The buttons cannot be sensitive to SLOW pressing/depressing. Only a FAST press can activate the buttons. Therefore, a quick „tap" is preferred to a slow „press" to activate a button.

Some „getting used to" is recommended, as the operation of piezoelectric buttons may differ from other devices you have used before.

Piezoelectric buttons generate one short pulse when pressed.

02
SCOOTER CONFIGURATION AND FUNCTION DESCRIPTION

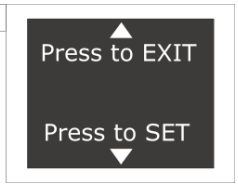
The scooter's parameters can be configured individually. To do this, start it in the settings mode.

Since the use of your scooter is closely linked to how it is configured, please read this section before using your scooter for the first time.

2.1 STARTING THE SETTINGS MODE

To start the settings mode, hold both handles triggers of the scooter down simultaneously and change the position of the main switch from OFF to ON. After a few seconds, the scooter will display the settings start screen (6):

6



To select, use the gear buttons built into the control module screen.

Information and functions on the screen 6

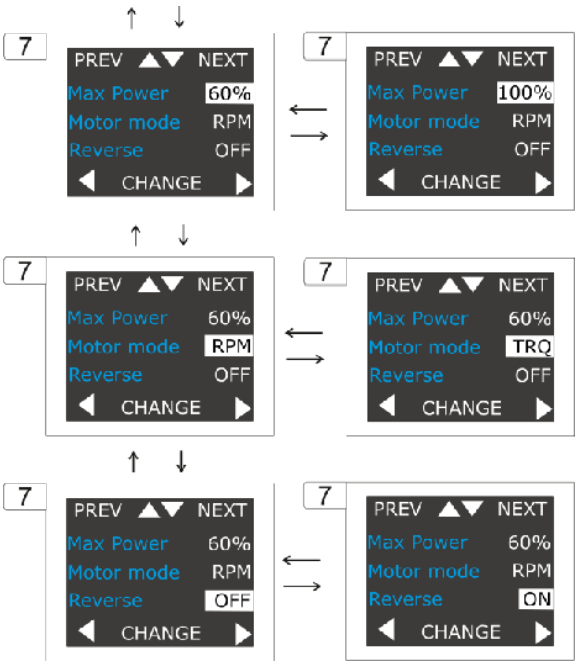
EXIT Wybierz by wyjść z trybu ustawień I wrócić do ekranu 2A bądź 2B.
SET Wybierz by przejść do szczegółów konfiguracji na ekranie 7.

Since version 4.0, navigating in the settings mode has been significantly simplified.

To change the currently modified parameter, use the gear buttons - up and down.

To change the value of the currently selected parameter, use the handle buttons - left and right.

2.2 MAXIMUM POWER, ENGINE MODE, REVERSE GEAR - SCREEN 7

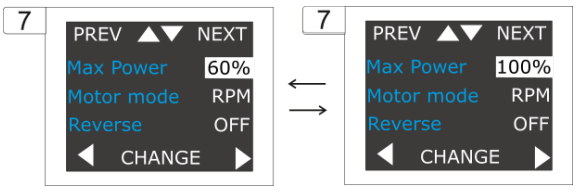


Information and functions on the screen 7

NEXT	**Next,** go to the next setting
PREV	**Previous**, go to previous setting
CHANGE	**Change**, using the handle triggers, change the highlighted value
Max Power	**Max power**, selecting the maximum available power
Motor mode	**Motor mode**, selecting the engine operating mode
Reverse	**Reverse gear**, activate or deactivate reverse gear

Setting the maximum power of the scooter

The maximum power of the scooter can be set between 60-100%, in 10% steps.
It will not reduce the number of gears, it will only reduce the power in each of them depending on the percentage factor set.
Only with the setting at 100%, the 9+ gear ('+', booster) will be available.

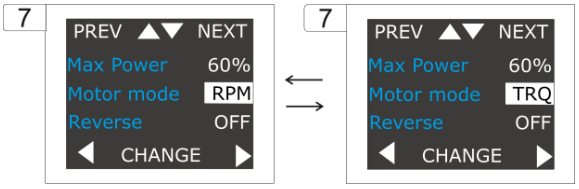


WARNING

When using the Seacraft Connect app, the ability to set the speed of each run individually is only available when using the settings: Max power: 100%, Motor mode: RPM

Selecting the engine operating mode

There are two available engine modes. Each has its main utility applications and differs in the mode in which the scooter engine operates.



Engine operating modes

RPM (fixed speed mode)

This is the standard engine mode, known from the first models of Seacraft scooters. It provides smooth, gradual acceleration and speed change. Engine control is based on a set number of RPMs - revolutions per minute. Thanks to this, the engine behaves similarly both under water and during tests outside the water. An additional feature of the constant speed mode is the correlation of the power used (visible on the scooter parameters screen) with the load. The greater the load, the more power the engine will direct to maintain a given speed. This allows you to compare the streamlining of different configurations, by comparing the power consumption of the gear you have set. Thanks to this, the constant speed mode is also the least sensitive to propeller contamination, e.g. with seaweed.

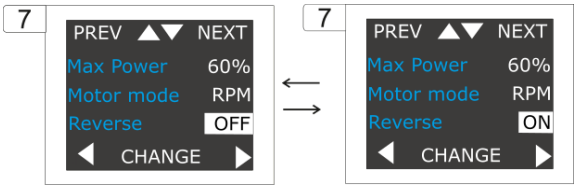
TRQ (constant torque mode)

This is the engine mode designed for professional users who require the fastest possible acceleration of the scooter. It provides the shortest possible time from pressing the scooter activation button to generating a noticeable thrust, still in a smooth manner. The engine is controlled based on the power supplied to the engine. This means that its rotational speed will depend on the load.

With TRQ (constant torque) mode active, the scooter activated on the surface (where there is no water resistance) will accelerate to the maximum possible RPM, regardless of the selected gear. The air resistance is so small that the scooter's behavior will be different than underwater. Therefore, it is not recommended to activate and operate the scooter in TRQ mode outside the water.

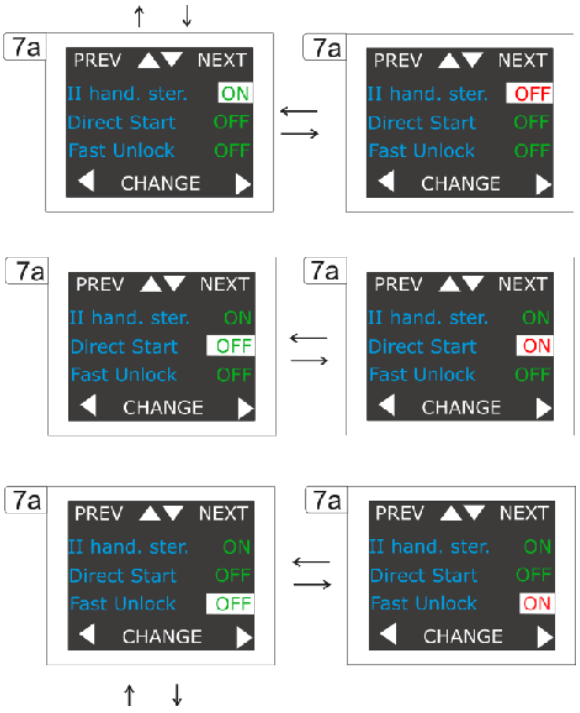
Setting reverse gear

Reverse gear can be active or not, depending on user preferences. If it is deactivated (set to OFF), it will not be possible to select it from the gears available to the user on the main screen.



2.3 TWO-HAND CONTROL, DIRECT START, QUICK UNLOCK - SCREEN 7A

Pressing the down button again reveals screen 7a, and the following settings:

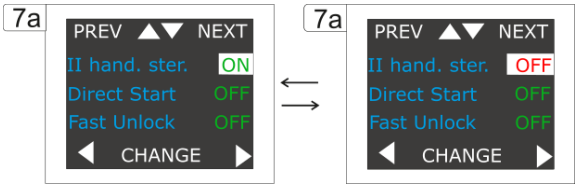


Information and functions on the screen 7a

NEXT	**Next**, go to next setting
PREV	**Previous**, go to previous setting
CHANGE	**Change**, using the handle triggers, change the highlighted value
II hand. Ster.	**Two-handed control**, Selecting the engine activation method
Direct Start	**Direct start**, turns off the scooter's home screen
Fast Unlock	**Fast unlock**, return to previous run after Time Lock

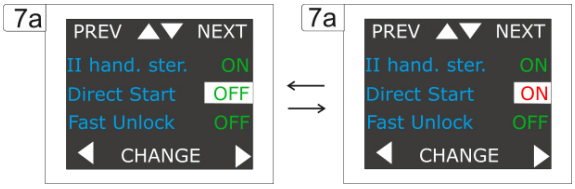
Two-handed or one-handed control

The Seacraft scooter's engine activation can be set to overhand. This means that the engine will only run when both handle buttons are pressed. (This is the recommended, safest option). Disabling two-handed mode means working in one-handed mode, which allows the engine to be activated with only one hand. (Special purposes, less safe option)



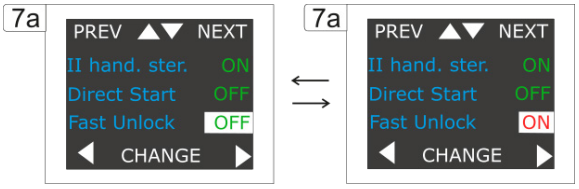
Direct start

Activating the 'Direct Start' (ON) function allows you to start using your scooter faster after starting it with the main switch. Screens 2A or 2B will not be displayed, the standard screen 4 or 4' will appear immediately.



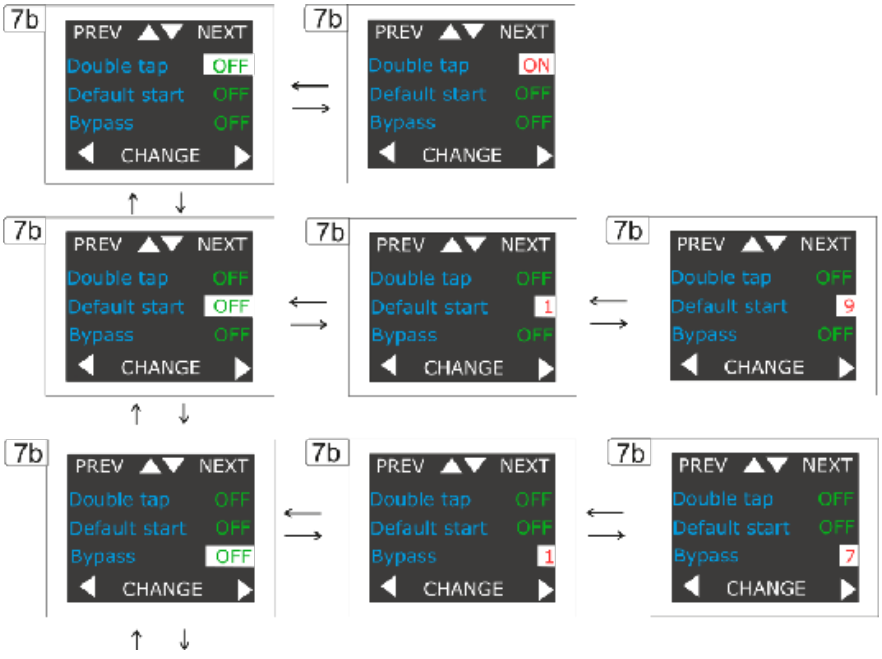
Fast unlock

This function is only available in single-handed control.
Fast Unlock allows you to quickly return to the previously used gear, after the 'Time Lock' function has been activated, which resets the scooter's gear to 0. Quickly double-clicking any button on the handle when this occurs will return you to the gear that was active.

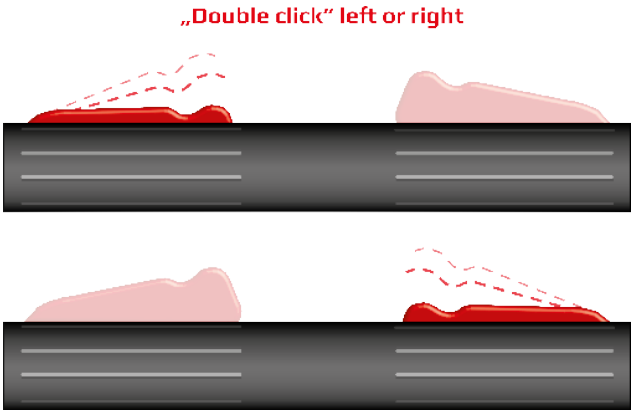


2.4 DOUBLE TAP, DEFAULT START, BYPASS – SCREEN 7B

Another press of the down button reveals screen 7b, and the following settings:



NEXT	**Next**, go to next setting
PREV	**Previous**, go to previous setting
CHANGE	**Change**, using the hand buttons, change the highlighted value
Double tap	**Double tap,** activate gear control function by double clicking
Default start	**Default start**, setting the starting gear
Bypass	**Bypass**, setting the working speed in Bypass mode



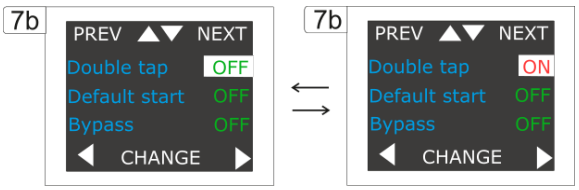
Double tap

This function is only available with one-handed control.

Double-tap is a quick double click on the scooter's unused handle, while holding the other handle down.

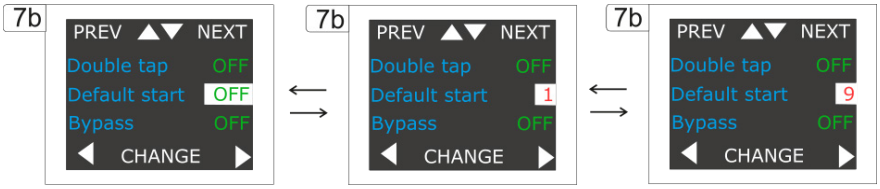
Using a double click when gear 1-8 is active changes the selected gear to 9.

A second double click restores the previously used gear.
This allows for quick acceleration, e.g. to catch up with a diving buddy.



Default start

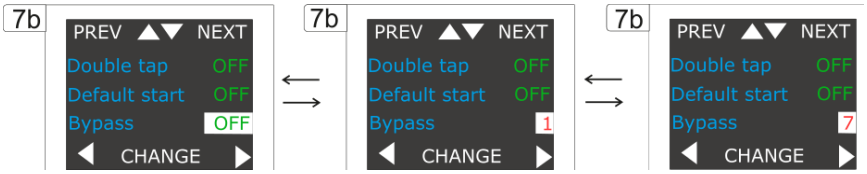
This function allows you to set the scooter gear that will be active after starting the scooter with the main switch. Gears 1 to 9 can be set.



Bypass

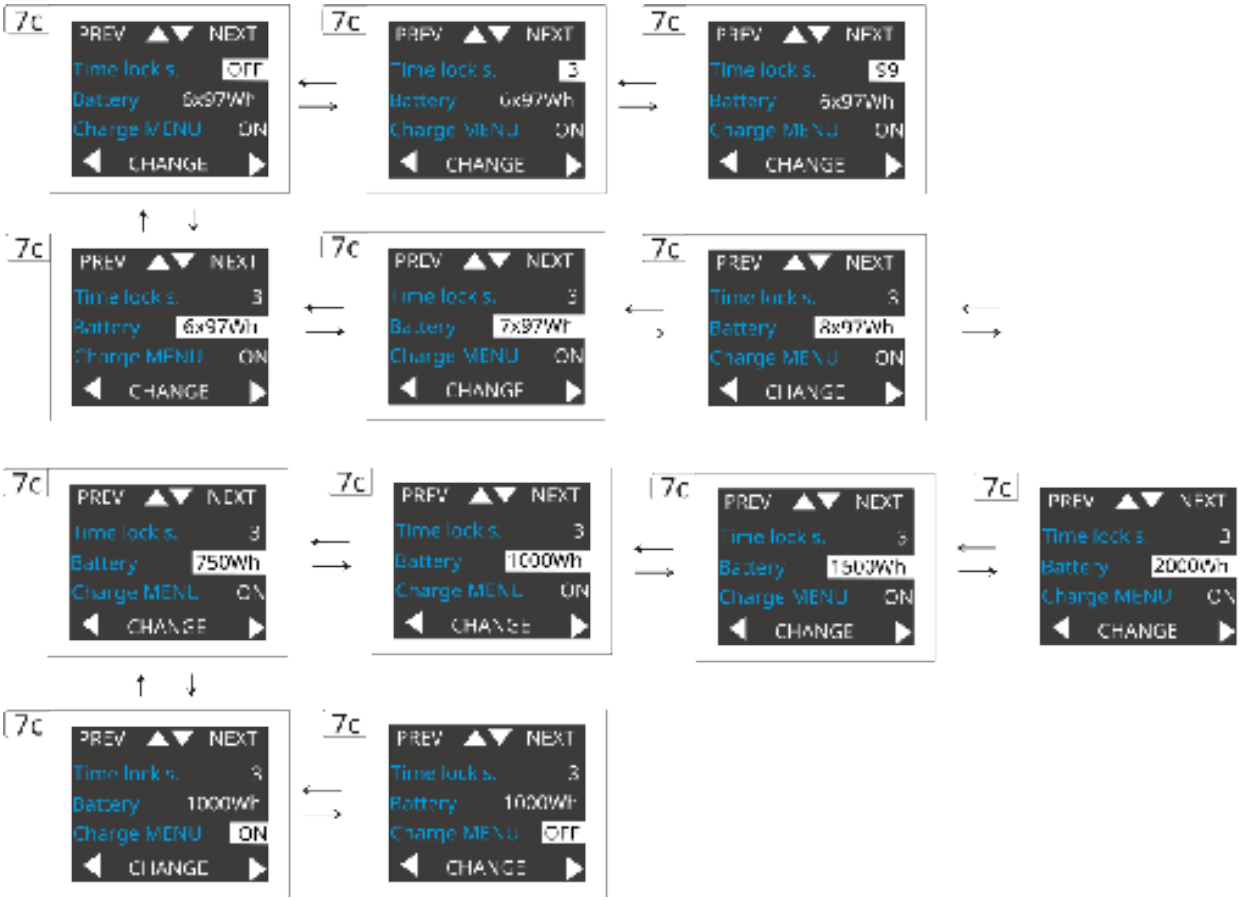
This is a special function that requires a high level of user awareness of its operation. It is dedicated exclusively to users whose safety may require that even a partially damaged scooter can support their return to the starting point of the dive - for example, in the case of cave diving.

During normal use, the scooter's engine electronics constantly communicate with the display electronics. In the event of a failure/damage to the scooter's electronics, its normal use is not possible.
If a gear dedicated to the Bypass function (from 1 to 7) has been set, and when the scooter is started, it is not possible to establish a connection with the display electronics (e.g. due to its damage) - the scooter activates emergency mode and starts working in the gear defined as Bypass.
This means that in the event of a scooter failure, it may be possible to continue using it by operating the main switch. The handle triggers, gear buttons and the display will be inactive. Therefore, activation of the Bypass function is intended only for users who are fully aware of its operation and effects.



2.5 TIME LOCK, BATTERY, CHARGE MENU – SCREEN 7C

Another press of the down button reveals screen 7c, and the following settings:



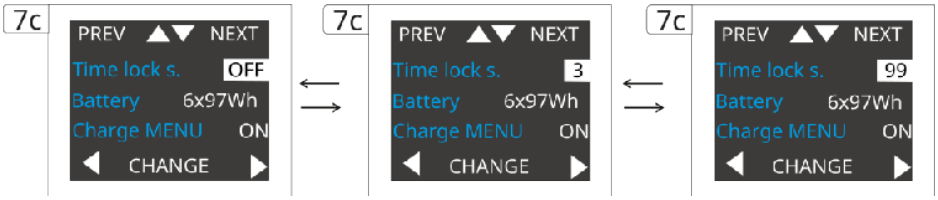
NEXT **Next,** go to next setting
PREV **Previos**, go to previous setting
CHANGE **Change**, using the handle triggers, change the highlighted value
Time lock s. **Time lock s.**, lock time setting, seconds
Battery **Battery**, setting the battery installed in the scooter
Charge MENU **Charge manu,** Activate/deactivate dedicated charging screen and lock

Time lock

This function determines the time after which – in the case of inactivity and not pressing any of the scooter's buttons – the currently selected gear will be set to 0.

This increases user safety and reduces the risk of an emergency situation when the scooter starts the engine without user control.

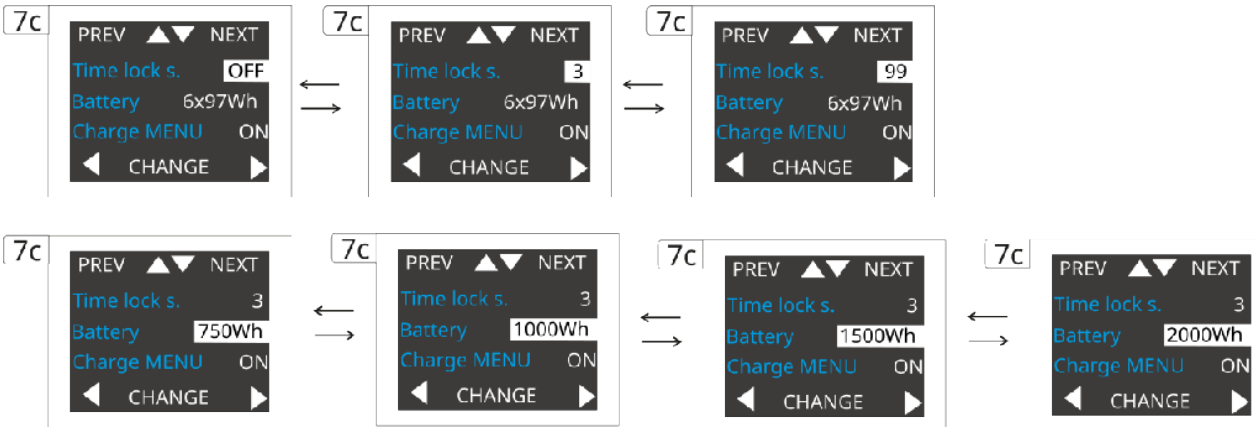
The time lock can be set in the range of 3-99s, or turned off.



Battery setting

The design of the Seacraft scooters allows for the installation of several types of batteries in the same scooter. In order for the module to calculate the remaining % of the battery and the estimated remaining operating time to work correctly, the installed battery must be set correctly in the menu.

Incorrect battery setting may cause incorrect battery charge status display. Check your battery type from the battery nameplate and the Seacraft battery manual.



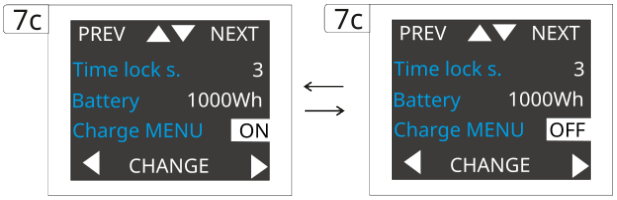
Charging menu

After connecting the charger, the scooter charging menu is activated by default, showing the charging progress and its current parameters. The scooter is blocked from working.

If the standard charging menu is disabled, after connecting the charger, this will be indicated by a lightning bolt icon and a flashing charging progress bar. Additionally, it will be possible to operate the scooter underwater.

This function allows for emergency use of the scooter even with a flooded charging socket.

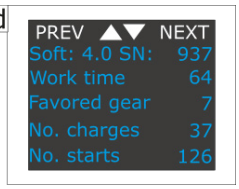
In such a case, the charging socket will probably be irreversibly destroyed, but the scooter will allow, for example, an emergency return to the starting point of the dive.



2.6 SCOOTER OPERATION HISTORY AND GENERAL SETTINGS

On the next screen you can read the scooter's serial number, software version, and its usage history.

7d

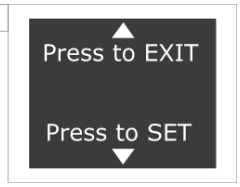


Soft Version of installed software
SN DPV serial number
Work time **Work time** Number of operating hours. (time counted only when the engine is running)
Favored gear **Favored gear** The most commonly used scooter gear
No. charges **Number of charges** Number of battery charges (counted as the number of charger connections detected by the scooter)
No. starts **Number of starts** Number of times the scooter was activated with the main switch, which resulted in the engine running for more than one minute

2.7 EXIT FROM THE SETTINGS MENU

To exit the settings menu, once you have completed the setup and verification, exit the scooter settings menu using the EXIT option.

6



2.8 RECOMMENDED SCOOTER SETTINGS

The manufacturer's recommended scooter settings are marked in green during the configuration process. This indicates the safest configuration options for the standard user. If the selected setting is highlighted in red, it indicates that selecting it involves an increased risk for the user and is not recommended. Experts and advanced users, after completing the appropriate training and fully familiarizing themselves with the operating features of the given configuration, can configure the scooter according to their own preferences.

03
USING THE SCOOTER

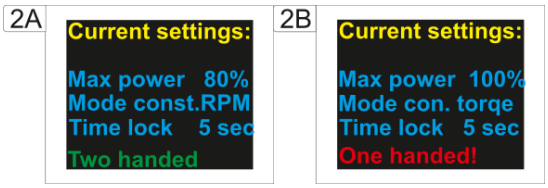
Software 4.2 introduces several new, unique features compared to previous versions. Be sure to read the DPV software configuration section first to learn about Bypass, Default Start, Charge Menu and other scooter features.

3.1 STARTING THE SCOOTER

Start the scooter by turning the main switch to the ON position. (parallel to the long axis of the scooter)

After setting the switch to the ON position, the display located in the scooter's control unit will show the following screens in sequence;

Manufacturer's logo display

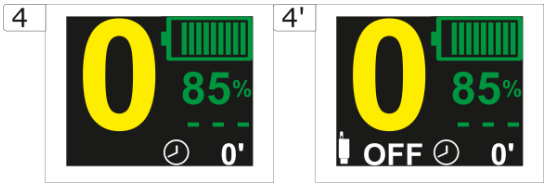


Current setting dispaly

With the Direct Start function activated, screens 01, 2A, 2B are not displayed after switching on the scooter.

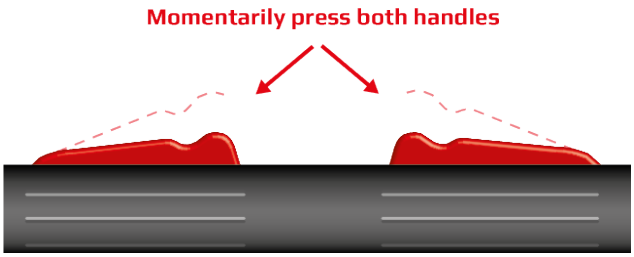
3.2 SCOOTER START SCREEN

After starting up, the scooter's initial screen will be displayed. Depending on whether a converter is installed, the DPV will automatically detect it and display screen 4 (no converter) or 4' (converter installed)



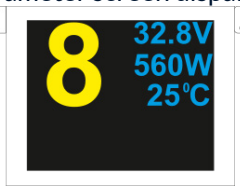
3.3 SCOOTER PARAMETERS SCREEN

A short, simultaneous press and release of both handle buttons (less than 1 second) will display screen 5 with the scooter's operating parameters.

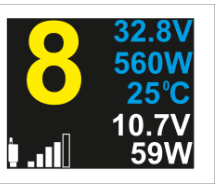


Parameter screen dispaly

5

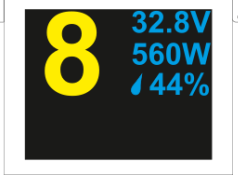


5'

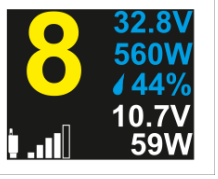


Scooter parameter screen – with and without power converter.

5a



5a'



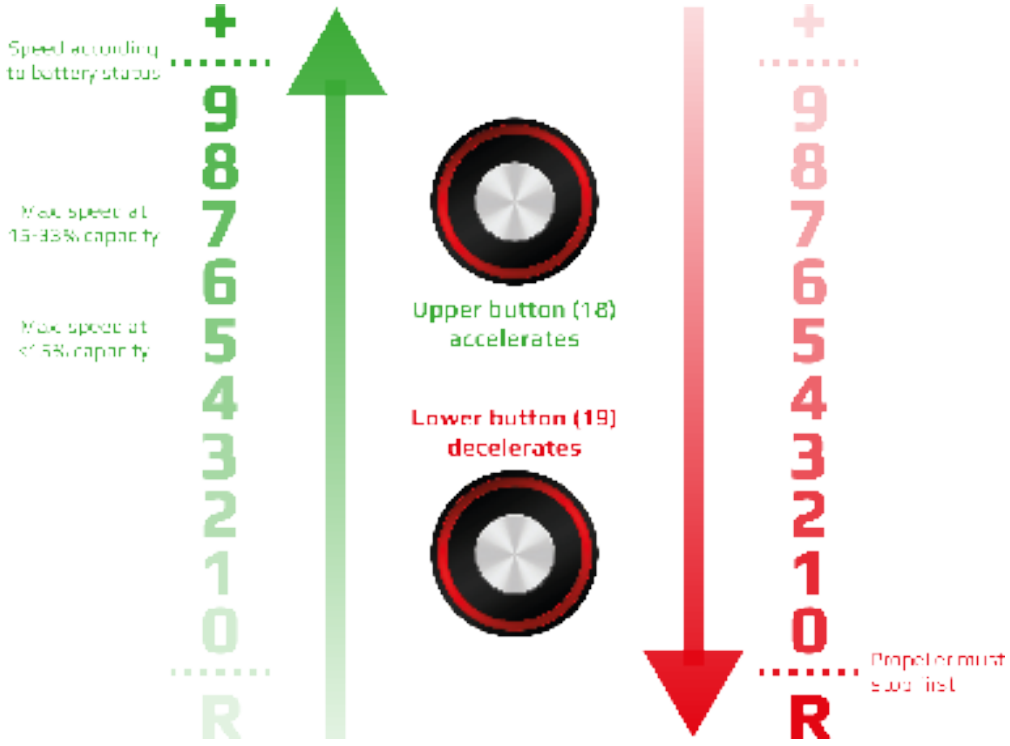
Scooter parameter screen – with and without power converter.

If you notice humidity above 70% during the dive, it is recommended to return to base by the shortest, safest route.
After returning to shore, check the inside of the scooter for humidity. Also check the seals for dirt and damage.
Above 80% humidity, a red WATER sign will be displayed on the main DPV screen.

3.4 SETTING THE SCOOTER GEAR

The speed and power of the Seacraft scooter are set based on the gear selections on the control panel. There is a gear 0 - standby mode, 9 main gears, a ‚booster' mode - gear ‚+', and reverse gear ‚R'.

After starting the scooter, it will start in the gear programmed as Default start. (factory and recommended - gear 0). Changing gears is possible using two piezoelectric buttons located directly above the scooter's display.



Pressing the top button increases the gear up, while pressing the bottom button decreases the gear down. Each press changes one gear.

Maximum available speed depends on battery charge level
In order to optimize the scooter's energy consumption and maximize its range, the engine controller will limit the maximum available gear depending on the battery charge level. Using the scooter's maximum power with a heavily discharged battery puts a heavy load on it, which results in a significant reduction in ranges that would still be possible to obtain using a slightly lower scooter power.

At 34-100% of the available battery capacity, the battery icon on screen 4 is green. All gears can be used.

At 15-33% of the available battery capacity, the battery icon on screen 4 is yellow, and the maximum available gear is gear 7.
Less than 15% of the available battery capacity, the battery icon on screen 4 is red, and the maximum available gear is gear 5.

Booster/ '+'
The special scooter gear – '+', uses all available power at a given battery charge and load. It will accelerate the propeller to the maximum possible revolutions at a given moment, providing maximum speed. Acceleration will take place gradually. The plus gear can be activated by pressing the top piezo button, using the scooter in gear 9.

WARNING

Use plus gear wisely as it puts a significant strain on both the battery and the scooter engine.

Prolonged use of this gear will reduce the scooter's range faster than normal, which may affect the dive plan. Using the scooter at maximum speed requires maximum attention and significantly reduces reaction time, e.g. to encountered obstacles.

Reverse gear
The scooter's reverse gear can only be activated when the scooter is in the ‚0' gear position, both handles are not pressed and the user consciously presses the lower gear button.

Before you engage the [R] engine, prepare for the effect of reverse water flow through the drive unit:

- Look behind you and make sure there is enough room to maneuver.
- Make sure no equipment is hanging in the propeller area
- Hold the lower part of the jet ski nozzle with one hand and the other on the control handle, pushing it away from your body. At the same time, this will tighten the harness lines, which will prevent them from being „sucked" into the drive. Remember that the jet ski will now be pushing you, so you need to stiffen your hands.

Reverse gear is useful for stabilizing your position over short distances, or for clearing the propeller of aquatic vegetation.

WARNING

Use reverse gear sparingly and only for short periods, as the propeller will be moving in the opposite direction to normal. This can wear out the post swirl stator.

3.5 STARTING THE ENGINE

After selecting the desired gear, the scooter can be started.

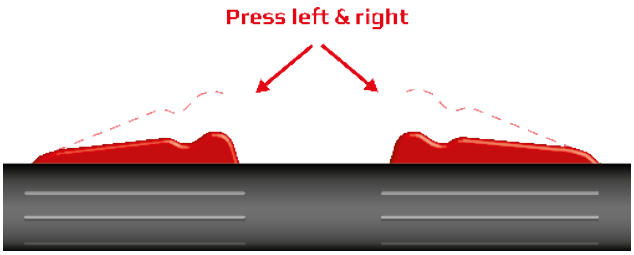
The user can set two methods to activate the scooter:

- Two-handed steering – The scooter is activated with both hands
- One-handed steering – The scooter is activated with one hand

WARNING

For safety reasons, the manufacturer recommends selecting the two-handed control mode (the variant marked on the scooter display as 'Two handed').
This is also the factory setting on every Seacraft scooter.

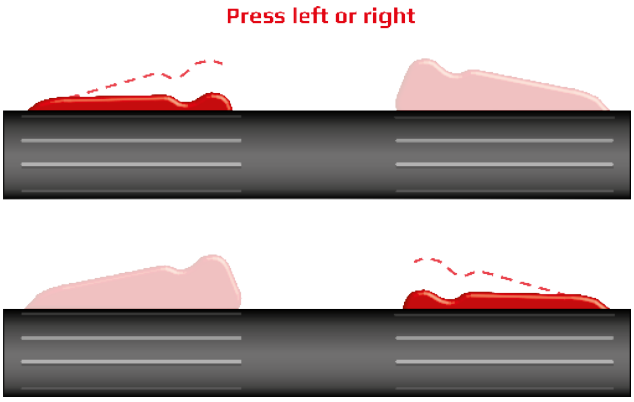
Two-handed steering



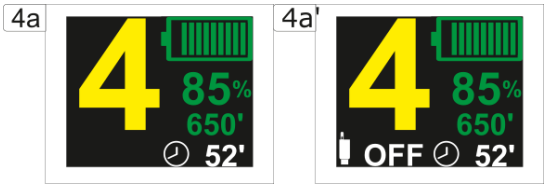
Selecting two-handed control means that to activate the scooter's engine you must press both the right and left handle buttons simultaneously.

One-handed steering
The scooter can be controlled with both hands. This mode causes the scooter engine to start when any of the handle buttons are pressed.

This also means that the propeller will rotate as long as the gear is different from zero, and at least one handle is pressed.

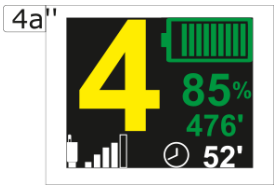


3.6 SCREENS DURING THE DIVE



Scooter screens with engine running.

The estimated remaining run time, based on the current engine load, will be displayed below the % battery. This time is displayed in minutes (')
The internal electronics measure the average current draw and every 6 seconds calculates how many minutes of driving time remain with the current load.



Scooter screens with a working engine and a workingpower converter.

If the voltage power converter is activated, its power consumption will be included in the calculation of the remaining operating time.

The calculation is based on measuring the estimated remaining battery capacity, taking into account the type of battery installed (which must be carefully selected in the settings).

The displayed remaining operating time is for guidance only and should not be used as a basis for making any decisions that could affect your life. Be sure to follow all the dive planning rules you learned during your DPV training.

However, if you need to re-plan your dive at short notice or encounter an unusual situation (e.g., towing a buddy in a changing current), the remaining dive time can be a helpful tool in selecting the optimal speed for a safe return.

The clock icon and the white number indicate the operating time – how many minutes in total the DPV was operating during a given start (so-called 'trigger time').

WARNING

When the engine load drops below 1.5A (approx. 50W, depending on the battery condition), the remaining operating time will not be displayed. The same applies when the DPV is not used underwater.

3.7 ADDITIONAL SCOOTER FUNCTIONS – PRACTICAL USE

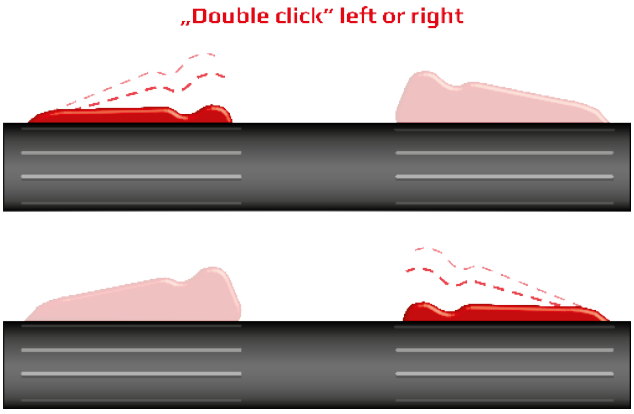
Time lock
Leaving the scooter without any activity (such as pressing buttons) for a period longer than the current Time Lock setting will return the selected gear to 0. (Standby mode)

WARNING

The time lock is an important safety feature that protects the user from accidentally or unintentionally starting the engine while using the scooter.

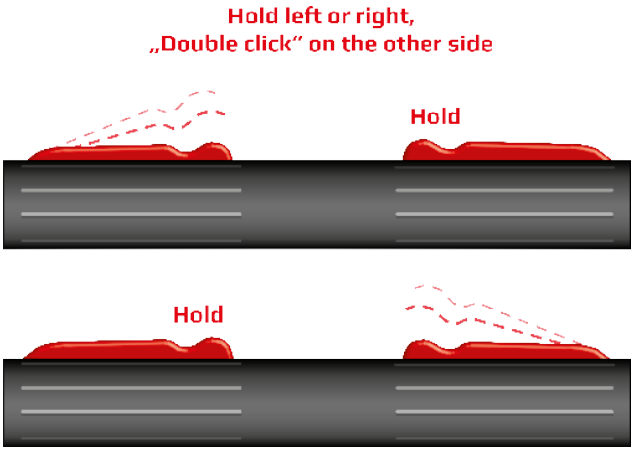
Fast unlock
When the Fast Unlock function is enabled, the scooter has reset the gear to 0 using the Time lock function, it is possible to quickly return to the previously selected gear.

To do this, press the left or right button of the handle twice in less than 0.5 seconds.



Double Tap
This function is available if Double Tap is active.

When using gears 1-8 and holding down one of the handle buttons, the user simultaneously presses the button on the other, free handle twice quickly. This selects the highest available gear (5, 7, or 9), regardless of which gear was previously selected, and allows for quick acceleration.



The time between clicks must be less than 0.5s
To return to the gear before accelerating, simply repeat the „double click".
This function allows you to quickly switch between 2 gears while driving, e.g. a short sprint.
Use this function wisely to avoid dangerous situations.

3.8 STOPPING THE ENGINE

To stop the scooter temporarily, simply release the handle button.
The scooter's engine will stop immediately.
To stop the scooter for a longer period of time, you must go to 0 gear:

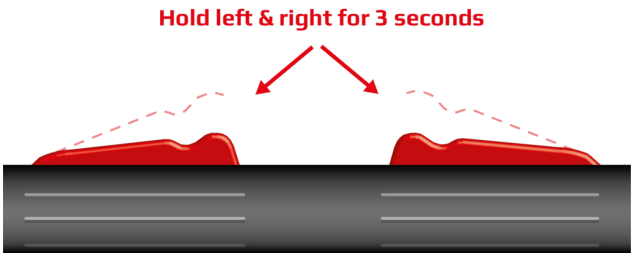
- Using the gear buttons to select gear 0
- Wait for the Time Lock function to work

W wyniku każdej z powyższych czynności bieg skutera zostanie ustawiony na 0. W takim przypadku, nawet jeśli użytkownik przypadkowo naciśnie przycisk rączki, silnik skutera nie zostanie uruchomiony.

3.8 Obsługa opcjonalnej przetwornicy

To activate the converter, first make sure that you have followed its user manual and that everything is set up correctly.

Then, in gear 0, hold both scooter handles for at least 3 seconds;



Screen 11 – Power Converter Settings will be displayed.

To turn on the converter and select its output voltage, use the gear buttons to select the power level.

During diving, you can choose between 5 output voltage levels, tuned to correspond to 20%, 40%, 60%, 80% and 100% of the heating power of 12V systems.
Corresponds to voltage steps of 6.0V, 7.5V, 9.4V, 10.7V, 12V.

For more information, see your inverter's instruction manual.

In addition to the scooter's gear (yellow number), additional information is displayed. Rows 4 and 5 (voltage and power) displayed in white, are only visible if the scooter is equipped with an optional voltage converter.

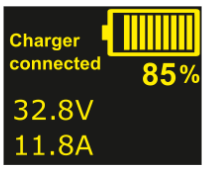
Row 3 will change its value every 3 seconds, alternately displaying the temperature and humidity inside the scooter's electronics compartment.

32.8 V	supply voltage (V)
560W	power consumption (W)
44%	humidity in electronics chamber (%)
25ºC	engine electronics temperature (ºC)
10.7V (option)	current output voltage from the voltage converter
59W (option)	power consumption from voltage power converter

04
CHARGING SCREENS

Once the charger is connected to the scooter, charging information will be displayed on the scooter screen (10).

10



The screen is activated by shorting the charger pins. The correct charging process is indicated by the display of the charging current greater than 1.0A (most often 5-10A). Additionally, the current battery voltage is displayed.

WARNING

When screen 10 is active, it is not possible to use the scooter's engine.

When the Charge MENU function is set to OFF, the above dedicated charging menu is disabled.

Only a white lightning bolt icon and a flashing appropriate battery charge status bar inform about the charger connection - as shown on screen 10'.
Using the scooter with this setting is also possible with the charger connected. In rare cases, flooding the charging socket may lead to the scooter being blocked by displaying screen 10. This setting allows for emergency use of the scooter even with a flooded charging socket.

10'

05
ERROR CODES FOR SELF-DIAGNOSIS

If there is an internal problem, the scooter will display one of the following error codes on the main screen:

Displayed abbreviation	Error description	Description of correct user operation
OV Err	Supply voltage too high	Charger failure, or incorrect battery connected. Turn off the scooter, disconnect the battery, report the problem to a service point.
UV Err	Supply voltage too low	Charger failure, or incorrect battery connected. Turn off the scooter, disconnect the battery, report the problem to a service point.
OT Err	Electronics temperature too high	Reduce speed in two gears. Reduce load on scooter.
SU Err	Scooter engine blocked during take-off	Turn off the scooter using the main switch, check if the propeller is not blocked, if necessary remove the steering wheel and unlock the propeller.
OC Err	Permitted motor current load exceeded	Turn off the scooter with the main switch, check that the propeller is not blocked, if necessary remove the steering wheel and unlock the propeller. Reduce the speed of the water by two gears. Reduce the load on the scooter. Make sure that no element is entangled in the propeller.
WATER	Too high humidity in the electronics chamber	Check that none of the seals are damaged. Report the problem to a service center. The scooter may be flooded.
TM Err	Internal data transmission error	Turn off the scooter using the main switch and start it again after 10 seconds.
FB Err	Engine start failure, drive feedback loop failure	Turn off the scooter using the main switch, check if the propeller is not blocked, if necessary remove the steering wheel and unlock the propeller.

If any error code is displayed on the screen, the user should immediately return to the starting point of the dive. Then, consider servicing the scooter at an authorized service center.

Some of the problems reported can be resolved underwater and allow further diving.

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