

USER INSTRUCTIONS

**Digital Swim Board (DSB)
Part No ND0001386**



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Specifications & Content

All information in this document is believed to be correct at the time of going to press, Northern Diver International Limited cannot be held responsible for any inaccuracies or omissions. If you find an error or feel we have missed important or useful information, please contact us. The latest version of the manual is always available to download from the website: www.ndiver.com. Specifications and information contained in this document are subject to change without notice and does not represent a commitment on the part of Northern Diver International Limited. Due to constant technological developments, the Digital Swim board can be changed at any time without notice. Illustrations within the manual may differ to each version of the product delivered but the functions will be as per instructions. If you have any questions concerning the material contained in this manual, please contact Northern Diver.

Handling Recommendations

The Digital Swim board system contains sensitive electronic components that may be damaged by an Electrostatic Discharge (ESD) if handled incorrectly. To minimise risk of damage, users should avoid dismantling the unit.

Waste Electrical & Electronic Equipment Statement

Under the European Union (EU) directive on 'Waste Electrical & Electronic Equipment' (Directive 2002/96/EC), from August 13, 2005, products categorised as electrical or electronic equipment cannot be discarded as municipal waste by placing in landfill, dumping in the sea or incineration. SEPARATE collection is mandatory. At the end of its life, you should either return this system and its associated leads & accessories (if appropriate) to Northern Diver International Limited with a certificate of decontamination (we reserve the right to protect our staff from the effects of any contamination) or it should be sent to an appropriate treatment or recycling agency.

Restriction of Hazardous Substances Statement

The EC RoHS directive 2011/65/EU. Effective from 02/01/2013

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1 Change Requests

Changes made to this document are stored within the table below.

All changes follow Northern Diver change request procedure as specified within the Quality Manual.

Only authorised person(s) can issue a change to this document, when authorisation of the change has been granted, updates and relevant information relating to the change will be added to the table and the document updated.

Change Request Number:	Description of change and location	Change Date:	Issue Number:	Changed By:	Approved By:
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2 Product Description

The Northern Diver Digital Swim Board (DSB) is designed to be a simple platform to display essential information to divers from all applications: Military, Rescue and Commercial.

The DSB incorporates the essential diving ancillaries:- Compass, Depth gauge and Stopwatch. To be clearly displayed to the diver via an OLED screen.

The screen features Manual and Automatic dimming functions to suit all diving environments and water conditions. With additional Covert feature allowing the display to be turned off whilst the unit remains on in the background.

The user interface comprises of simple push buttons that allow the user to navigate the DSB features.

The OLED screen displays, depth in meters, time in Hrs/Min/Sec's, battery level, compass heading in degrees, N-S-E-W, stopwatch and attitude.

Dive duration and depth are logged automatically and saved internally as a 'dive history set'. This can be downloaded to any PC/Laptop via Bluetooth connection and will be stored as a spreadsheet format for easy analysis.

Users can personalise and calibrate their unit via Bluetooth connection. Allowing changes to be made to:- clock times, brightness (max & min), Data log times, depths, power off duration time.

The internal Lithium-Ion battery is charged via a wireless docking station provided with each unit.

The DSB transportation case has a foam insert for all the components to be neatly packed, the case is heavy duty to protect kit when in transit or storage.

Throughout the manual there will be four safety alert boxes as shown below **DANGER, WARNING, CAUTION AND NOTICE.**

ATTENTION SYMBOLS



This symbol is used to refer to instructions.



This symbol is used to indicate information which is crucial to the operation of the device.

3 Safety Notice



IMPORTANT READ BEFORE USE

Before using your Digital Swim Board (DSB), please read and follow these safety considerations carefully, if you have any other issues, please contact the supplier's technical support.

3.1 Operation.

Do not rely on this product or its sensors as primary means of life-support during or after a dive. DSB is designed as a secondary tool, and not as a replacement for Depth Gauges, Compass, dive computer or similar equipment.

Do not use this product if there's any sign of damage to the housing or peripheral equipment fitted, or if there appears to be damage which could cause water ingress.

Do not attempt to dismantle or service this product yourself, contact the Northern Diver technical support for any spares or repair required.

The DSB is intended to be used by a trained user who has read the manual and has familiarised themselves with the controls on the surface and during a shallow dive in safe conditions.

Functionality checks should be carried out every time the unit is used and at service intervals determined by the service provider.

3.2 Maintenance & Cleaning.

After use thoroughly wash the system in fresh water, remove any weed or other detritus that may have been collected during operation. Do not clean with solvents, use a damp cloth to wipe down the exterior before you replace back into its storage case.

The unit contains a calibrated pressure sensor which we recommend needs to be maintained and calibrated on an annual service regime or part of a Planned Preventive Maintenance (PPM), this service can be carried out at Northern Diver Ltd.

3.3 Storage.

When storing the DSB or shipping, please observe the following:-

Do not store the unit in direct sunlight, this may cause discolouring, perish rubber mouldings/seals.

Always remove any salt or other residues from product after use, wipe dry before storing.

It is recommended that when not in use to store the product in the transportation case provided, this will protect the product.

Store in the recommended temperate range stated in the specification.

4 Technical Specification

Item	Specifications	
Product name	Digital Swim Board	
Part number	ND0001386	
Manufacturers Details:	Northern Diver (International) Ltd , Appley Lane North, Appley Bridge, Wigan, Lancashire, WN6 9AE Website - www.ndiver.com Tel +44(0)1257 254444	
Display	OLED	
Displayed Information	- Depth (Meters or Feet) - Time (hours/minutes/seconds) - Compass bearing (numerical degrees) - Compass bearing (eight cardinal points) - Stop Watch (Minutes/Seconds) - Battery Level indicator (pictorial) - AOA (Angle of attack indicator)	
Depth Rating	Max Operating Depth – 50m	
Depth Accuracy	Typically, +/- 2%	
Depth Resolution	0.1M	
Battery	lithium ion 18650 cell.	
Battery Life	Standby	2.5 Months
	Display off	100 Hours
	Display Min Brightness	30 Hours
	Display Max Brightness	16 Hours
Charging	Wireless Docking Station	
Dimensions and weight	Dimensions	268*215*80mm (10.55*8.45*3.15")
	Weight	1.1kg (2.4lbs)
Materials	Housing: Acetal Lens: Polycarbonate O-Rings: Nitrile Screws: Stainless Steel Buttons: Anodised Aluminium	
Working Temperature Range	-10°C to +50°C	
Storage Temperature Range	-20°C to +60°C	
Dive Log Storage	Max of 256 data logs and 10 hours of data logging	
Data Transfer	Bluetooth Wireless PC Connectivity	

5 Package Contents



Item	Part Number	Description	QTY
1	ND0001386	Digital swim board Unit	1
2	CASE-RAID-15L-433015	Transportation Case	1
3	ND0001607	Wireless Charger	1
4	ND0003854	Allen Key	1
5	ND0003855	USB Software	1
6	ND0003856	USB Bluetooth Connector	1

6 Instructions for Use



- **Caution:** Do Not Use When Low Battery Indicator Is flashing. The battery should be recharged immediately before further use.

6.1 - Button Functions:-

There are 4 buttons that allow the user to interact with the DSB features.

BUTTON 1 (TOP RIGHT)

Function 1 – Press and hold for 5 seconds to power up swim board.

Function 2 – Press and hold for 5 seconds to power down swim board.

BUTTON 2 (BOTTOM RIGHT)

Function 1 – Press once to start the stop watch function.

Function 2 – Press once to stop the stop watch function.

Function 3 – Press and hold for 3 seconds to reset the stop watch.

Button 3 (TOP LEFT)

Function 1 – Press once to activate covert screen.

Function 2 – Press once to deactivate covert screen.

Function 3 – Press and hold at start up to zero depth.

Function 4 – Press and hold for 7 seconds to turn Bluetooth® function on.

Function 5 – Press and hold for 7 seconds to turn Bluetooth® function off.

Button 4 (BOTTOM LEFT)

Function 1 – Press once to toggle between display features.

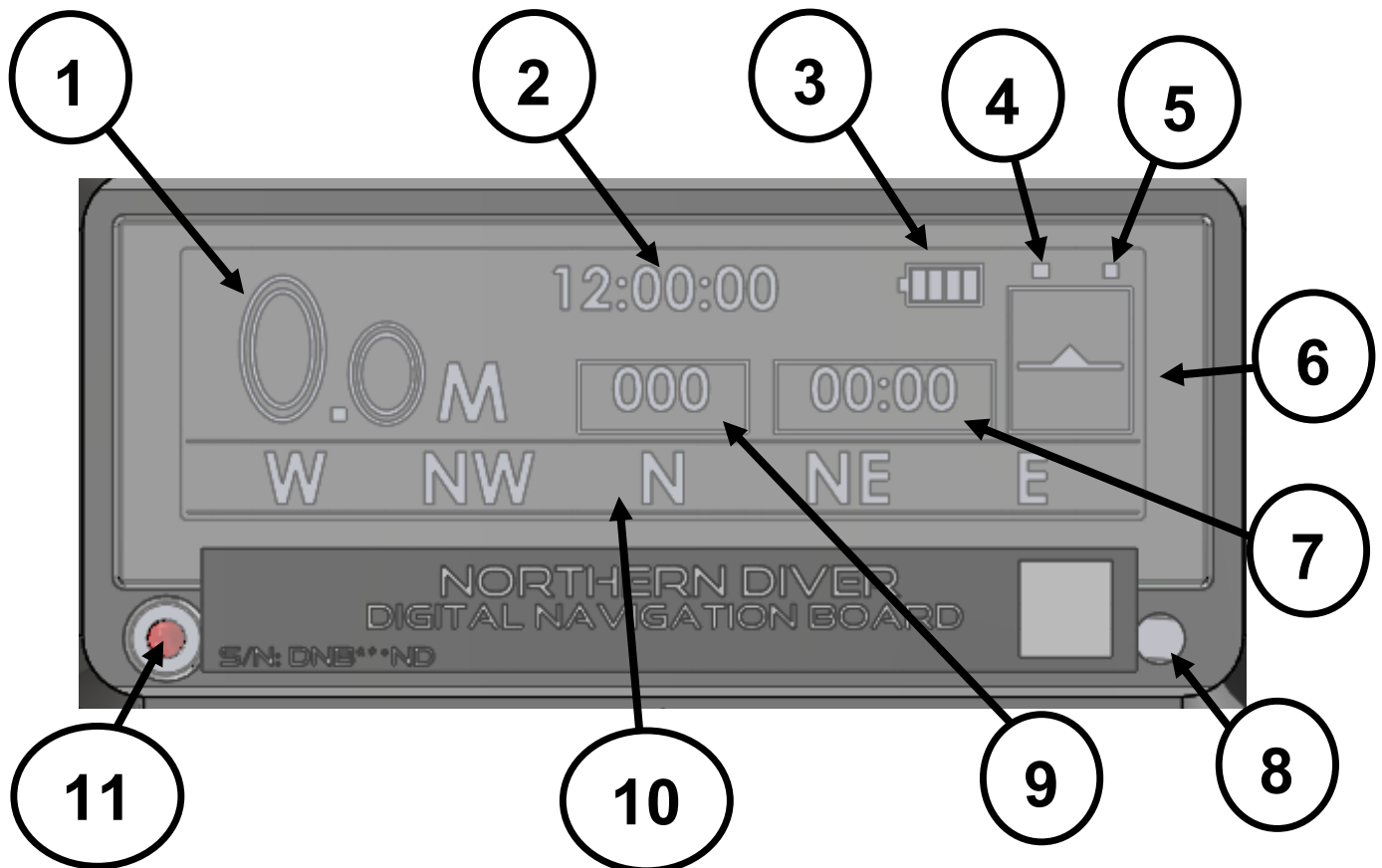
If there is no interaction with the swim board for 5 minutes the swim board will go into sleep mode, press button 3 to turn display back on.

If there is no interaction with the swim board for another 15mins the swim board will go into power down mode, press and hold button 1 for 5 seconds to turn swim board back on.



6.4 Display Information:-

information is displayed to the user via the screen on the Digital Swim Board (DSB) in this section we will identify the different areas of the screen and then information they are displaying.



5 Mode: -

The user has the ability to toggle information displayed in this area of the screen by pressing button 3 below is the information that is displayed:

Depth – This feature shows a current depth gauge, available in Metres or Feet.



Water Temperature – This feature shows current water temperature, available in degrees Celsius or Fahrenheit.



Numerical compass heading – This feature shows an enlarged compass heading of numerical degrees.



Max depth - This feature shows the maximum depth reached during the dive, available in Metres or Feet.



Elapsed Time – This feature shows the dive duration (Hour/Minutes/Seconds).



2 Clock:-

- Real Time Clock in top centre shows current time. This can be set using Bluetooth interface to PC.

3 Battery Indicator:-



100%



75%



50%



25%

- Battery indicator gives accurate indication of battery charge state.

4 Zero Depth :-

- within the first 3 seconds of turning the swim board on the user can calibrate the zero depth of the swim board.

5 Bluetooth® icon: -

when the icon is showing the swim boards Bluetooth® is turned on. It is advised to turn this feature off while not using the Bluetooth® feature, as it will reduce battery life.

6 Attitude Display :-

Attitude display shows tilt and pitch of the swim board allowing diver to avoid disorientation on night missions or in low visibility water.

7 Stopwatch :-

Stopwatch display shows minutes and seconds for mission timing.

8 Auto Dimming Sensor: -

There is an automatic dimming sensor which will control the brightness of the OLED display.

9 Heading :-

This shows the heading value in degrees of the compass.

10 Compass :-

This shows compass display relative to the direction the swim board is pointing. A horizontal scrolling graphic shows N-S-E-W information.

11 Charging indicator: -

When the swim board is placed on the charger, the red LED will light up. Once the battery is fully charged the LED will go off to signal to the user the swim board is fully charged.

7 Recharging The Battery

To charge, place the charger on a flat and dry surface away from any water. **Note – The battery should be fully charged before a dive.**

Connect the USB cable into charger and plug the cable into a USB compatible power supply, the red LED on the charger will illuminate.



Place the swim board on top of charger ensuring the charger locates in the into the hole.



During charge the red LED light will light up, showing connection to charger and the swim board is charging. Once the battery is fully charged the red LED will go out.



CHARGING

CHARGING COMPLETE

8 Calibration Instructions

When powering up the unit calibration of the depth sensor may be required to offset the depth to read 0M at the surface.

NOTE – Before Diving the depth must read 0.0M on the display.

Turn on the digital swim board by pressing and holding button 1 until the screen is on.



BUTTON 1 TO TURN ON

To calibrate depth to zero press and hold **button 3 (Top Left)** within the first 3 seconds of powering up.



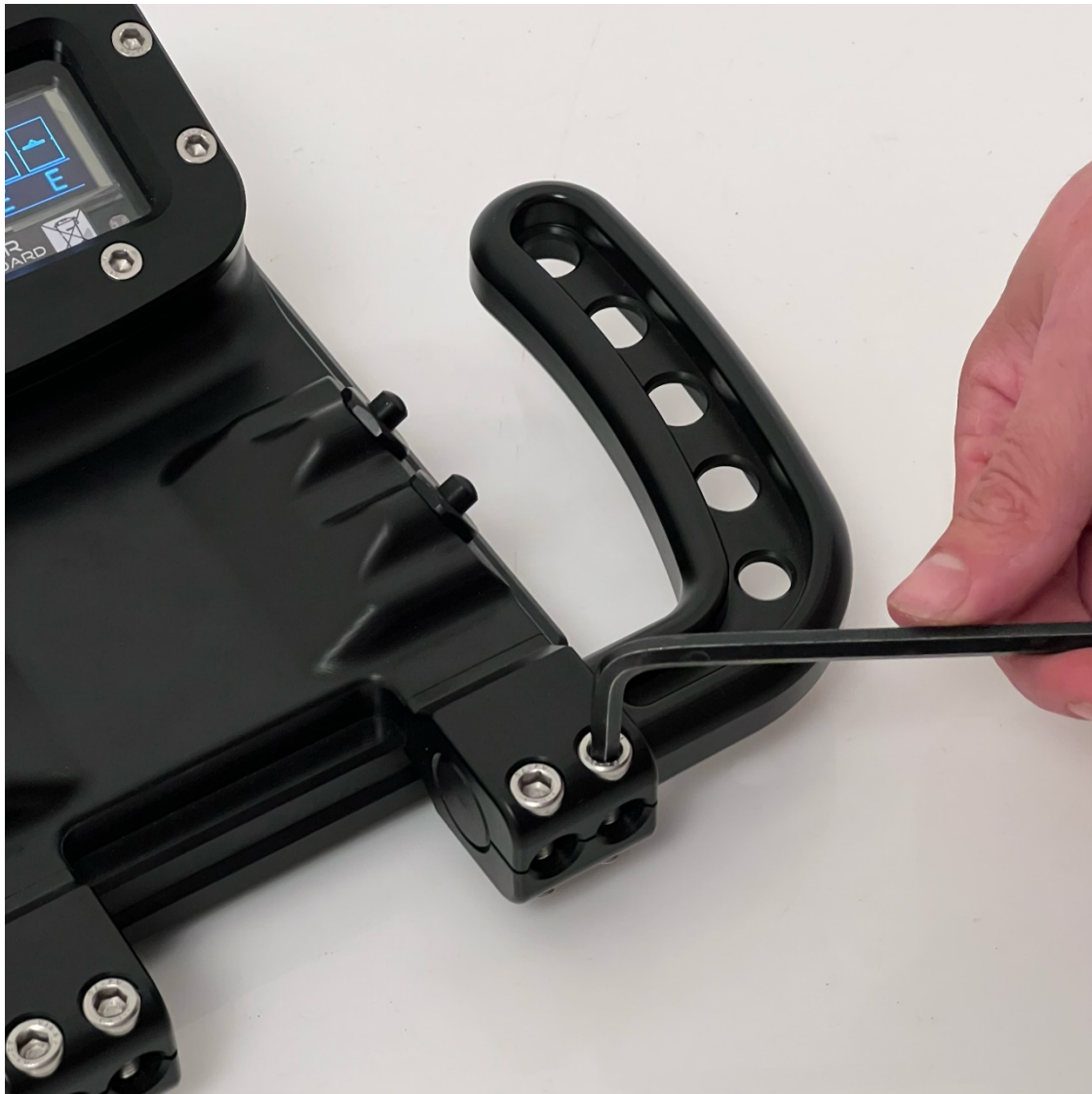
BUTTON 3 TO CALIBRATE

The unit must be powered down & back up if the calibration window has been missed.

9 Handle Adjustment / Removal

Using the 5mm Allen key provided the handles can be loosened and orientation adjusted.

Loosen the two screws and orientate the handle into a suitable position & retighten to lock the handle in place.

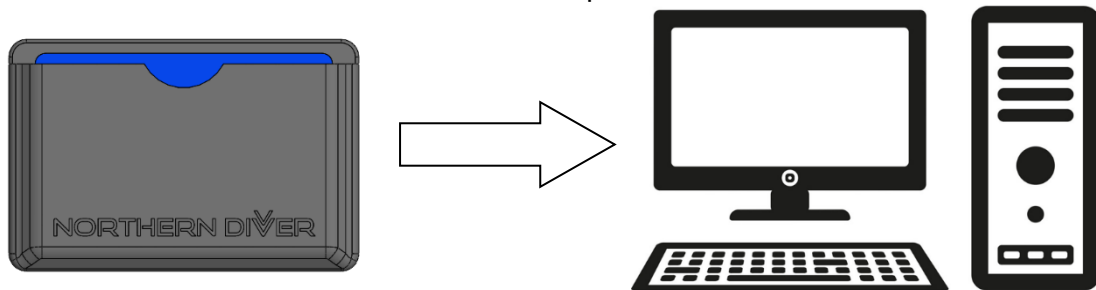


10 Loading Software / Data Transfer

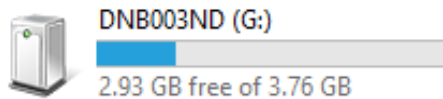
Bluetooth communication with swim board is used to transfer data logs and configure features and data to be changed inside the swim board without opening the unit.



Insert the Northern diver USB card into the PC USB port.



Find the USB card on the PC file explorer, Double click on the "swimboard_user_interface.exe" and the user interface will open up.



☐ Name	Date modified	Type	Size
☐ Battery Information	28/09/2020 12:20	File folder	
☐ User Manual	28/09/2020 12:20	File folder	
☒ Swimboard_user_interface.exe	22/09/2020 14:56	Application	430 KB

The screenshot shows the 'Swimboard User Interface V2.00' window. It features a blue title bar and a light gray background. The interface is organized into several functional areas:

- COM1:** A dropdown menu set to 'COM1' and a 'Serial Number' field with a 'Read' button.
- Run Time:** A field showing '00:00:00' with a 'Read' button.
- Dive Log:** A dropdown menu for 'Dive Log' and buttons for 'Recorded Dive Logs', 'Read Data', and 'Read Index'.
- Real Time Clock:** A field showing '09:03:35 08/10/20' with 'Set RTC' and 'Read RTC' buttons.
- Timing:** A section with five rows of settings: 'Display off time' (120), 'Cal reset enabled' (2), 'Dive idle time' (600), 'Auto power off' (1800), and 'Press to pwr up' (4). Each has a 'Read' button. A 'Press pwr down' setting (5) has a 'Write' button.
- Display:** Two rows for 'High Brightness' (100) and 'Low Brightness' (0), each with 'Read' and 'Write' buttons.
- Pressure Sensor Offset:** A field with 'Write', 'Read', and 'Auto-Reset' buttons.
- Depth:** Three rows: 'Dive start depth' (0.5), 'Dive stop depth' (0.4), and 'Max safe depth' (6), each with a 'Read' or 'Write' button.
- Mode flags:** Checkboxes for 'Imperial' and 'Pure O2' with a 'Read' button.

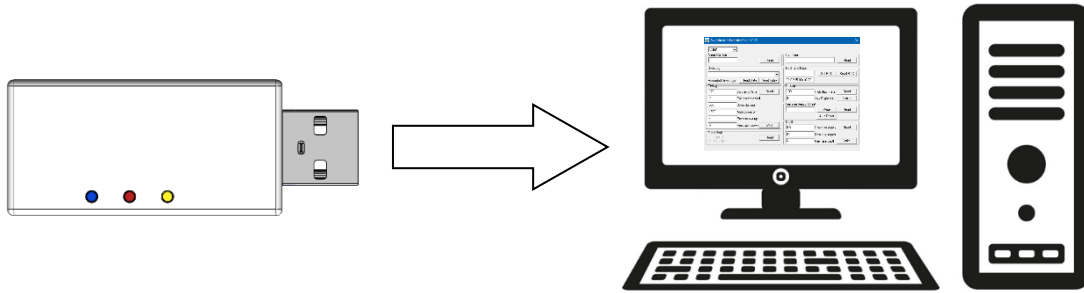
- **Com port :-** this is used to tell the software which port the Bluetooth® device is in (see 5.8 for more info) (drop down box only)
- **Run time :-** this is the total “On” run time for the unit. (read only)
- **Serial Number :-** The serial number of the swim board; it should match the USB stick and label on the front screen DNB003ND (read only)
- **Dive Log:-** the dive log section is where all the dive logs have been recorded. Once the log is full it will over write the oldest entry. 10 hours' worth of data can be logged see 5.11.1 for more info (drop down box only).
- **Real Time Clock:-** The real time clock (RTC) is used to update the on clock within the swim board. The clock within the user interface takes it time form the clock used on the computer. To change the time on the clock press “Set RTC”. (Editable)
- **Timing:-** the timing page is where different features timing can be adjusted.(Editable)
 - Display off time: how long until the display will turn off if not in use in seconds.
 - Dive idle time: how long until the display will turn off if in use in seconds
 - Auto power off: how long the swim board will fully turn off when not in use in seconds.
 - Press to pwr up: how long the power button would need to be pressed to power the system up.
 - Press to pwr down: how long the power button would need to press to power the system down.

User Instructions – Digital Swim Board Draft Version

- **Display:-** change the display max and minimum brightness
Max = 250
Minimum 0
- **Mode flags:-** mode flag shows the users the units the swim board is set up for
imperial - feet and Fahrenheit.
Pure O2 – used for high O2 diving
No box ticked - Standard units are meters and C°
- **Depth:-** the dive start depth and finish depth is where the settings are used to start and stop the dive log data. Once the swim board sees a depth of 0.5m it will start a log and when the swim board sees a depth of 0.4m it will stop the log if the diver were to dive again within 2 minutes it will still be on the same dive log.

User Instructions – Digital Swim Board Draft Version

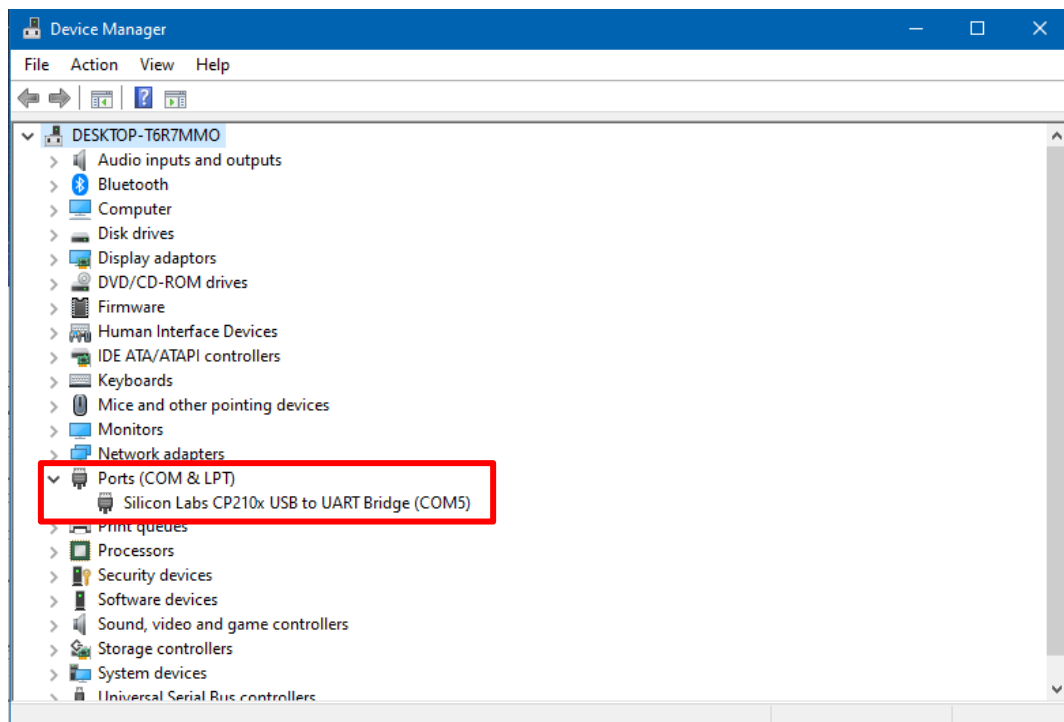
Connect the Bluetooth® device into the same PC that has the swim board user interface open on it.



The Bluetooth device has 3 lights yellow, red, and blue each light list below:

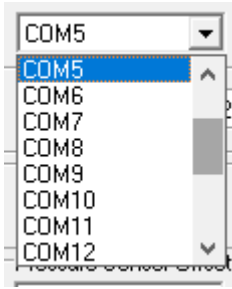
- Solid red light – error with device unplug and try again.
- Solid red light quick flashing blue light – searching for devices (first attempt)
- Solid red light double quick flashing blue light – search found no data transmitted. (first attempt)
- Yellow light – data transmitting
- Double blue light flashing connected no data in transmission (first attempt and second attempt)
- Continuous flashing blue light searching for device (second attempt)

With the Bluetooth® device has been inserted into the PC confirm the COM port the device is connected to, the COM port can be found within the device manager under ports (COM & LPT).



User Instructions – Digital Swim Board Draft Version

On the swim board user interface click on the COM drop down select the matching COM port as displayed within the device manager.

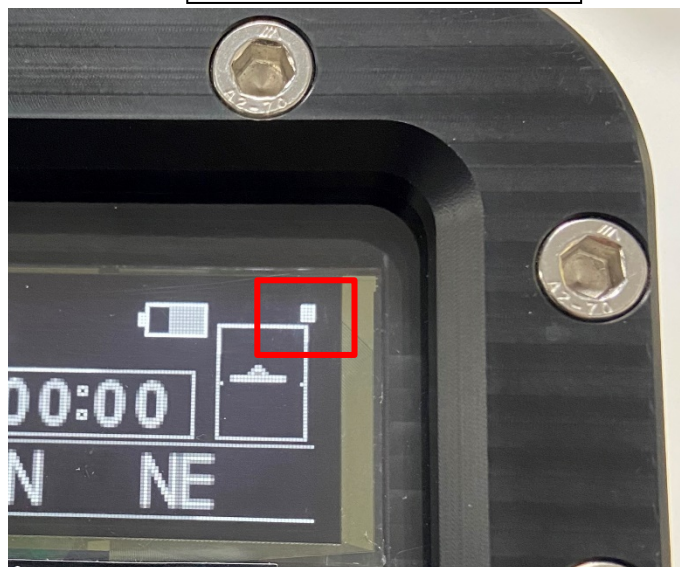


Once the correct COM port has been selected turn the swim board Bluetooth® on by holding button 3 down for 8 seconds.

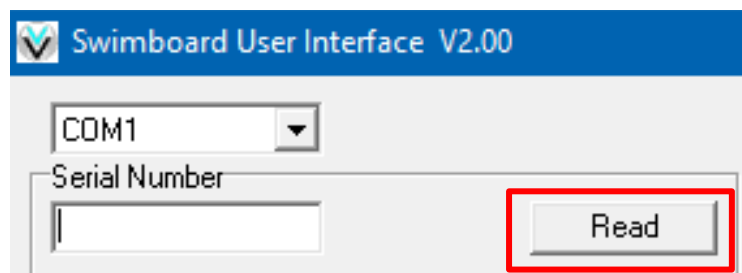
BUTTON 3 TO TURN ON BLUETOOTH



BLUETOOTH INDICATOR

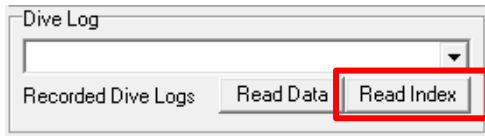


Now Pressing Read next to the serial number should generate the boards serial confirming connection has been made by Bluetooth.

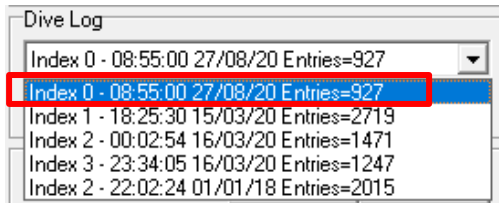


Recorded Dive logs download instructions.

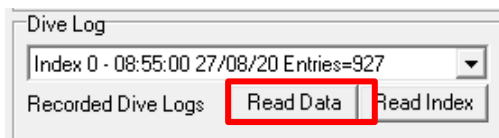
Once the swim board has been connected to the PC the dive log can be accessed. First click on read index.



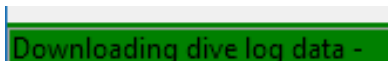
Select dive entry from index drop down, the dive is logged against time and date.



With the correct dive index loaded within the dive log box. Click on Read Data.

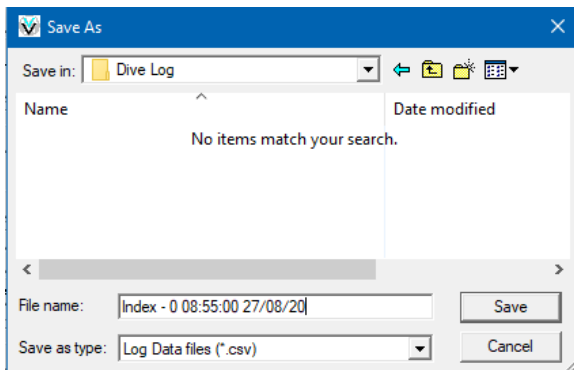


The downloading dive log data will appear in the bottom left of the window indicating the data is being downloaded to the PC. The Bluetooth device will be flashing yellow.



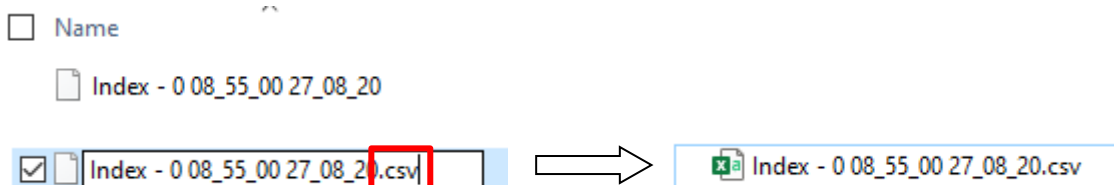
When the download is complete a save as window will appear.

Save the dive log to a known location. (recommend creating a backup on Northern Diver USB card under file "Dive Log" in case data was lost on PC)



Located the saved file and convert to an excel document by right clicking on the file, "rename" add ".csv" to the end of the file name and click off file.

This will change the file into a excel® document.



User Instructions – Digital Swim Board Draft Version

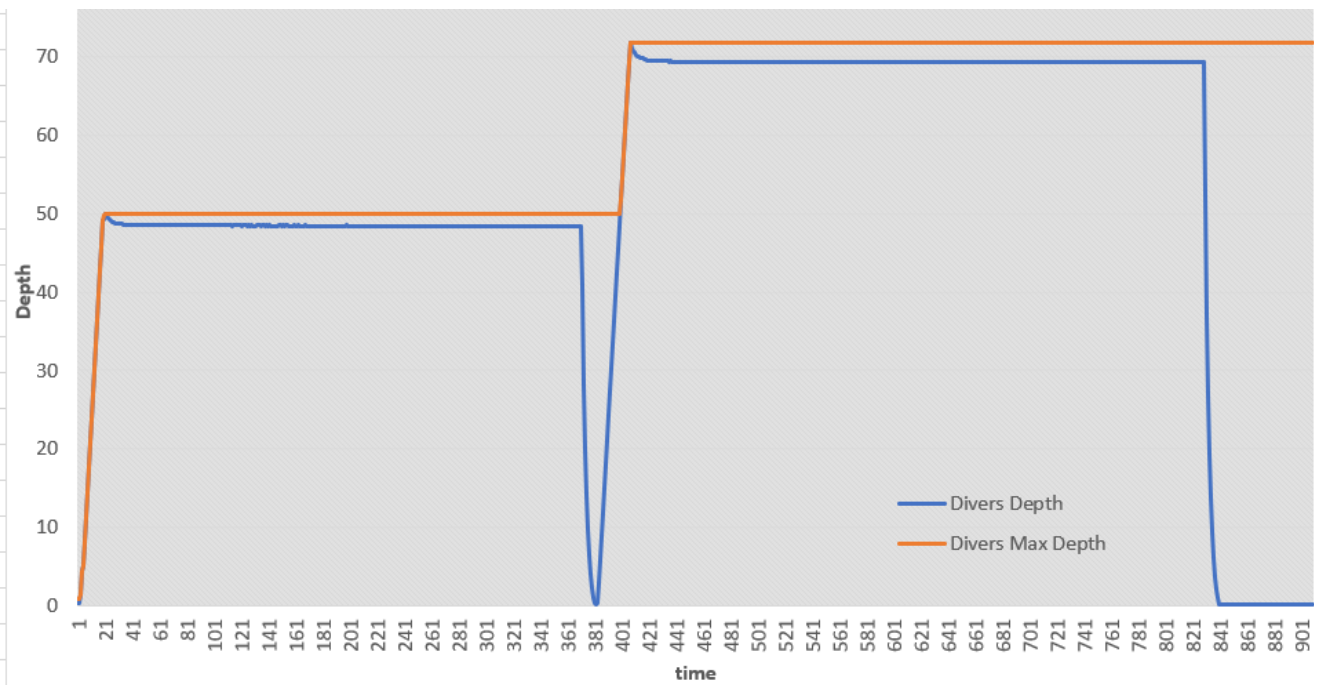
Open the excel file, Using the data the user can either read the raw data from the columns or can create graphs to display dive log information.

Northern Diver Depth Timer dive log file								

Created on	28	September	2020	at 3:40 PM				

Dive log index=	0							
Dive log timestamp=	08:55:00	27/08/20						
Number of dive log entries=	927							

Dive Time	Over-dep	Depth	Max Depth	Stopwatch	Heading	Roll	Pitch	
5	0	0.3	0.8	00:00:10	144	-1	42	
10	0	0.3	0.8	00:00:15	148	-1	41	
15	0	1.3	1.3	00:00:20	147	0	43	
20	0	4.4	4.4	00:00:25	149	0	42	
25	0	5	5.1	00:00:30	147	-1	42	
30	4	8.1	8.1	00:00:35	153	0	42	
35	9	11.2	11.2	00:00:40	148	0	42	
40	14	14.4	14.4	00:00:45	150	0	42	
45	19	17.5	17.5	00:00:50	148	0	42	
50	24	20.7	20.7	00:00:55	149	0	42	
55	29	23.8	23.8	00:01:00	150	0	42	
60	34	26.9	26.9	00:01:05	147	0	42	
65	39	30.1	30.1	00:01:10	147	0	43	
70	44	33.2	33.2	00:01:15	150	0	43	
75	49	36.4	36.4	00:01:20	154	0	43	
80	54	39.6	39.6	00:01:25	154	1	43	



11 Fault Finding

Fault	Cause	Remedy
No Display	Unit is switched off	Read instructions switch unit on
	Battery not charged	Recharge battery
	Covert Mode enabled.	Press button 3 to wake up screen
	Faulty Battery / Switch	Contact Northern Diver
	Unit has been flooded	Contact Northern Diver
Sensor	Out of calibration	Read instructions & re-calibrate

Technical assistance is provided by Northern Diver International Engineering & Servicing Department, who can provide:

- A help line for technical enquiries.
- On-site maintenance, testing and calibration.
- Training technicians for servicing either in response to a call or as part of a planned maintenance contract.

For advice and information, contact:

Northern Diver Engineering Dept,
 Northern Diver International Ltd,
 Appley Lane North,
 Appley Bridge,
 Lancashire,
 WN69AE.
 United Kingdom.
 Tel: +44(0)1257 25 4444
 Engineering@Ndiver.com
<https://www.ndiver.com/>

12 Warranty Policy

Changes :- Northern Diver International Limited Is continually developing its product range and reserves the right to alter the above specification without notice.

Liability:- Northern Diver International Limited assumes no liability for damages, losses, or cost incurred consequentially through the operation or malfunction of any Northern Diver (International) Ltd product.

The manufacturer, Northern Diver International Limited (hereafter after referred to as Northern Diver), warrants that at the time of shipment all products shall be free from defects in material and workmanship and suitable for the purpose specified in the product literature.

Conditions

Unless other terms are specifically requested and mutually agreed in writing prior to dispatch, the conditions of the warranty include, but are not limited to:

- The warranty is only deemed to be valid if the equipment was sold through Northern Diver or one of its approved distributors.
- The warranty commences immediately from the date of customer acceptance and runs for a period of 365 days. Customer acceptance will always be deemed to have occurred within 72 hours of delivery.
- The equipment must have been installed and commissioned in strict accordance with approved technical standards and specifications and for the purpose that the system was designed.
- The warranty is not transferable.
- Northern Diver must be notified immediately (in writing) of any suspected defect and if advised by Northern Diver, the equipment subject to the defect shall be returned by the customer to Northern Diver, via a suitable mode of transportation and shall be freight paid.
- The warranty does not apply to defects that have been caused by failure to follow the recommended installation or maintenance procedures, or defects resulting from normal wear & tear, incorrect operation, fire, water ingress, lightning damage or fluctuations in vehicles supply voltages, or from any other circumstances that may arise after delivery that is out with the control of Northern Diver. (Note: The warranty does not apply in the event where a defect has been caused by isolation incompatibilities.)
- The warranty does not cover the transportation of personnel and per diem allowances relating to any repair or replacement.
- The warranty does not cover any direct, indirect, punitive, special consequential damages or any damages whatsoever arising out of or connected with misuse of this product.
- Any equipment or parts returned under warranty provisions will be returned to the customer freight prepaid by Northern Diver.
- The warranty shall become invalid if the customer attempts to repair or modify the equipment without appropriate written authority being first received from Northern Diver.
- Northern Diver retains the sole right to accept or reject any warranty claim.
- Each product is carefully examined and checked before it is shipped. It should therefore be visually and operationally checked as soon as it is received. If it is damaged in anyway, a claim should be filed with the courier and Northern Diver notified of the damage.
- Any customer acceptance testing (if applicable) must be performed at either Northern Diver premises or at one of their approved distributors unless mutually agreed in writing prior to despatch. Northern Diver reserve the right to change specifications at any time without notice and without any obligation to incorporate new features in instruments previously sold.

If the system is not covered by warranty, or if it is determined that the fault is caused by misuse, repair will be billed to the customer, and an estimate submitted for customer approval before the commencement of repairs.