

Project SCUPA

Wearable

User Manual

July 2023

V1.0

Controls

Interaction with the device is done through 4 hall sensors located on the sides of the device. The hall sensors can be triggered using Neodymium magnets. Figure 1 shows the placement of the sensors on the device.

The hall sensors are used for the following interactions:

- **UP:** Scrolling up within menus or zooming out on the map
- **DOWN:** Scrolling down within menus or zooming in on the map
- **RETURN (LEFT):** Used to exit menus, or to instantly jump back to the map screen when activated in the main menu
- **ENTER (RIGHT):** Used to enter menus and for window specific actions such as sending messages and adding bookmarks
 - o **ENTER (RIGHT)** may be held down for 1.5 seconds for a unique LONG PRESS action. This is used for deleting messages and bookmarks.

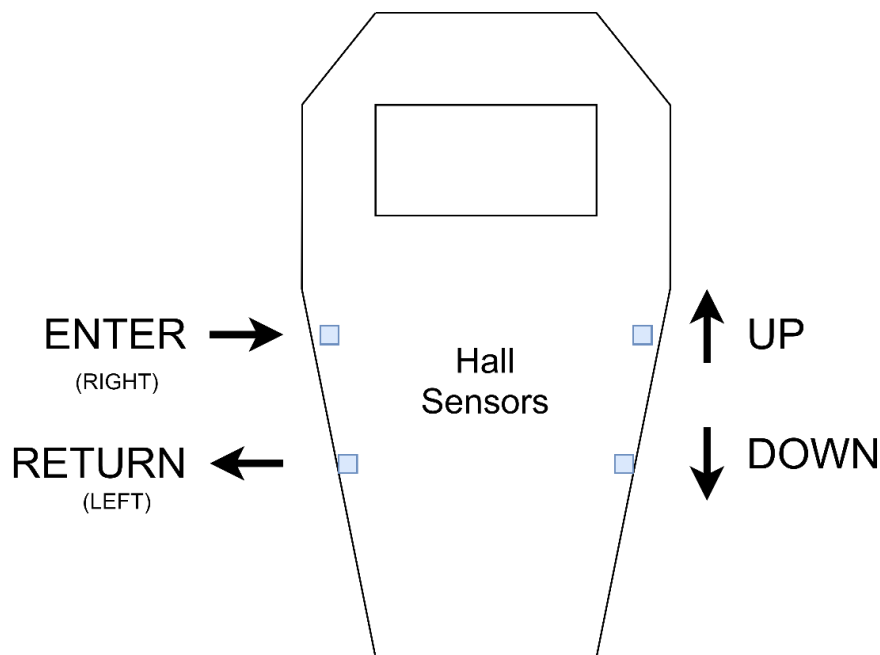


FIGURE 1: CONTROL LAYOUT

The buttons ENTER and RETURN are referred to as RIGHT and LEFT respectively within the GUI.

Startup

The wearable will automatically start upon power-up of the Buoy. The power to the wearable is controlled by the STM32 on the buoy.

Upon starting, the wearable will wait for the buoy to establish a GPS connection. This can be skipped using LONG PRESS ENTER. After a valid GPS coordinate has been received, the device will mark this location as the starting location which will be automatically saved at bookmark location 1. Please note that if this step is skipped, the device may be initialized at an undefined starting location.

Map view

The map view (figure 2) is the main window loaded after the startup phase. The map gives a top down view of the surrounding area. The center of the screen is the current user location. Within the center there is also a compass with a compass needle indicating the currently facing direction of the device. The map always maintains up as north. For an accurate reading of the compass the device should be as flat as possible relative to the earth. and the magnets to activate the hall sensors should not be near the device.

The two range rings show a radius equal to the distance printed below each ring. These rings can be used to quickly estimate the distance to a bookmarked location.

The top left of the screen shows the current user GPS coordinates, and extra information such as the currently selected bookmark and the distance to this bookmark.

The top right shows the current zoom level in meters per pixel.

If a course is selected a cyan line that leads towards the selected bookmark will be drawn. The selected bookmarks depth and distance will also be printed below the marker on the map.

The user can zoom out and into the map using the UP and DOWN interactions respectively.

RETURN (LEFT) can be used to exit the map view and return to the main menu.

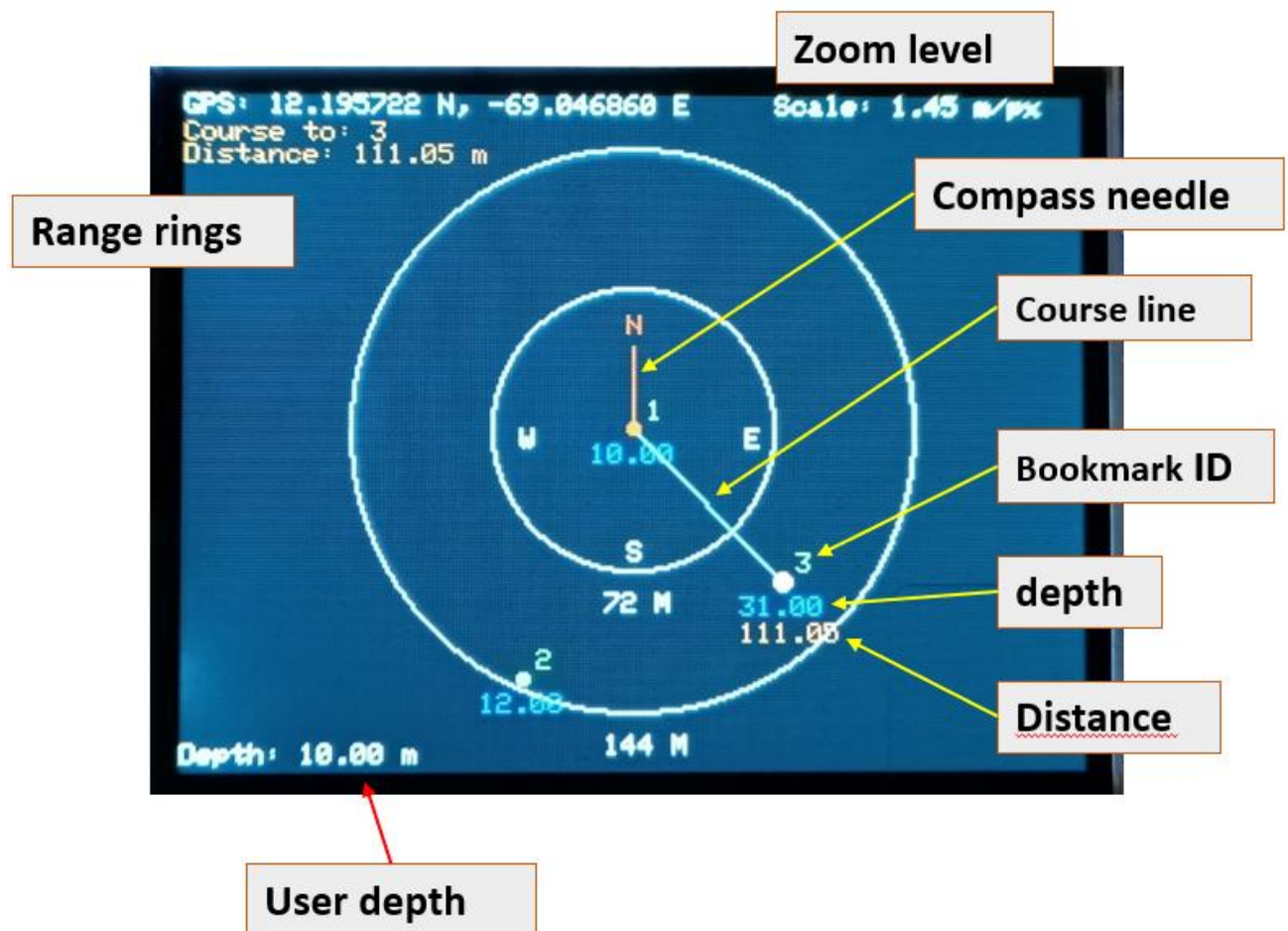


FIGURE 2: ANNOTATED MAP VIEW

Lastly, the lower left corner will indicate the user's current depth. This corner will also show if there are any unread messages and errors.



FIGURE 3: ERROR MESSAGES IN LOWER LEFT MAP CORNER

Main menu

The main menu shows each selectable window and can be scrolled using the UP and DOWN interactions. Entering the selected window can be done using ENTER (RIGHT).

While in the main menu, the map can be quickly reached by pressing LEFT (RETURN) regardless of the selected window.

If there are unread messages, this will be displayed next to the Check Messages menu option (see figure 4).

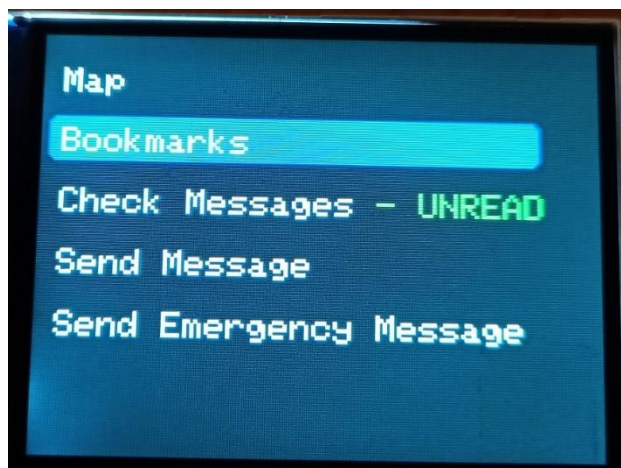


FIGURE 4: MAIN MENU

Bookmarks

The bookmark menu shows a list of bookmarks. It supports multiple pages of bookmarks with 12 bookmarks per page and up to a total of 64 bookmarks. This menu is navigable using the UP and DOWN buttons. ENTER (RIGHT) pressing a set bookmark opens an information menu with more detailed information. ENTER (RIGHT) pressing again sets a course to the selected bookmark.

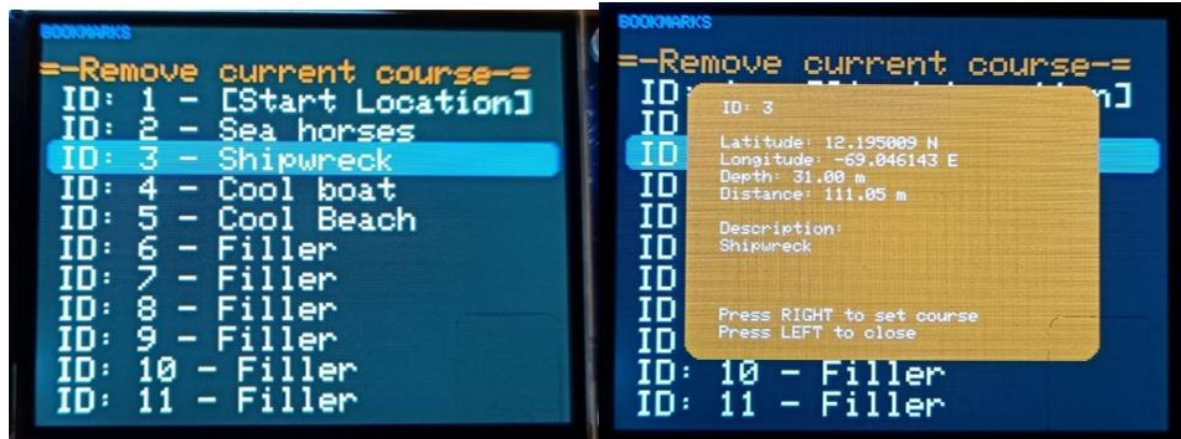


FIGURE 5: BOOKMARK MENU AND INFO PANEL

LONG ENTER (RIGHT) pressing an existing entry will give a warning prompt to delete the entry, LONG ENTER (RIGHT) pressing again will confirm this deletion.

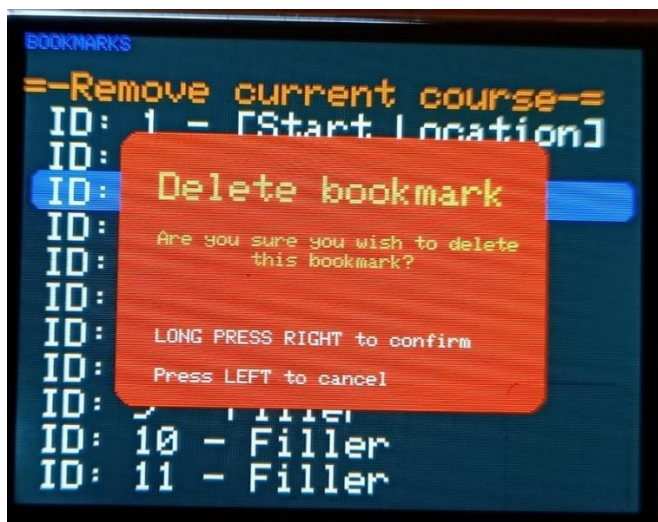


FIGURE 6: BOOKMARK DELETION

A bookmark of the current user location can be entered by selecting an empty slot and then ENTER (RIGHT) pressing this slot. This will open a menu to select a description to add to this location.

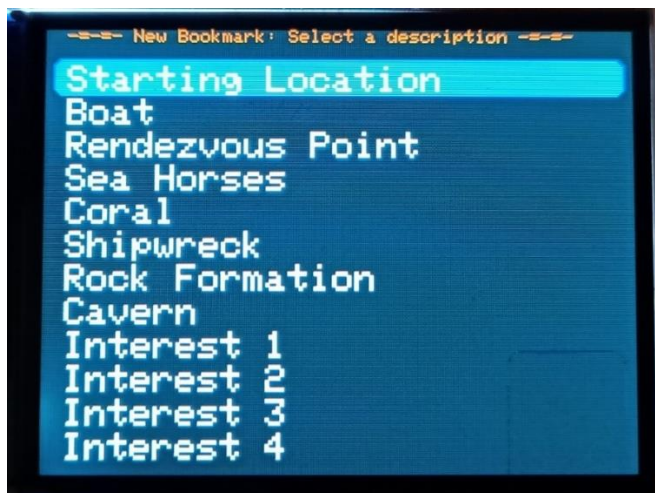


FIGURE 7: ADDING A NEW BOOKMARK

Check messages menu

The check messages menu is similar to the bookmark menu and lists up to 64 received messages by order in which they were received. If the message list is full the last message will be replaced with the newest message. Unread messages are marked in green and read messages in white.

ENTER (RIGHT) pressing on a message will enlarge it and open it in full if the text didn't fit in the menu. LONG ENTER (RIGHT) pressing will show a deletion prompt similar to the bookmark menu.

Received emergency messages will be marked in red in the menu. When an emergency message is received it will automatically be opened and shown on the screen, no matter which menu the user is currently in.

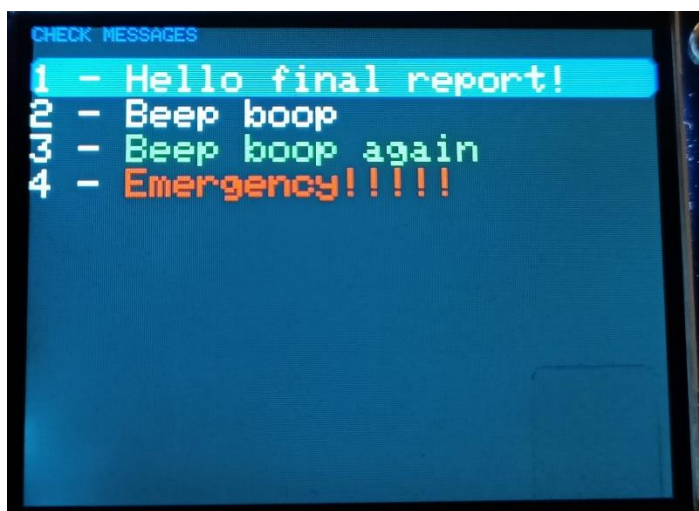


FIGURE 8: CHECK MESSAGES WINDOW

Send message/emergency message menus

These menus allow the user to send the selected preprogrammed message to the base station by selecting and ENTER (RIGHT) pressing the message. This will return the user back to the main menu after sending. Emergency messages will get priority and get a priority pop up at the base station.

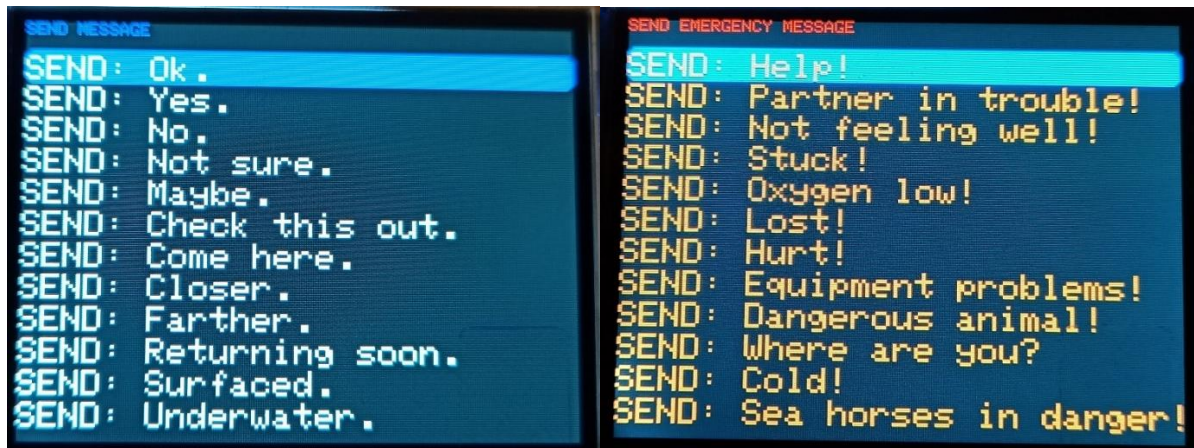


FIGURE 9: SENDING NORMAL AND EMERGENCY MESSAGES

For more information, see the full technical report.