

# USER MANUAL

SOFTWARE ENGINEERING AND PROJECT

UNIVERSITY OF ADELAIDE

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## Prospector Sea Floor Mapping System

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Semester 2, 2016

Revision History				
Date	Name	Student ID	Updates	Version
19th Oct 2016	Navdeep Singh	1660360	Added the basic structure of draft	0.1
20th Oct 2016	Liang Yuan	1679380	add detail manual	0.2
26th Oct 2016	Navdeep Singh	1660360	Added Screenshots and Details	0.3
29th Oct 2016	Yann Frizenschaf	1162562	Edits for release	1.0

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# 1 Abstract

This document is the User Manual for the Prospector Sea Floor Mapping System (SFM). It is designed to introduce a novice user to the user of the SFM Operations Graphical User Interface (GUI) to the various functions of the system including control of the robot prototype and map file import/export.

# 2 Introduction

## 2.1 Overview

The Prospector SFM system enables Map exploration through remote, autonomous control of a robotic vehicle which facilitates data acquisition. The primary goals of the software platform are therefore:

- to enable a human operator to send appropriate commands to the robot via a graphical user interface (GUI) in order to initiate autonomous exploration of the survey area (and intervene when necessary); and
- extract the gathered data via the same GUI into a XML file format.

## 2.2 Purpose

The purpose of this document is to detail the User Manual for the Prospector Seafloor Mapping System (SFM), developed for SeaFaults. It contains the details of how to connect to robot, how to perform a mapping operation and how to use the GUI.

## 2.3 Scope

This document defines the User manual for the software component of the SFM system only.

## 2.4 Assumptions

- The Machine running the GUI will have the Java 8 runtime environment pre-installed.

- The operator will know the current IP address of the robot.
- The robot will be powered on and connected to an appropriate Bluetooth or Wifi network.

## 3 Human Interface Design

### 3.1 Overview of the User Interface

An overview of the GUI is shown in Figure 1. The GUI consists of four main panels (clockwise from far left of the figure):

- The map panel, including the map legend, which shows the current state of the mapping operation
- The control panel, consisting of arrow buttons for robot control, mode selection drop-down menu, destination entry fields, map loading and saving buttons, and robot manual position correction fields.
- The information panel, which displays system state information
- The connection panel, used to connect to the robot.

## 3.2 Detailed Design of the User Interface

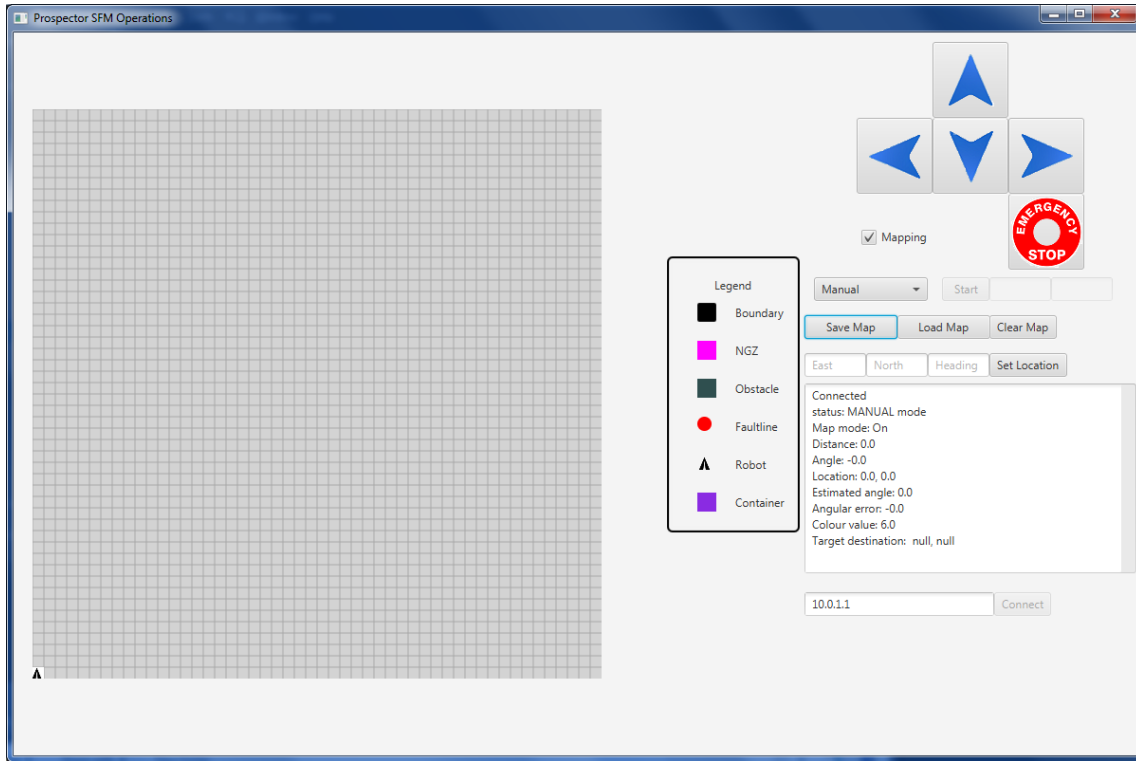


Figure 1: User interface

### 3.2.1 Connection field

The user interface provides an input for user to input the IP address of the robot, in order to connect to robot, show below:

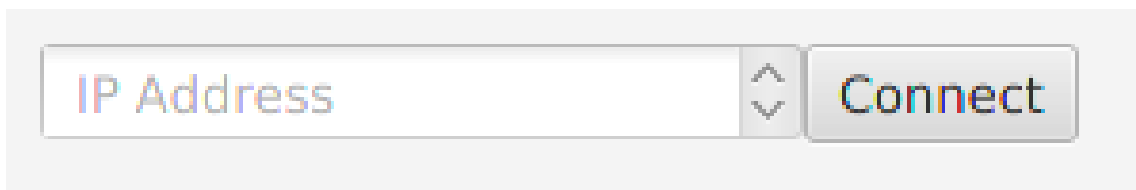


Figure 2: Connect

### 3.2.2 Control mode

The user interface provides the function that user can choose the control mode, including automatic mode, manual mode and move-to-point mode. When user chooses the automatic mode, the four direction buttons are dim, and the emergency button is light, shows as figure 3. When user chooses manual mode, all control buttons are light, shows as figure 4 . When user chooses move-to-point mode, the four direction buttons are dim, the emergency button is light. In addition, user need to input the point, shows as figure 5.

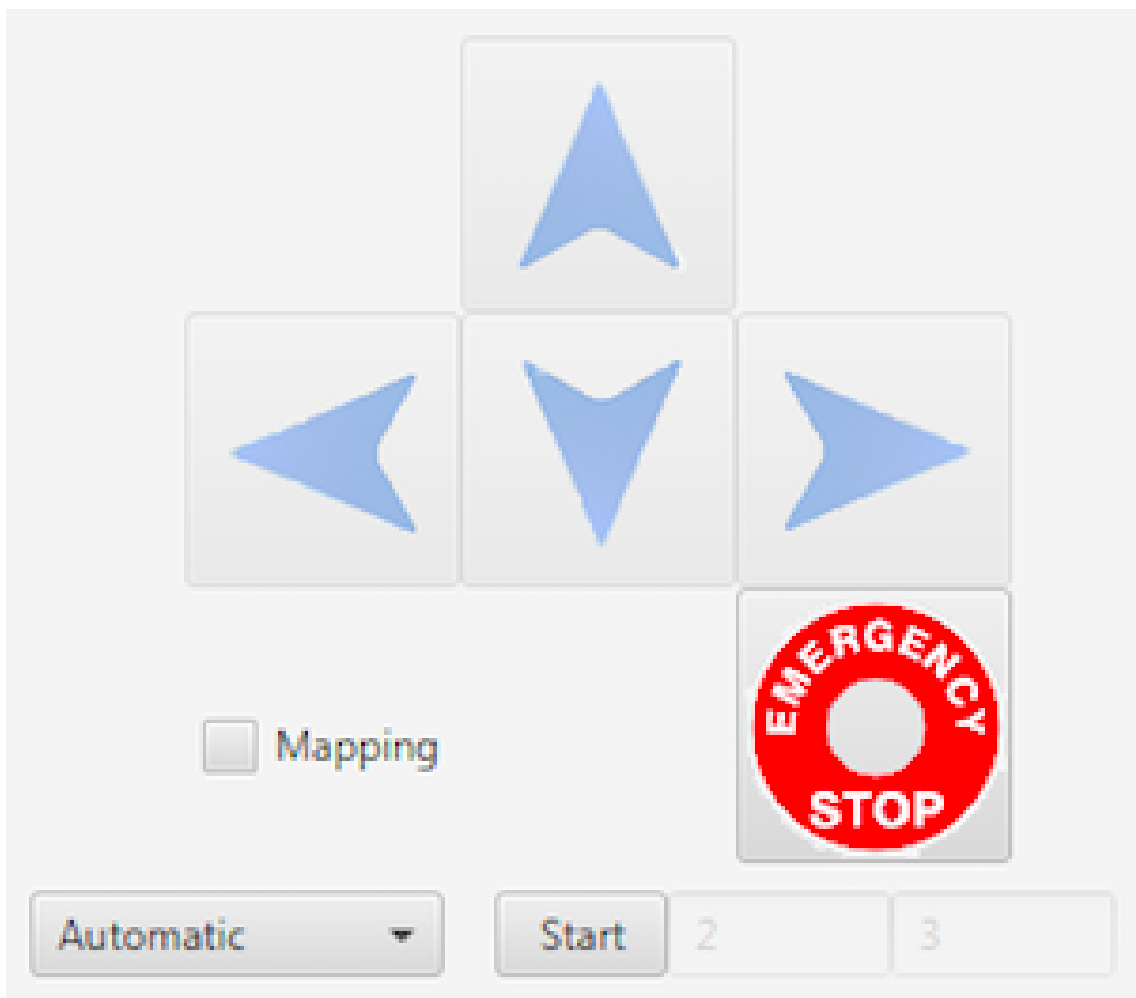


Figure 3: Automatic Mode

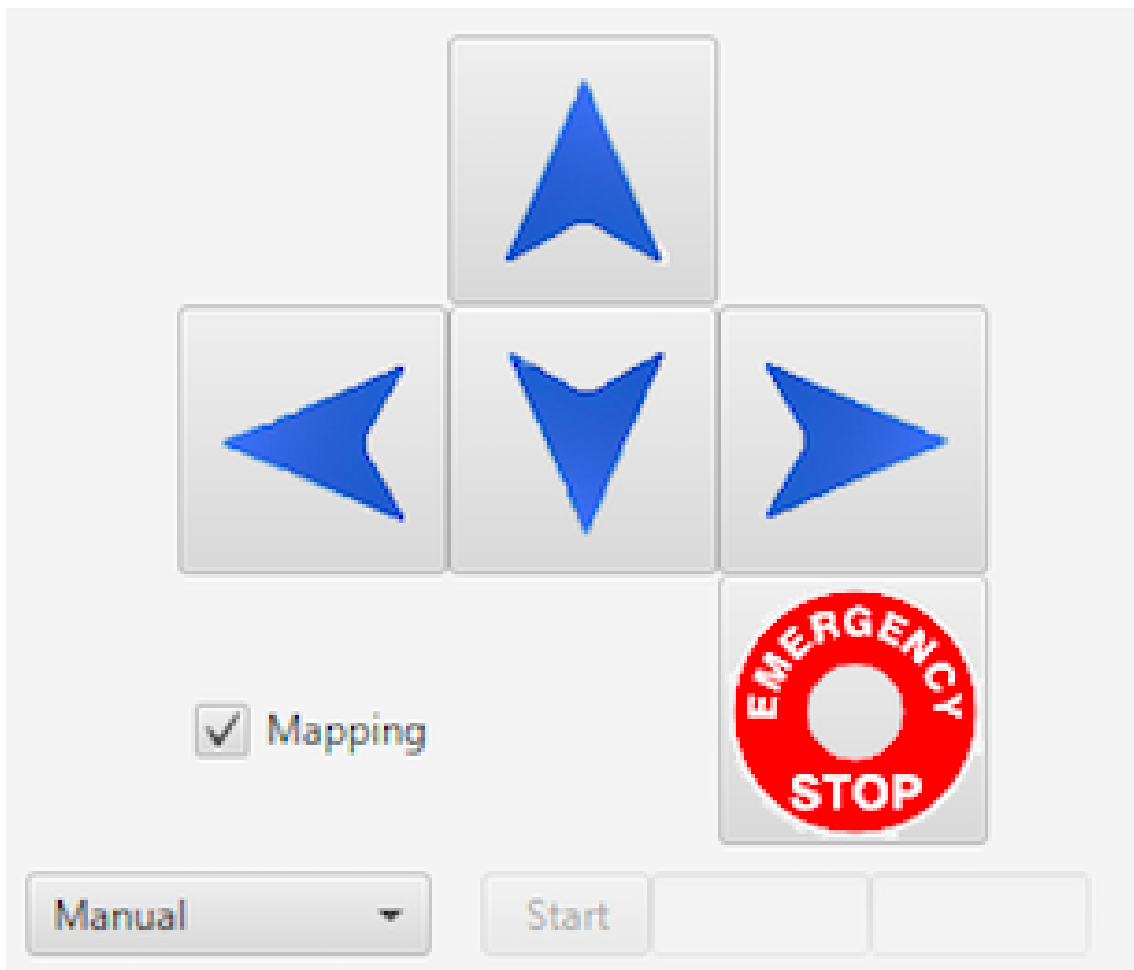


Figure 4: Manual Mode



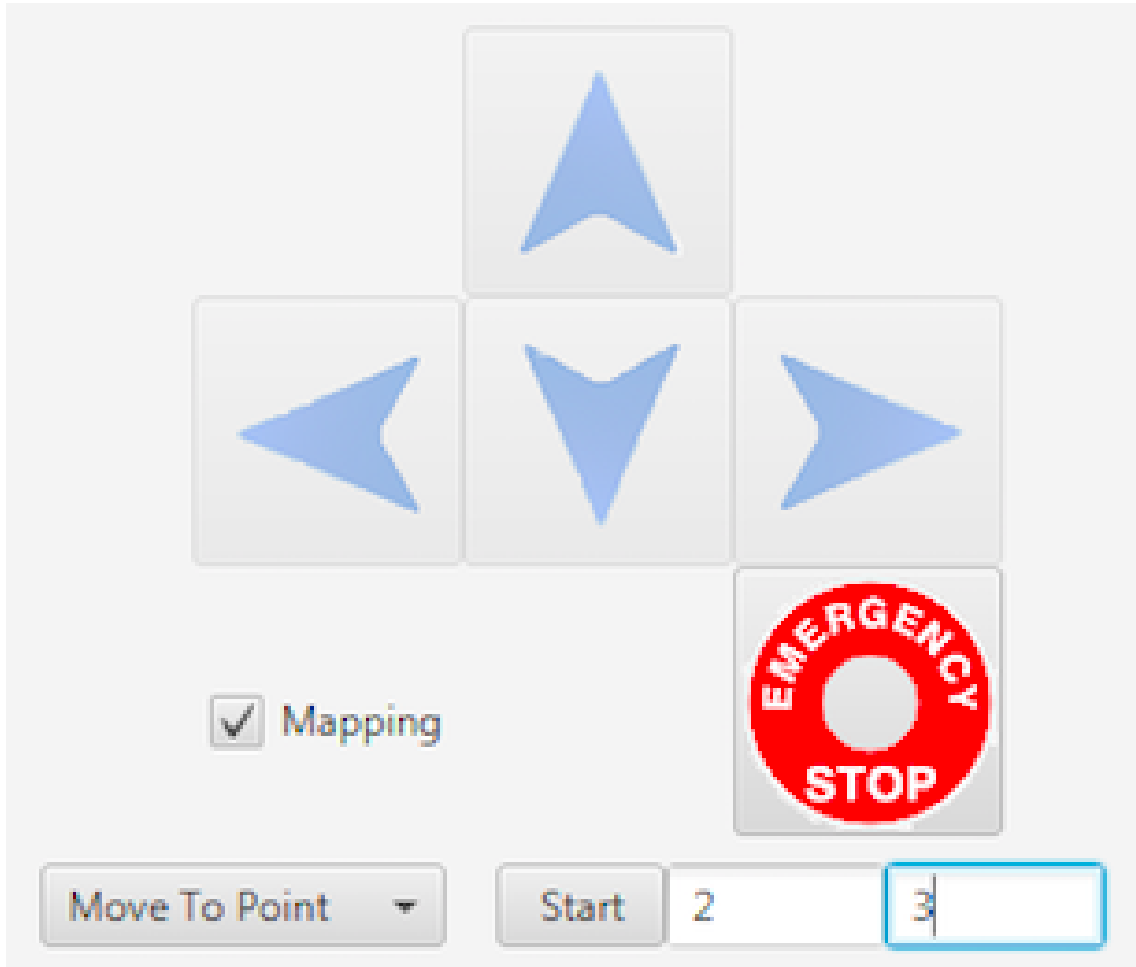


Figure 5: Move to Point

### 3.2.3 Map operation

The user interface provides three buttons in terms of map operation. The "Save Map" button is to save the map that has been drawn by robot, the "Load Map" button is to load the map that has provided, and the "Clear Map" button is to the current map, show below:



Figure 6: Save Map 1

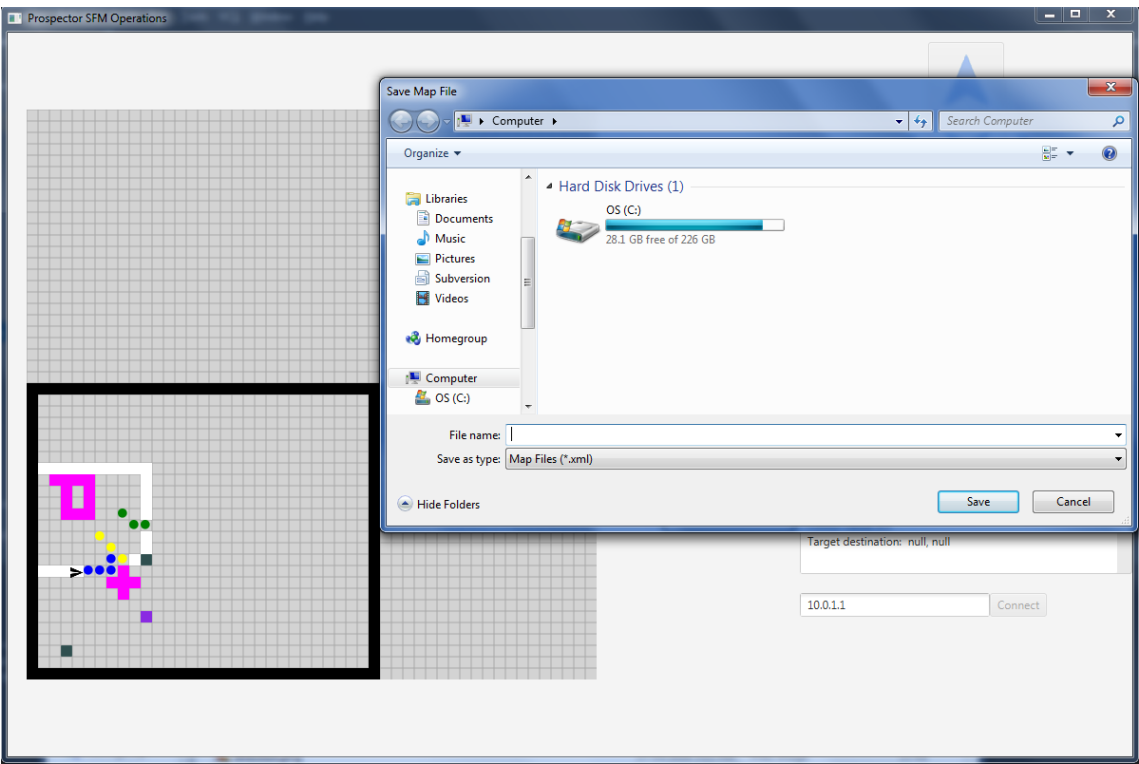


Figure 7: Save Map 2

### 3.2.4 Location setting

The user interface provide an input field for user to set the start location. Users need to type the location, and put the robot at that point, show below:

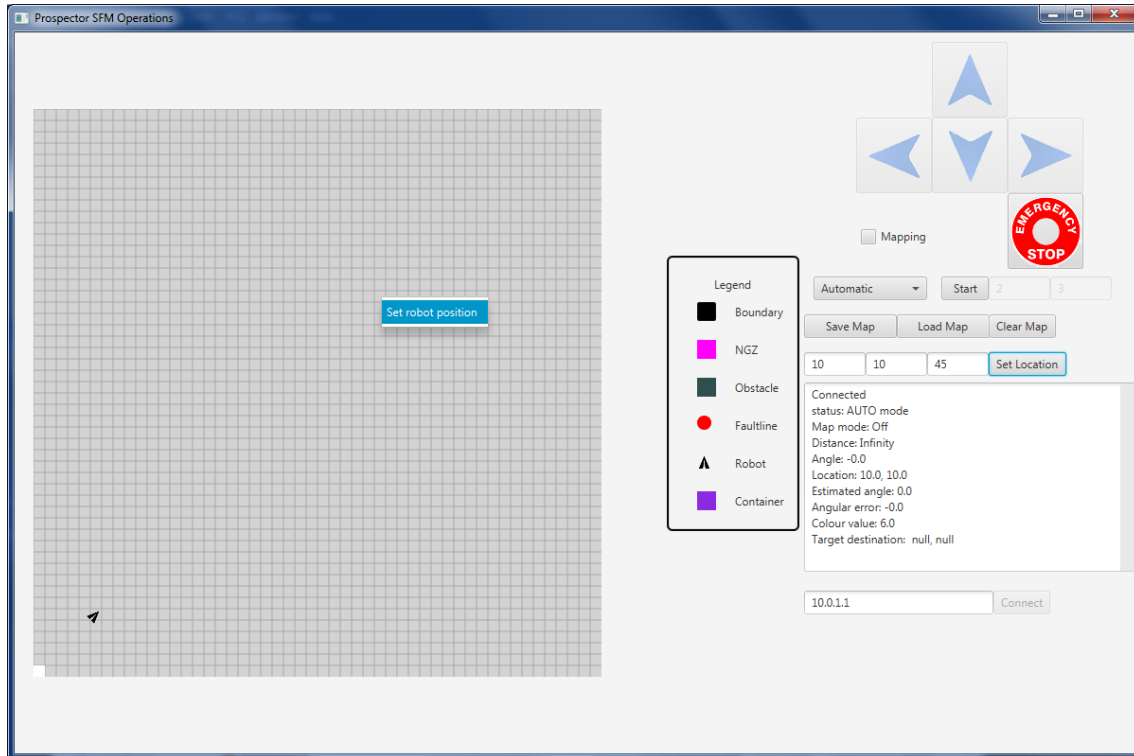


Figure 8: Location Setting 1

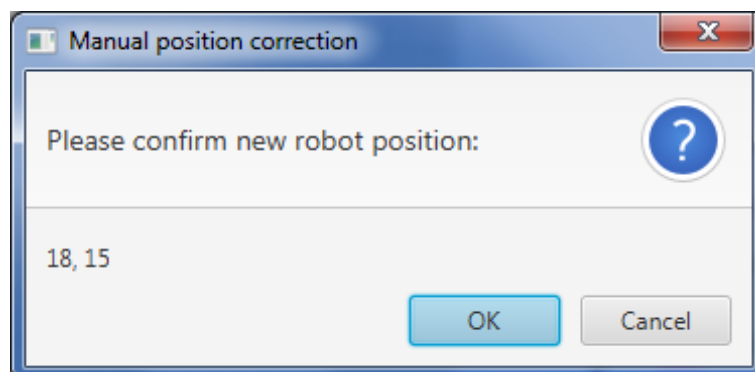


Figure 9: Location Setting 2

### 3.2.5 Information field

The user interface provides the information about the robot, such as whether connect, the distance between the robot and obstacle, and the current location, show below:

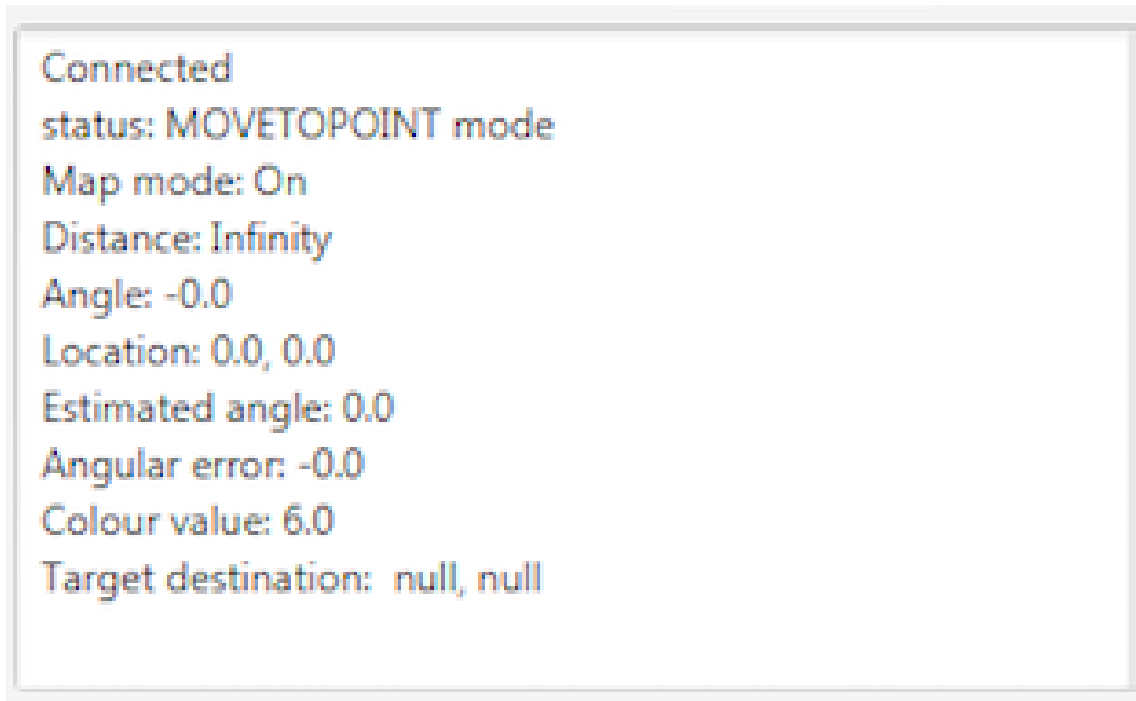


Figure 10: Information Field

### 3.2.6 Map legend

The user interface provides the legend to demonstrate the label, for example, the black square means the bound, the pink square mean the no-go-zone, show below:

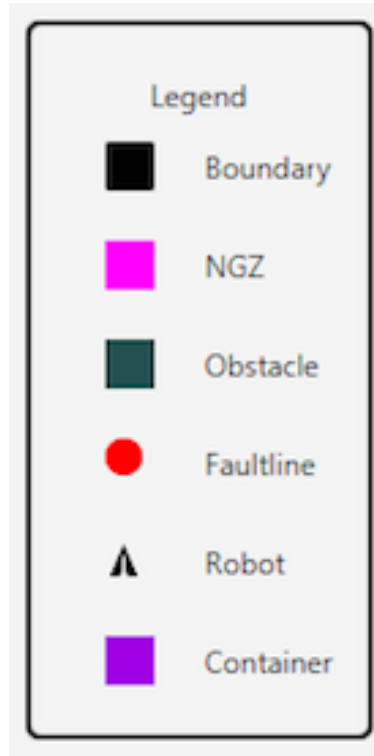


Figure 11: Map Legend

### 3.2.7 Map drawing

The user interface provides an area to draw the map that robot detected in real-time, the map will be show as grid, users can check the robot's work, show below:

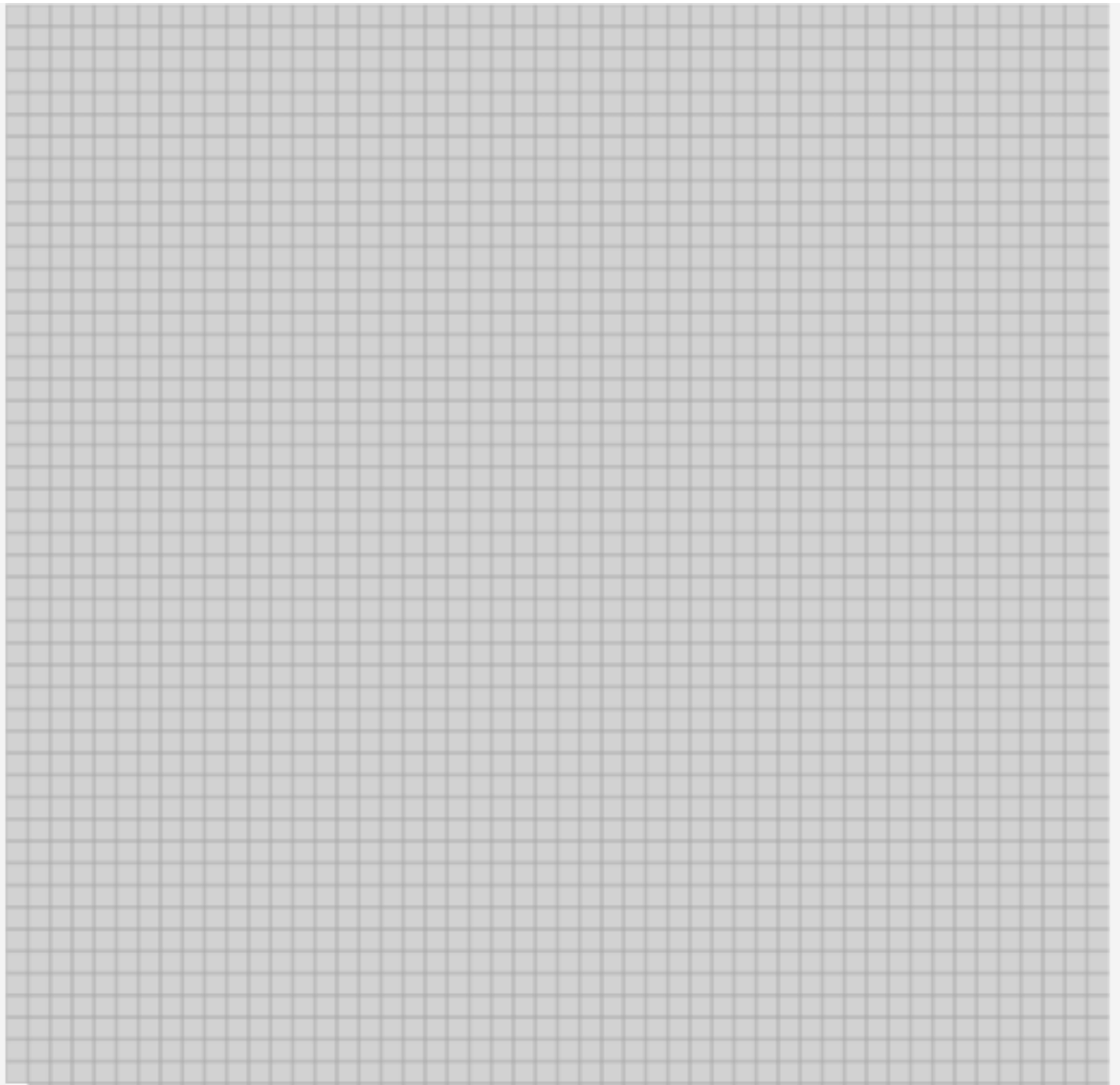


Figure 12: Map Grid

### 3.2.8 Setting a No Go Zone

The user interface allow user to mark a No Go Zone (NGZ) by choosing which area user want to make a NGZ. To Specify the NGZ area user just has to Select the area with left click on the Map grid and leave it will be marked as NGZ.

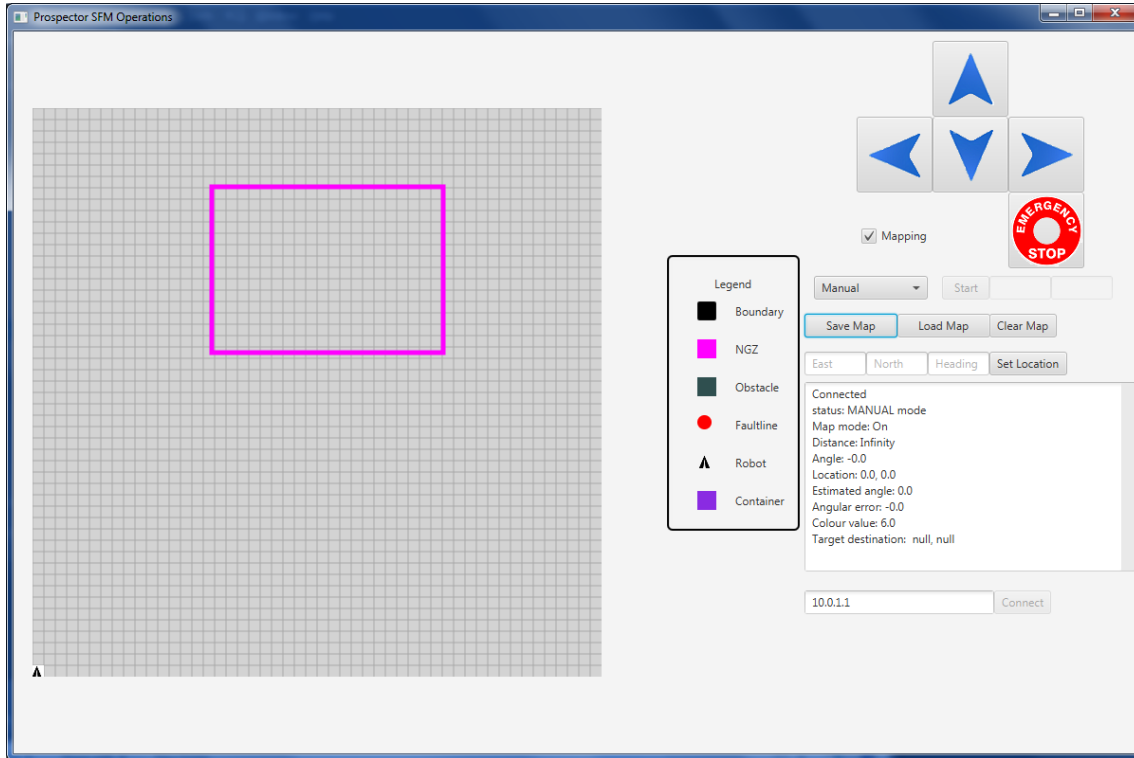


Figure 13: No Go Zone

## 4 References

- [1] Prospector Team 2016. *Software Requirements Specification: Prospector Seafloor Mapping System*. Version 0.1 (Draft).
- [2] Prospector Team 2016. *Software Design Document: Prospector Seafloor Mapping System*. Version 1.0 (Draft).