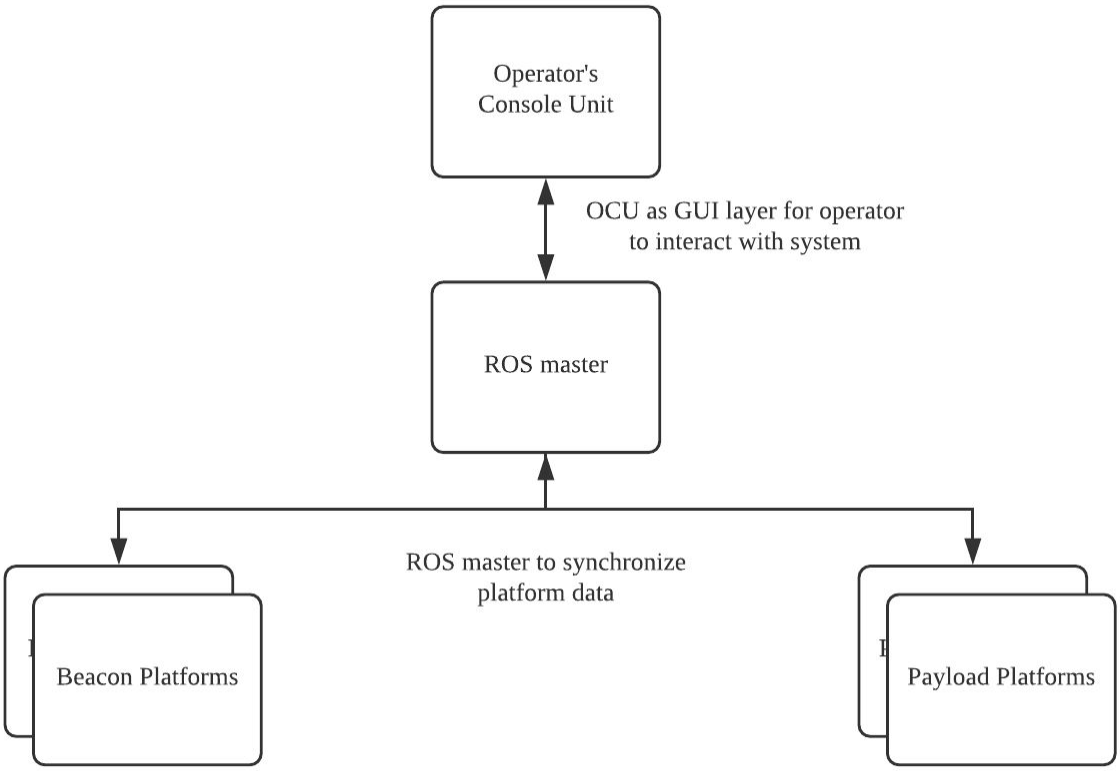
User Manual

System Overview



Overall System architecture

The Raptor system consists of the following:

- Payload platform, the robot which carries the payload and executes formation orders
- Beacon platform, robot which carries stationary beacons for payload platform localization
- ROS master, main controller in which all information received, processed, and sent
- Operator's Console Unit, graphical user interface for the operator to command platforms.

This document describes the steps to set up the above system.

Required Machines

- ROS Master, an Ubuntu machine with ROS Melodic, ROSBridge Suite and ROSMaster Raptor package installed
- Operator Console Unit (OCU), a Windows machine with the OCU app installed
- Beacon and payload platforms with batteries plugged in
- Raptor Wifi Router with all static IPs saved

Setup Procedure

1. Turn on Raptor Wifi, connect ROS Master and OCU to it.

2. Turn on ROS Master and launch the following in separate terminals:

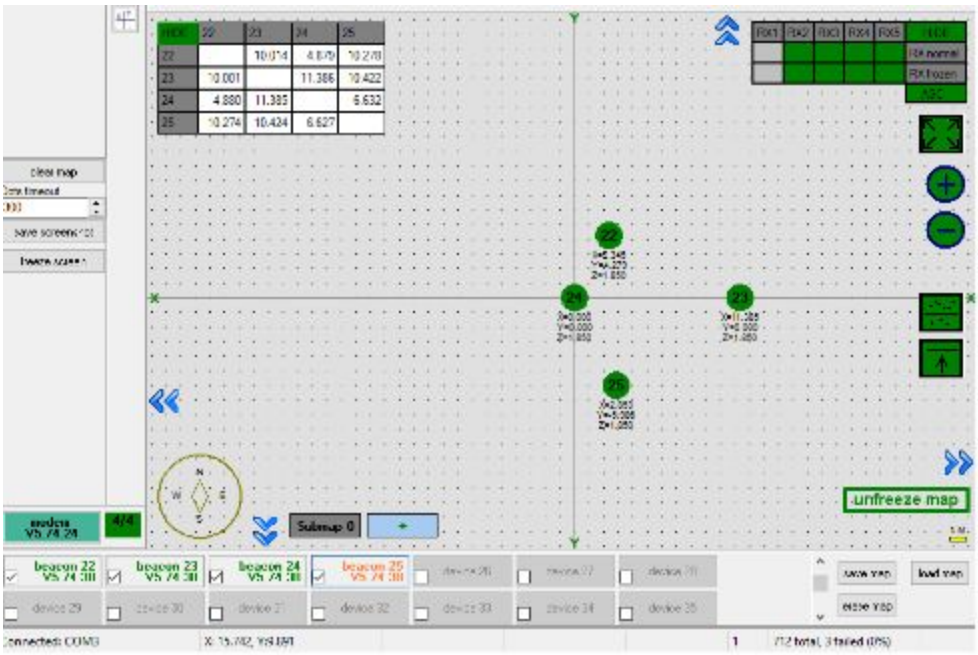
ROS module	**Command**
ROSBridge	roslaunch rosbridge_server rosbridge_websocket.launch
Map Server	roslaunch gps_navigation start_map_server.launch

3. Run OCU and input the ip address of ROS Master when prompted

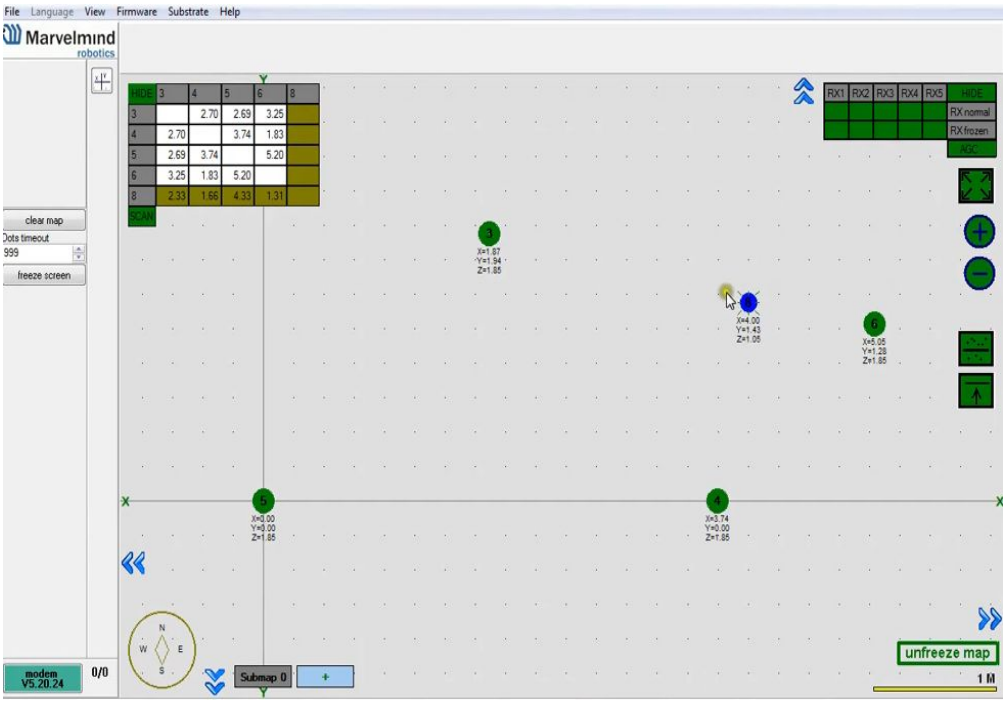
4. *Turn on beacon platforms

5. *Teleop beacon platforms to different corners of operational area to form map using Manual Movement Mode in OCU

6. In Marvelmind Dashboard,
    a. Add the stationary beacons from the beacon platforms and position them
    b. freeze submap



c. Add all the mobile beacons (payload platform) onto the map
d. Freeze the map



7. Turn on the payload platforms

8. Wait for payload platforms to boot up. Payload platforms will move slightly to indicate system ready on ROS and OCU will indicate activated platforms as blue

9. System is now ready for commands from OCU

*In the production system, beacon platforms are not used as placement is too low for Marvelmind beacons to function. Instead, Marvelmind beacons are placed 2m above ground to maintain line of sight with all payload platforms.
** For more information on Marvelmind beacon please visit:
https://marvelmind.com/pics/marvelmind_navigation_system_manual.pdf