XBEE USER GUIDE

Communications module for a sailboats fleet.

1/ Before powering up the sailboats, connect a xBee device stamped "E[id]" to the raspberry of each sailboat that
will be part of your fleet. Connect the xBee stamped "C" (Coordinator) to the computer you will use for remote control
and type the command "roslaunch plymouth_internship_2019 fleetCoordinator size:=[yourFleetSize]" in a terminal.
The ID of the coordinator should be printed quickly, and then the connection process begins ("Waiting...").

2/ Power up every sailboat of your fleet. Node "fleetSailboat" should launch automatically so you do not need to connect
to a terminal on the sailboat. The connection may last about 2 minutes after powering up.
If you think the connection did not work (message not received, boat already powered, ...), connect via ssh to the
raspberry of your sailboat, check if the node "fleetSailboat" exists, kill it if yes, then type
"rosrun plymouth_internship_2019 fleetSailboat" in the terminal of the sailboat.

3/ Once you get the expected number of sailboats connected to the network, Coordinator should print
"Got boats [id1, id2,...] connected". If you monitor the corresponding terminal in a sailboat, a similar message should
be printed too.
From this moment you can control each sailboat of your fleet.

To control sailboats with keyboard:
- Press f[id] to take control of the boat with the corresponding ID (written on the backside of its xBee device).
A message will be printed to indicate you which pad you may use (2 pads: Arrows or ZQSD/WASD).
- Tighten the sails with the upper key, shock them with down key.
- Turn left with left key, right with right key...obviously.
- Press f[id] again to release the boat so that it comes back to autonomous mode.
- You can control up to two sailboats at a time, with the two pads. However, keyboard monitor can only detect one
key at a time, so only try to command one actuator at a time.
- You may use ESC to release all sailboats.

To launch a terminal-style command:
- Press Insert. A window will pop up, asking you to type your command.
- Your command should begin by the ID of the boat to which you wish to send to send the command. Use "all" to broadcast.
- After this, type your command as if you were in the terminal of the sailboat.
Exceptions:
Never use signs '@', '=' or '#'.
If your command requires ":=", simply type ":". ":" will be replaced automatically.
Do not use quotations marks ('), ROS will convert automatically your character strings don't worry.
- Press enter or click on the confirmation button. Cancel if you want to cancel...obviously.

Specific commands:
- Use "[receiverID] kill [node]" to kill a node. This will look for every node that contains the typed string and kill it.
Use "-a" or "--all" instead of [node] to kill all of them.

- Use "[receiverID] [command] --relaunch" to kill all running nodes (except fleetSailboat and nodes containing 'ros' in their names)
Caution: if you mistype your command while using "--relaunch" option, all nodes will be killed but nothing will be launched.

General information:

Connection process will not work if you launch Coordinator after at least one sailboat. Should this happen, kill every xBee-linked
node and restart procedure.

(SSH required) If you think you cannot control the sailboat from coordinator even if the coordinator printed correct connection data, maybe the fleetSailboat node failed to properly connect or crashed. In that case, shut down both fleetCoordinator
and fleetSailboat nodes and relaunch them. This is rare but seems more likely to happen when
the sailboat is far from the coordinator or the xBee device is close to the actuators.
You may use the TX and RX LEDs on the coordinator xBee device:
both should be blinking multiple times per second.