Experiment 11

Familiarise ROS Serial Arduino for hardware interface

Objective

- Familiarise the concept of serial communication between ROS and Arduino.
- Serial communication is essential for sensor and actuator interface in robotics.

Theory

Arduino is an open -source hardware and software platform allows wide variety of applications. Arduino is popular among project developers to experiment different capabilities. Serial communication, realised by Arduino is very significant in robotics. Majority sensors gives signal as serial input to the hardware. So testing serial communication example in Arduino is significant in many ways.

Procedure

1. Connect arduino to the USB port. Though the arduino is connected to a USB port, it internally converts to a serial port.
2. check the arduino is connected by command ls /dev in terminal and ensure ttyUSB0 is there
3.Download arduino ide zip file and extract to home folder
4. Run the installation sudo ./install.sh
5. The ide will be installed and open the ide
6. From sketch>>libraries>>include library, select roserial Arduino library and make sure that the folder is inside the folder which contains other libraries
7. Run the following commands to make the arduino executable
sudo usermod -a -G dialout user
sudo chmod a+rw /dev/ttyUSB0
8. From foles>>examples>> ROS Serial Arduino Library choose Hello world
9. To remove the bug in ros library go to ~/arduino-1.8.19/libraries/Rosserial_Arduino_Library/src/ros$ msg.h change #include <string.h> and memcpy()
10. Run the code from Arduino
11. In ROS workspace, start a new master
12. Run the command in the master "rosrun rosserial_python serial_node.py /dev/ttyUSB0"
13. To receive the message check rostopic echo /chatter

Output

The message transmitted from the Arduino will be echoed in the receiver.