ROS driver for the ICM-20948

1 Installation

1.1 Install ROS package on PC

```
$ cd catkin_ws/src
$ git clone https://github.com/Alpaca-zip/icm_20948.git
$ cd .. && catkin_make
```
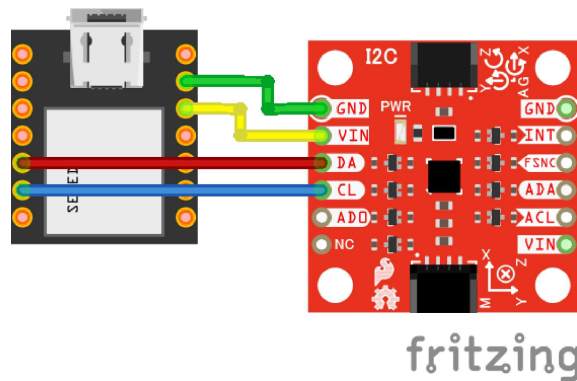
1.2 Download Arduino IDE on PC

 Get the latest version from the download page.

https://www.arduino.cc/en/software

2 For Seeeduino Xiao

2.1 ICM-20948 interfacing with Seeeduino Xiao

Seeeduino Xiao ICM-20948 connections

2.2 Preferences

 After Arduino IDE is run, click File -> Preferences in the top menu of the IDE. When the Preferences window appears, copy and paste following link to the Additional Boards Manager URLs textbox.

https://files.seeedstudio.com/arduino/package_seeeduino_boards_index.json

2.3 Install the board package via Boards Manager

 Click Tools -> Board -> Boards Manager..., print keyword "Seeeduino XIAO" in the searching blank. Here comes the "Seeed SAMD Boards". Install it.

2.4 Select your board and port

Click Tools -> Board, find "Seeeduino XIAO M0" and select it. Now you have already set up the board of Seeeduino XIAO for Arduino IDE. Then, Select the serial device of the Arduino board from the Tools | Serial Port menu. This is likely to be COM3 or higher.

2.5 Download the Arduino library for ICM-20948 and ROS

Click Sketch -> Include Library -> Manage Libraries...

2.5.1 ICM-20948 library

Print keyword " ICM 20948" in the searching blank. Here comes the "SparkFun 9DoF IMU Breakout - ICM-20948". Install it.

Important note:

By default the DMP functionality is disabled in the library as the DMP firmware takes up 14301 Bytes of program memory.

To use the DMP, you will need to:

1, Edit ICM_20948_C.h

2, Uncomment line 29: #define ICM_20948_USE_DMP

3, Save changes

If you are using Windows, you can find ICM_20948_C.h in:

Documents\Arduino\libraries\SparkFun_ICM-20948_ArduinoLibrary\src\util

2.5.2 ROS library

Print keyword " Rosserial " in the searching blank. Here comes the " Rosserial Arduino Library". Install it.

2.6 Upload the program

Open the "include/ICM_20948_ROS_Example/ICM_20948_ROS_Example.ino". Then, simply click the "Upload" button in the environment. Wait a few seconds and if the upload is successful, the message "Done uploading." will appear in the status bar.
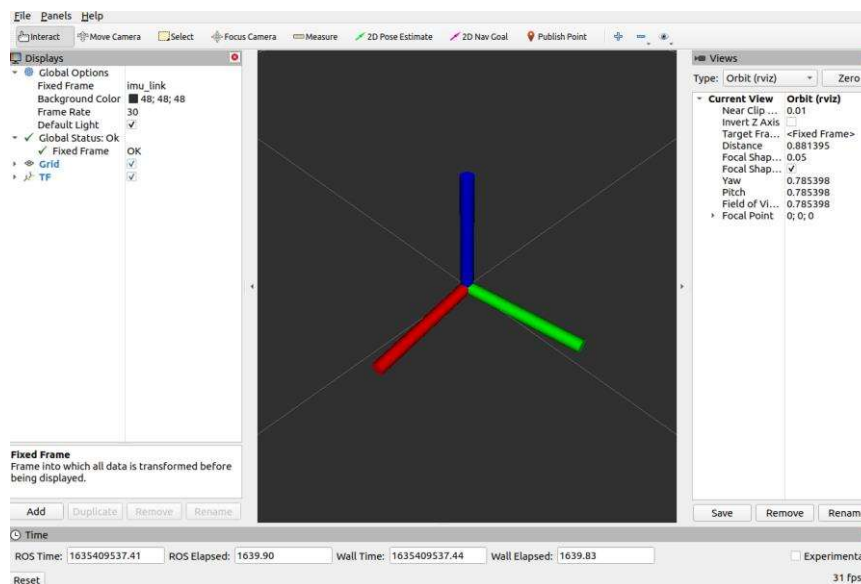
3 Usage

Launch icm_20948_example node

To run the node with a different port, for example on /dev/ttyACM0, you must specify the "PORT_NAME" parameters on the command line:

```
$ roslaunch icm_20948 icm_20948_example.launch PORT_NAME:=/dev/ttyACM0
```

If the node is successfully launched, the terminal will print below messages and RViz will be opened.

Roll, pitch and yaw visualization

Visualization on Rviz

If you want to see other IMU data, you will need to:

1, Edit icm_20948_example.cpp

2, Uncomment line 15~17

3, Save changes

4, catkin_make