Lab3: Attitude Determination with the CubeSatSim

Lab Objective

In this lab, you will explore the process of attitude determination using the CubeSatSim, a simulated CubeSat platform equipped with **Inertial Measurement Unit (IMU)** sensors. Attitude determination is a critical aspect of satellite operation, as it involves calculating and maintaining the orientation of the satellite in space. Through this lab, you will gain practical experience in using accelerometer and gyroscope data from IMU sensors to estimate the CubeSat's orientation.

Lab instruction

Step1: Receive Radio from your satellite

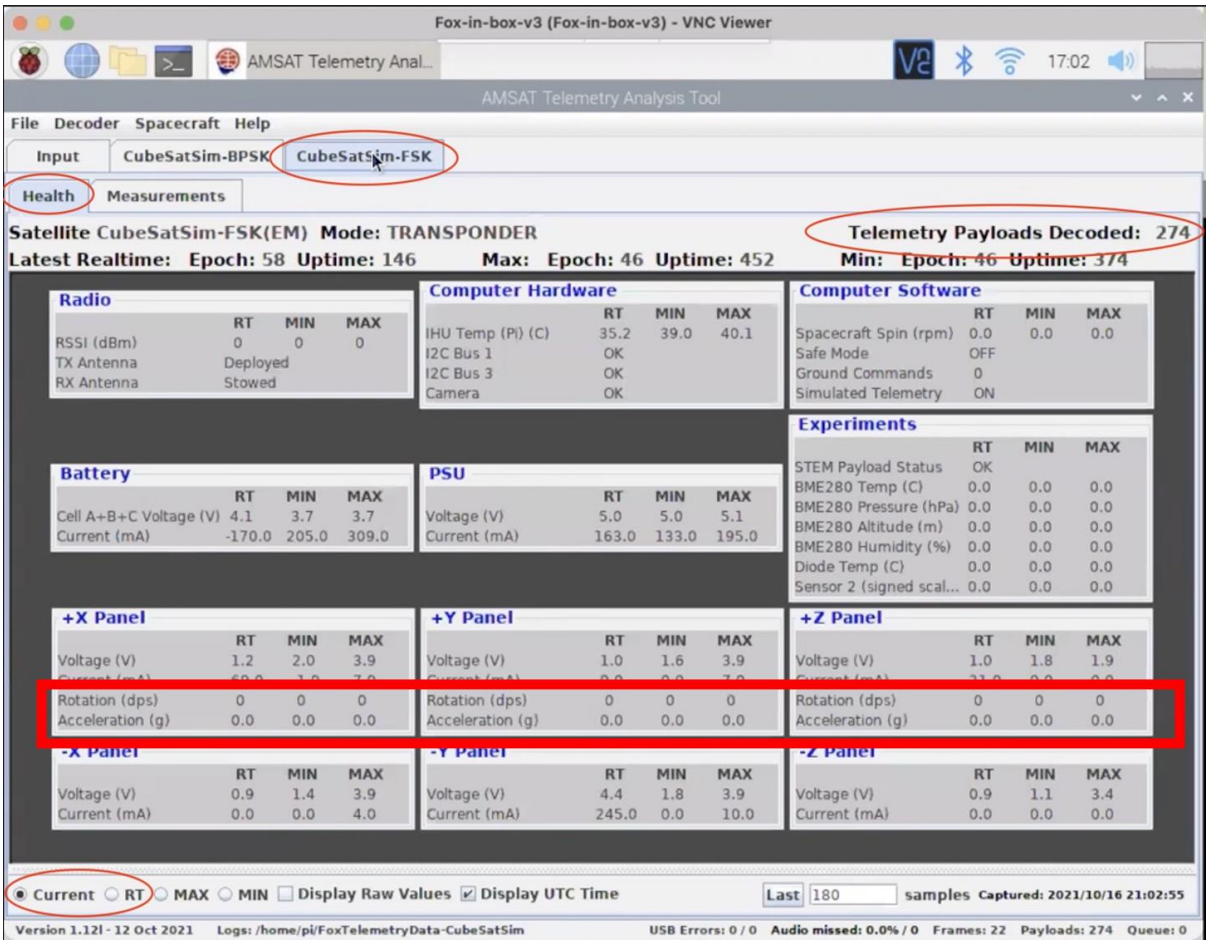
From the ground station, start to receive the signal from your satellite.

Step2: Rotate your satellite

The data receiving frequency of the ground station is not much high as expected, so slowly change the orientation of the satellite.

Step2: Download CSV Data from the Ground Station

As previously you did, click each component and save csv files into ‘./CSV_Files’. Keep naming conventions as ‘x_imu_dps’ and ‘x_imu_acc’, ‘y_imu_dps’ , ‘y_imu_acc’, ‘z_imu_dps’ , ‘z_imu_acc’. This is not required to create your own python file.



Step3: Download or Copy Python Code (If you are running the reference code)

Link to Lab3 Code

Step4: Let's check the Result

If you want to convert radian to degree, you can simply multiply 180/pi. Verify if the sensor worked!