Satellite Tracking Unit

This package contains all requisite files for the compatible Satellite Tracking Unit hardware. The Arduino compatible software file handles the interpretation of ZigBee API packets containing the Satellite position and time data and translates that information to precisely timed step signals for two Azimuth and Elevation motors. The python files are intended for use with a Raspberry Pi and gather the positional information for weather satellites, compiles API packets containing this information and transmits them via an xBee.

Prerequisites

If using the Arduino IDE, please ensure the following libraries are included in the 'libraries' folder. This link contains an example of how to set up libraries for Arduino: `https://www.arduino.cc/en/Guide/Libraries`

Adafruit LSM303DLHC Library
`https://github.com/adafruit/Adafruit_LSM303DLHC`

Pololu LSM303 Library
`https://github.com/pololu/lsm303-arduino`

Adafruit Sensor Library
`https://github.com/adafruit/Adafruit_Sensor`

xBee Library
`https://github.com/andrewrapp/xbee-arduino`

Example

To run the Satellite Tracking Unit software, first SSH into the Raspberry Pi, examples of this can be found here:

Windows
`https://www.raspberrypi.org/documentation/remote-access/ssh/windows.md`

Mac/ Linux
`https://www.raspberrypi.org/documentation/remote-access/ssh/unix.md`

To run the Satellite Tracking Program type:
python RaspberryPi\SatelliteTrackerInterface /dev/ttyUSB0

You should then see the following interface:

```
Looking for xBee...
xBee Found!

NOAA 4 [-]
(656.0, 'Seconds until the next pass.')
('Visible for:   ', 1135.0, 'seconds')
('Rise Time:   ', '10/26/17 05:25:27', 'Azimuth:   142.2')
('Transit Time:', '10/26/17 05:35:00', 'Elevation:  17.7')
('Set Time:    ', '10/26/17 05:44:22', 'Azimuth:    25.8')

NOAA 2 [-]
(799.0, 'Seconds until the next pass.')
('Visible for:   ', 1212.0, 'seconds')
('Rise Time:   ', '10/26/17 05:27:51', 'Azimuth:   146.9')
('Transit Time:', '10/26/17 05:38:02', 'Elevation:  24.0')
('Set Time:    ', '10/26/17 05:48:03', 'Azimuth:    17.7')

NOAA 5 [-]
(1221.0, 'Seconds until the next pass.')
('Visible for:   ', 844.0, 'seconds')
('Rise Time:   ', '10/26/17 05:34:53', 'Azimuth:   127.0')
('Transit Time:', '10/26/17 05:41:58', 'Elevation:   6.4')
('Set Time:    ', '10/26/17 05:48:56', 'Azimuth:    48.8')
```

To track a satellite select one from the list and type its name, for example:
NOAA 4

The Satellite Tracking Unit will then move to the rise azimuth position and wait for the satellite to pass. Once the satellite is above the horizon, the unit will start tracking.

For more information or trouble shooting, please see the User Manual.