Drone control + telemetry

Drone side:

- Pixhawk
- SiK radio

Ground side:

- QGroundControl
- SiK radio

Video streaming system

Drone side:

- Raspberry Pi Zero 2 W
- LTE Modem
- Camera

Ground side:

- Raspberry Pi
- LTE Modem
- Stores video feed into a ROS2 bag for later processing

Evidence this works lol

https://www.reddit.com/r/raspberry_pi/comments/1bit8bw/connecting_pi_zero_2_w_to_waveshare_sim7600gh_4g/

Re: Does Raspberry Pi work with 4G LTE USB modems?

Sun Aug 12, 2018 6:12 pm

I tested the raspberry Zero W with stretch (full and lite) with the ATT modem for iot LTE-M and it works great connecting the modem to the USB port the modem force the network communication thru it. The only problem I have found is that the raspberry minimum data communication, without your application doing nothing, only the OS idle uses 1 MB every 4 hours and the ATT rate is $ 1.50 for 1MB/month (or the time you want) so you end paying $1.5 every 4 hours and your application is not running (1MB in wi-fi is negligible). I haven't found the way to reduce the data rate from Stretch, I have shootdown some services but I think is the clock synchronising what keeps the network data flowing. If I can't get to stop all the network activity in idle it will not be useful. Next step will be to block all the ports except the one I am using.

termic

Posts: 1

Joined: Sun Aug 12, 2018 5:47 pm

We will use a Raspberry Pi Zero 2 W on the drone for video capture and encoding and another Raspberry Pi on the ground for receiving and displaying/storing the stream.

Since the drone will be flying high (likely over 30-50m) and could be far from the ground station, WiFi is not reliable, so 4G LTE is the best choice. It provides unlimited range as long as we have cellular network coverage. High-bandwidth streaming with 4G.

We will use WebRTC over 4G. The Raspberry Pi on the ground receives the stream of data and sends it over serial to a computer which stores the data to be processed.

In terms of camera we're probably looking at a Raspberry Pi camera Module v3, a Raspberry Pi HQ camera or an Arducam 16MP Autofocusrap

For 4G LTE USB Modems for the Raspberry Pi's we can use the Quectel EC25-E's or Huawei E8372.

Pixhawk

Sensors

- MPU600 (6-DoF IMU i.e. accelerometer and gyroscope)
- ST Micro 16-bit gyroscope
- ST Micro 14-bit accelerometer/compass (magnetometer)
- MAES barometer

Interfaces

- 5x UART serial ports, 1 high-power capable, 2 with HW flow control
- Spektrum DSM/DSM2/DSM-X Satellite input

- PPM sum signal
- RSSI (PWM or voltage) input
- I2C, SPI, 2x CAN, USB
- 3.3V and 6.6V ADC inputs

QGroundControl