CGO3+ UART read tool

Abstract

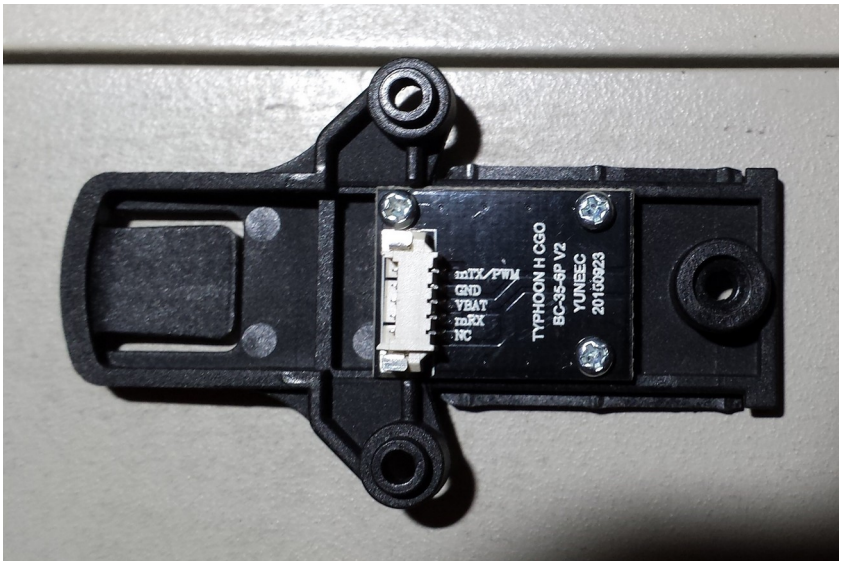
The CGO3+ camera belongs to Yuneec Typhoon H drone. The Typhoon H is easy to repair but camera gimbal not. If gimbal was bent, sensors, or gimbal main board had to be changed, a new calibration of the gimbal is necessary. To access the gimbal you need a Serial-to-USB converter attached to the serial connection that in normal operation is used for communication between flight controller and camera.
Once connected the tool offers two functions:

- Act as flight controller to tilt and rotate the camera. This offers the possibility to reuse the camera for other purposes.
- Act as gimbal checker. With this function you can read and record a lot of data coming from gimbal or camera itself. And you can try to calibrate the gimbal.

NOTE: This is an experimental process, not an official tool. This may work or not, no warranty. You use it on your own risk.

Preparation

You need a mount for the CGO3+ where it can rotate and tilt freely. Connect a Serial-USB converter (also known as programmer cable) to Gound, Rx and Tx. You can use The USB cable YUNA100 from Q500 if you have one or any other converter that has 3.3V level. Do not connect power. Rx and Tx must have 3.3V level.



This is a camera mount YUNTYH108. You need one with contact PCB.
Connect Ground to GND converter Tx to mTx/PWM and converter Rx to mRx.

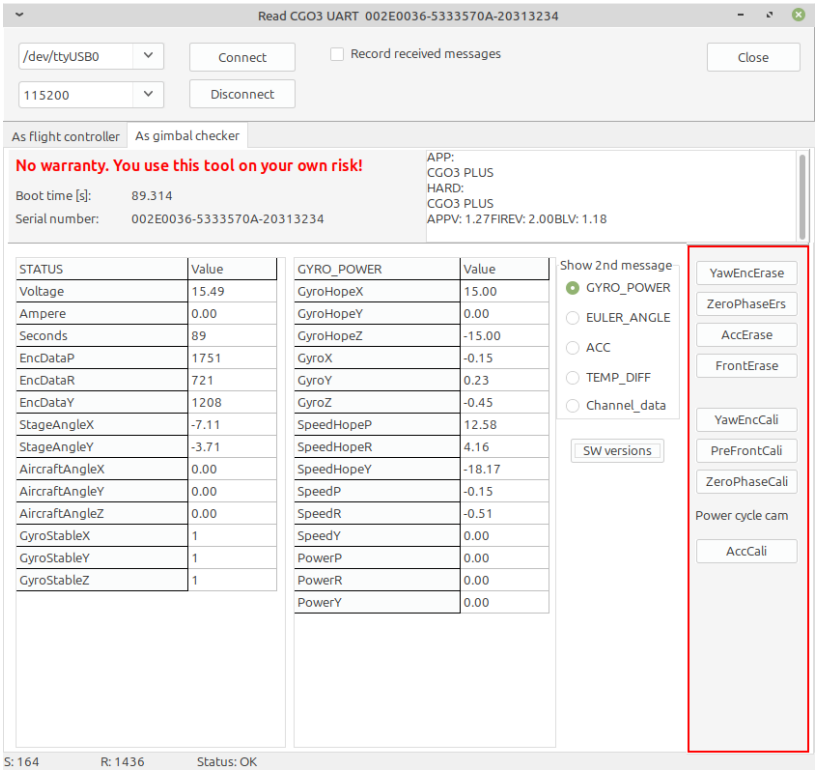
Download this tool at: https://github.com/h-elsner/CGO3p_control
Binaries for Windows and LINUX are available. For MacOS you must compile it by yourself. Source code is there.

Installation: No installation, simply unzip the file. It is a portable application. You need only the executable for your OS.

CGO3+ gimbal calibration

This training video from **Yuneec** describes the calibration process:
https://www.youtube.com/watch?v=sATbbMajMCk

In short:
Connect Serial to USB converter to CGO3+ UART;
Start CGO3+ UART read application;



Select COM port (usually the last in the list);
Click on 'Connect‘
Power on CGO3+
Erase:

- Yaw encoder
- Zero phase
- Acc
- Front

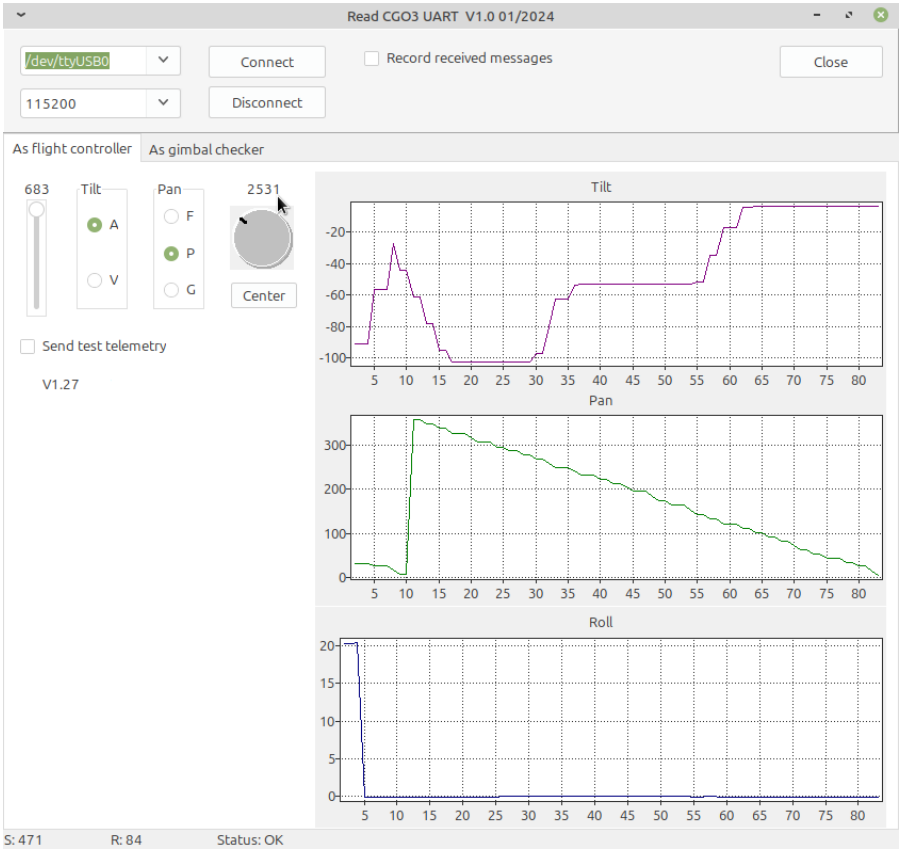
Begin with Yaw encoder calibration, wait until success message will appear;
Hold the camera faced forward and leveled (I use the CGO3+ gimbal lock) and start Pre-front calibration;
Then Zero phase calibration;
Click on 'Disconnect';
Power cycle the camera;
Click on 'Connect‘ again;
Do Accelerometer calibration;

Note: If „No ACC Offset„ will be reported or Accelerometer calibration never ends, then try a Camera Calibration on the drone started by ST16. If successful it will result in „ACC Offset OK“.

Simply buttons from up to down, always wait on success message.

CGO3read as Flight controller

This is a demo project how to control tilt and pan by your own application. It offers all possibilities that ST16 has.



You can record the messages that come from camera (SysID=3) and gimbal (SysID=2). Data from MessageID=3 (Gimbal position) will be displayed in the 3 charts.

More information about communication between flight controller and gimbal/camera in "Format_CamUART_messages.ods".
See also the tool, described here: https://github.com/h-elsner/H480_UART_reading