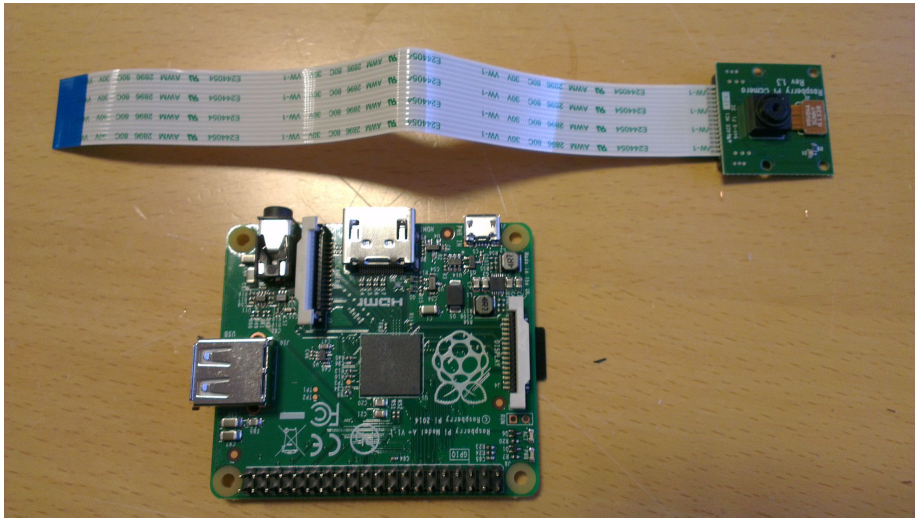
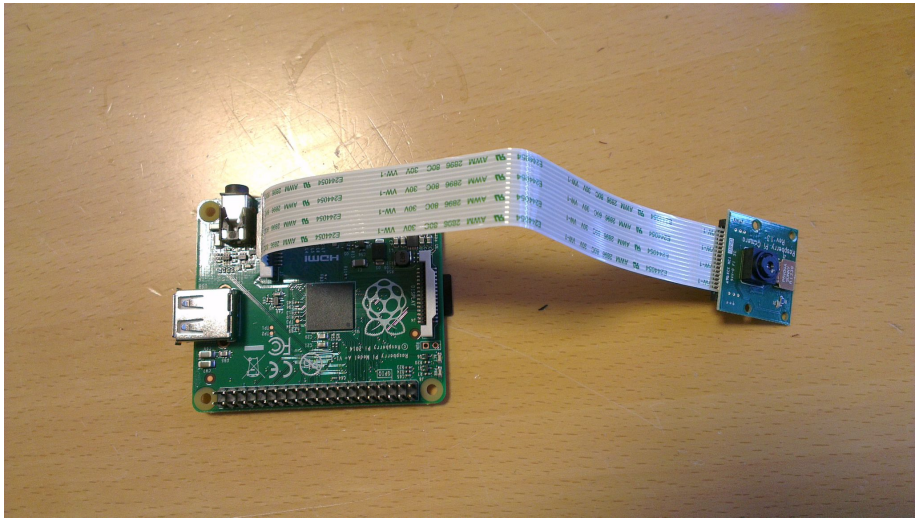
Camera Payload

IDT Summer Course

Connecting Camera to Raspberry

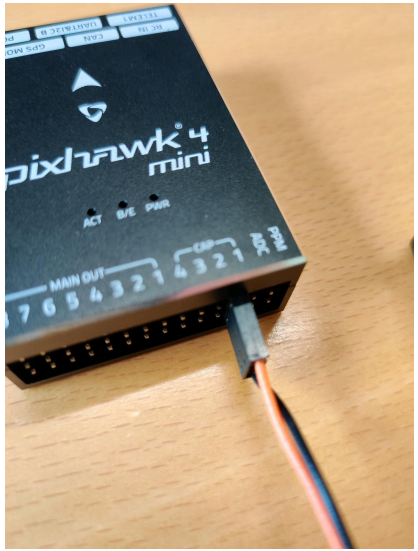
- Locate camera port next to DC power port
- Lift the tab on top
- Place the strip connector (blue side facing the DC power port)
- While holding the strip in place, push down the tab

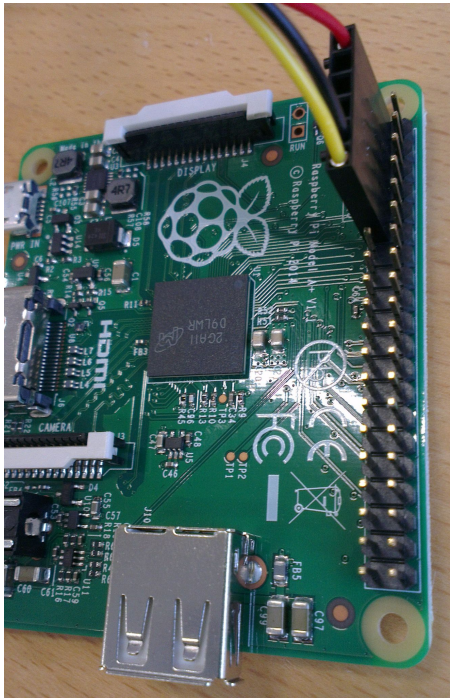




Connect ATTINY

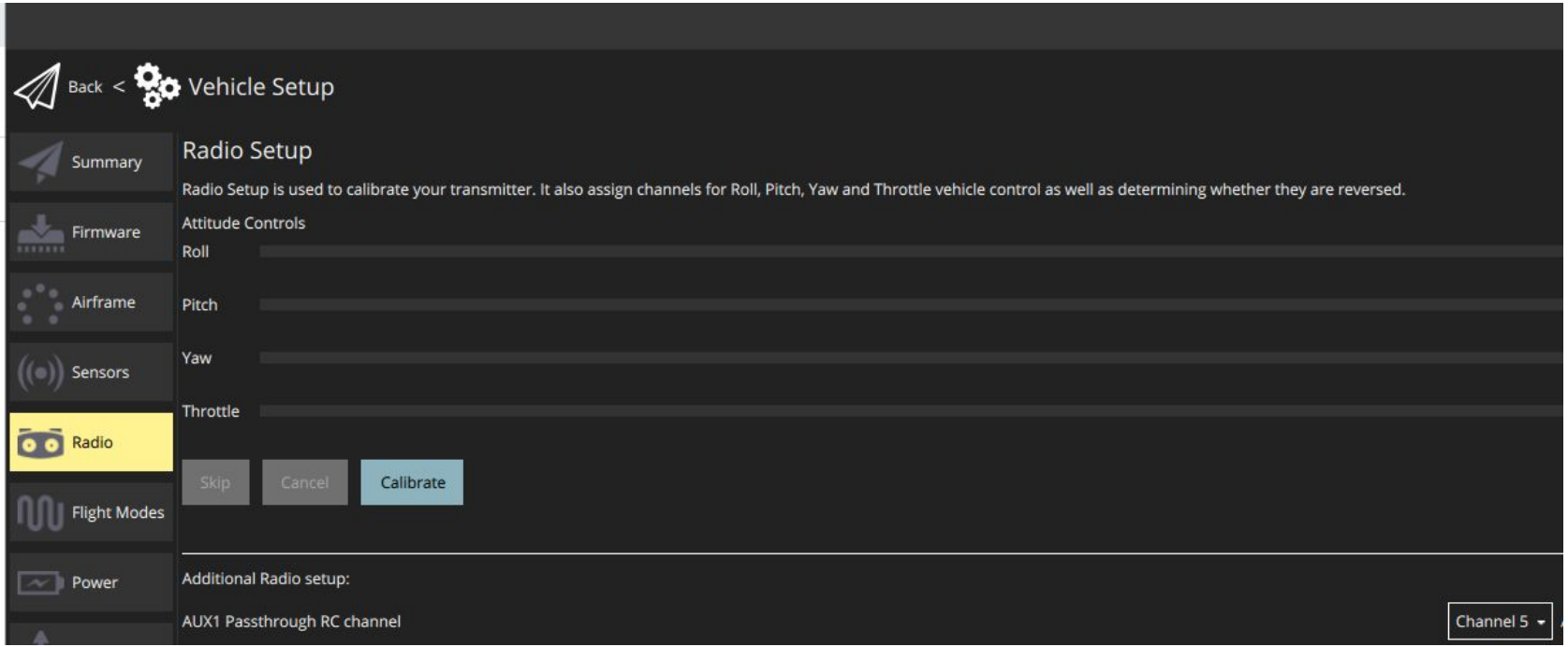
- Connect the 6-pin connector to the RPI as image shows. Make sure its on the right pins as otherwise you will fry the ATTINY
- Connect 3-pin connector to the FC





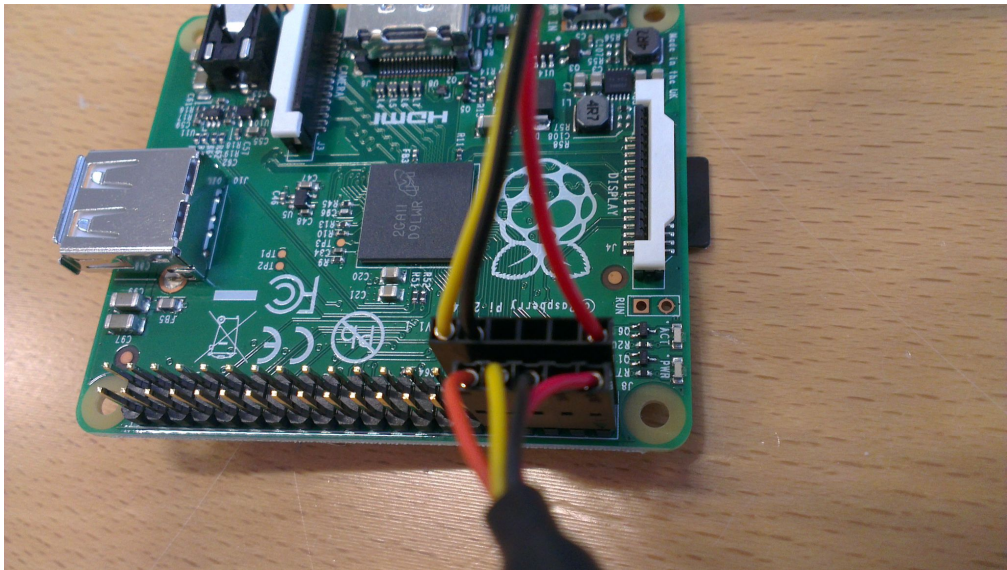
Set QGC

- Select RC channel to activate camera recording



Connect to RPI

- install screen “sudo apt install -y screen”
- Connect FTDI cable to RPI and PC (Bottom cable in image)
- Open terminal and write “screen /dev/ttyUSB0 115200”
- Login on pi with:
- Username: pi
- Password: raspberry



Screen logout

- To logout of a running screen instance use the following key combinations

exit screen	`Ctrl-a :` quit or exit all of the programs in screen.
force-exit screen	`Ctrl-a C-\` (not recommended)

Nano cheatsheet

Overview of nano's shortcuts

The editor's keystrokes and their functions

File handling

Ctrl+S	Save current file
Ctrl+O	Offer to write file ("Save as")
Ctrl+R	Insert a file into current one
Ctrl+X	Close buffer, exit from nano

Editing

Ctrl+K	Cut current line into cutbuffer
Alt+6	Copy current line into cutbuffer
Ctrl+U	Paste contents of cutbuffer
Alt+T	Cut until end of buffer
Ctrl+]	Complete current word
Alt+3	Comment/uncomment line/region
Alt+U	Undo last action
Alt+E	Redo last undone action

Search and replace

Ctrl+Q	Start backward search
Ctrl+W	Start forward search
Alt+Q	Find next occurrence backward
Alt+W	Find next occurrence forward
Alt+R	Start a replacing session

Deletion

Ctrl+H	Delete character before cursor
Ctrl+D	Delete character under cursor
Alt+Bsp	Delete word to the left
Ctrl+Del	Delete word to the right
Alt+Del	Delete current line

Operations

Ctrl+T	Execute some command
Ctrl+J	Justify paragraph or region
Alt+J	Justify entire buffer
Alt+B	Run a syntax check
Alt+F	Run a formatter/fixer/arranger
Alt+:	Start/stop recording of macro
Alt+;	Replay macro

Moving around

Ctrl+B	One character backward
Ctrl+F	One character forward
Ctrl+←	One word backward
Ctrl+→	One word forward
Ctrl+A	To start of line
Ctrl+E	To end of line
Ctrl+P	One line up
Ctrl+N	One line down
Ctrl+↑	To previous block
Ctrl+↓	To next block
Ctrl+Y	One page up
Ctrl+V	One page down
Alt+\	To top of buffer
Alt+/	To end of buffer

Special movement

Alt+G	Go to specified line
Alt+]	Go to complementary bracket
Alt+↑	Scroll viewport up
Alt+↓	Scroll viewport down
Alt+<	Switch to preceding buffer
Alt+>	Switch to succeeding buffer

Information

Ctrl+C	Report cursor position
Alt+D	Report line/word/character count
Ctrl+G	Display help text

Various

Alt+A	Turn the mark on/off
Tab	Indent marked region
Shift+Tab	Unindent marked region
Alt+N	Turn line numbers on/off
Alt+P	Turn visible whitespace on/off
Alt+V	Enter next keystroke verbatim
Ctrl+L	Refresh the screen
Ctrl+Z	Suspend nano

Python Code

The RPI has two files already. One used to take a single image when you flick the switch and one used to record video. They are named

- record_images.py
- record_video.py

You can write your python file on your computer and copy and paste (right-click menu) it in the terminal with nano or you can use nano directly to write the code.

In the top of the files make sure to set the correct resolution depending on what RPI camera you have. Is printed on the camera

Python Code

Write a program that does the following:

1. When your switch is activated start saving images in a folder named the current date and time. (So create the folder and use that as storage)
2. Every second save one image from the camera. Name the image accordingly with relative time from when you started recording.
    a. So the image taken 2 seconds after start recording is called “img_000002”
    b. (Hint, look at “:” options in the string format. “this is a string with variable 0: {0}”.format(var0))
    c. (Hint, save the timestamp when you first start recording and use that to get relative time)
3. When switch goes low, stop recording and go back waiting for next time the switch goes high

Auto run python on power-up

- When your code are done and you want it to run as soon as the RPI gets powered on you can follow these steps
- “sudo nano /etc/rc.local”
- før “exit 0” tilføj:
- “/usr/bin/python /home/pi/record.py &”
- Change “record.py” to whatever your python script is called.
- Reboot

RPI mount on Drone

- Camera should be mounted as close to directly under the FC as possible
- Instead of the FDTI cable to power the RPI, use the UBEC. Connect the red and black wire from it as shown on the image. (This is where the FTDI cable was connected before