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Daniel's Notes

Reading list

Projects

- Projects
- Crudus MD Notes
- Crudus Sense
- Crudus Photos
- Maximus

3D Printing

- 3D printing

Electronics

- Electronics

Useful stuff

- Markdown Cheatsheet
- Useful commands

Vehicles

- Vehicles
- BMW - BS82067
- MV Agusta - FC7664

Reading List

- Elixir phoenix absinthe graphql react apollo https://schneider.dev/blog/elixir-phoenix-absinthe-graphql-react-apollo-absurdly-deep-dive/
- Uber design: http://simonpan.com/work/uber/
- Modern GPS Tracking Platform: https://www.traccar.org

Topics

Collision engine

- https://gamedev.stackexchange.com/questions/26501/how-does-a-collision-engine-work

The OAuth 2.0 Authorization Framework

- https://tools.ietf.org/html/rfc6749

Event Sourcing

- https://www.martinfowler.com/eaaDev/EventSourcing.html

Micro frontends

- https://www.martinfowler.com/articles/micro-frontends.html

Micro services

- https://www.martinfowler.com/microservices/

12 factor application

- https://12factor.net/

RabbitMQ RPC

- https://www.rabbitmq.com/tutorials/tutorial-six-python.html

Check out

- My business card runs linux
- https://www.envoyproxy.io/docs/envoy/latest/start/start
- https://github.com/heptio/contour
- https://www.jaegertracing.io/
- https://istio.io/

Video course

- https://www.linkedin.com/learning/jhipster-build-and-deploy-spring-boot-microservices/welcome
- https://www.linkedin.com/learning/microservices-asynchronous-messaging/getting-work-done-in-microservices
- https://vimeo.com/74589816
- https://vimeo.com/99531595
- https://www.infoq.com/presentations/migration-cloud-native/

3D Printing

- Ultimaker
- Snapmaker

CNC

Snapmaker

https://forum.snapmaker.com/t/reverse-engineering-the-module-wiring/3031

3D Printing Module:

```
PIN1: VCC, Heater Socket Pin 1, Fan+
PIN2: Stepper Coil A+
PIN3: Heater Socket Pin 2
PIN4: Stepper Coil A-
PIN5: Thermistor Socket Pin 1
PIN6: Stepper Coil B-
PIN7: GND, Fan-, Thermistor Socket Pin 2
PIN8: Stepper Coil B+
```

Heated Build Plate:

```
PIN1: Heating Element +
PIN2: UNUSED
PIN3: Heating Element -
PIN4: UNUSED
PIN5: Thermistor +
PIN6: Thermistor -
```

The heating element registered as 12Ohms so 48W at 24V. The Thermistor gave a reading of 80kOhm in my 90 degree F garage.

Linear Module:

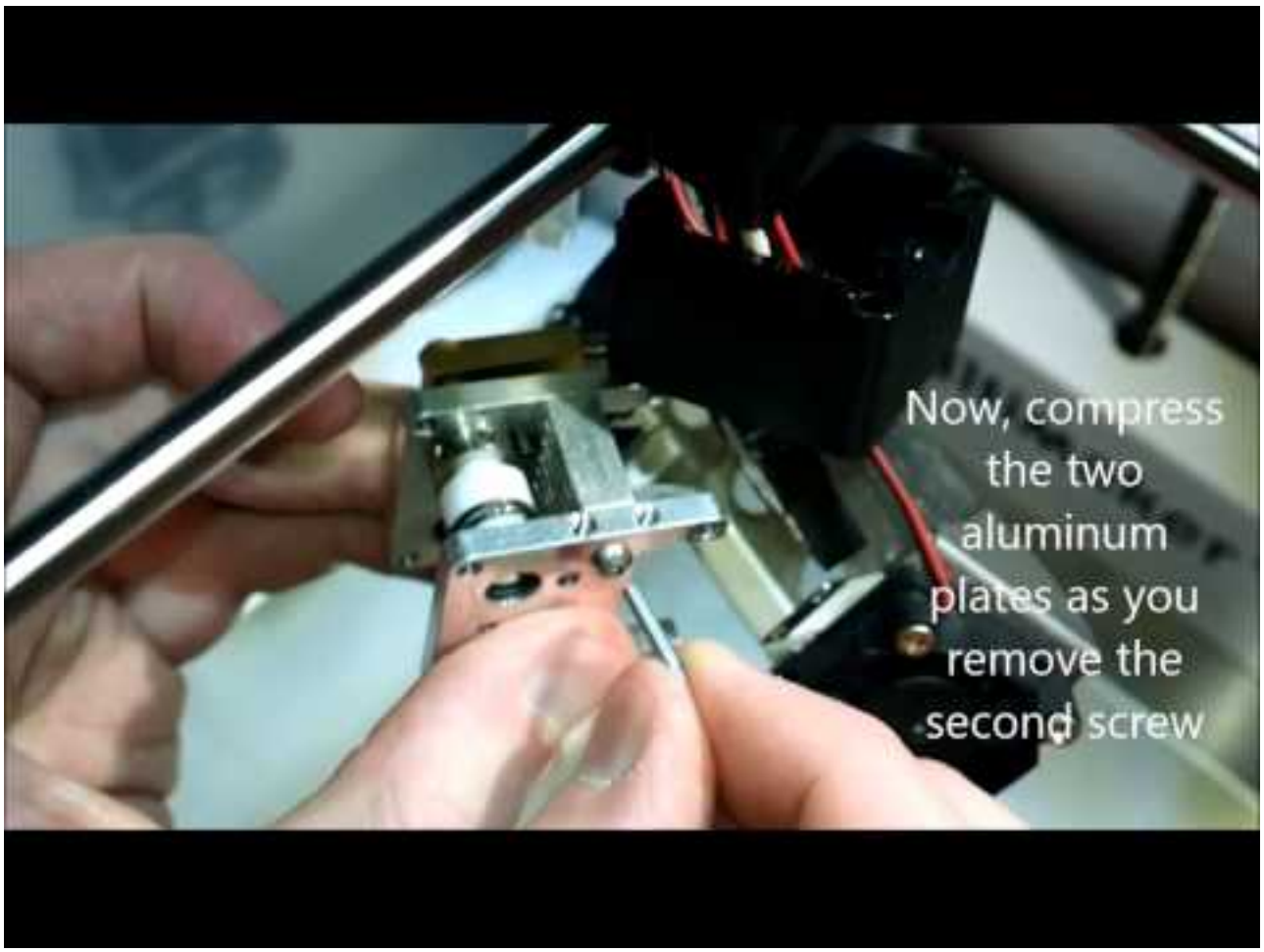
```
PIN1: Coil A +
PIN2: Coil A -
PIN3: Coil B +
PIN4: Limit Switch +
PIN5: Coil B -
PIN6: Limit Switch -
```

Ultimaker

Repairs

Nozzle

Ultimaker 2 - Removing the Nozzle https://www.youtube.com/watch?v=-1Nh0snHLYw


Now, compress
the two
aluminum
plates as you
remove the
second screw

Amateur radio

RTLSDR

- RTLSDR

Articles

- Walkie Talkies

Links

- Ham radio Frequency Chart
- Norske Frekvenser

BaoFeng UV-5R

![Baofeng](./Amateur radio/uv-5rLG.jpg)

Features

25KHz/12.5KHz Switchable (Wide/Narrow Band)

FM Radio (65.0MHz-108.0MHz)

Large Inverted LCD Display

LED Flashlight

High /Low RF Power Switchable

VOX

50 CTCSS/ 104 DCS Tones

Tone searching/scanning

Dual standby

PC programmable

Transmitter time-out timer(TOT)

Busy channel lock-out(BCLO)

UV-5R SPECIFICATIONS

Frequency range:

[TX] 136 - 174MHz, 400 - 520MHz

[RX] 136 - 174MHz, 400 - 520MHz, 68-108MHz (FM Broadcast)

Channel Capacity:

128 Channels

Channel Spacing

25KHz (wide band)12.5KHz (narrow band)

Sensitivity

≤0.25μV (wide band) ≤0.35μV (narrow band)

Operation Voltage

7.4V DC ±20%

Battery:

1500mAh

Frequency step:

2.5, 5, 6.25, 10, 12.5, 20, 25, 30 and 50KHz

Antenna:

Antenna Connector: SMA-Female / Antenna Impedance: 50Ω

Accessory Connector:

Kenwood 2 Pin Standard

Stability:

±2.5ppm

Output power:

5W / 1W

Audio Power Output

700mW/10%

Links

- Manual

Electronics

- I2C

Canbus

Tools

- https://github.com/eerimoq/cantools

Canbus addresses

- https://community.carloop.io/t/list-of-can-id-descriptions-from-opengarages-org/104
- http://www.loopybunny.co.uk/CarPC/can/267.html

i2c

Articles

- I2C in a nutshell

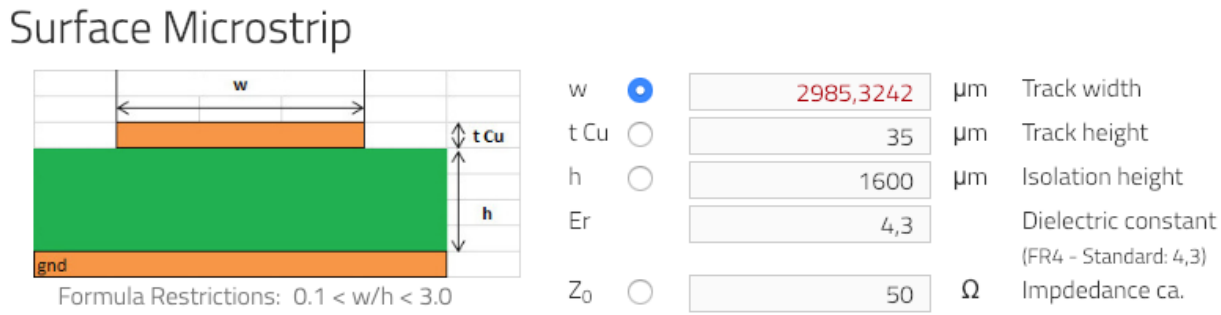
Led

Links

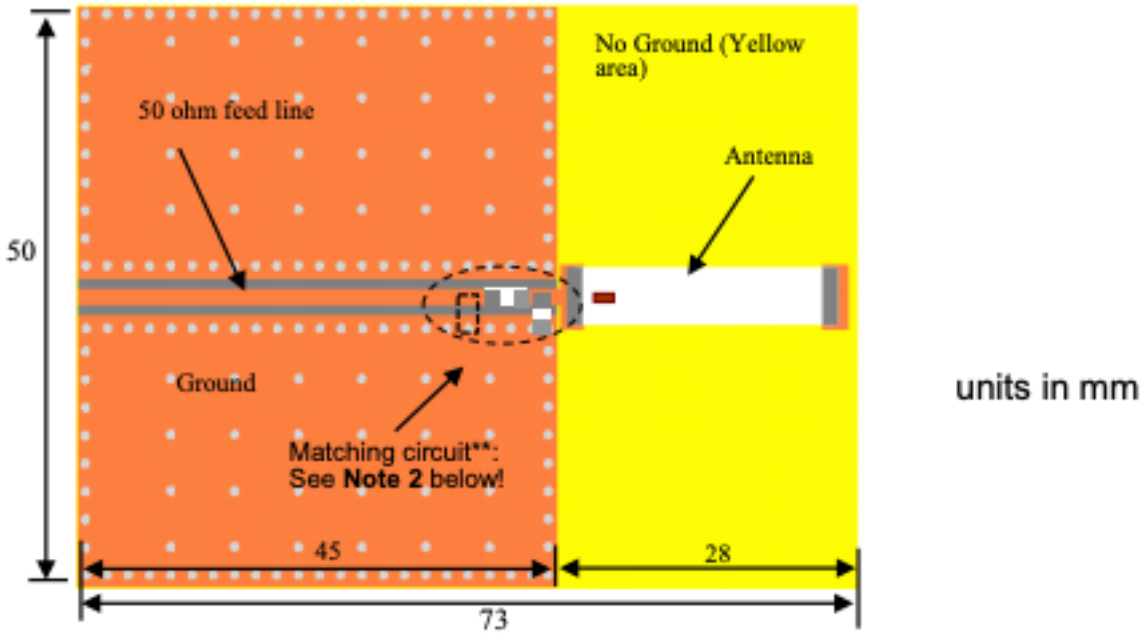
- https://www.instructables.com/id/WiFi-LED-Light-Strip-Controller/

433mHz

Tools



Strip line impedance calculator: https://www.multi-circuit-boards.eu/en/pcb-design-aid/impedance-calculation.html



50 ohm impedance feed line: https://www.disk91.com/2015/technology/hardware/design-a-50ohm-impedance-net-for-rf-signals/

PDF's

- 433 MHz ISM Antenna SMD.pdf

Audio

Articles

- How to build a Microphone Amplifier Circuit

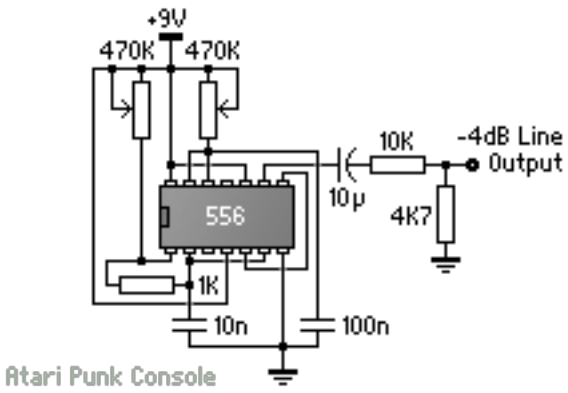
Microphone Array

Links

- Quad op-amp LM3900 (PDF)
- Multi-channel audio mixer circuit using LM3900

Synthesizers

Atari Punk Console Modification (changed speaker to line output) of the Stepped Tone Generator taken from the "Engineer's Mini-Notebook - 555 Circuits" by Forrest M. Mims, III (Siliconcepts, 1984)

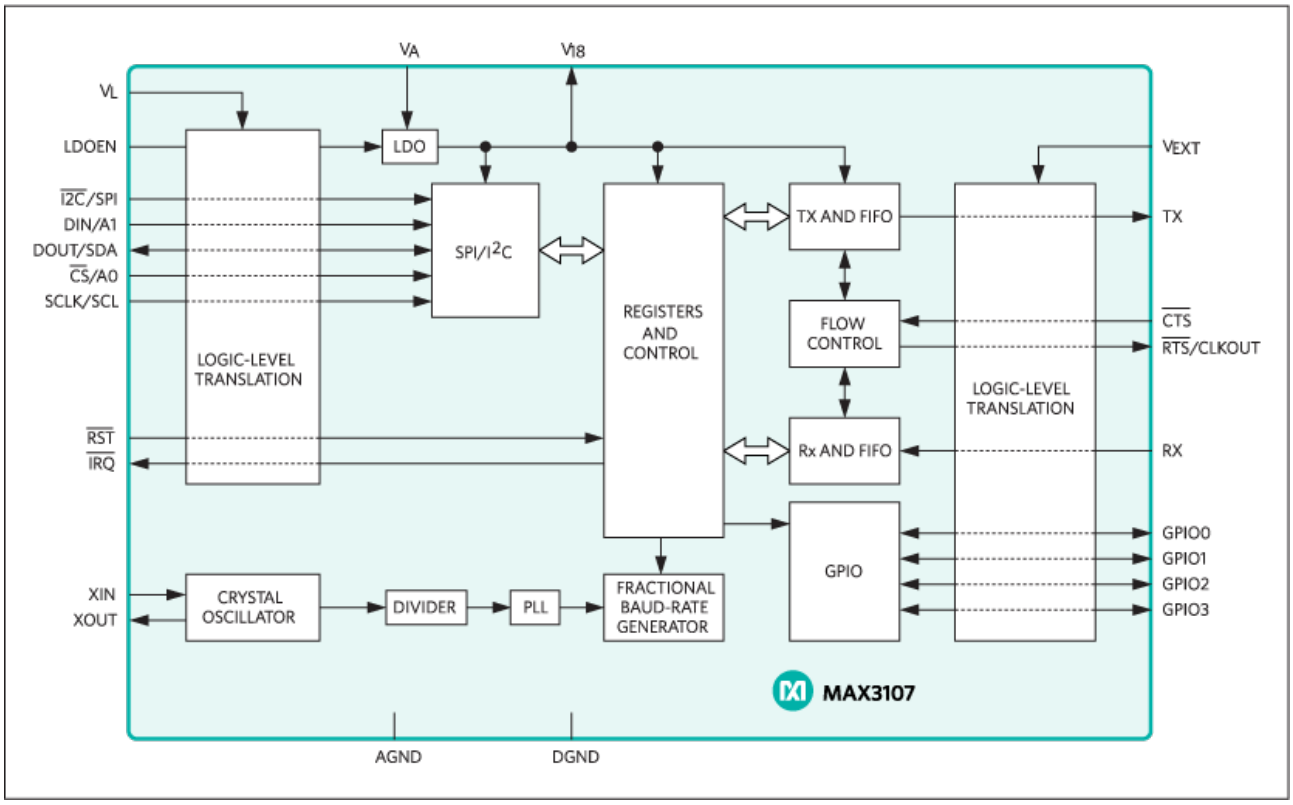


Links

- https://compiler.kaustic.net/machines/apc.html

MAX3107

The MAX3107 is an advanced universal asynchronous receiver-transmitter (UART) with 128 words each of receive and transmit first-in/first-out (FIFO) that can be controlled through I²C or high-speed SPI™. The 2x and 4x rate modes allow a maximum of 24Mbps data rates. A phase-locked loop (PLL), prescaler, and fractional baud-rate generator allow for high-resolution baud-rate programming and minimize the dependency of baud rate on reference clock frequency.



Datasheets

- MAX3107.pdf

Espressif

ESP 32

Encryption

- https://limitedresults.com/2019/11/pwn-the-esp32-forever-flash-encryption-and-sec-boot-keys-extraction/

ESP 8266

Modbus

Tutorial: https://www.renesas.com/eu/en/www/doc/whitepapers/interface/rs-485-transceiver-tutorial.pdf

Chip brukt i kontroller: SN65HVD485E Half-Duplex RS-485 Transceiver (http://www.ti.com/lit/ds/symlink/sn65hvd485e.pdf)

RS-485 til UART https://www.sparkfun.com/products/10124

Anbefalt modbus usb driver: https://www.sparkfun.com/products/9822

Datasheets: https://www.sparkfun.com/datasheets/BreakoutBoards/USB-to-RS485-Breakout-v11.pdf

For “end of line” motstand kjøp både 120 og 220ohm

Hardware

SDR

LimeSDR

- LimeSDR Mini

SDRPlay

- SDRPlay

Machine learning

Programming

- Rust

Frameworks

Firebase

Alternatives

- Sapphire

Sapphire

Open source alternative to firebase https://sapphire-db.com/start/main

Spring boot

Quarkus The JHipster Quarkus demo app

- https://quarkus.io/

Programming languages

Golang

Tips and tricks

```
go mod init
go mod vendor
```

Vendors

Links

Web framework

- Gin gonic

ORM

- http://gorm.io/

GUI

- https://hackernoon.com/how-to-add-a-gui-to-your-golang-app-in-5-easy-steps-c25c99d4d8e0
- https://github.com/andlabs/ui
- https://github.com/therecipe/qt

Web

- GraphQL Schema Language Cheat Sheet
- Learn Golang + GraphQL + Relay #1
- Learn Golang + GraphQL + Relay #2
- https://github.com/mingrammer/go-web-framework-stars

Div

- https://github.com/avelino/awesome-go

Articles

- Example of Golang CRUD using MySQL from scratch

Hammerspoon

This is a tool for powerful automation of OS X. At its core, Hammerspoon is just a bridge between the operating system and a Lua scripting engine. What gives Hammerspoon its power is a set of extensions that expose specific pieces of system functionality, to the user.

https://www.hammerspoon.org/

Rust

Links

Web

- https://rocket.rs/

GUI

- https://github.com/PistonDevelopers/conrod
- http://relm.ml/relm-intro

ORM

- http://diesel.rs/guides/getting-started/

ESP32

- https://mabez.dev/blog/posts/esp32-rust/

Projects

- Crudus MD Notes
- Maximus

Status Light

iOS app

- https://stackoverflow.com/questions/23535355/how-to-detect-call-incoming-programmatically
- https://www.raywenderlich.com/150015/callkit-tutorial-ios

BMW Media Center

- BMW Connected Apps Protocol https://hufman.github.io/stories/bmwconnectedapps
- Shopping list

Articles

- https://hackaday.io/project/161745-can-bus-hacker
- https://hackaday.com/2019/05/09/sniffing-can-to-add-new-features-to-a-modern-car/

Shoppinglist for BMW

Bmw controller

- https://www.cubietruck.com/products/cubieboard4-cc-a80-high-performance-mini-pc-development-board
- https://www.96boards.org/product/hikey960/

Crudus Markdown Notes

En markdown applikasjon som kan synkronisere med git.

Platform

iOS / Android

- Nativescript
- https://libgit2.org/
- https://github.com/libgit2/objective-git
- https://github.com/Raekye/ObjectiveGit-iOS-Example

Desktop

- Electron

Links

- https://libgit2.org/
- https://cocoapods.org/pods/libgit2
- https://github.com/libgit2/libgit2#android

Libraries

JavaScript

- Marked
- Remarkable
- PageDown (and PageDown Extra)
- markdown-it
- Gitdown: GitHub markdown preprocessor

- reMarked.js: HTML-to-Markdown processor
- Kramed: Fork of Marked

Other Editors

- StackEdit: In-browser MD document editor
- Minimalist Online Markdown Editor
- Mou: macOS editor
- Haroopad: Cross-platform editor

Crudus Photos

Tensor flow

Image to text ![Image to text](./Projects/Crudus Photos/A2399A8D-E525-49D5-B751-CC896F304C16.jpg) https://github.com/tensorflow/models/tree/master/research/im2txt

Articles

Building a private, local photo search app using machine learning https://towardsdatascience.com/building-a-private-local-photo-search-app-using-machine-learning-8aeeef8d245c

A step by step guide to Caffe http://shengshuyang.github.io/A-step-by-step-guide-to-Caffe.html

Photo History

Histogram in photography https://www.phototraces.com/photography-basics/histogram-in-photography/

Histogram basics https://docs.opencv.org/3.1.0/d1/db7/tutorial_py_histogram_begins.html

Tools

- Tagbox
- NVIDIA docker support

```
sudo apt install exiftran libjpeg-turbo-progs
```

Ubuntu

Links

Caffe

- https://caffe.berkeleyvision.org/

Model zoo

- https://github.com/BVLC/caffe/wiki/Model-Zoo

Docker image

- https://github.com/BVLC/caffe/tree/master/docker

Diff image

- https://stackoverflow.com/questions/5132749/diff-an-image-using-imagemagick

Image Fingerprint

- https://realpython.com/fingerprinting-images-for-near-duplicate-detection/

Frame Hash

- https://github.com/sschnug/pyVideoHash/blob/master/frame_hash.pyx

Image recognition

- https://www.learnopencv.com/image-recognition-and-object-detection-part1/

Duplicate images

- https://github.com/philipbl/duplicate-images
- https://blog.iconfinder.com/detecting-duplicate-images-using-python-cb240b05a3b6
- https://www.youtube.com/watch?v=AIyJSGmkFXk

OpenCV Line detection

- https://www.codepool.biz/opencv-line-detection.html
- https://docs.opencv.org/3.4/dd/dd7/tutorial_morph_lines_detection.html

Detect horizon

- https://stackoverflow.com/questions/4705837/horizon-detection-algorithm

OpenCV Auto-level / histogram

- https://docs.opencv.org/2.4/modules/imgproc/doc/histograms.html?highlight=equalizehist#cv2.equalizeHist

OpenCV rotate images

- https://www.pyimagesearch.com/2017/01/02/rotate-images-correctly-with-opencv-and-python/

MIT Deep learning

- https://github.com/lexfridman/mit-deep-learning

Tensorflow and docker

- https://www.sicara.ai/blog/2017-11-28-set-tensorflow-docker-gpu
- https://stackoverflow.com/questions/47068709/your-cpu-supports-instructions-that-this-tensorflow-binary-was-not-compiled-to-u
- https://github.com/lakshayg/tensorflow-build

OpenCV 4 https://www.pyimagesearch.com/2018/08/17/install-opencv-4-on-macos/

Crudus Sense

BLE device configuration specification

Name	Type	R/W	Key	UUID
Device name	String	R/W	deviceName	5759f8cc-69ee-11e9-8a12-1681be663d
WiFi Mac	String	R		51ecb1ca-6b85-11e9-a923-1681be663c
WiFi SSID	String	R/W	wifi-ssid	51ecb440-6b85-11e9-a923-1681be663c
WiFi passwd	String	W	wifi-pwd	51ecb594-6b85-11e9-a923-1681be663c
Room	String	R/W	loc-room	51ecb6ca-6b85-11e9-a923-1681be663c
Floor	Integer?	R/W	loc-floor	51ecb7f6-6b85-11e9-a923-1681be663d
Compound	String	R/W	Loc-comp	51ecb922-6b85-11e9-a923-1681be663c
MQTT topic	String	R/W	mqtt-topic	51ecba4e-6b85-11e9-a923-1681be663c
MQTT host	String	R/W	mqtt-host	51ecbf26-6b85-11e9-a923-1681be663d
MQTT port	Integer	R/W	mqtt-port	51ecc156-6b85-11e9-a923-1681be663c
MQTT username	String	R/W	mqtt-user	51ecc2c8-6b85-11e9-a923-1681be663d
MQTT password	String	W	mqtt-pwd	51ecc3fe-6b85-11e9-a923-1681be663d

Name	Type	R/W	Key	UUID
Crudus Accounts username	String	W	crudus-user	51ecc52a-6b85-11e9-a923-1681be663d
Crudus Accounts token	String	W	crudus-token	51ecc6d8-6b85-11e9-a923-1681be663d
Calibration temperature	String (comma separated)	R/W	cali-temp	51ecca5c-6b85-11e9-a923-1681be663d
Calibration humidity	String (comma separated)	R/W	cali-hum	51eccbb0-6b85-11e9-a923-1681be663d
Soft reset	boolean	W	soft-reset	51eccd18-6b85-11e9-a923-1681be663d

MQTT publish Topics

Topic	Payload	Comment

MQTT Subscribe Topics

Topic	Payload	Action	Comment
/sense/ota		Calls OTA for update	

Extensions

Sleep Tracking using an Arduino https://duino4projects.com/sleep-tracking-using-an-arduino/

Reset: https://www.esp8266.com/viewtopic.php?t=9558&start=8

Chip: CCS811 (indoor air quality sensor)

Kaldheim.org

Links

- https://themes.getbootstrap.com/product/milo-magazineblog-theme/

Maximus

Components

- Stereo Pi
- Configure BNO055

Robotics

- Robotics

Articles

- Comparing Gyroscope Datasheets

Artificial Intelligence

- AI Notes

BNO055

Installation

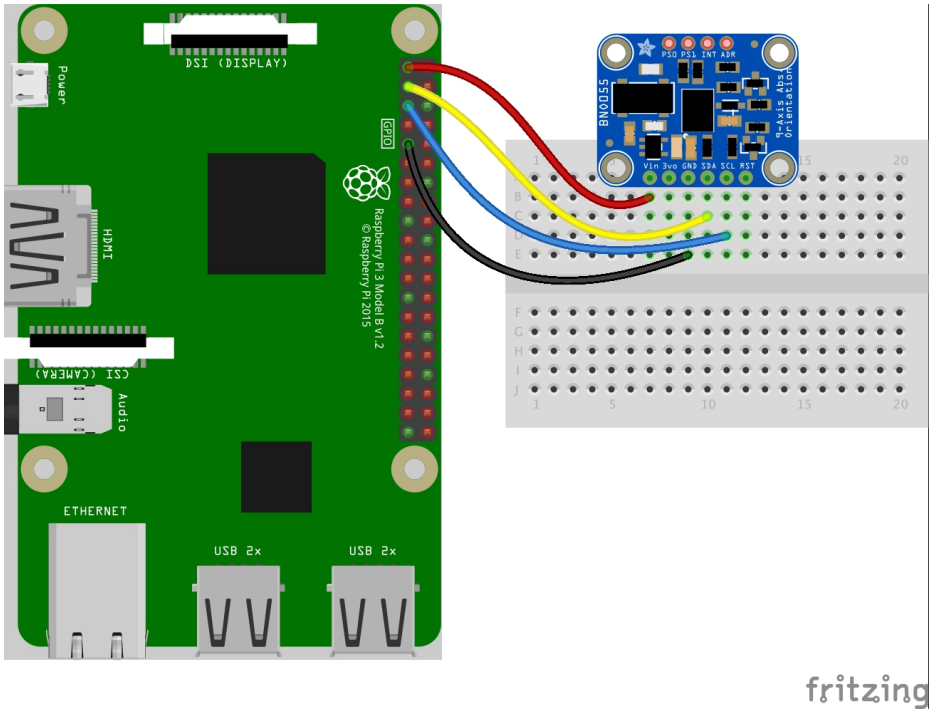
- BNO055 - Python & CircuitPython

```
pip3 install RPI.GPIO
pip3 install adafruit-blinka
```

i2c configuration

- I2C Clock Stretching

In order to use certain I2C sensors, such as the BNO055, you'll need to enable I2C clock stretching 'support' by greatly slowing down the I2C clock on the Raspberry Pi using the device tree overlay.



Edit */boot/config.txt*

```
### Uncomment some of all of these to enable the optional hardware interfaces
dtparam=i2c_arm=on
dtparam=i2s=on
dtparam=spi=on

### Clock stretching by slowing down to 10KHz
dtparam=i2c_arm_baudrate=10000
```

Reboot the device

```
sudo reboot
```

Check for i2c devices:

```
$ i2cdetect -y 1
     0  1  2  3  4  5  6  7  8  9  a  b  c  d  e  f
00:          -- -- -- -- -- -- -- -- -- -- -- -- --
10: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
20: -- -- -- -- -- -- -- -- 28 -- -- -- -- -- -- --
30: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
40: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
50: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
60: -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
70: -- -- -- -- -- -- -- --
```

```
mkdir Maximus && cd Maximus
python3 -m venv .env
```

```
source .env/bin/activate
pip3 install adafruit-circuitpython-bno055
```

Create new project Example data from sensor:

```
Temperature: 28 degrees C
Accelerometer (m/s^2): (-0.2, -0.07, -9.77)
Magnetometer (microteslas): (-27.75, -4.0625, 32.5)
Gyroscope (rad/sec): (-0.001090830782496456, -0.004363323129985824, 0.0)
Euler angle: (None, None, None)
Quaternion: (0.011474609375, -0.3623046875, 0.9320068359375, 0.0)
Linear acceleration (m/s^2): (1.28, 0.0, -0.01)
Gravity (m/s^2): (-0.21, -0.08, -9.8)
```

PID controller

- Arduino BNO055 PID Gyro sensor
- PID Control for multiple linear actuators

Videos

- How to Implement an Inertial Measurement Unit (IMU) Using an Accelerometer, Gyro, and Magnetometer
- How to Merge Accelerometer with GPS to Accurately Predict Position and Velocity

Links

- Adafruit BNO055
- Adafruit BNO055 absolute orientation sensor

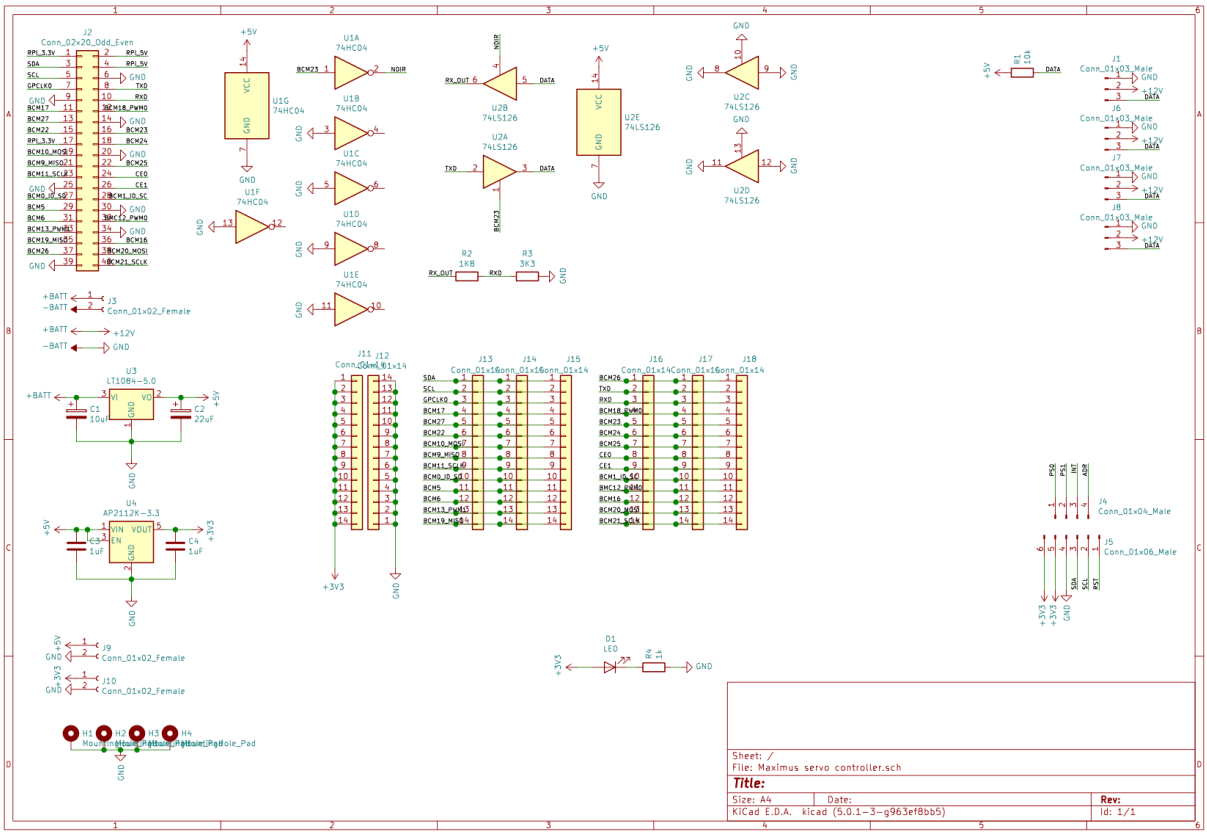
Documents

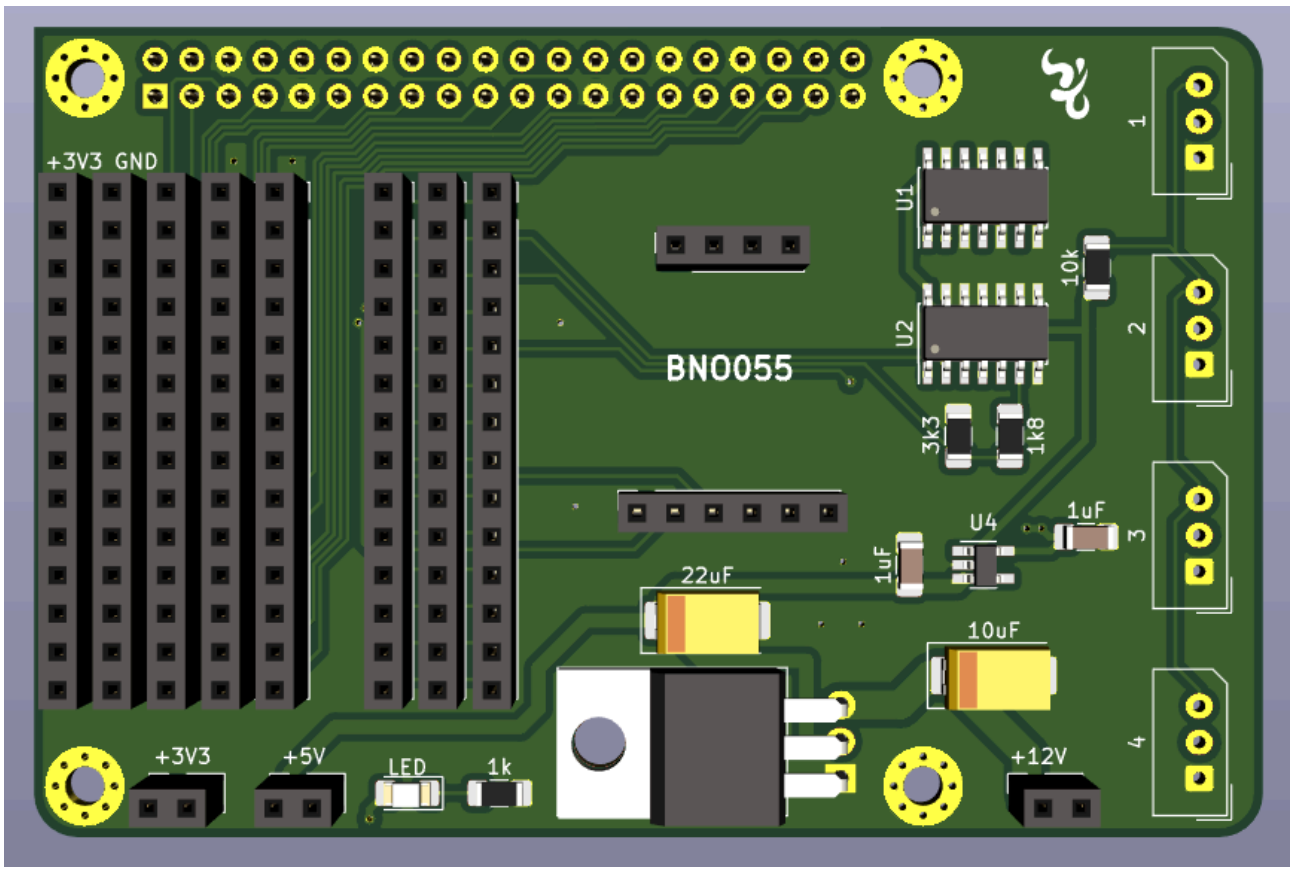
- An introduction and tutorial for PID controllers (PDF)

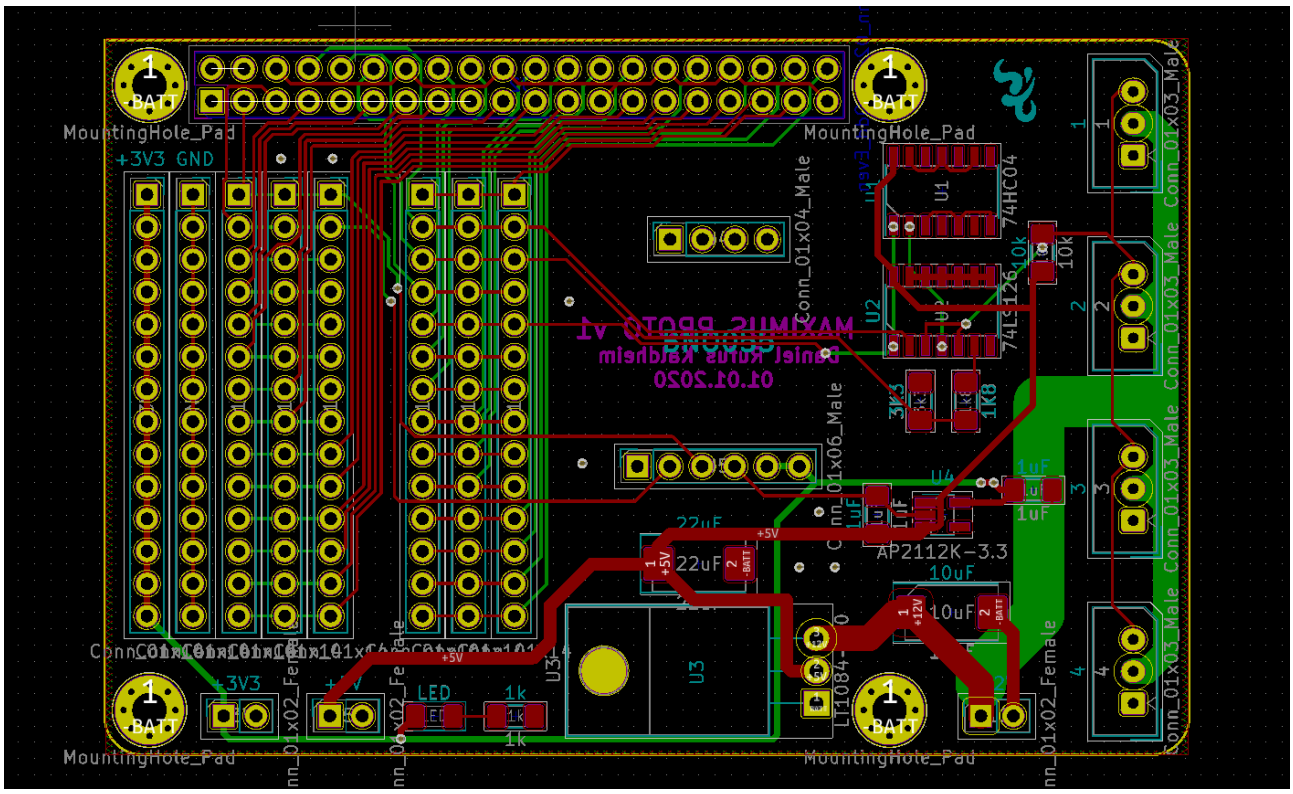
Books

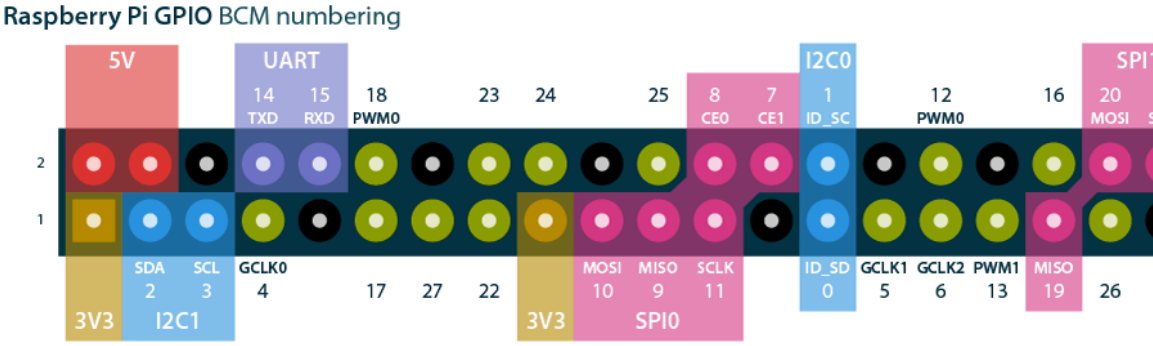
- Technician's Guide to Programmable Controllers
- PID Controllers: Theory, Design, and Tuning
- PID Control Fundamentals
- Model-Reference Robust Tuning of PID Controllers (Advances in Industrial Control)
- HANDBOOK OF PI AND PID CONTROLLER TUNING RULES (3RD EDITION)

Development board









Raspberry Pi pinout

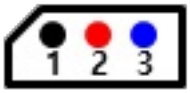
Dynamixel AX-12A

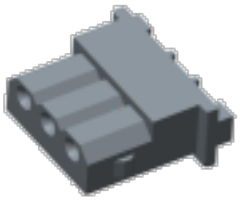
DYNAMIXEL is a robot exclusive smart actuator with fully integrated DC Motor + Reduction Gearhead + Controller + Driver + Network in one DC servo module.

Specification

Item	Specification
Baud Rate	7843 bps ~ 1 Mbps
Resolution	0.29 [°]
Running Degree	0 [°] ~ 300 [°] Endless Turn
Weight	53.5g(AX-12, AX-12+), 54.6g(AX-12A)
Dimensions (W x H x D)	32mm x 50mm x 40mm
Gear Ratio	254 : 1
Stall Torque	1.5 N*m (at 12V, 1.5A)
No Load Speed	59rpm (at 12V)
Operating Temperature	-5 [°C] ~ +70 [°C]
Input Voltage	9.0 ~ 12.0V (**Recommended** : 11.1V)
Command Signal	Digital Packet
Protocol Type	Half Duplex Asynchronous Serial Communication (8bit, 1stop, No Parity)
Physical Connection	TTL Level Multi Drop Bus
ID	0 ~ 253
Feedback	Position, Temperature, Load, Input Voltage, etc
Material	Engineering Plastic

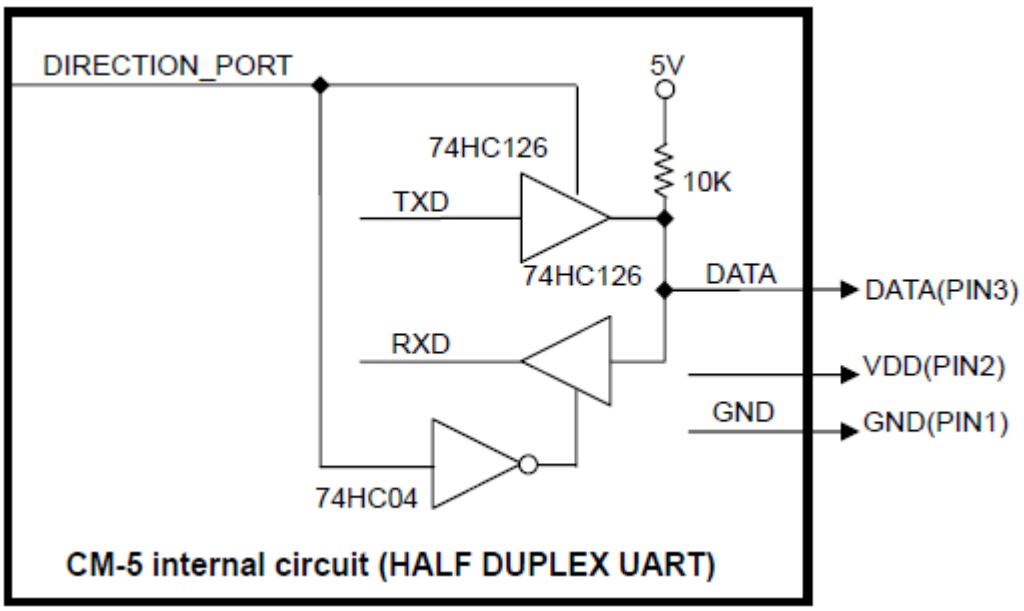
Wiring

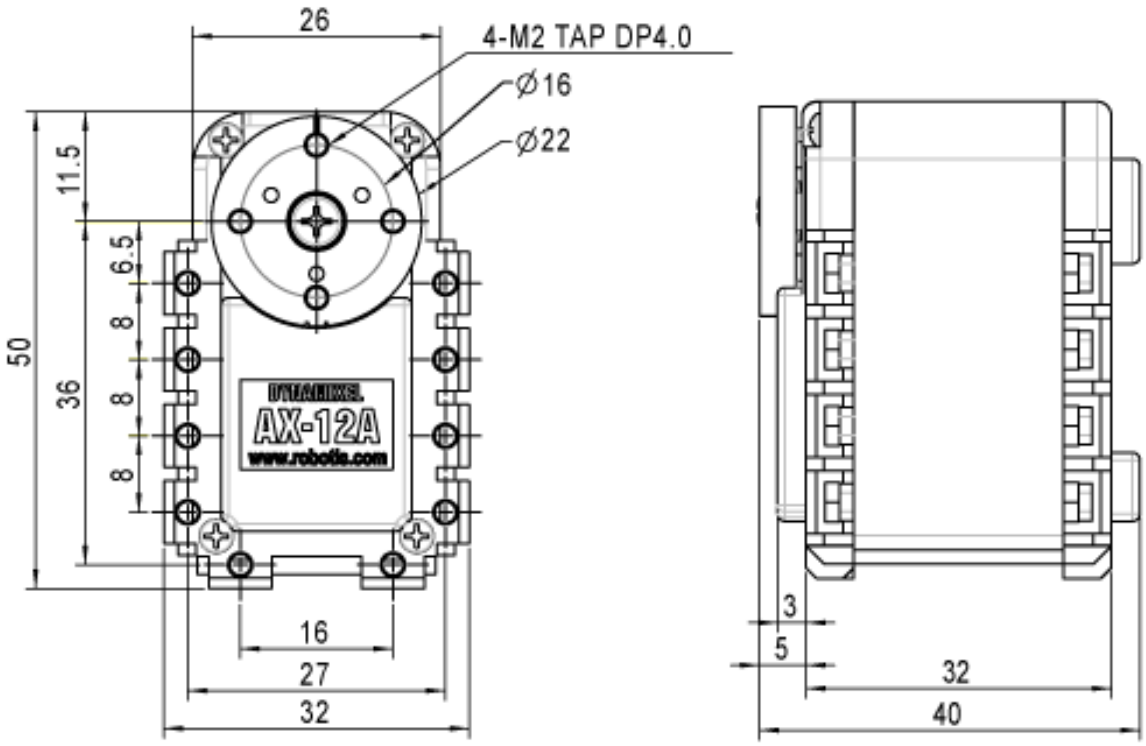
Item	TTL
Pinout	1 GND2 VDD3 DATA
Diagram	

Item	TTL
Housing	 MOLEX 50-37-5033
PCB Header	 MOLEX 22-03-5035
Crimp Terminal	MOLEX 08-70-1039
Wire Gauge	21 AWG

TTL communications To control the DYNAMIXEL actuators, the main controller needs to convert its UART signals to the half duplex type.

The recommended circuit diagram for this is shown below.





Drawings

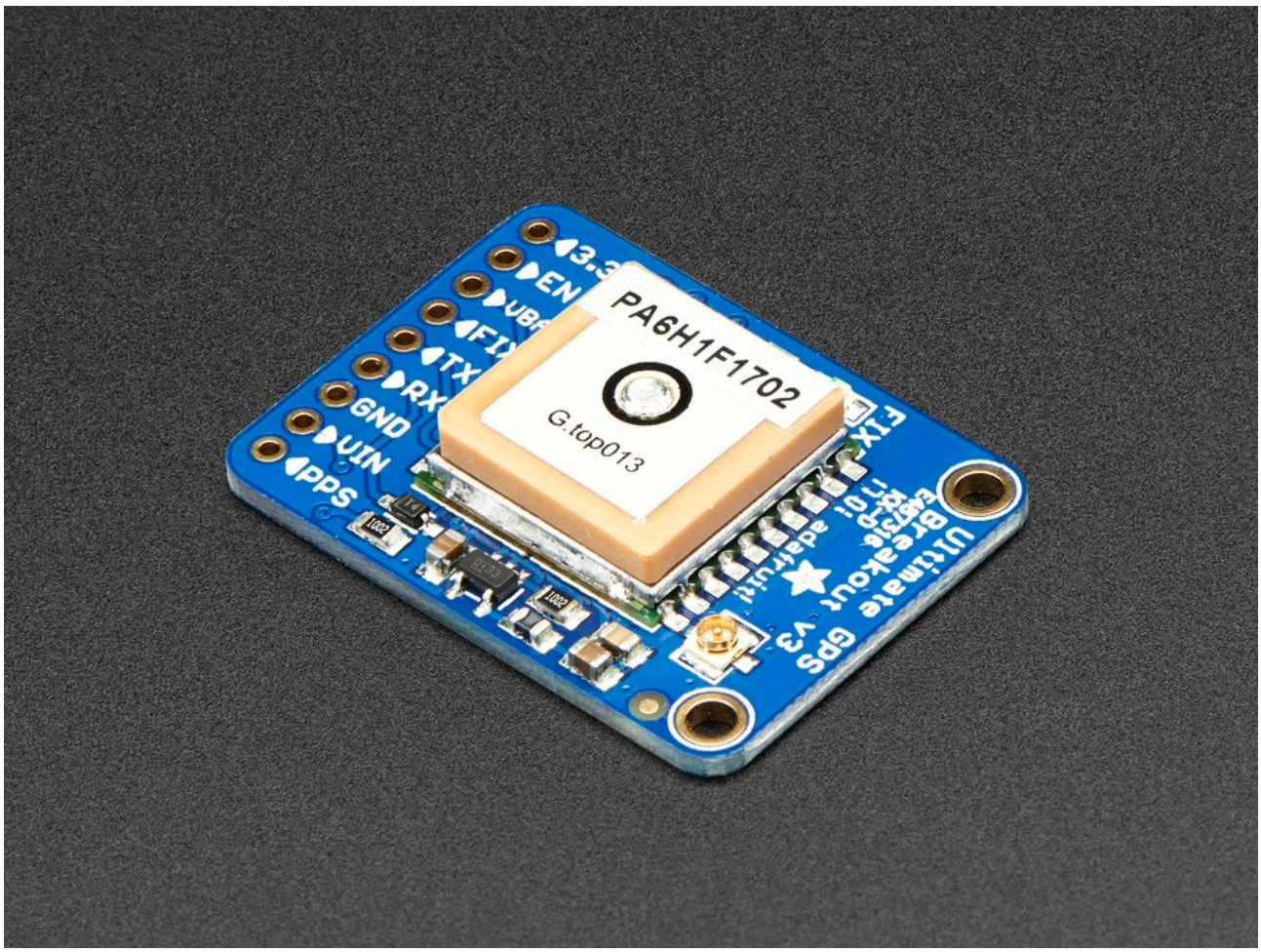
Links

- E-manual
- Dynamixel SDK

GPS

Adafruit ultimate GPS breakout

- -165 dBm sensitivity, 10 Hz updates, 66 channels
- 5V friendly design and only 20mA current draw
- Breadboard friendly + two mounting holes
- RTC battery-compatible
- Built-in datalogging
- PPS output on fix
- Internal patch antenna + u.FL connector for external active antenna
- Fix status LED



Technical details

- Satellites: 22 tracking, 66 searching
- Patch Antenna Size: 15mm x 15mm x 4mm
- Update rate: 1 to 10 Hz
- Position Accuracy: < 3 meters (all GPS technology has about 3m accuracy)
- Velocity Accuracy: 0.1 meters/s
- Warm/cold start: 34 seconds
- Acquisition sensitivity: -145 dBm
- Tracking sensitivity: -165 dBm
- Maximum Velocity: 515m/s
- Vin range: 3.0-5.5VDC
- MTK3339 Operating current: 25mA tracking, 20 mA current draw during navigation
- Output: NMEA 0183, 9600 baud default, 3V logic level out, 5V-safe input
- DGPS/WAAS/EGNOS supported
- FCC E911 compliance and AGPS support (Offline mode : EPO valid up to 14 days)
- Up to 210 PRN channels
- Jammer detection and reduction
- Multi-path detection and compensation

Links

- Adafruit product page
- Adafruit Overview

Adafruit Fona 3g cellular breakout

- Quad-band 850MHz GSM, 900MHz EGSM, 1800MHz DCS, 1900MHz PCs - connect onto any global GSM network with any 2G SIM.
- This is the European Version - with dual-band UMTS/HSDPA 900/2100MHz WCDMA + HSDPA

- Fully-integrated GPS (Qualcomm PM8015 GPS) that can be controlled and query over the same serial port
- Make and receive voice calls using a headset or an external 8Ω speaker + electret microphone
- Send and receive SMS messages
- Send and receive GPRS data (TCP/IP, HTTP, etc.)
- AT command interface can be used with 300, 600, 1200, 4800, 9600, 19200, 38400, 57600, 115200, 230K, 461K, 961K, 3.2M, 3.7M and 4.0Mbps
- Native USB support - plug it into a computer and you'll get serial ports for AT commands, GPS NMEA as well as a modem (note we've only tried out the AT&NMEA ports on Windows)

Cool fact: The Fona also has a built-in GPS.

Not-so-cool fact: The Pi can only make one serial connection. Checkout article *Sending AT commands to SIM900 whilst pppd is active*

GPS specifications

- 16 acquisition channels
- GPS L1 C/A code
- Sensitivity
  - Tracking: -157 dBm
  - Cold starts : -144 dBm
- Time-To-First-Fix
  - Cold starts: 100s (typ.)
  - Hot starts: 1s (typ.)
- Accuracy: approx 2.5 meters

Implementation

Setup Edit */boot/config.txt*

```
enable_uart=1
```

Install dependencies

```
sudo apt-get update

sudo apt-get install ppp screen
```

Try it out

```
sudo screen /dev/serial0 115200
```

Celluar

```
sudo -i

cd /etc/ppp/peers/

wget https://raw.githubusercontent.com/adafruit/FONA_PPP/master/fona
```

Open that file to view PPPD settings when ”fona” is called.

```
vim fona
```

You should see this:

```
### Example PPPD configuration for FONA GPRS connection on Debian/Ubuntu.

### MUST CHANGE: Change the -T parameter value **** to your network's APN value.
### For example if your APN is 'internet' (without quotes), the line would look like:
### connect "/usr/sbin/chat -v -f /etc/chatscripts/gprs -T internet"
connect "/usr/sbin/chat -v -f /etc/chatscripts/gprs -T telia"

### MUST CHANGE: Uncomment the appropriate serial device for your platform below.
### For Raspberry Pi use /dev/ttyAMA0 by uncommenting the line below:
/dev/ttyUSB0
###/dev/ttyAMA0
### For BeagleBone Black use /dev/ttyO4 by uncommenting the line below:
###/dev/ttyO4

### Speed of the serial line.
115200

### Assumes that your IP address is allocated dynamically by the ISP.
noipdefault

### Try to get the name server addresses from the ISP.
usepeerdns

### Use this connection as the default route to the internet.
defaultroute

### Makes PPPD "dial again" when the connection is lost.
persist

### Do not ask the remote to authenticate.
noauth

### No hardware flow control on the serial link with FONA
nocrtscts

### No modem control lines with FONA.
local
```

connect to internet:

```
sudo pon fona
```

disconnect

```
sudo poff fona
```

Realtime clock

Set the realtime clock see Forum

`AT+CLTS?` You will get this if it is disabled:

`+CLTS: 0`

To enable it enter this:

`AT+CLTS=1`

`CLTS=1` must be saved in the SIM800's nonvolatile memory so it will be enabled when the module powers up and registers on the network.

Since this setting is not automatically saved in nonvolatile memory, you must save it with:

`AT&W`

(This saves all writeable settings)

Now restart your SIM800

After it registers AT+CCLK? will respond with the correct time, as in my case:

`+CCLK: "14/08/08,02:25:43-16"`

Send SMS Set in sms mode: `AT+CMGF=1`

Send message

```
AT+CMGS="+4794835300"<ENTER>
> your message<ctrl+z>
```

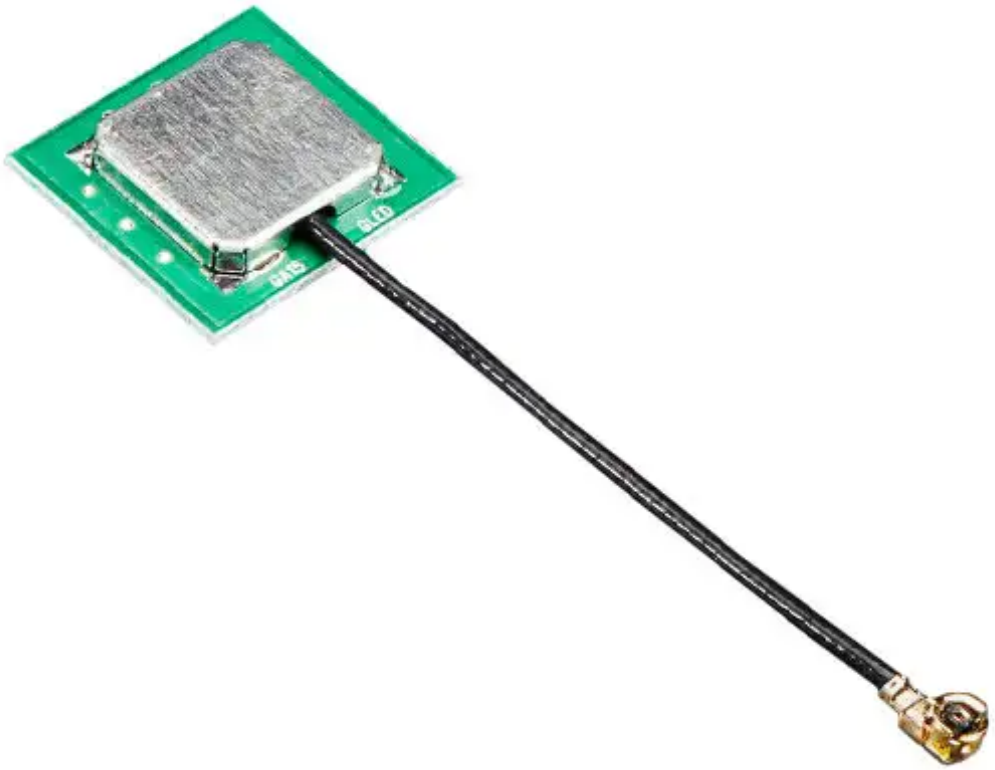
Datasim:

"+47 580009700018"

Articles

- Cellular & GPS Enabled Pi 3: Fona + Pi 3
- FONA Tethering to Raspberry Pi or BeagleBone Black
- Sending AT commands to SIM900 whilst pppd is active

GPS antenna Recommended GPS antenna



Links

- RF ANT 1.575GHZ CER PATCH CAB

Datasheets

- Passive GPS Antenna uFL - 15mm x 15mm 1 dBi gain

Maximus AI

For termial conversations

- http://www.methods.co.nz/asciidoc/

AIML

- http://www.alicebot.org/aiml.html
- https://www.tutorialspoint.com/aiml/
- http://www.devdungeon.com/content/ai-chat-bot-python-aiml
- https://github.com/pandorabots/rosie/tree/master/lib/aiml

Unicode hex: ”\xf0\x9f\x90\xb6”

Artificial Intelligence

- http://blog.hackerearth.com/2015/12/artificial-intelligence-101-how-to-get-started.html

Words, spelling and so on

- https://market.mashape.com/wordsapi/wordsapi
- https://github.com/montanaflynn/Spellcheck-API/
- https://market.mashape.com/sentity/sentity-text-analytics
- https://market.mashape.com/aylien/text-analysis
- https://market.mashape.com/textanalysis/text-summarization
- https://www.meaningcloud.com/developer/
- https://market.mashape.com/faceplusplus/faceplusplus-face-detection
- http://developers.answers.com/

Grammar

- https://learnenglish.britishcouncil.org/en/
- https://github.com/markfullmer/grammark/tree/Version-3
- https://github.com/languagetool-org/languagetool (http://wiki.languagetool.org/public-http-api)

NLP / NER

- Part-of-speech tagging (POS)
- Chunking (CHK)
- Name entity recognition (NER)
- Info: http://nlp.stanford.edu/software/CRF-NER.shtml
- Download: http://nlp.stanford.edu/software/stanford-ner-2016-10-31.zip
- https://github.com/agentile/PHP-Stanford-NLP (old) use patrickschur
- https://packagist.org/packages/patrickschur/stanford-nlp-tagger
- http://php-nlp-tools.com/

Intent parser

- https://github.com/MycroftAI/adapt

Object recognition (caffe)

- http://tutorial.caffe.berkeleyvision.org/caffe-cvpr15-detection.pdf

Image analyze

- https://github.com/Samshal/PHP-Photo-Information
- http://caffe.berkeleyvision.org/

Automatic speech recognition

- http://cmusphinx.sourceforge.net/
- http://kaldi-asr.org/

Questions / answers

- https://github.com/TScottJ/OpenEphyra
- https://cs.umd.edu/~miyyer/qblearn/
- https://github.com/brmson/yodaqa

Lucida

- http://lucida.ai/media/hpca-lucida-djinn-tutorial.pdf

Animations

- https://www.youtube.com/watch?v=_WlqMqXpyxA

OCR / Deep learning

- https://blogs.dropbox.com/tech/2017/04/creating-a-modern-ocr-pipeline-using-computer-vision-and-deep-learning/

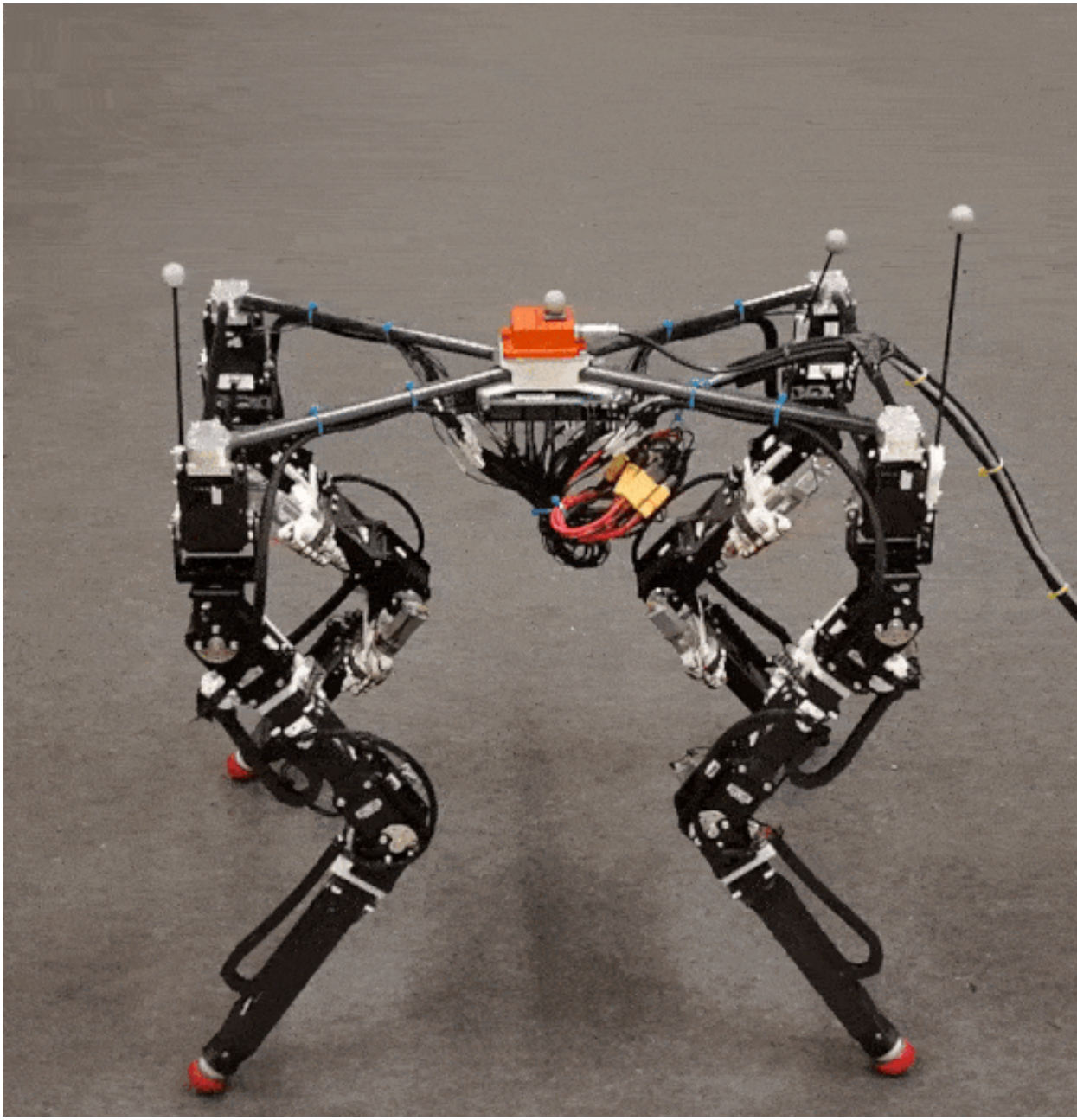
Neural network (arduino)

- http://robotics.hobbizine.com/arduinoann.html

Other Links

- https://github.com/GokuMohandas/practicalAI
- http://www.aicheatsheets.com/

Maximus robotics



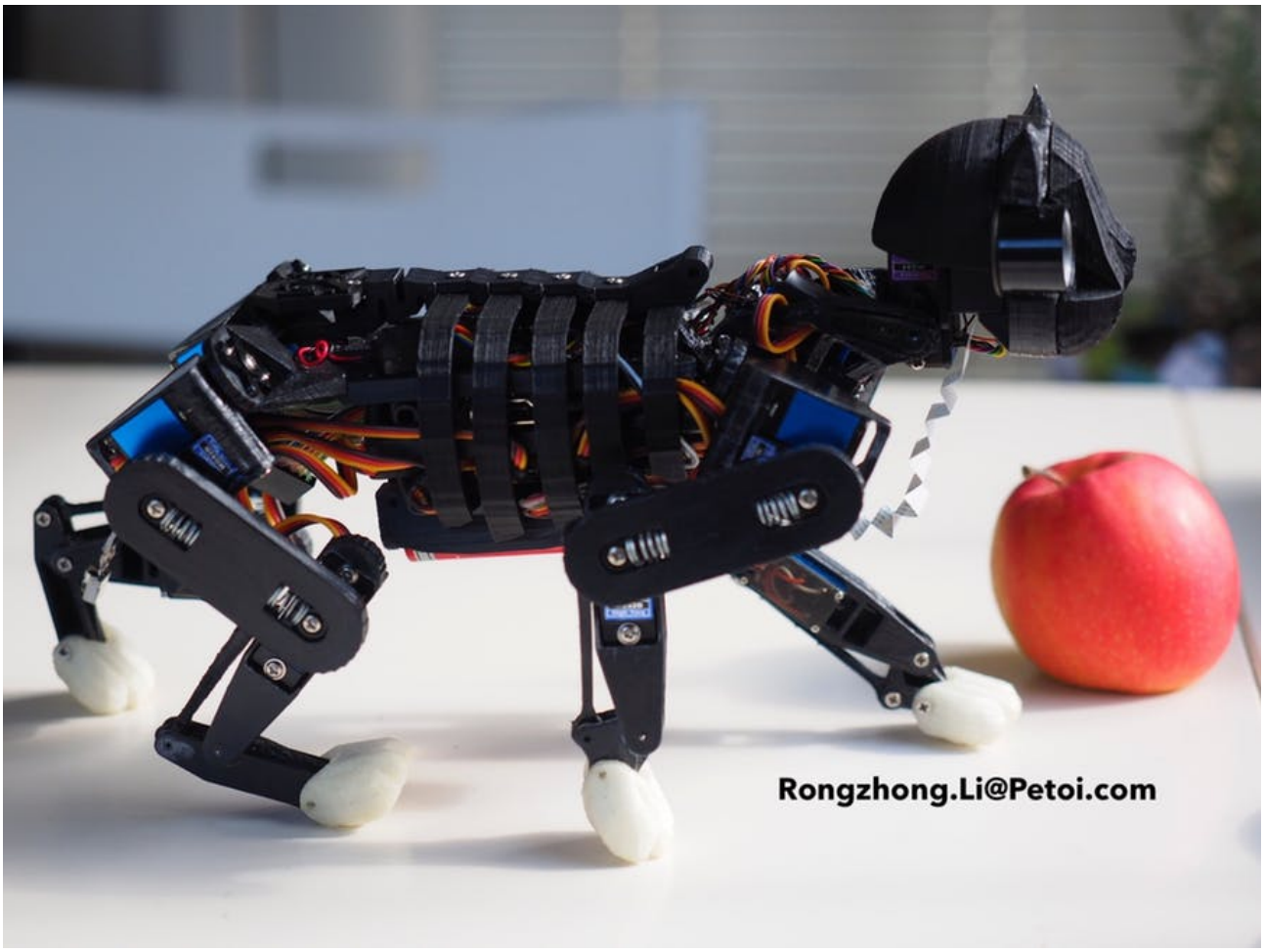
DyRET Robot

Links

- DyRET Documentation

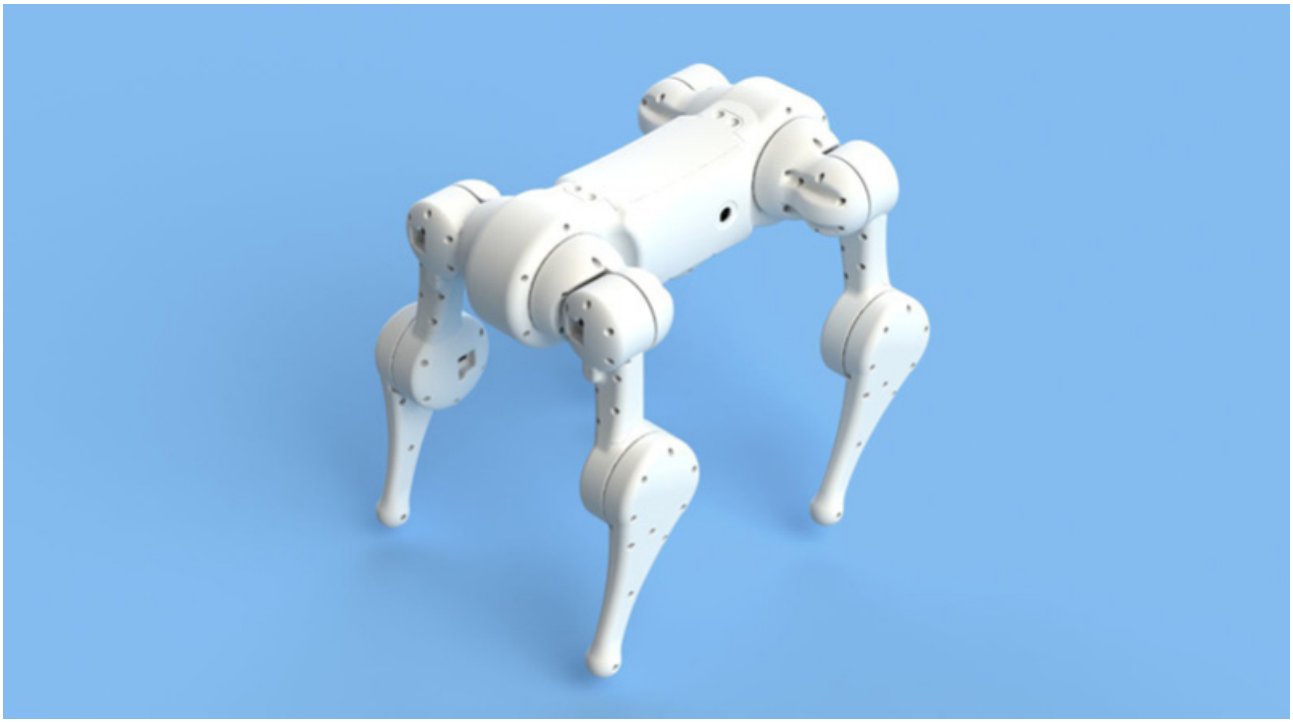
Jetson Nano

- https://www.nvidia.com/en-us/autonomous-machines/embedded-systems/jetson-nano/



Open Cat

https://www.hackster.io/petoi/opencat-845129



Pet dog

- https://hackaday.com/2019/03/30/a-pet-robot-just-like-boston-dynamics-makes/
- https://hackaday.io/project/164493-dizzy-wolf

Mechanical keyboard

Inspiration

- https://github.com/ruiqimao/keyboard-pcb-guide
- https://imgur.com/gallery/fGa13nZ

Motorcycle App

- Profile
  - Navn
  - epost
  - område / by
  - kommunikasjon (hjelm)
- Kjøretøy
  - model
  - årsmodel
  - merke
  - Bensin-logging
    - ⋆ Stasjon / lokasjon
    - ⋆ liter
    - ⋆ tripteller
    - ⋆ dato
    - ⋆ drivstoff type (oktan)
    - ⋆ drivstoff-pris
    - ⋆ fulltank / ikke full tank
  - Vedlikehold
    - ⋆ Sjekkliste
    - ⋆ dekkbytte
    - ⋆ bremseklosser
    - ⋆ Diverse
- Venner
- Grupper
  - inviter venner til gruppe (lukket gruppe)
  - åpen gruppe

    - Åpen gruppe men begrenset godkjenning av admin
- Meldinger
    - venn til venn
    - gruppechat
    - turchat
- Ruter
    - Lag rute via kart
    - Lag rute ved å kjøre
    - Logg rute i bakgrunnen
    - legg til stopp punkt (pauser etc)
- Turer
    - planlegg rute via eksisterende rute
    - planlegg rute ved å lage via kart
    - inviter venner
    - inviter gruppe
    - kjør tur
        - ⋆ legg til møteplass
        - ⋆ legg til stopp (pauser etc)
        - ⋆ logg hvem som er med bassert på godkjenning og automatisk synkronisering av lokasjon
        - ⋆ logg faktisk kjørt rute
        - ⋆ logg tid
        - ⋆ logg tilfeldige forbipasserende (bassert på lokasjon og tid) (frivillig)
- statistikk
    - drivstoff forbruk
    - tid på sykkel
    - Avstand på sykkel

Pip-Boy

Montering

- https://ytec3d.com/pip-boy-3000-mark-iv-assembly/

LCD skjerm

- https://no.mouser.com/ProductDetail/Newhaven-Display/NHD-43-480272MB-ASXN-CTP?qs=sGAEpiMZZMu%2fRY1

Project Management System

Inspiration

- https://codetree.com/

Reflow Oven

Links

Tutorial: http://www.whizoo.com/reflowoven

Ovn: https://www.skousen.no/hvitevarer/ovn/mini-ovn/product/royal-16-ltr/

Isolasjonsteip: https://www.skruvat.no/Isolasjonstape-Reflect-A-Gold-P418338.aspx

Isolasjonsteppe: https://bakerovner.no/produkt/keramisk-isolasjon-rull-1260-c/

Fugemasse / lim: https://coop.no/sortiment/obs-bygg/maling-og-tilbehor/lim-fug-sparkel/casco-heat#product-info

USB Media Controller

Dimensions

Høyde: 35mm x Bredde: 70 - 100mm

Security

Articles

- Exploiting WiFi stack on Tesla Model S

LoRaWAN

LoRaWAN Encryption Keys Easy to Crack, Jeopardizing Security of IoT Networks

Shopping lists

Shopping list for home office

Keyboard

- https://www.daskeyboard.com/daskeyboard-4-ultimate/
  - https://www.teknikmagasinet.no/produkter/data-o-tv-spill/tastatur/varemerker/das-keyboard/das-keyboard-4-ultimate-with-cherry-mx-blue
- https://mechanicalkeyboards.com/shop/index.php?l=product_detail&p=3901
- http://www.wasdkeyboards.com/index.php/products/mechanical-keyboard/wasd-v2-105-key-iso-custom-mechanical-keyboard.html

Network

- https://mikrotik.com/product/RB3011UiAS-RM
  - https://www.eurodk.com/en/products/mt-rb/routerboard-3011uias-rm
  - https://freak.no/forum/showthread.php?t=219922&page=28

Software

- Rabbit MQ

Rabbit MQ

Security

- Rabbit MQ access control: http://www.rabbitmq.com/access-control.html
- Multi-tenant SaaS AD: https://vincentlauzon.com/2016/03/10/multi-tenant-saas-with-azure-active-directory-b2b-b2c/

UX - UI

- Colors

Methods

- https://material.io/design/
- http://www.designkit.org/methods

Colors

Links

- https://www.canva.com/colors/color-palette-generator/

Useful stuff

Useful Commands

Terminal recording

Asciinema

```
brew install asciinema
```

1. Install

```
asciinema rec filename.cast
```

2. Record

```
asciinema play filename.cast
```

3. Play

WiFi QR-code

```
qrencode -o wifi.png "WIFI:T:WPA;S:<SSID>;P:<PASSWORD>;;"
```

Rsync

Rsync cheatsheat

```
## syncing folder src into dest:
rsync -avzP ./src /dest
## syncing the content of src into dest:
rsync -avzP ./src/ /dest
```

Unite PDF documents

```
brew install poppler
```

Install

```
pdfunite file1.pdf file2.pdf output.pdf
```

Usage

Vehicles

Cars

BMW - BS82067

Projects

- BMW Media Center

Roofbox

Sledge size

- Lengde: 152 cm
- Høyde: 50 cm
- Høyde, sammenlagt: 30 cm
- Bredde: 47 cm
- Vekt: 16 kg

Repairs

Rear break light Shopping list

- Baklykt skjerm høyre

Rear break light Links

- https://www.bimmerforums.co.uk/forum/f74/rear-light-cluster-failure-fix-led-type-fitted-2008-lci-t115027/
- http://bimmers.no/forums/topic/804388-e91-lci-2010-problem-med-led-blinklys-bak/

Links

- Koed.no
- GSBildeler.no

Motorcycles

MV Augusta - FC7664

Tidy Tail 954,82 kr (ink frakt, eks moms)

- https://evotech-performance.com/products/mv-agusta-brutale-800-tail-tidy-2013-onwards

Speil Styreender Snell Svart Dobbel ledd 219kr + frakt

- https://www.xlmoto.no/speil-styreender-snell-svart-dobbel-ledd#?p

USB-kontakt Booster 12V 329kr + frakt

- https://www.xlmoto.no/usb-kontakt-booster-12v#?p

Eksos

- https://www.designcorse.com/products/qd-exhaust-f3-b3-rivale

Kunder

Aibel

Haugaland Kraft

Hydro