IĽN

test

Hello

Title

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1 Maybe useful text

Thursday 20. August 2020, the group gathered and had a meeting with Steven Bos. We discussed our project idea and the potential use of the Microsoft HoloLens 2. It was in the group's best interest to put our resources into the microcontroller rather than the goggles, dismissing any development with the HoloLens.

On September 10. the group met to plan the project. After deciding on the initial design, we drew a sketch and wrote a short description. This was sent to our professor, along with a list of required parts as well as the associated budget. The initial design can be seen in section XX.

On the 16th of September, we ordered three Arduino Nano 33 BLE Sense w/headers from Arduino.cc. This came to 1080NOK. In addition to this the professor provided us with a car for the project. It is called Turnigy Trooper, and was originally a radio controlled car. However everything but the battery and servo motors for thrust and steering, have been stripped away.

The servo motors are controlled by a pulse-width modulated signal. This means in essence that we send discrete signals, where the signal will rise at a fixed frequency. The length of time the signal is high before going low will determine the behaviour of the servo motors. Luckily for us there is a standard regarding the behaviour generated by a specific pulse width.

We will need to write a library which will abstract this away in the code. Where the interface for steering will take an angle, and the motor interface will hopefully be able to take a velocity in m/s, where negative numbers will mean going backwards.

Before we could start using Ada's real-time library under runtime, we had to generate the library for our microcontroller nRF52840. We followed the official guide [kilde] to generate and build the library.

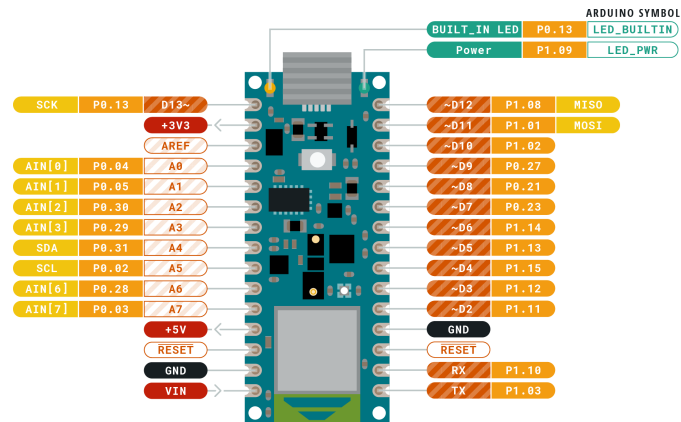Legge til utilization test og grafikk.

2 Maybe useful pictures

NANO 33 BLE SENSE
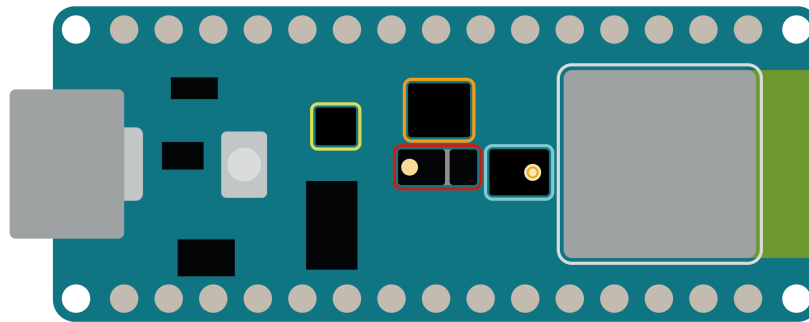
◆ Color, brightness, proximity and gesture sensor

◆ Digital microphone

◆ Motion, vibration and orientation sensor

◆ Temperature, humidity and pressure sensor

◆ Arm Cortex-M4 microcontroller and BLE module

ARDUINO SYMBOL

BUILT_IN LED	P0.13	LED_BUILTIN
Power	P1.09	LED_PWR

SCK	P0.13	D13~		~D12	P1.08	MISO
		+3V3		~D11	P1.01	MOSI
		AREF		~D10	P1.02	
AIN[0]	P0.04	A0		~D9	P0.27	
AIN[1]	P0.05	A1		~D8	P0.21	
AIN[2]	P0.30	A2		~D7	P0.23	
AIN[3]	P0.29	A3		~D6	P1.14	
SDA	P0.31	A4		~D5	P1.13	
SCL	P0.02	A5		~D4	P1.15	
AIN[6]	P0.28	A6		~D3	P1.12	
AIN[7]	P0.03	A7		~D2	P1.11	
		+5V				GND
		RESET				RESET
		GND		RX	P1.10	
		VIN		TX	P1.03	

Legend

⬛	Ground	🟦	Internal Pin	▨	Digital Pin	🟧	Microcontroller's Port
🟥	Power	🟫	SWD Pin	▢	Analog Pin		
🟩	LED	▢	Other Pin	🟨	Default		
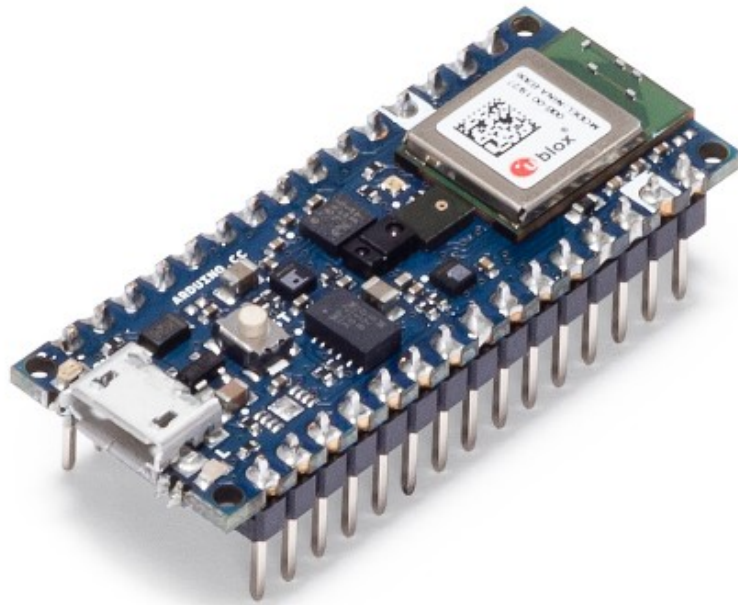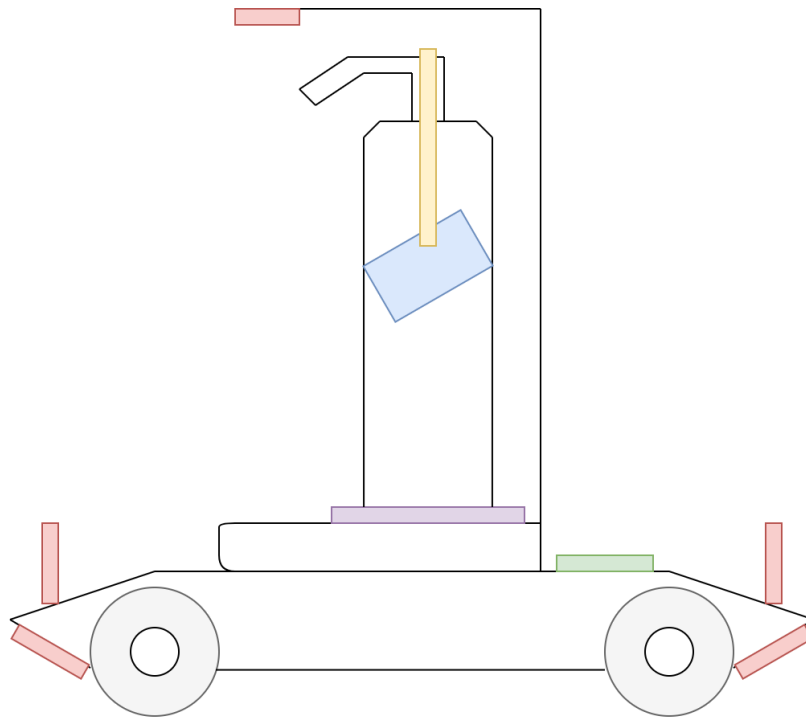
	Arduino NANO 33 BLE SENSE		Pressure Plate		Rubber Band
	Proximity Sensor		Servo Motor		

3 Maybe sources

https://store.arduino.cc/arduino-nano-33-ble-sense-with-headers
https://www.microsoft.com/en-us/hololens/buy
https://github.com/AdaCore/bb-runtimes