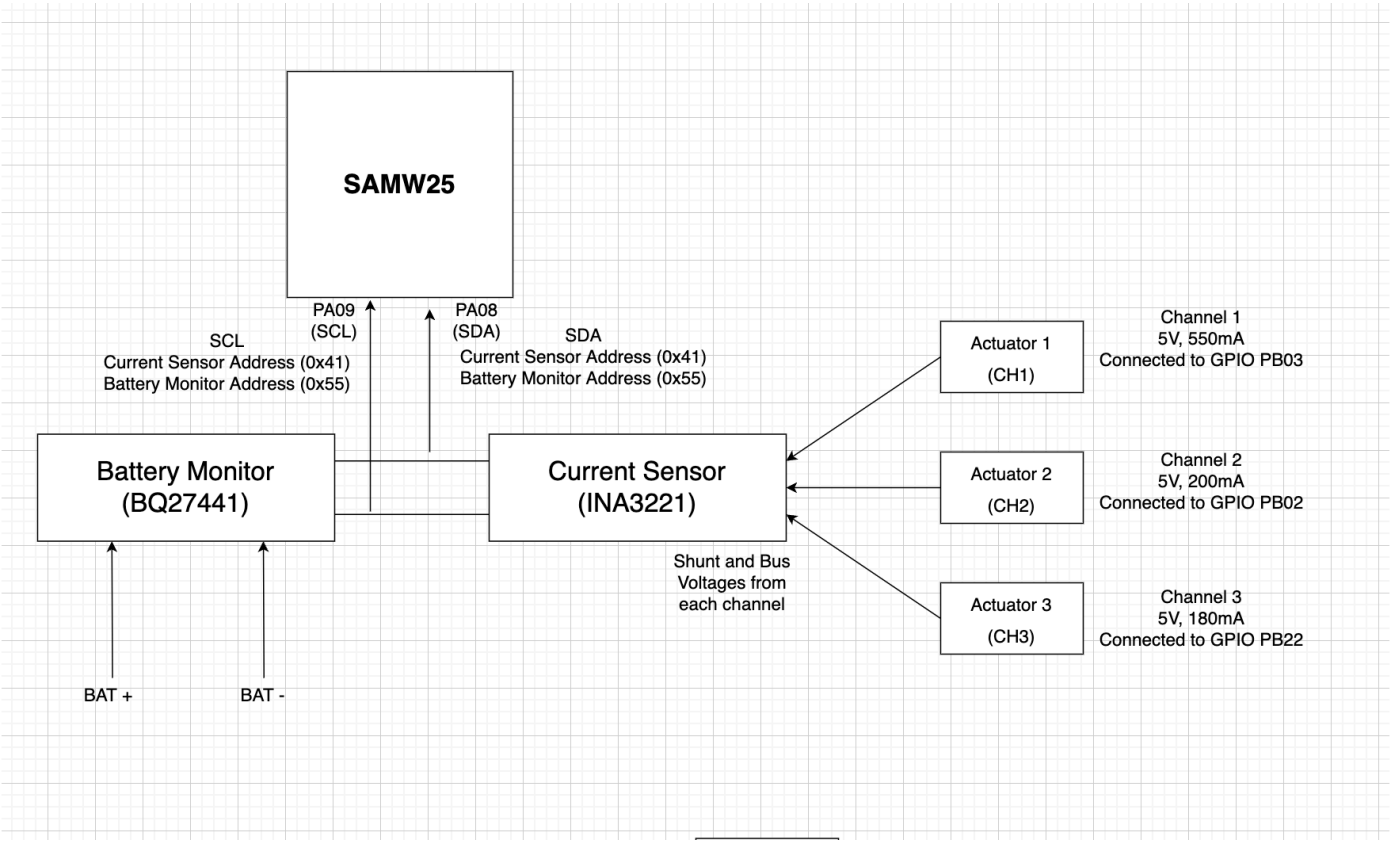
1. Sensor Drivers

Submit a block diagram of the hardware setup, detailing the pin connections between the SAMW25 and the sensors.



Commit your functioning drivers to the GitHub repository.

Made Driver for our two sensors INA3221Driver

- INA3221.c
- INA3221.h

BQ27441Driver

- BQ27441.c
- BQ27441.h

Submit a photo of the hardware connections between the custom PCBA and your sensors.

Both of our sensors are on the PCB.

Submit a video showing your sensors clearly working under the control of the SAMW25. You can use the Saleae Logic Analyzer to capture waveforms or CLI printing to show correct operation.

INA3221 Current Sensor Initialized

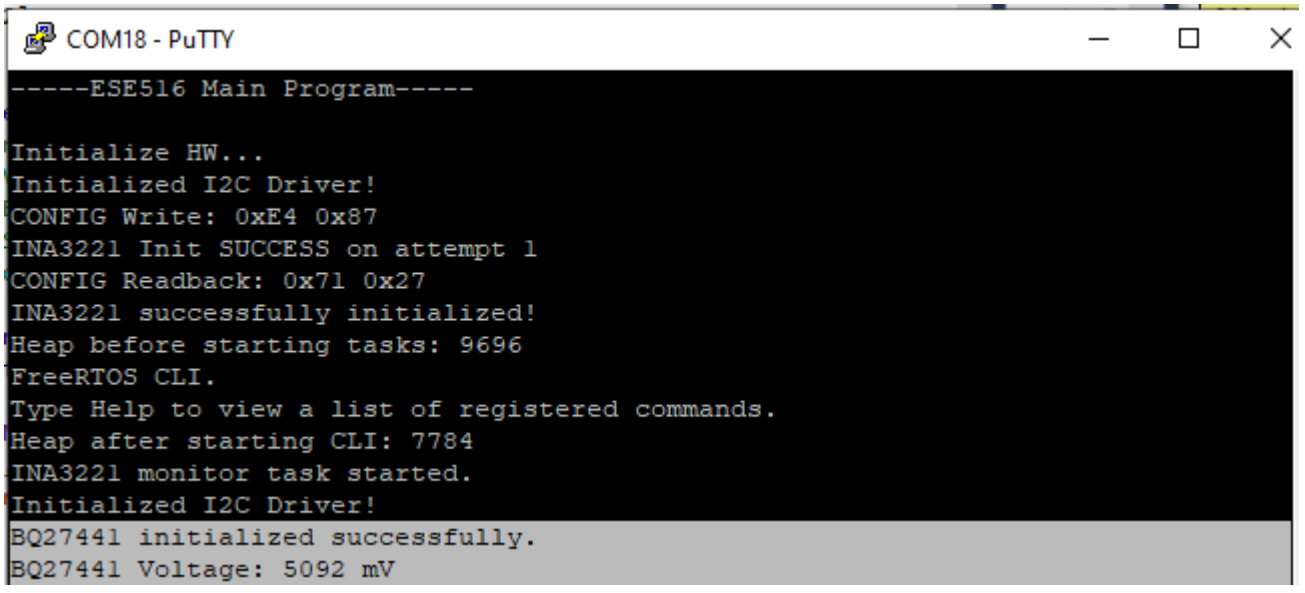
PuTTY (inactive)

```
SHUNT[0]: 66 mV
CUR[0]: 132 mA
CH1 - Voltage: 4848 mV | Current: 132 mA
BUS_RAW[1]: 0x00 0x00
BUS[1]: 0 mV
SHUNT_RAW[1]: 0x00 0x00
SHUNT[1]: 0 mV
CUR[1]: 0 mA
CH2 - Voltage: 0 mV | Current: 0 mA
BUS_RAW[2]: 0x00 0x00
BUS[2]: 0 mV
SHUNT_RAW[2]: 0x00 0x00
SHUNT[2]: 0 mV
CUR[2]: 0 mA
CH3 - Voltage: 0 mV | Current: 0 mA
-----
IN

-----ESE516 Main Program-----

Initialize HW...
Initialized I2C Driver!
CONFIG Write: 0xE4 0x87
INA3221 Init SUCCESS on attempt 1
CONFIG Readback: 0x71 0x27
INA3221 successfully initialized!
Heap before starting tasks: 9696
FreeRTOS CLI.
Type Help to view a list of registered commands.
Heap after starting CLI: 7784
INA3221 monitor task started.
Initialized I2C Driver!
```

INA3221 Current Sensor Reading Values from CHannel 1

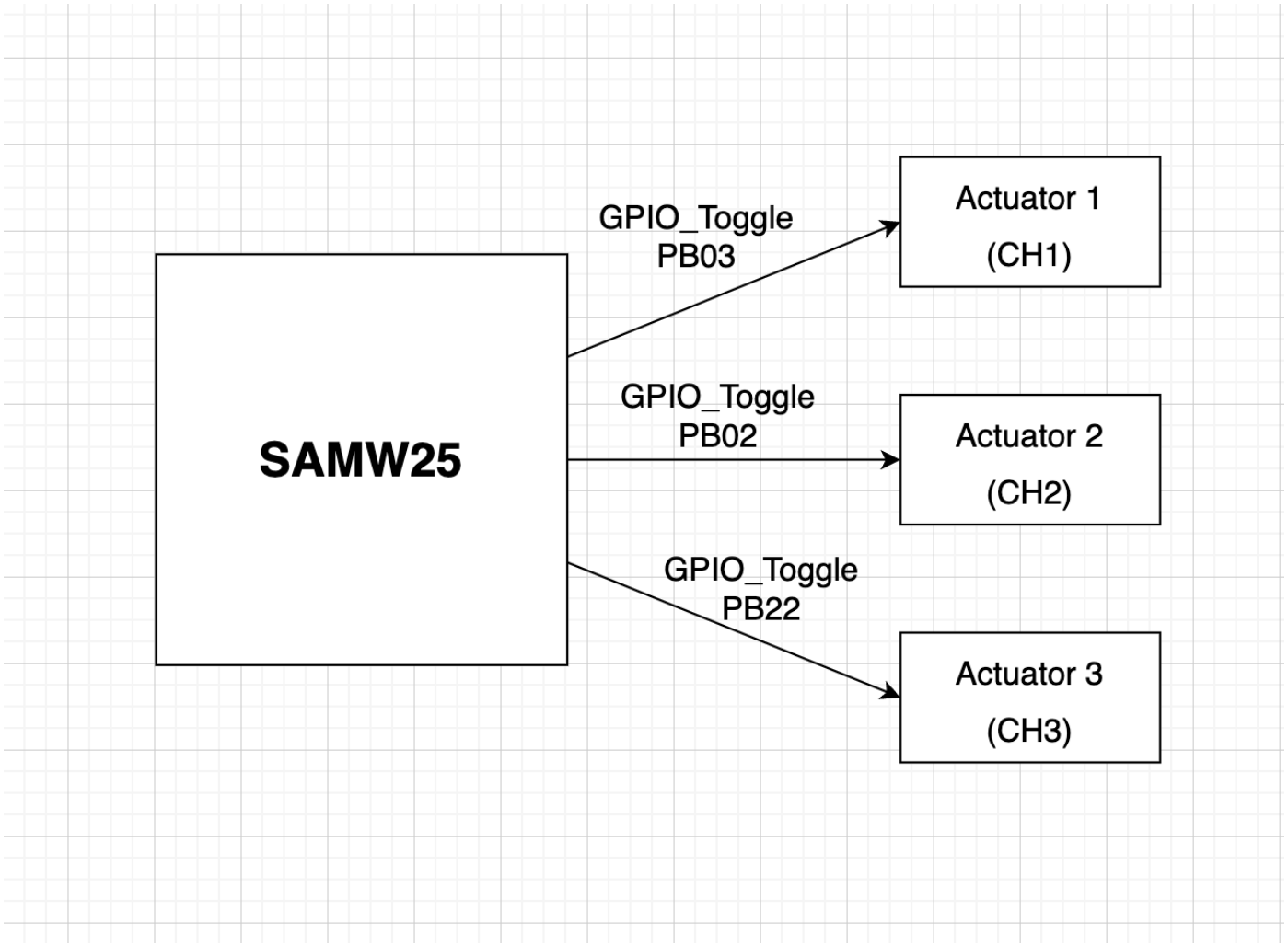
```
SHUNT[0]: 55 mV
CUR[0]: 110 mA
CH1 - Voltage: 0 mV | Current: 110 mA
BUS_RAW[1]: 0x00 0x00
BUS[1]: 0 mV
SHUNT_RAW[1]: 0x00 0x00
SHUNT[1]: 0 mV
CUR[1]: 0 mA
CH2 - Voltage: 0 mV | Current: 0 mA
BUS_RAW[2]: 0x00 0x00
BUS[2]: 0 mV
SHUNT_RAW[2]: 0x00 0x00
SHUNT[2]: 0 mV
CUR[2]: 0 mA
CH3 - Voltage: 0 mV | Current: 0 mA
-----
BUS_RAW[0]: 0x12 0xF0
BUS[0]: 4848 mV
SHUNT_RAW[0]: 0x34 0xB8
SHUNT[0]: 67 mV
CUR[0]: 134 mA
CH1 - Voltage: 4848 mV | Current: 134 mA
BUS_RAW[1]: 0x00 0x00
BUS[1]: 0 mV
SHUNT_RAW[1]: 0x00 0x00
SHUNT[1]: 0 mV
CUR[1]: 0 mA
CH2 - Voltage: 0 mV | Current: 0 mA
BUS_RAW[2]: 0x00 0x00
BUS[2]: 0 mV
SHUNT_RAW[2]: 0x00 0x00
SHUNT[2]: 0 mV
CUR[2]: 0 mA
CH3 - Voltage: 0 mV | Current: 0 mA
```

BQ27441 Battery Monitor Initialized and Reading Battery Voltage



2. Actuator Drivers

Submit a block diagram of the hardware setup, detailing the pin connections between the SAMW25 and the actuators.



Commit your functioning drivers to the GitHub repository.

Made Driver for our 3 actuators (GPIO toggling) GPIO Driver

- gpio.c
- gpio.h

Submit a photo of the hardware connections between the custom PCBA and your sensors. Submit a video showing your sensors clearly working under the control of the SAMW25. You can use the Saleae Logic Analyzer to capture waveforms or CLI printing to show correct operation.

IMPLEMENTATION CONNECTIONS AND WORKING VIDEO

https://drive.google.com/file/d/11b0ykCpYmEKo0b0_jzOConoR50VvNQ0Q/view?usp=sharing