CSS Isotek Discussion

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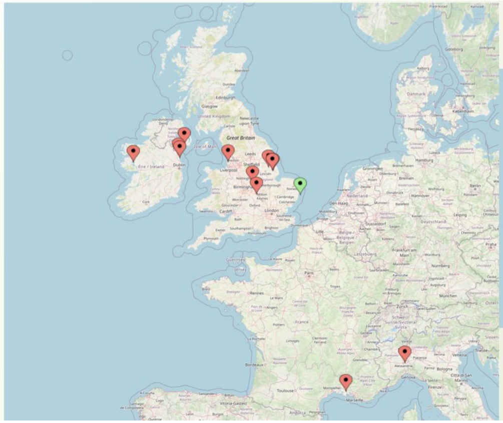
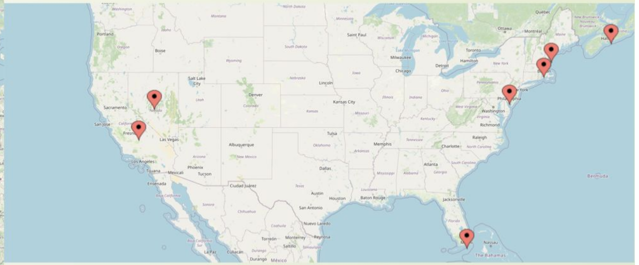
Housekeeping

- Who Am I (quick re-introduction)
- The Test
  - Design
  - Cool parts
  - Bit’s i’d do different
  - Challenges
  - Fun Bits…
  - Demo & Discussion
- Q&A and extra discussion

Rosindale Systems

[redacted]





Naim Audio

A26332
SWEET ASSORT
brakes
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TRESTON
MADE IN FINLAND

naim
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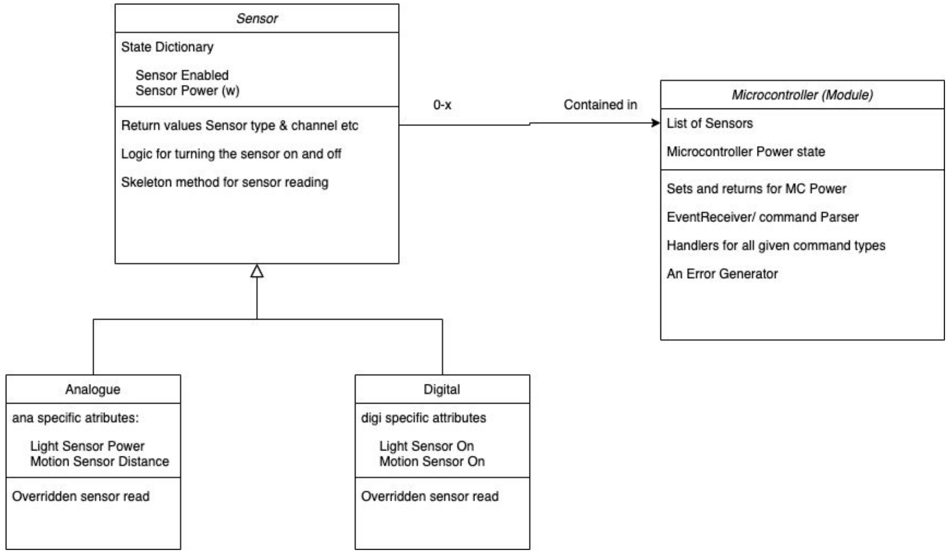
naim

Access to the code:

https://github.com/TheLastCD/HardwareModule

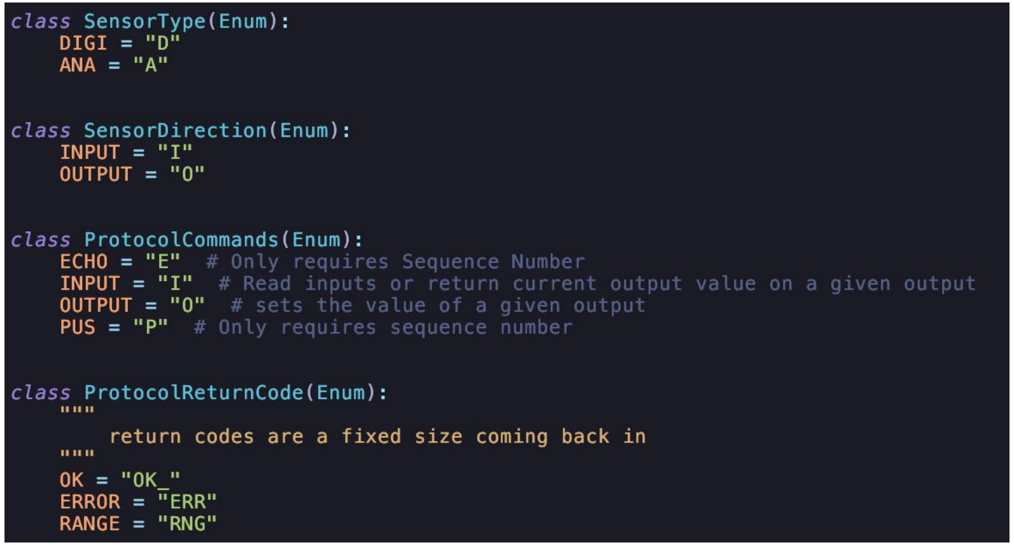
My Approach and Challenges

- Build supporting class that duplicates the sensors and the microcontroller
- Mock the returns and model the behaviour in the implementation



Notable Parts

- Using Enums to provide easy abstraction
- Making use of regex:
  - Ie r'^\^.*\n$'
  - Easy disqualification
- Using a factory to build the sensors
  - Easily scalable

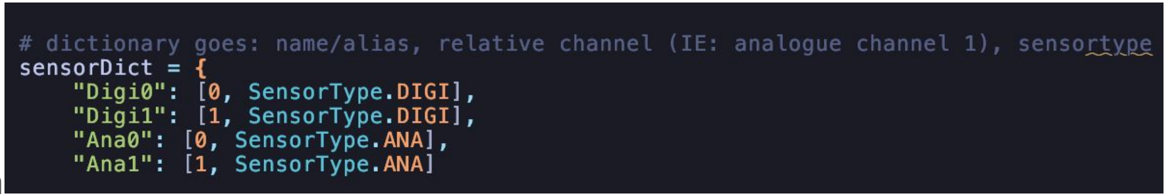


```python
class SensorType(Enum):
    DIGI = "D"
    ANA = "A"


class SensorDirection(Enum):
    INPUT = "I"
    OUTPUT = "O"


class ProtocolCommands(Enum):
    ECHO = "E"  # Only requires Sequence Number
    INPUT = "I"  # Read inputs or return current output value on a given output
    OUTPUT = "O"  # sets the value of a given output
    PUS = "P"  # Only requires sequence number


class ProtocolReturnCode(Enum):
    """
        return codes are a fixed size coming back in
    """
    OK = "OK_"
    ERROR = "ERR"
    RANGE = "RNG"
```

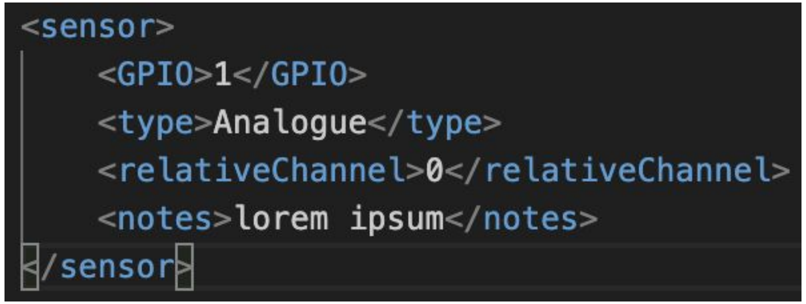
What i’d do differently

- Not being able to use switches
    - Syntactically looks worse in my opinion

- Using a dict to instantiate
    - it‘s simple
    - But rather use a manifest in xml …



```python
# dictionary goes: name/alias, relative channel (IE: analogue channel 1), sensortype
sensorDict = {
    "Digi0": [0, SensorType.DIGI],
    "Digi1": [1, SensorType.DIGI],
    "Ana0": [0, SensorType.ANA],
    "Ana1": [1, SensorType.ANA]
```



```xml
<sensor>
    <GPIO>1</GPIO>
    <type>Analogue</type>
    <relativeChannel>0</relativeChannel>
    <notes>lorem ipsum</notes>
</sensor>
```

Challenges

- No Hardware
  - Lack of ability to tinker
  - Having to make estimations and assumptions i’m not happy with
  - Hardware orients the software makes understanding easier
- Scope creep
  - I would have made the server if i wasn’t told not too
  - Wanted to do Parallel solutions but they’re not necessary

Fun Bits…

- Implementing protocols somewhat from scratch
  - Supper fun to chase down how it works
  - If only i was reading it straight from hardware
  - Fun parts of working at naim
- Made me rethink how i’ve been writing code for microcontrollers
  - Was a great learning experience
- Having something to mull over
  - The bouldering session was more fun

2 brief questions on the specification

- Why \n and not \0?
  - It’s more standard especially in C/C++
- The arbitrary length of SS
  - Seems like an area where we could cause malloc issues/ buffer overflows on the microcontroller
  - Makes catching errors on the python side harder as well

Quick Demo

Any Questions