# Assignment 2
## Dew point Generator / Scientific Data Logger

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## Intro

This report documents the design process for a RP2040 based embedded system that has the dual purpose of being a scientific datalogger, and a smart interface with an analogue dew point generator.

(explanation on the context)

Digital to analogue conversion and PWM Background (only a couple of sentences) Big Q did stuff on this

(explanation of the dew point generator and how it functions and why it is important for ensuring there isnt any condensation or something like that)

## Feature Demonstration

alsdkjfhasdlkdfjh

### Components

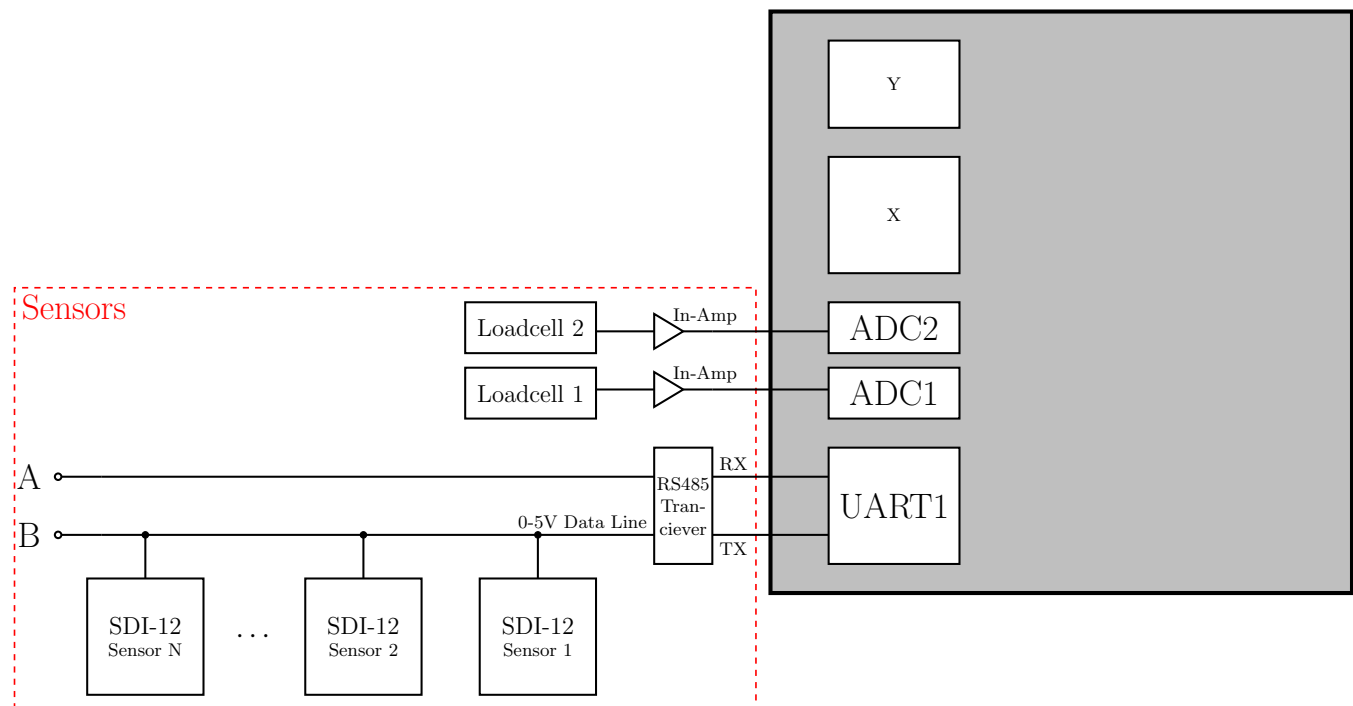Feel free to move and change the name of this subsection later



**Fig. 1.** Block diagram of the system

As seen in fig. 1 there were lots of blocks
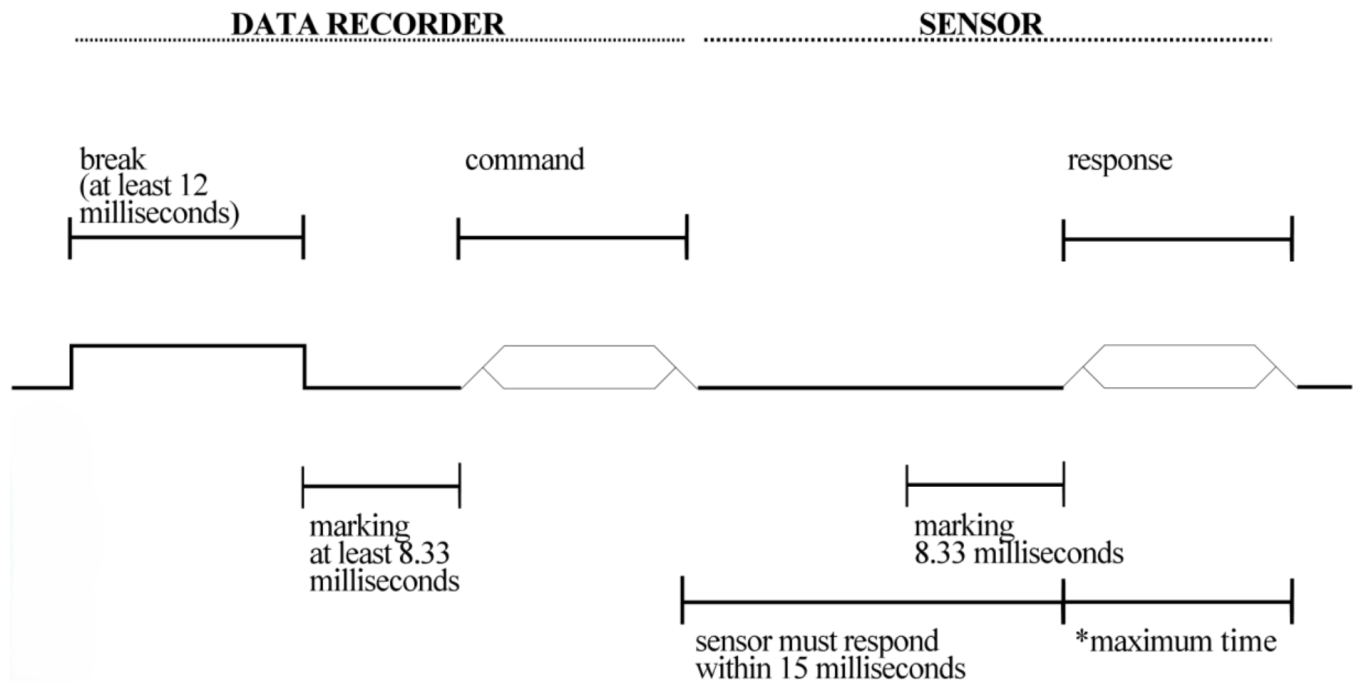
### Sensors

SDI-12

**Fig. 2.** SDI-12 timing from SDI-12 Support Group (2019)

we used the `uart_break()` function to send the break signal, and then used the `uart_read_stuff()` function to read the response from the sensor. The response was then parsed to get the data. The timing of the SDI-12 protocol is shown in fig. 2.

Load Cell (MT603) analogue signal, therefore requires ADC?

Sap Flow Sensor (SF5) uses SDI-12

Leaf thermistor uses SDI-12

**Things to check:**

- is 12V necessary?
- should we choose I2C or SPI (or both) as interface between RP2040 and DAC?
- do we want bluetooth or wifi?

- crystal like in assignment 1? - ADC for load cell?

# Discussion

We discuss.

# Conclusion

We conclude.

# Appendix

# References

SDI-12 Support Group, *SDI-12: A Serial-Digital Interface Standard for Microprocessor-Based Sensors*, SDI-12 Support Group, River Heights, Utah, Jan. 2019, version 1.4. [Online]. Available: http://www.sdi-12.org