Meters for measuring electrical and physical quantities

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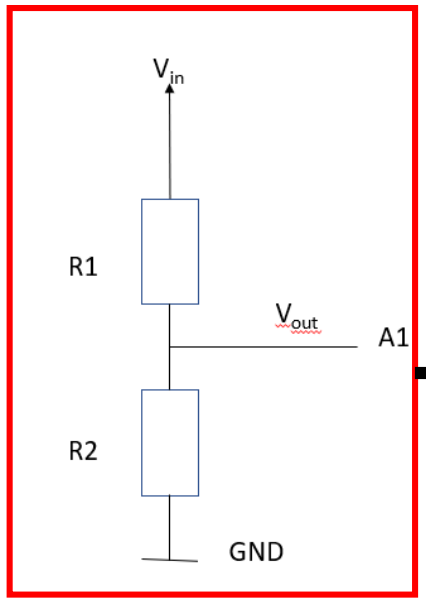
Objective

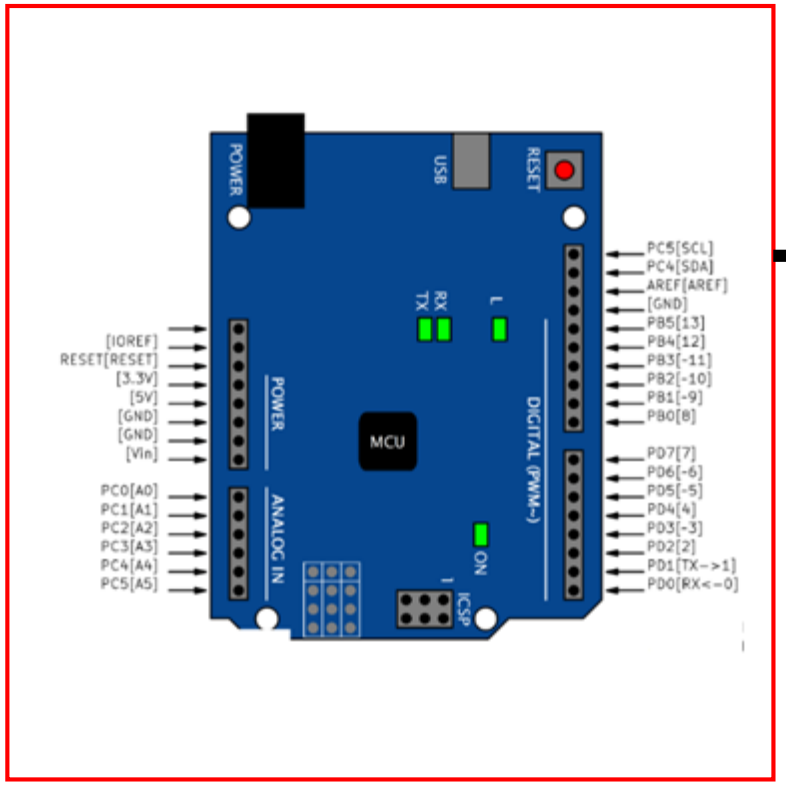
Program digital meters for measuring electrical and physical quantities with a possibility of repeated measurement and data logging.

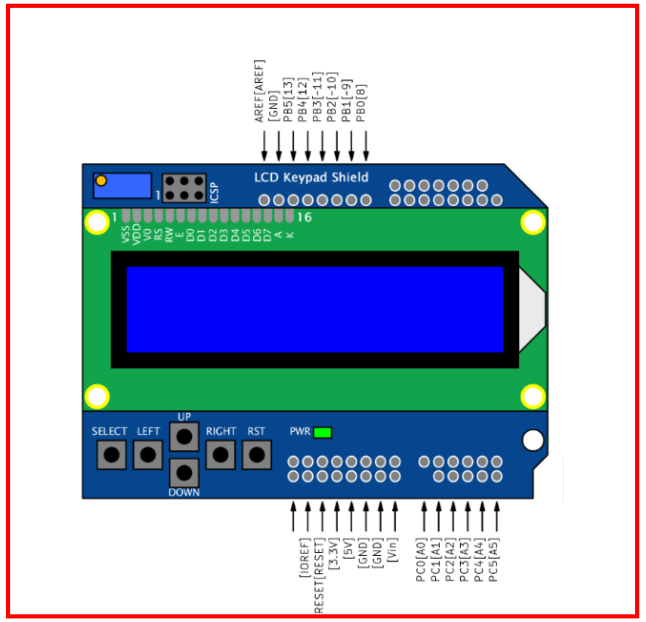
Description

- Measuring Voltage ,Resistance and Light intensity.
- A simple Voltage divider was used to obtain a voltage that is converted by the ADC to digital form.
- The obtained value is the recalculated to obtain a data representation of the actual value of the measured quantity that is sent to the LCD for the display and through UART to PuTTY SSH Client for logging

2.Block diagram







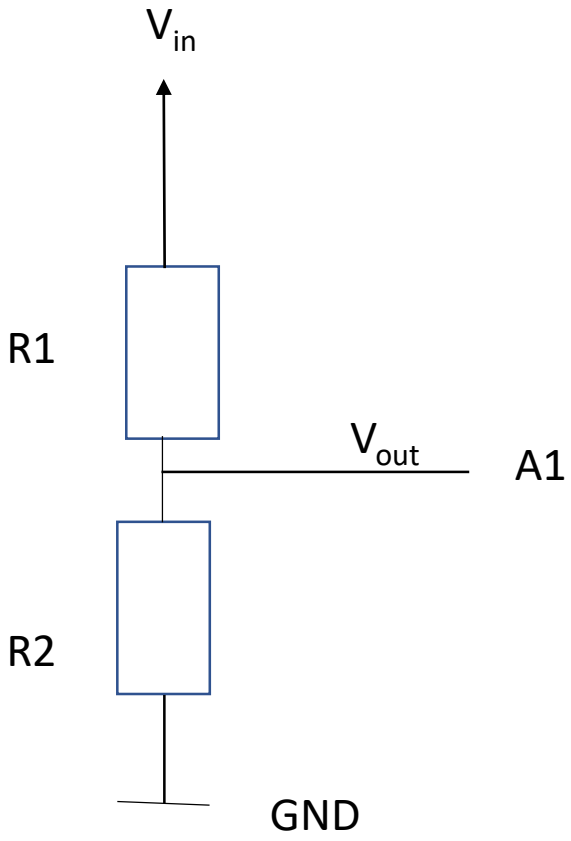
UART

Methods of Measurement

- $Vout = \frac{ADC * Vref}{1023}$

- Where Vref is the reference voltage of the ADC.

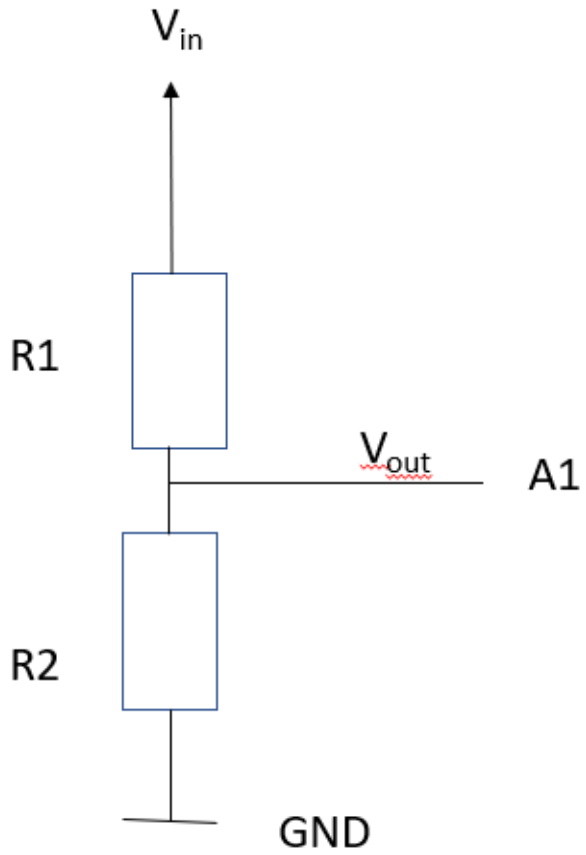
Voltage



$$Vin = \frac{Vout\ (R1+R2)}{R2}$$

Where R1 and R2 are known.

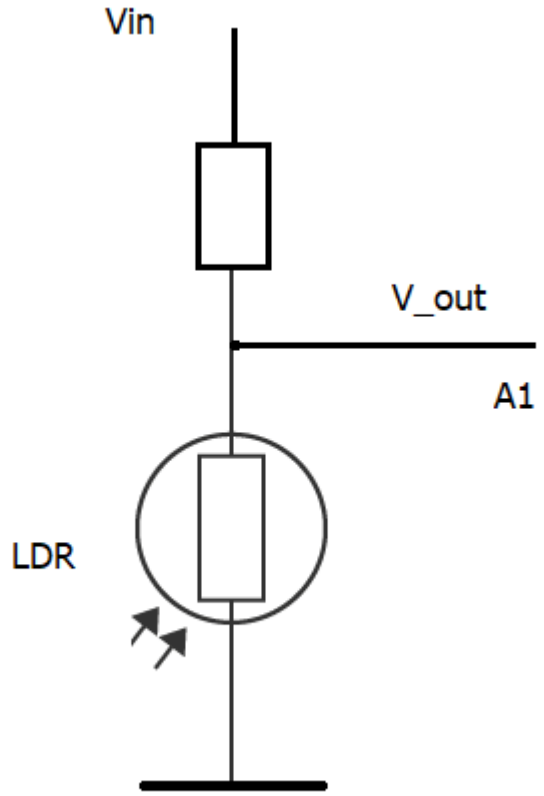
Resistance



$$R2 = \frac{R1 * V\_out}{Vin - V\_out}$$

where R1 is known

Light intensity



$$LDR = \frac{R1 * V\_out}{Vin - V\_out}$$

Where R1 is known

Thank you for your attention.

References

1. Microchip, AVR 8-bit Toolchain for Windows, Linux, Mac OS X
2. UART library developed by Peter Fleury,http://homepage.hispeed.ch/peterfleury/avr-software.html
3. Video - https://www.youtube.com/watch?v=jFEycrZ0ezA&fbclid=IwAR0YLZLkZ3AY4rmHj69GYbvOjTtShyFzoAgjNzxsEtYiQ4EieZ8vyoofHTg