Datalogger with C# application

This project allows you to acquisition data from one analog and one digital input from Arduino UNO in four different ranges of time using a .NET Framework application.
At the end of the data acquisition, it is possible to save the results in one file .txt.
The USB port establishes the communication between the computer and the Arduino UNO.
Was developed the application in C# language, and the codes from the application and Arduino are available.

Materials and Method

For this project, was used the Arduino UNO REV3. Figure 1 shows the connections from Arduino UNO REV3.

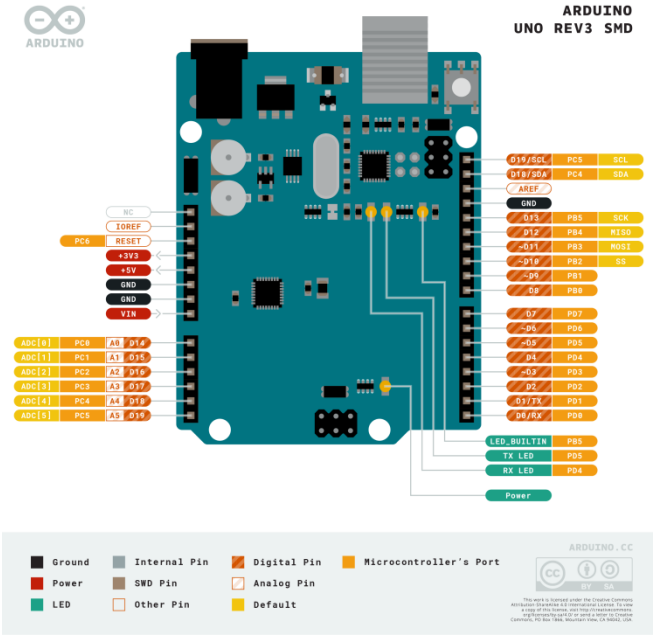


Figure 1 - Arduino UNO REV3

Was used the internal pull-up resistor for maintaining the digital inputs in High level (+5VDC) as a default configuration.
To test the digital input was used a press button to set the input D12 in Low level (GND) when pushed down. Figure 2 shows the schematic for the test.

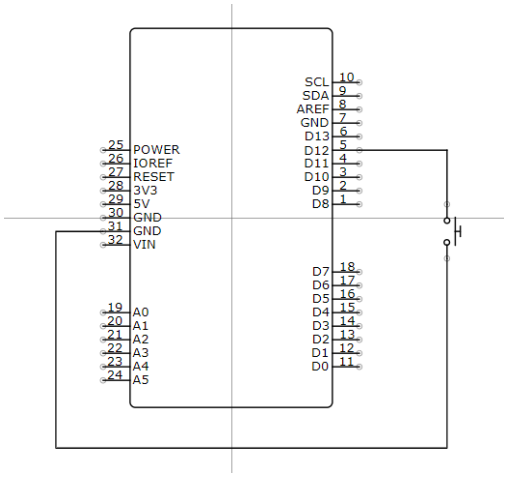
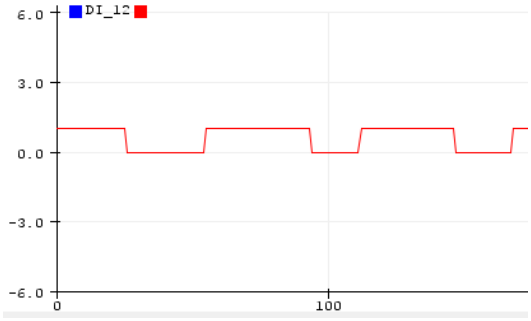


Figure 2 - Digital input test schematic

Graphic 1 show the digital input signal detected.



Graphic 1 - Digital input detected

The analogRead() command converts the input voltage range, 0 to 5 volts, to a digital value between 0 and 1023. This is done by a circuit inside the microcontroller called an analog-to-digital converter or ADC. Figure 3 shows the schematic for the test.

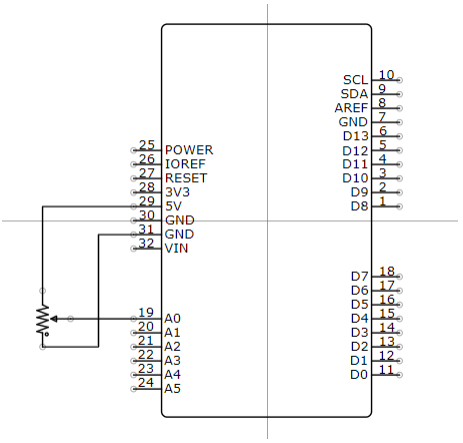
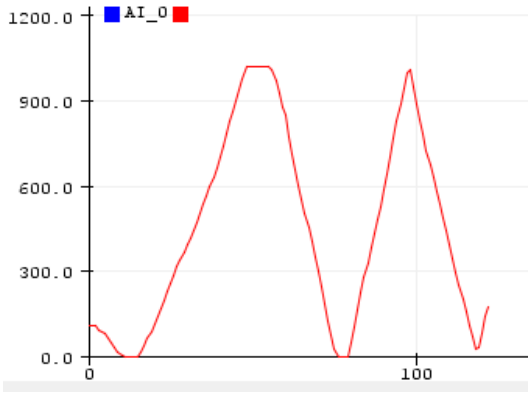


Figure 3 - Analog input test schematic

Graphic 2 show the analog input signal detected



Graphic 2 - Analog input detected

By turning the shaft of the potentiometer, you change the amount of resistance on either side of the center pin (or wiper) of the potentiometer. This changes the relative resistances between the center pin and the two outside pins, giving you a different voltage at the analog input. When the shaft is turned all the way in one direction, there is no resistance between the center pin and the pin connected to ground. The voltage at the center pin then is 0 volts, and analogRead() returns 0. When the shaft is turned all the way in the other direction, there is no resistance between the center pin and the pin connected to +5 volts. The voltage at

the center pin then is 5 volts, and analogRead() returns 1023. In between, analogRead() returns a number between 0 and 1023 that is proportional to the amount of voltage being applied to the pin.

A C# application was build to make the data acquisition from digital and analog inputs. Figure 4 shows the application Datalogger Arduino.

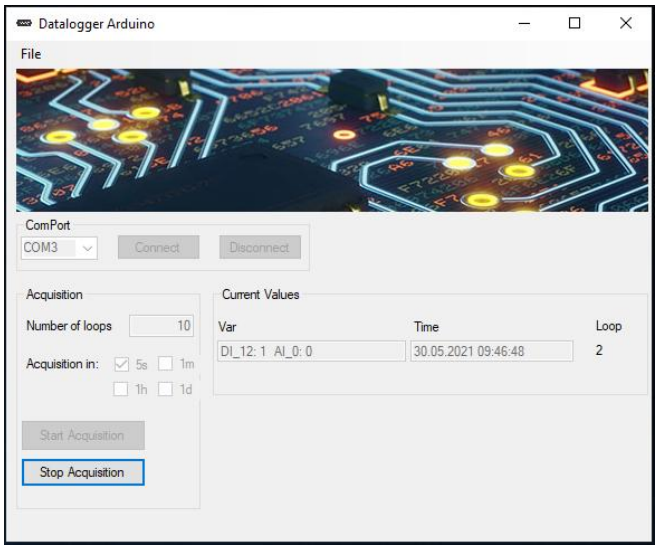


Figure 4 - Datalogger Arduino

It is possible to change the parameters of the number of loops and ranges of time of acquisition. At the end of the test, it is possible to save the data as file .txt. (File -> Save). Figure 5 shows the data acquisition file.

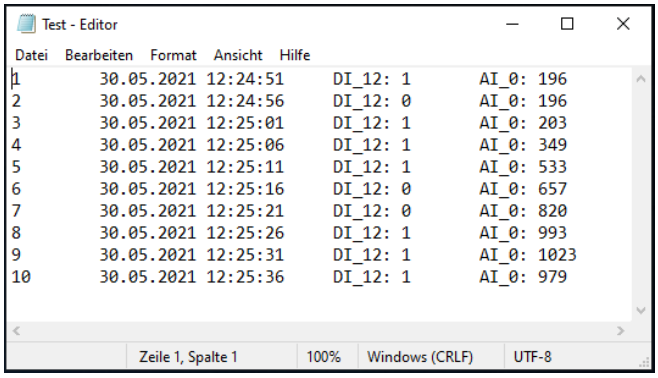


Figure 5 - test file