UNIVERSITATEA TEHNICĂ
DIN CLUJ-NAPOCA

The digital clock

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Grupa: 2232

- Theoretical part

The clock is an instrument for measuring time. Normally, the term "clock" refers to a device that indicates the exact time according to a standard of time, and the term stopwatch refers to a device that measures durations of time. By extension, the term 'clock' is also used for devices that receive and indicate the exact time transmitted by satellite by a remote device.

Since this device is indispensable to our lives , I chose to build a digital clock, which indicates the time and date with the help of the Proteus program and the tools provided by it.

For the realization of this practical project we used:

- ✓ I used an "Arduino uno" board
  An Arduino board is composed of an 8-, 16- or 32-bit Atmel AVR microcontroller (although since 2015 microcontrollers from other manufacturers have been used) with complementary components that facilitate programming and incorporation into other circuits. An important aspect of the Arduino is that it has connectors standard, which allow the user to connect the board with the processor to different interchangeable modules called shields. Some shields communicate with the Arduino

directly via digital or analogue pins, but others can be addressed individually via serial bus I²C allowing the use of several modules in parallel.(Figure 1)

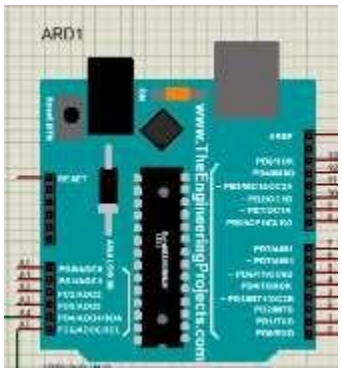


Figure 1. Arduino Uno

- ✓ LED Biby-A LED is a small light source, most of the time accompanied by an electrical circuit that allows modulating the shape of light radiation. It was used to set the fixed time (e.g. 08:00 - the LED is on for 60 seconds, otherwise it is off) (Figure 2)

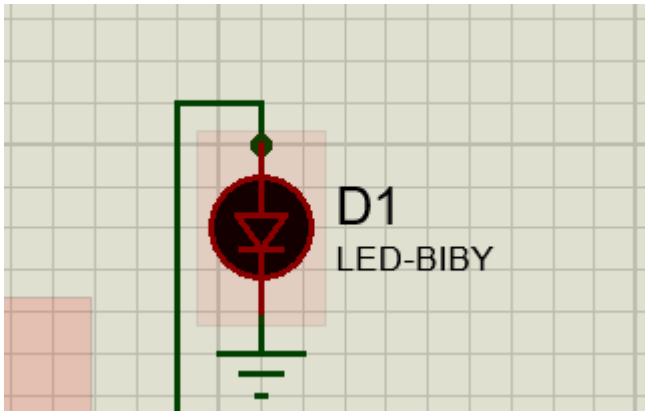


Figura 2-Led-Biby

- ✓ LCD1(LM016L)-It is a display that displays the time and date, being connected to pins 2,3,4,5,6; and to pins 8,9 to be able to change the time/date.(Figure 3)

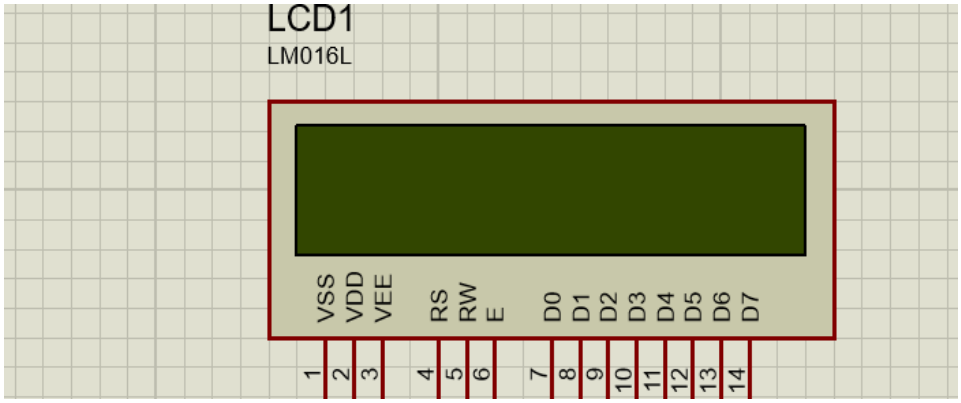


Figure 3-Digital Ecran

- ✓ 2 Button- There are 2 buttons that change the time and date. The button connected to pin 9 changes the hour/minute/year/day/month/year digits, and the button connected to pin 8 selects what changes.(Figure 4)

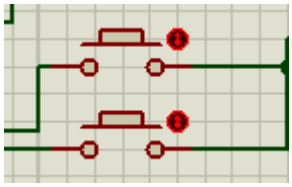


Figure 4-2 Button

- ✓ CRYSTAL(PCB)- A **printed circuit board** or **printed wiring**, (abbreviated **PCB**, *Printed Circuit Board (Printed Circuit Board*), is a printed wiring board that has the role of mechanically supporting and electrically connecting an assembly of electrical and electronic components, in order to achieve a functional final product, (which can be: a simple dimmer of a light bulb). (Figure 5)

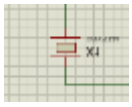
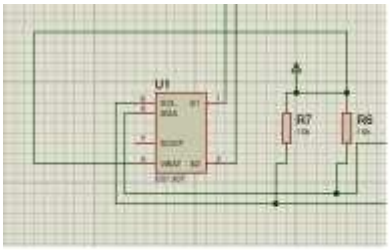


Figure 5- Crystal-oscillator showing frequency

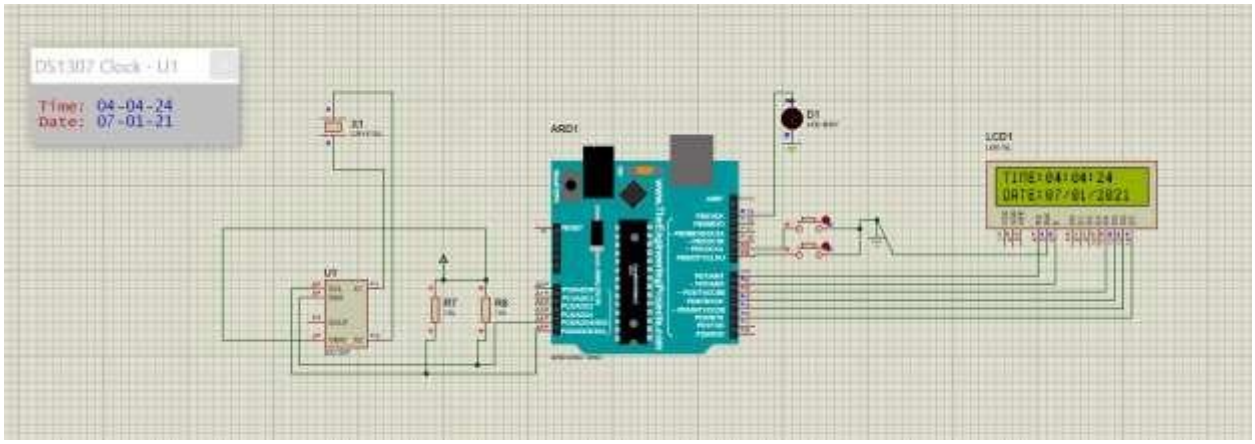
- ✓ DS1307-It is a clock, which is linked to the CRYSTAL(frequency oscillator) and 2 resistors-linked to the Arduino Uno-
  The signal line screen has tensile resistors, to restore data signals and clock SDA SCL when no device installs it.

Figura 6. Ds1307-Clock

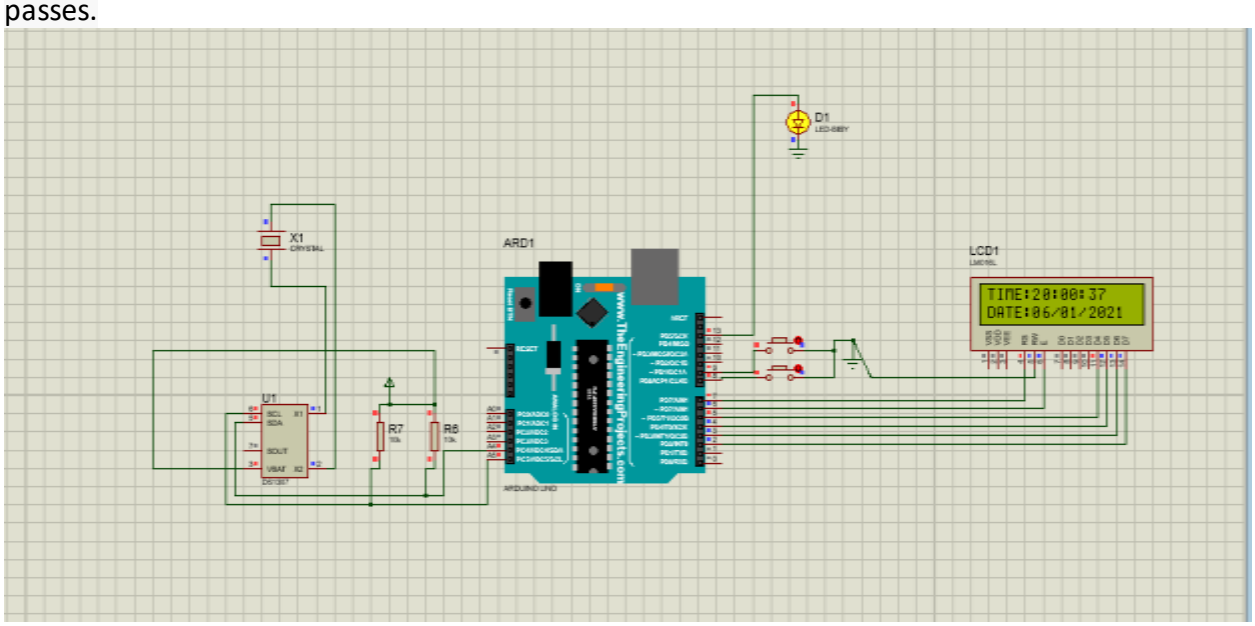


How does it work?

The digital clock displays the time and date on a digital screen, so you can change the hour/minute/day/month/year from the buttons.

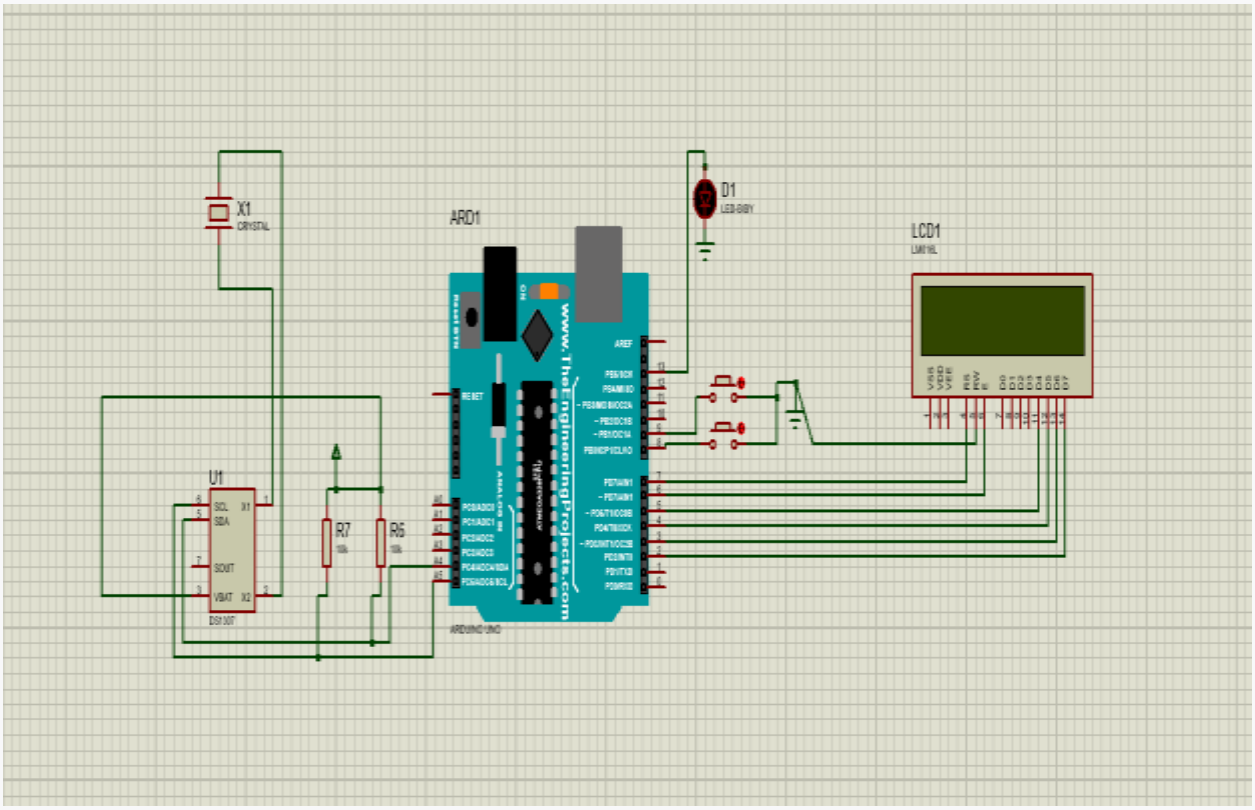


Because for this digital clock, the fixed time (**e.g. 08:00) is a priority, so at the fixed time the LED lights up,** and it lights up for 60 seconds, i.e. until the fixed time passes.



Circuit electric (Proteus)

The complete circuit of this project is:



- Bibliography

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