

8051 PROJECT :

Real Time Wheather Monitoring System

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Introduction

AIM: *To collect and store various parameters like temperature, light intensity as data through different sensors and implement a logger system which converts this data into a meaningful format using 8051 Micro controller .*

Components used: Project is implemented in Proteus Simulator.

Devices and Sensors: 8051 Micro controller (AT89c52), RTC (DS1307), EEPROM(AT24C512), Temperature sensor (DS1621), ADC (MCP3204), LDR, Virtual Terminal (Serial Window), LCD (20*4), Potentiometer

Interfacing Summary

- 1) RTC interfacing using I2C
- 2) EEPROM interfacing using I2C
- 3) DS1621 Temperature sensor using I2C
- 4) ADC MCP3204 using SPI (Potentiometer and LDR)
- 5) Virtual Terminal – UART
- 6) LCD interfacing

Project Submission Requirements

- Time (In AM-PM format), temperature (in degrees), light intensity (Volts or percentage) and one analog reading of Potentiometer (in volts) should be displayed on LCD.
- The presentation of data should be as a **data log** on hyper-terminal.

Format:

LOG ID	Time	Temperature	Light Intensity	Pot Reading
1	12:10 PM	31.50	65 %	3.2 V
2	01:10 PM	32.79	72 %	1.4 V
3	06:50 PM	28.44	32 %	4.6 V

- The log data should be stored in EEPROM and retrieved for displaying on virtual Terminal .
- The data LOG should be displayed only on a switch press. (External Interrupt)

Module Functions

Real Time Clock (RTC - DS1307)

To Keep track of current date and time. Configure and gather date, day, time and AM/PM format. This module acts as a reference value for the logger system.

Temperature Sensor (DS 1621)

To measure the temperature of the particular location with precision.

EEPROM (AT24C08)

To save and maintain a log for all the data collected in a meaningful way.

Module Functions (Contd...)

ADC (MCP3204)

To convert analog sensor output to digital values. The voltage levels of analog signal is converted into a digital value that we can process using a micro controller.

Light Dependent Resistor (LDR)

To measure the light intensity at a particular location. The resistance of the LDR changes based on light intensity. If Light intensity is more, then the resistance will be low and vice versa.

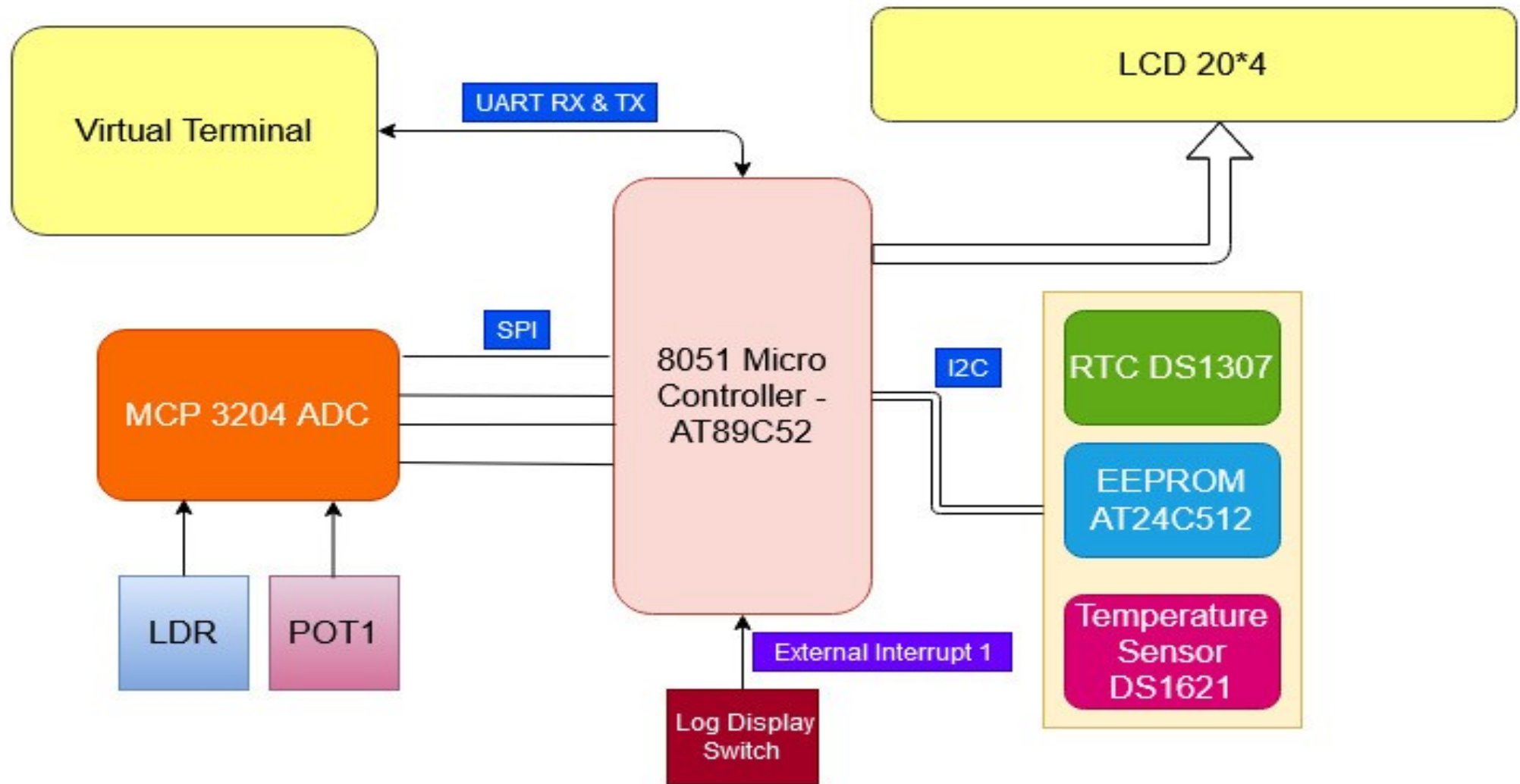
Hyper Terminal

To display the parameters acquired by the sensors as a data log.

LCD

To display current values one by one.

Block Diagram



Approach (Part 1)

- 1) Install Proteus and Check for all components availability.**
- 2) Verify your UART and LCD Drivers in Proteus**
- 3) Implement I2C Functions and I2C Device Write & Read in Keil.**
- 4) Interface RTC with 8051 and check all the functions (Separate Project)**
- 5) Interface EEPROM with 8051 (Separate Project)**
- 6) Combine RTC and EEPROM in one project file. Display the RTC Value in LCD and Store them in EEPROM.**
- 7) Display the values stored in EEPROM to Hyper terminal .**

Approach (Part 2)

- 8) Interface Temperature sensor DS1621 and display the temperature in LCD (Separate Project)
- 9) Interface MCP3204 ADC using SPI Protocol. (Code will be provided with the package). Connect a Potentiometer and LDR to its 2 channels. Display the values in LCD.
- 10) Combine DS1621 and MCP3204 part to the step 6 Main Project.
- 11) Display all the values available in LCD and store them in EEPROM
- 12) Retrieve the values in EEPROM and Display them in Hyper terminal

Approach (Final Step)

13) Implement the Log Display Switch over the main project as a controlling INPUT.

14) Optimize the code and Display the OUTPUT as in the requirement Document.

NOTES:

- 1) Virtual Terminal should display the Log only when Log switch is pressed. That Data has to be taken from EEPROM.
- 2) Data in LCD are live data. Directly print them without storage.
- 3) RTC should be used as the reference element. Log step size is 1 minute. When ever minute updates in RTC, a log has to be stored.

Project Submission

- Report of your Project Story. Things you did, Challenges you faced and What you learned.
- Screen shot video of your project working. Share the video in google drive and share the link.
- A small description on how you can modify this project.