

# Data Logger using PIC Micro Controller

Talluri Pranetha, V. Arun, SVS Prasad



**Abstract:** When transporting the goods from one place to another place the components should work perfectly according to our application. This project shows you how to get temperature and humidity values for particular components which are kept in a certain room or area or during the shifting process along with the real time clock. Sometimes due to room temperatures also we can observe a change in the component readings. So in that cases, data logger systems will be helpful. Here we are measuring various weather parameters like temperature, humidity, time and date. For this we require sensors for getting temperature and humidity values and a real time clock is used to get real time. We can retain previous values also by using previous records. Finally, we can display these parameters on the LCD display and save the records so that we can access the previous records. For this storage we can use controller memory or else externally we can connect the memory called SD-card.

**Keywords:** MicroC pro, Proteus software, PIC-18F6527, Sensor, RTC, LCD

## I. INTRODUCTION

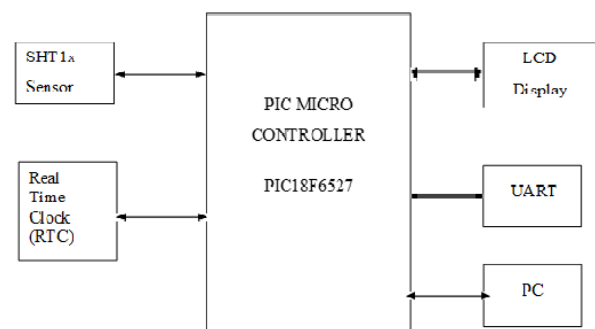
The process of gathering the information for extent use is called data logger. It is a method to track the events throughout testing the employment of a system or a product. The brain of a human and its memory are the nature's erection. Wherever theirs is the necessity to gather data quicker than an individual's information loggers will probably fetch the data and in case wherever perfection is crucial also. An information from the log device which we want to store and retrieve the information.

The data loggers are not only used for the technical purpose but also it can be used for the other applications like monitoring the plants, monitoring the medicines in a medical store etc. the type of information or data tested is determined by the user only which depends on the requirement of the application. A data acquisition is an electronic device it will record the data over time, sensor or via external instruments. Some data loggers can be interfaced with PC and a use of software to interface with the data logger and then view the results and analyze the collected data.

## II. HARDWARE COMPONENTS

The below shows the block diagram for this of my project that is data logger using PIC.

a. SHTxx is a single chip humidity and temperature values detecting sensor module consist of a graduated digital output. It make sure the highest responsibility and wonderful future stability. The device comprise of an electrical phenomena capacitive compound device for humidity and a band gap for temperature detector. This ends up in a higher level signal quality, a quick latent period.



**Figure 1: Functional blocks of the data logger system**

a) Real Time Clock: PCF8583 is a clock circuit supported a 2040 bits static CMOS RAM organized as 256 words by 8-bits. Addresses are transferred serially via the two line two way I2C bus. The intrinsic word address register is incremented mechanically once every written or browse the knowledge computer memory unit.

The detailed pin explanation is as follows,

- The oscillator input is the first pin and it has 50Hz frequency and also it is an pulse event input
- The second input is the oscillator output pin
- The third pin is used for the address input and is indicated as A0
- The fourth pin is used for VSS purpose i.e., power supply
- The fifth pin is used for the serial data line i.e., indicated as SDA and is used for serial data transmission
- The sixth pin is used for serial clock line and is indicated as SCL
- The seventh is used for drain interrupt output and by default it will be active low pin
- Last pin is used for positive supply

## III. PIC MICRO CONTROLLER

In my project I have used PIC-18 as my controller for the operation. The PIC-18 is very popular and the reason for selecting this specified controller is that there are number of features present in this architecture. In this controller, the program was written in c language and now-a-days this language has become more pre-dominant one. In an advanced controllers there is an extended mode feature is available.

Revised Manuscript Received on February 28, 2020.

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It will make the addressing modes more comfortable to the code compiler. This PIC-18 series is also suited for core independent peripherals.

- The RB0 pin of the microcontroller is connected to D4pin of the LCD
- The RB1 pin of controller is connected to D5 pin of pic
- RB2 pin of controller is connected to D6
- RB3 pin of controller is connected to D7
- “E” means enable pin and is connected to RB5
- RS means reset pin and is connected to RB4
- RW pin is connected to ground pin of the controller
- Here the LCD display used is the LM044L and it is off 20\*4 format

#### IV. SOFTWARE DESIGN

Here during this project 2 software’s square measure used for the compilation of the program. They are,

- MicroC professional for PIC controller
- Proteus software system

There is a unique feature for this software named active comments. If you go into that active comment option there you can attach files, images, URL etc. and can assign them as we want. If you give a right click on that existing URL link then it will display an image then you can drag that image and can copy where ever you want and if you give a double click on specified link that particular file will be open on the window. Another advantage in MicroC pro is that you can declare a local variable as you need. In my project temp, humidity, date and time are declared as local variables. For this variables I have allotted some parameters also like for time I have allotted 24hours and for date I have allotted year, month and date. The MicroC has some built in tools like HTML tool, bit map editor, interrupt assistant, seven segment editor etc. these are few of them. And also in this software a fast converter option was also there like conversion of HEX, binary, float.

##### A. Option of code Assistant

This code assistant option will display some of the functions that are frequently used in the execution code. These functions will be useful for the user where if the user did not remember them also this assistant code will help the user in finding the functions. This option is like a first aid kit for program developers. As basically as a user you first concentrate on the program code and in the middle if you want you take the help of code assistant. If you don’t want to get any syntax errors then you need to include all the variables and function calls also. Do not forget that after completion of your code work save the file with dot c extension only then only your file will be compiled otherwise you will get a syntax error again. After completion of code writing use code completion option so that a list of identifiers will be displayed on the window. If you don’t remember exactly the identifier name then enter \\* in the window then some of the identifier names will be displayed and you can select from them.

##### B. Usage of software for the beginners

- In case if the user who are going to use the MicroC pro software for the first time, then the user can look around regarding the software. Before using the software the user should know about the detailed specifications about the micro controller.

- If the user has a good command on the c programming language then it will be very easy to understand how to operate this software. For the beginners who are using this software for the first time can follow or refer the example programs which are there in the software. These example programs will be there in the library files.
- The user can use the example programs for getting an idea regarding the process of building the program in the software. These example programs will be helpful of the simulation process will be in this one and also very easily the user can create a new program according to their application and can run the program as simple as that.
- In this software you can find the data sheets for different controllers and other components also so that you will have an idea of how the controller operation will be and about the pin descriptions also i.e., which pin operates for which operation.

##### C. Need of Integrated Development Environment methodology

- In this software in the code editing feature it will have an auto correct options, rebuilding the program, assigning the variables or parameters correctly and auto completion and auto saving options are available here.
- For the easy assignment of the program, there is a feature called project management. It will help the user for the multiple project managements.
- If the user want to change the project settings i.e., the default settings want to change then those changes can be made in the project settings option.
- With the help of this IDE, if the user want to create the interfaces then simply write the program code in c language and select the elements which you want to use in your application, then this IDE will compile your code according to your application.
- During the compilation process, if any errors are generated or if any of the variables are not declared then you can find those errors in the error window itself. The syntax will help you where the error is exactly.
- In this IDE, creating a new and fresh project is easier than from the existing file. So try to create the new project instead of an existing one.
- With the help of the underline markings, undeclared variables or folders will help you in recognizing the errors very easily.
- By using this IDE the user can manage all the data and can run the data very quickly. To get the workspace better for your application arrange the layout manually in the windows or select for the default application.
- One can save the time for their project by using this IDE in MicroC pro software.

##### D. Project Management advance features

There is one the option called edit project in that there are a set of configuration bits. If you select the option there you can observe a list of options will be displayed from that select one of the option which was best suited for your application. In this edit project you can see oscillator settings by default all those settings are predefined for most of the controller applications.



Do not waste the time for searching all the options in the settings, based on your application and priority select the one you want. There are another options also like power up timer, low power LF etc. you can enable those options or disable also based on your requirement. In general project settings it will display maximum of the compilation options. There are some example algorithms also in the example programs those algorithms will be helpful in designing the project.

### E. PROTEUS Software

Proteus design suit is best suited for design automation. Generally this software is used by design engineers and technicians are also been used for schematics creating for the manufacturing of printed circuit board called PCB. Intern an ISIS version was also there, it came into existence before 12 years and this was been used and establish by many of the users roughly throughout the world.

Initially America has started this one for the purpose of simulation with the available proteus VSM module. With this VSM module a circuit interactive simulation will be done. The license for the proteus is proprietary.

Proteus is one of the best software for most of the micro controller designs that are for simulation purpose. Due to this reason this software is most available. The one who want to simulate there program can use this software for simulation purpose. After completion of simulation part the design in this software will redirect to PCB deigning. Because of this multiple features it is also called as all in one package. So due to this reason most the students will prefer this software. After getting an aware of all these points the user or the beginners will get an idea of what is proteus and also its unique features.

After all this if you are aware of this software then you can easily download from the internet through lab Centre, it will also provide the updated versions also. If you are unable to download this software you can opt for some of the video tutorials or you can also follow some of the links available in the net.

Before using this software kindly refer the user manual which was contained in the pdf. In that every think was explained in detail about all the features of proteus and installation process and additional settings list. This type of manuals will be helpful for the beginners to start very easily. One of the most important thing in this software is that, the more you practice you will get an experience and awareness of this software.

### Schematic Design Procedure

- If you are a beginner then start from the orientation fundamentals that is selecting from the library file folder and drag those attached files on to the schematic design.
- In this process, the design is comparatively massive and thus it is an inexpensive quantity.
- Generally it offers a complete tip therefore the user can feel a perfect fundamentals.
- The user will tend to ask for the scanning the complete format so that it can have a vital options.
- If you don't want any of the designs in the schematic then in the library file do not attach that related files in the library folder.

## V. RESULT AND DISCUSSION

Coming to result discussion part, the output is seen on the software by using proteus software. Where with the help of programming part I have designed overall schematic circuit. With the help of RTC we can observe the continuous real-time date and time readings and also in addition I have displayed my company name and the general details of students. Further this project can also be extended to usage of memory card where we can copy the whole details of the components into the memory card which will be helpful for future purpose. Even we can display the images also on this display by it is possible through some modifications and more practical experiment.

## VI. CONCLUSION

The knowledge lumberman is a useful one to gather and to inspect the experimental data having the flexibility to obviously gift real time results, with sensors and probes ready to reply to variables that square measure on the far side ancient the conventional vary offered from most standard instrumentation. Knowledge loggers are used for mensuration the temperature might need bounded constraints in terms of speed, memory and value. Additionally knowledge loggers with accumulated range of channels square measure advanced.

From the above work, it is terminated that during this device among all the 3 channels, a pair will accurately measures the temperature within the given span of your time.

## ACKNOWLEDGMENT

I would like to express my gratitude to my guide Associate professor V.ARUN sir for the useful comments, remarks and engagement through the learning process of this master thesis. Furthermore I would like to thank Mr. BALA SAIDA REDDY for introducing me to the topic as well for the support on the way. Also, I like to thank my department HOD sir for encouraging me to go forward in my project work. Also I would like to thank participants in my survey, who have willingly shared their precious time during the process of interviewing. I would like to thank my loved ones, who have supported me throughout entire process, both by keeping me harmonious and helping me putting pieces together. I will be grateful forever for your love.

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