

Railroad Signal Security System

The railroad signals technology present an incredible evolution where the biggest improvement to the systems occurred when they jump from manual systems to the automatic systems which basically were based in timers and relays, then automatic systems were introduced, based in the implementation of microcontrollers where induction sensors or frequency sensors were able to determinate the presence of the locomotive cars. Furthermore, there is the necessity of a system that alerts and displays an alert message in the case of any failure in the electrical system by monitoring the different factors that have the potential to alter the system. The Railroad Signal Security System is a system designed to monitor the three principal factors time, temperature and voltage that have the potential to interrupt the normal operation of the system and display an alert message in the case of any failure in the electrical system of the signal.

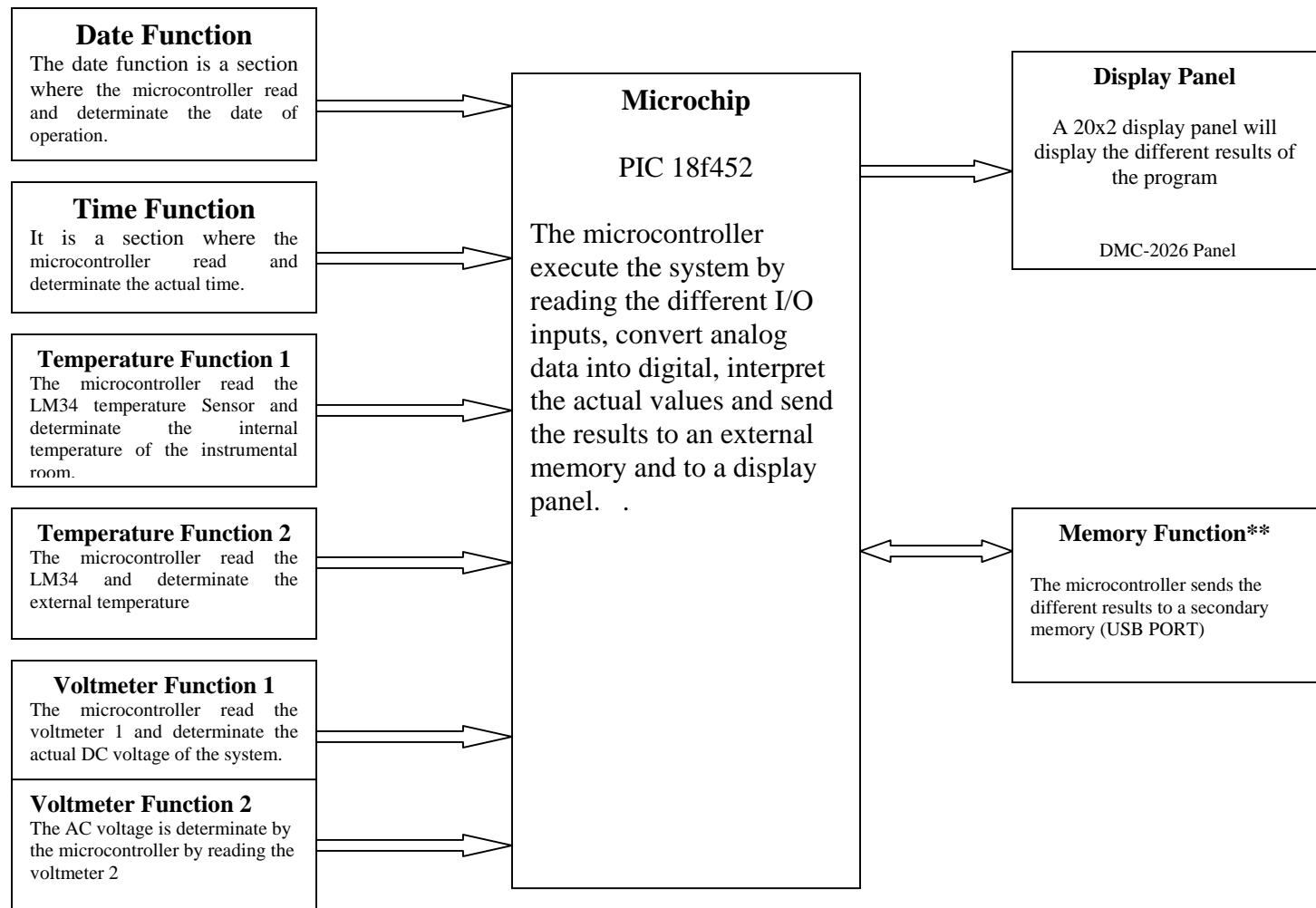
Time is the first factor that the system will be monitoring since it is important to have a timed data that will tell the maintainer or supervisor of the exact date and time of any event of failure that might have occurred in the electrical system. The next important feature that the time function will provide is that the system is going to be able to check and process the times that the signal had been maintaining by a process where the maintainer entered a password in order to login his time and date of operation. The system will perform the timing operation by the interaction of two main devices, the PIC18F452 microcontroller and the DS1307 serial real-time Dallas clock.

Second, the system will be equipped with two temperature devices that will be monitoring not only the ambient temperature but also the internal temperature of the equipment room. Temperature is an important factor to monitor since it can cause a failure in the system at any time because most of the electronic components are limited to a specific range of temperature in order to work properly. The temperature readings will be performed by a circuit that will be based in a LM34DZ temperature sensor which will send a voltage signal to the PIC microcontroller which is going interpret and display the actual temperature.

Finally, the signal will be monitoring the primary and secondary voltages of the system because the system is depending 100% on the input power, the AC voltage and DC voltage (batteries), in order to function properly and execute any operation. In fact, it is not so important how complex or modern the technology in the system is if there is not enough electrical power to perform and activate the system. The voltage readings will be execute by converting either the 120v AC or 12v DC to a regulated DC voltage that will oscillate between 0 and 5v and then such as reading will be processed and displayed by the microcontroller.

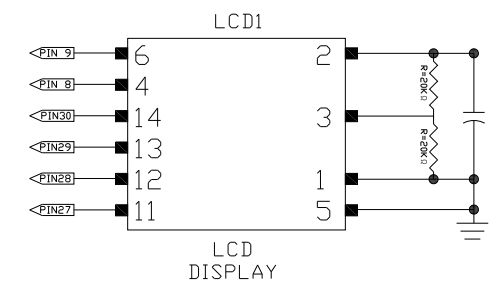
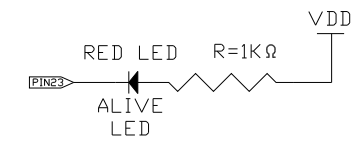
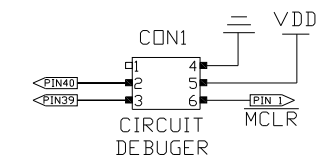
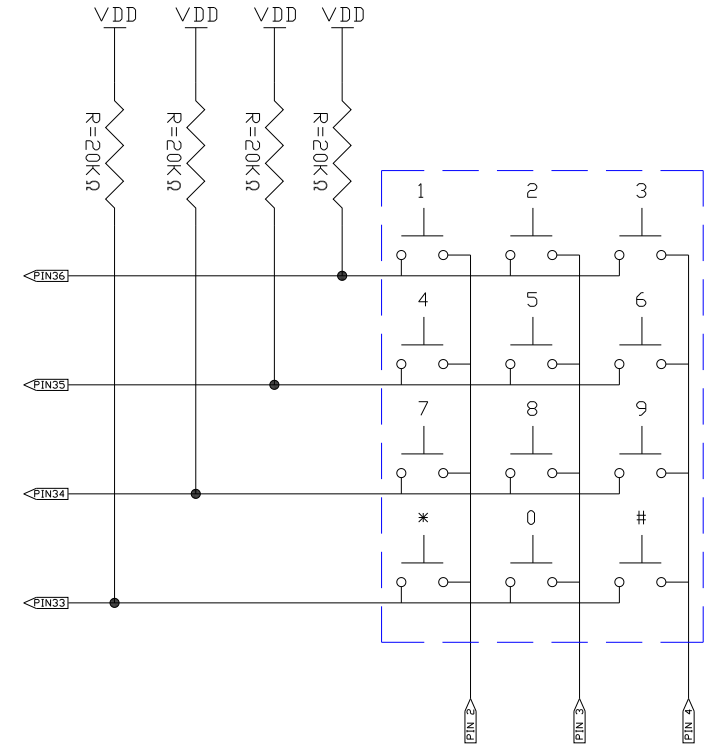
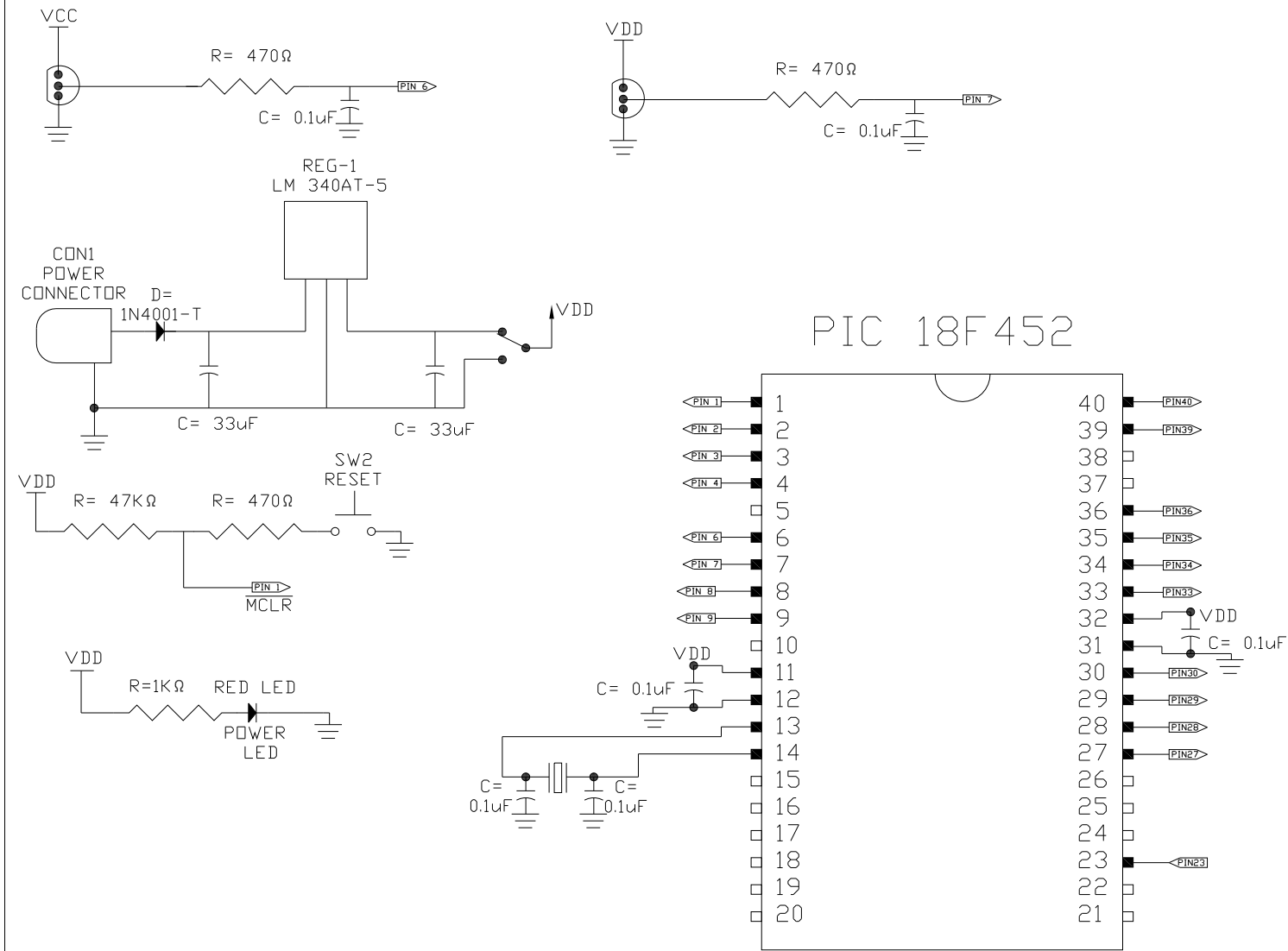
In conclusion, it is important to design a system that performs all the functions described above, the railroad security system will execute and perform all the requirements. In fact, the PIC18f452 microcontrollers tend to be the best microcontroller to execute and perform all the functions which not only have all the characteristics but

also results very attractive since it is a microcontroller that can be customized and programmed by relatively low price.

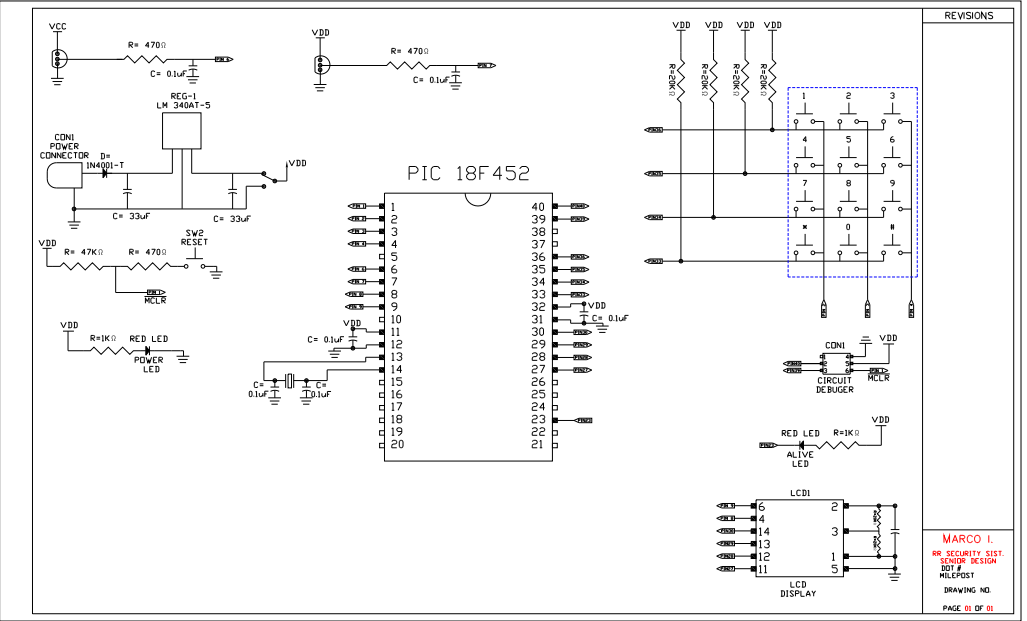


Block Diagram 1: Actually Functions of the System

** This section will be perform and execute after the project is done and working properly.



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REVISIONS

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