

TRANSMISSION OF INTAKE RESERVOIR LEVEL THROUGH TEXT MESSAGE TO THE POWER STATION

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ABSTRACT

The Samanalawewa Dam is used for hydroelectric power generation in Sri Lanka. It is the second largest hydroelectric scheme in the country and producing 405 GWh of energy annually. Here the intake and power station is situated about 5km distance. When process the power generation it is most important information is intake reservoir level. In the intake water level detecting sensor is used and intake reservoir level is displayed by processing Programmable Logic Controllers (PLC). This measured values should be transmitted to the power plant. But now the transmitting devices is completely disturbed. Because there is no suitable communication method to get the intake water level to the power station. Therefore using mobile communication implemented a system to transmit the above data.

Keywords: Intake, BCD, GSM

1. INTRODUCTION

The dam is stored lots of water behind it in the reservoir. Near the bottom of the dam wall, there is the reservoir intake. Gravity is caused to fall through the penstock inside the dam. At the end of the penstock there is a turbine, which is turned by the moving water. Here the intake is situated about five kilometers upstream of the dam on the right bank of the Walawe River. The intake is inserted a level sensor to indicate the reservoir level. A small analog (4-20) mA signal handed over to the PLC by the sensor. This analog signal converted to the digital signal and then the reservoir level displayed on the seven segment displays. It is important to communication between power station, intake and dam. The maintaining process is controlled by PLC system of the power station, intake and dam. There had a telecontrol units to get each places information to another. But, now the telecontrol units are disturbed. Because implemented a system to transmit intake reservoir level to the power station¹.

2. METHODOLOGY

First a way is founded to obtain intake reservoir level sensor output. Here the sensor out (4 – 20) mA analogue signal. It directly connected to the PLC.

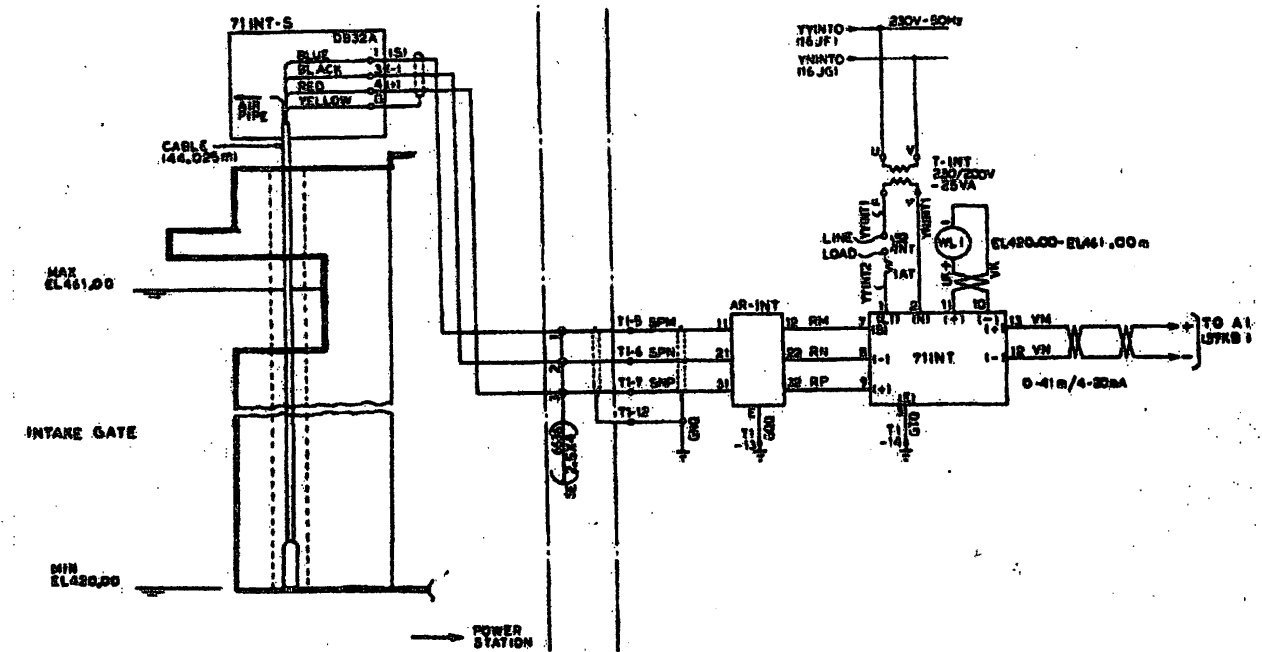


Figure 1: Water level measuring circuit

This analogue signal converted to digital signal. After studied the system, parallel outputs were obtained from the PLC. After get these signal designed a system to transmit the data.² Here five BCD (Binary Code Decimal) digital signals are obtained from the PLC. Here three stages are included in the project. Data acquisition, processing and transmission.

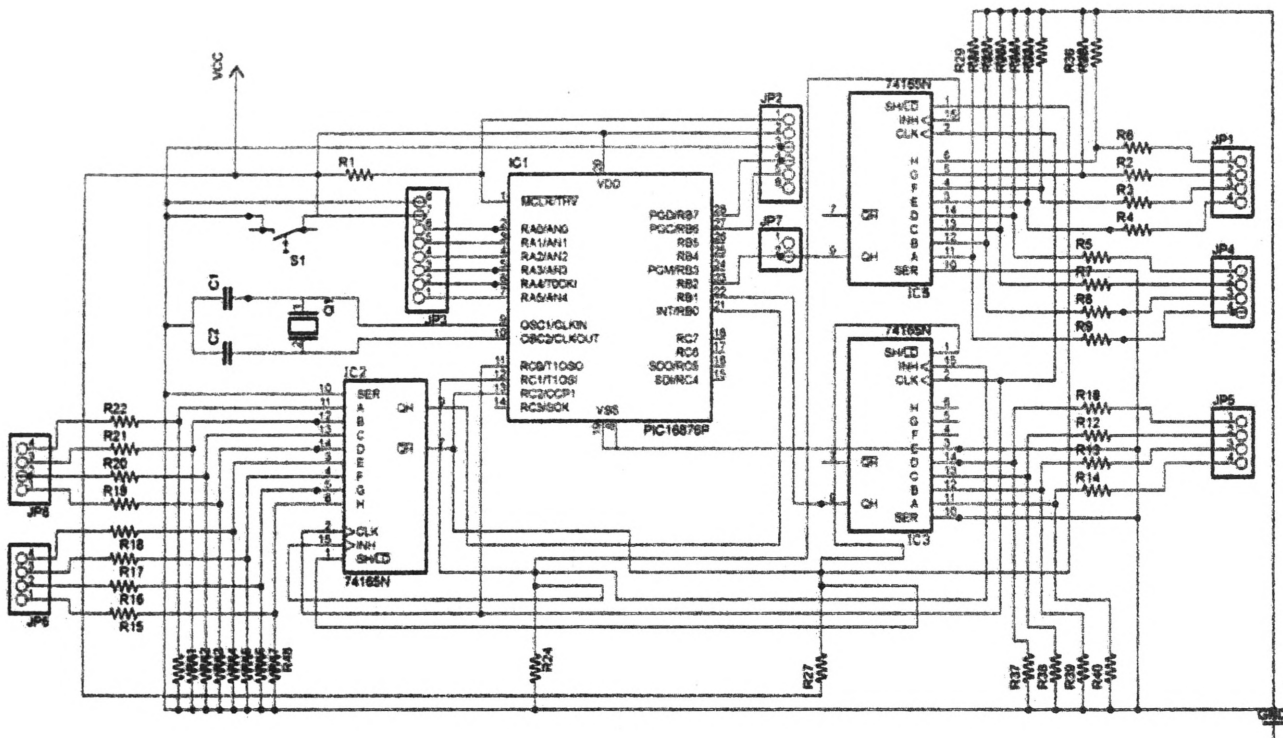


Figure 2: Schematic diagram of data acquisition and data processing

In the system the twenty BCD signals are acquired by the 8 – bit parallel in serial out shift registers. The serial output of the shift registers are handed over to the PIC microcontroller. After processing the data the intake reservoir level is transmitted to the power station through text message using GSM (Global System for Mobile Communication) module.

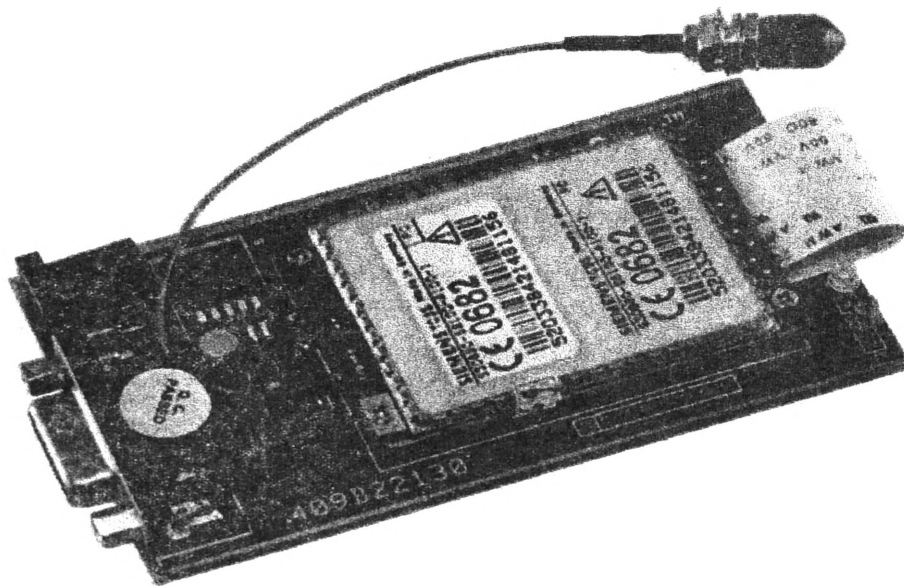


Figure 3: TC35 GSM Module

3. RESULTS AND DISCUSSION

This study was done to implement a system to transmit data from one place to another place. The water level is transmitted successfully through text message by this project. The system have three parts. Data acquisition, Data processing and Data transmission.

A test circuit is designed to check the performance of the system.

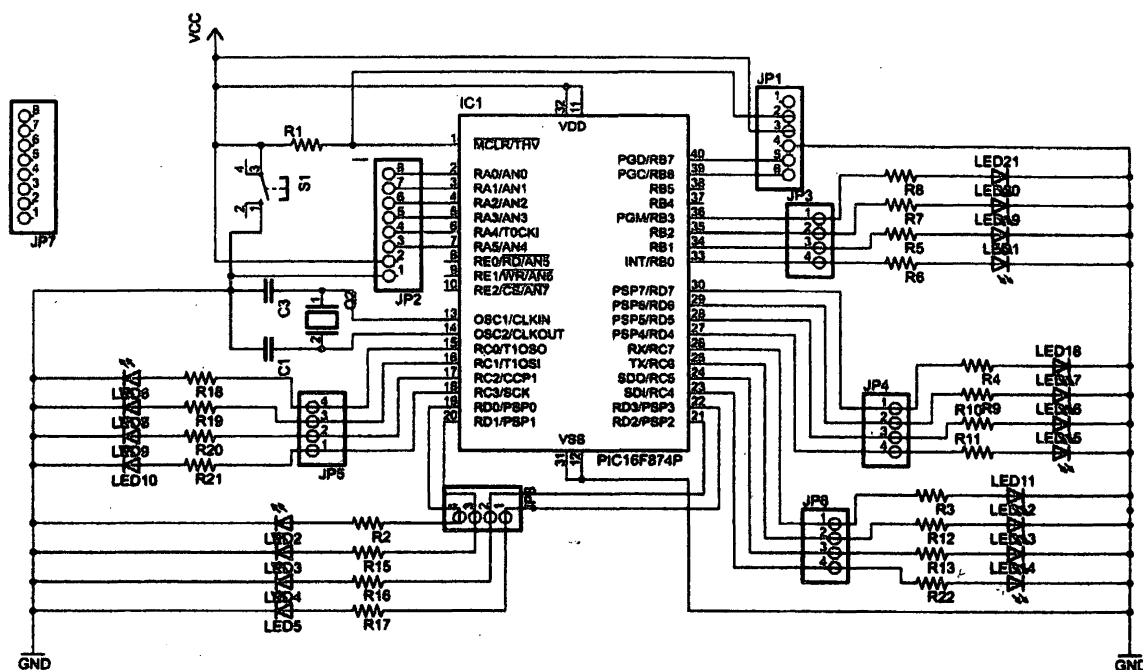


Figure 4: BCD data input schematic diagram

The data processing unit is get the BCD values from this circuit. Here SN54LS65 parallel in serial out shift registers are used to data acquisition. 16F877 microcontroller is used to process the data. Siemens TC35 GSM module is used for the data transmission. Generally power station is get this value through telephone conversations. But it is not a better way to obtain the reservoir level. If the telephone facilities were down it couldn't be received this value. After the device is implemented the intake reservoir is transmitted to the power station efficiency.

4. CONCLUSION

During the training period, mainly the attention is focused to develop a system to data transmission. A system is designed and it was chosen as my industrial training research project. Here input data get from the existing system and processed them using shift registers and microcontroller. After that a GSM modem is used and sent a text message to the power station.

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