LIQUID LEVEL PROCESS MONITORING SYSTEM USING SCADA SOFTWARE

This thesis is presented in partial fulfilment for the award of the

Bachelor of Engineering (Hons) Electrical Engineering

UNIVERSITI TEKNOLOGI MARA

ISMAWATI BINTI ISMAIL
Faculty of Electrical Engineering
UNIVERSITI TEKNOLOGI MARA
PULAU PINANG

ACKNOWLEDGEMENT

First of all, by the name of Allah, the Beneficent, the Merciful. It is the deepest sense of gratitude to Allah who gives me strength and ability and let me possible to complete this project and thesis as it is today. I would like to take this opportunity to express my heartfelt appreciation to this following persons whose have contributed directly or indirectly toward the completion of the study.

I would like to take this opportunity to express my most gratitude to my supervisor Mr. Mohamad Faizal Abd Rahman for his guidance, advice and willingly give his suggestion and ideas from beginning of this project until the thesis complete. Also, wish to express my heartiest thanks to Mr. Yaakob Abdullah for his guidance and encouragement.

Great thank to technicians in the Instrument Laboratory for their help. Lastly, but not least, I would like to express my special gratitude to my family and to all my friends and especially to Nur Azlan Abdul Malek who somehow or other had helped me directly or indirectly in successful completion of my project, until this text complete.

Lastly, may Allah bless you all.

ABSTRACT

Liquid level monitoring system is a system to monitor and control the level of liquid inside a tank using SCADA. The system is implemented through the integration of hardware and software parts. The hardware part covers the process of building a tank and control circuit. This project uses water level as its variable and ultrasonic sensor as a device to measure the water level. The ultrasonic sensor is mounted at the top of the tank without physical contact with the liquid material. Ultrasonic sensor is the leading sensor technologies in liquid level tank measurement and control operations and it uses the propagation time of a sound pulse to calculate the distance of a target. For that reason, ultrasonic sensor is the best tool to measure the amount of water inside the tank and distance to the surface of the liquid. The hardware part is connected to the Programmable Logic controller (PLC). PLC is connected to the personal computer (PC) by using RS-232 USB cables. CX-Programmer will be used to program the PLC and the Lookout software from National Instrumentation to develop a SCADA system.

Keywords – PLC, SCADA, ultrasonic sensor

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1.1 Background

The term "SCADA" is an acronym that stands for Supervisory Control and Data Acquisition. SCADA commonly used in the industries to monitor the operation and process [1]. By using SCADA, time, money and energy can be reduced because the system can eliminate the need for site visits for inspection, adjustment and data collection. SCADA can be use to monitored and controlled the operations in real time environment. Besides that, adjustment or modification to the operations can be performed directly to the systems. It also can improve the efficiency of the system and life-period of the equipment. SCADA also can reduce the operational cost and eventually save more money in the needs for repairs and maintenance [2].

An example of using SCADA system is in the wastewater treatment process. The application of SCADA in the system is for remote monitoring and control of water treatment plants and water pumping stations by a central control center. The project requirements are to provide remote monitoring and control of water treatment and pumping stations from any locations. SCADA is used in many application because it can be controlled from long distance or controlling a wide area of operations. In the wastewater treatment process, a central control center is responsible to monitor and control all the plants and pumping stations using SCADA system [3].

In the process of study the SCADA system in real application, a simple water level system is introduced. The water level system consists of tanks, solenoid valve, pumps and controller. The SCADA system of the water level system is then being built accordingly to monitor the level in the tank.