

MECHATRONICS BOOK SERIES

CONTROL AND INTELLIGENT SYSTEMS

Momoh Jimoh E. Salami
Abiodun Musa Aibinu
Yasir Mohd Mustafah



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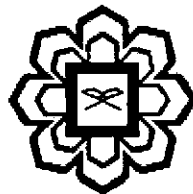
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Chapter 30

Development of Prototype Real-time system for SCADA-based Monitoring and Controlling System for Sewage Treatment Plant

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30.1 Introduction

An intelligent Supervisory Control and Data Acquisition (i-SCADA) system has been developed by the authors in the previous study [1] for the monitoring and control of the sewage treatment plant (STP) using IUM.Malaysia Gombak campus as case study [2,3]. The work mainly involved software development of the remote terminal unit (RTU) and main terminal unit (MTU) using NI Labview software platform.

In order to demonstrate the applicability of the proposed STP monitoring system, the present paper presented the real-time implementation of the developed system using NI Labview as main target hardware. A laboratory scale STP is developed, necessary sensors and other hardware components required for practical implementation are carefully selected and integrated to form a simple laboratory scale prototype of the STP system.

The overview of SCADA system is given in Section 2. Prototype development of the RTU and MTU are detailed in sections 3 and 4 respectively. The integration and testing of RTU and MTU together with results are given in section 5. Section 6 gives the conclusion of the chapter.

30.2 SCADA System Overview

A SCADA system consists of a number of remote terminal units (RTUs) collecting field data and sending the data back to a master station (MTU), via a communication system [4,5]. The master station displays the acquired data and allows the operator to perform remote control tasks. The RTU provides an interface to the field analog and digital sensors situated at each remote site. The communications system provides the pathway for communication between the master station and the remote sites. This communication system can be wire, fiber optic, radio, telephone line, microwave and possibly satellite. Specific protocols and error detection philosophies are used for efficient and optimum transfer of data (communication systems will later be discussed in the coming chapters). The master station (MTU) gathers data from the various RTUs and generally provides an operator interface for display of information and control of the remote sites.

The typical SCADA system architecture is shown in Figure 30.1. The major components in SCADA system development are: RTU/MTU Software, hardware selection and interfacing with sensors at remote station, and communication link between RTU and MTU.