SELECTED TOPICS IN ADVANCED ELECTRONICS

Edited by

Khalid A. S. Al-Khateeb

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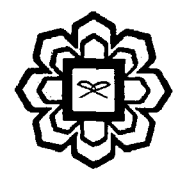

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CHAPTER 22

SUPERVISORY CONTROL AND DATA AQUISITION SYSTEM (SCADA) USING MICROCONTROLLER

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Synopsis

A supervisory control and data acquisition (SCADA) system can be developed with an auto-fault detection capability. The PLC used in a standard SCADA system can be replaced by a microprocessor chip, resulting in a lower cost. Signals derived from a large number of detectors and sensors can be processed simultaneously, without impairment to the operational efficiency of the system. The design can be made to enable the system to check the alarm status, true or false, i.e. to determine whether the system is normal or faulty. Very often the system gives a wrong indication because the sensor may be open circuit, short circuit or malfunctioning. The data acquisition circuit can be interfaced with the micro controller board to evaluate the current flow conditions. A program written in Visual Basic may provide a graphical layout of the plan of a building, which can be displayed on a monitor to give a clear indication where the alarm spot is set-off. A close circuit television (CCTV) camera is incorporated with a pan-tilt mechanism allows an automatic capture of a particular location, where the alarm has been triggered, at the same moment of the alarm signal.

1 Introduction

SCADA systems have been regarded with substantial interest in recent years for a variety of applications. They are especially important in complex facilities operating in real time with computerized environments such as large power plants, ships, aircrafts, and intelligent buildings. Alarm signals and function status signals from around the field are gathered and sent to the operators at the monitoring stations. Operators may be required to attend to specific problems that might otherwise