

A Smart Voltage and Current Monitoring System for Three Phase Inverters Using an Android Smartphone Application

Abstract

In this paper, a new smart voltage and current monitoring system (SVCMS) technique is proposed. It monitors a three phase electrical system using an Arduino platform as a microcontroller to read the voltage and current from sensors and then wirelessly send the measured data to monitor the results using a new Android application. The integrated SVCMS design uses an Arduino Nano V3.0 as the microcontroller to measure the results from three voltage and three current sensors and then send this data, after calculation, to the Android smartphone device of an end user using Bluetooth HC-05. The Arduino Nano V3.0 controller and Bluetooth HC-05 are a cheap microcontroller and wireless device, respectively. The new Android smartphone application that monitors the voltage and current measurements uses the open source MIT App Inventor 2 software. It allows for monitoring some elementary fundamental voltage power quality properties. An effort has been made to investigate what is possible using available off-the-shelf components and open source software

1. Introduction

Because of the increasing advances in technology, smart systems are increasingly being used. These systems allow technicians, administrators, and managers to monitor and control the performance of devices from a safe distance. The monitoring system is very important when working in the field of three phase systems; some users and companies use smart monitoring software programs. These programs are installed on the user's smart phone or company computers to allow employers to make decisions if there is an error. The main objective of this paper is to create a smart monitoring system based on an intelligent control system. The proposed system is called a smart voltage and current monitoring system or SVCMS. The SVCMS is designed to monitor the performance of a three phase grid by measuring voltage and current. The SVCMS design consists of two parts; the first is the control system shown in Figure . This system has been designed

using the Arduino Nano V3.0 as a microcontroller to read and calculate the RMS voltage and current from sensor units . The Arduino Nano V3.0 is an open source platform that is very cheap, flexible, and has special-purpose data processing capabilities. Similar applications have been proposed for previous versions of this microcontroller. The voltage sensor unit design is based on the ZMPT101B current transformer

Block Diagram :

