Project summary

Cond.st.UPT. as.ing. Mâțiu Iovan Liliana

DIFFICULTY

Main Objective

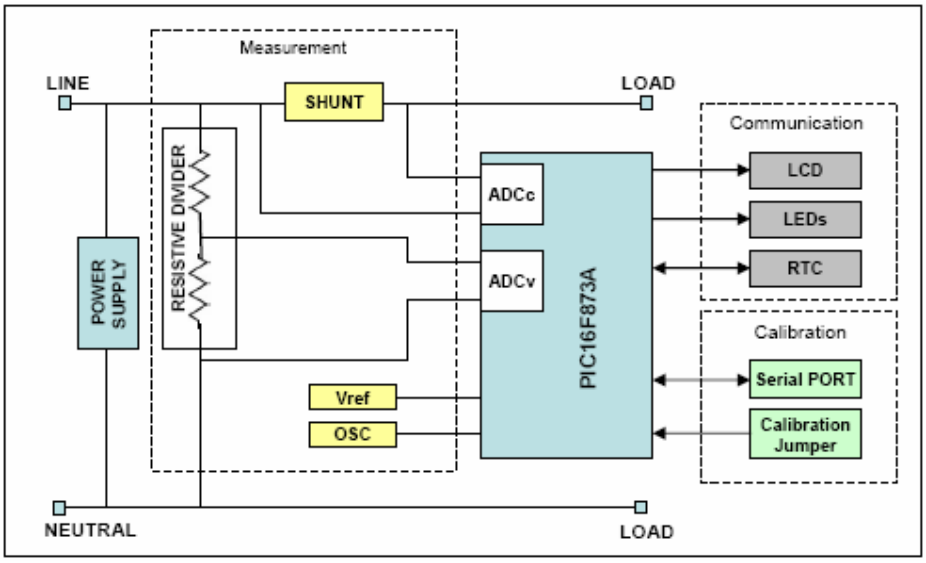
Design and development of a Single-Phase Electronic Watt-Hour Meter.

Sub-Objectives

To make students become more familiar with the major stages in development process;
To make students become more familiar with latest metering technologies;
To prepare a comprehensive report on the design.

Abstract

The deployment of electronic energy meters has gained a great deal of momentum over the past several years. This is due to their two main advantages over the traditional electromechanical designs: improved accuracy and an expanded set of features. Current microcontroller technology allows designers to build meters that are competitive in price with traditional devices, while maintaining the required IEC 1036 Class 1 accuracy of ±1% for domestic applications.
The target of this project is to design a basic watt-hour meter using PIC16F873A PICmicro® Flash microcontroller. The conceptual design for the energy meter is shown in figure below.



Line voltage and current are sampled sequentially at regular intervals, with voltage and current being presented to different analog input channels. To measure voltage, the AC line is sampled across a potential divider. For current measurement, a shunt creates voltage signal across burden that is proportional to the load current.

Development Tools

EasyPIC4 Development Board (Mikroelektronika)
Extension Boards (AD Converter, RTC)
PICmikroC Compiler (Mikroelektronika)
PIC MCU (Microchip)
Oscilloscope, Signal Generator, Digital Counter
Testing boards, electronic components
PC
Documentation

Skills and Requirements

The student should have good knowledge of data acquisition systems, microcontroller's architecture, C programming (intermediate), assembly programming (intermediate), analog and digital circuits, electronic instrumentation and measurements. English is compulsory.

Elster Rometrics
Persoană contact: Ovidiu Vetreș
Tel. 0745346737
e-mail: ovidiu.vetres@ro.elster.com