Web based Power Metering System

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Introduction:

     This document describes the hardware used to construct the Web Based Power Monitoring System base station. This base station stores the values of the power read from the meters and hosts a web page that will display this information.

     The overall goal of this system is to be able to monitor the power consumed or certain periods of time and display them on a web page for the general public to observe whenever they choose. My partner Sebastian Scheiff will be building the power meter portion of this project.

Hardware:

     The base station performs three main functions: to communicate with the power nodes, to store data retrieved from the power nodes, and to communicate with the world wide web so that the stored data can be observed by others.

Base Station:

     The base station will be run by a ColdFire processor [U1]. It will have an Ethernet link to communicate with the Web [J2] and it will have serial communication with the power nodes [J1] using the SCI (UART) port. It will use a MAX3535E [U3], which will be isolated by an EPC3115S-2 [T2] transformer, to drive the serial communication with the power nodes. The data gathered will be stored on a CAT25080LI-G EEPROM chip [U2] that connects to the MCF52233 [U1] through the SPI port. The EEPROM chip will have its HOLD_L and WP_L pins pulled high because I don't intend to use the pause option that the HOLD_L pin offers. The WP_L (write protect) pin will be held high so that the chip will always be ready to be written to

without requiring an additional I/O pin from the Microcontroller.

The Ethernet communication will be isolated by way of a Pulse™ H1102 [T1] transformer all of the Ethernet driving is taken care of inside the microcontroller. Attached to the corresponding pins (ACTLED, LNKLED, SPDLED, DUPLED, COLLED) there will be five LED's hooked up through a resistor to V_{CC} (+3.3V).

The base station will be powered from a 2.1mm barrel plug the will be regulated by a LD29080 [VR1] voltage regulator. The regulator will have a green LED (VDD) in the circuit so that an observer can tell if the station has power or not.