GPRS based SCADA implementation with fencing security and SMS alerts

The purpose of this project is to acquire the remote electrical parameters like Voltage, Current and Frequency and send these real time values over GPRS Technology using GPRS Modem along with temperature at power station. If any unauthorized person crosses the boundary limits then the IR sensor will send you the appropriate message to owner's mobile phone and also it will send the alert message when the electrical parameters crosses threshold value. This project is also designed to protect the electrical circuitry by operating an Electromagnetic Relay. This Relay gets activated whenever the electrical parameters exceed the predefined values. The Relay can be used to operate a Circuit Breaker to switch off the main electrical supply.

This system automatically send the real time electrical parameters periodically (based on time settings) into predefined website. User can monitor these parameters on the internet. This system can be designed to send SMS alerts whenever the Circuit Breaker trips or whenever the Voltage or Current exceeds the predefined limits. The IR sensor alerts when anyone enters into the monitoring room using SMS.

This project makes use of an onboard computer which is commonly termed as microcontroller. This onboard computer can efficiently communicate with the different sensors being used. The controller is provided with some internal memory to hold the code. This memory is used to dump some set of assembly instructions into the controller. And the functioning of the controller is dependent on these assembly instructions. The controller is programmed using Embedded C language.

The objectives of the project include:

1. Sensing different electrical parameters (voltage, current, temperature).
2. Forwarding the electrical parameters over GSM network.
3. Monitoring of parameters on predefined website.
4. Producing buzzer alerts (if necessary).
5. Automatic circuit breaking operation.

The project provides us exposure on:

1. Initialization of ADC module of microcontroller.
2. GPRS modem.
3. Interfacing GPRS modem with microcontroller.
4. Embedded C programming.
5. PCB designing.
6. Different electrical sensors.
7. LCD interfacing.
8. IR sensor characteristics.

The major building blocks of this project are:

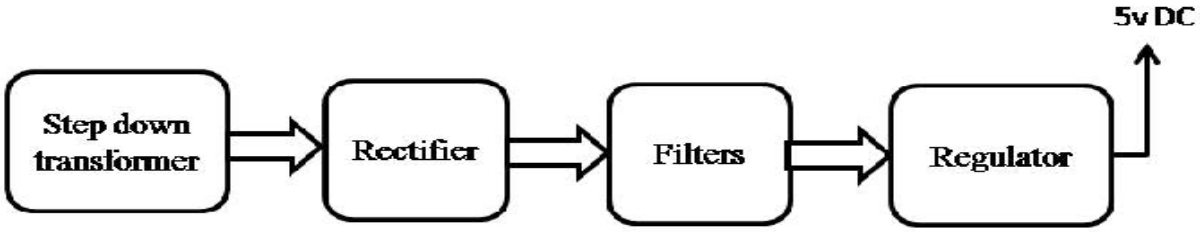
1. Regulated Power Supply.
2. Microcontroller.

3. LCD display with driver.
4. Electromagnetic Relay with driver.
5. Temperature Sensor.
6. Voltage Sensor.
7. Current Sensor.
8. GPRS Modem.
9. Buzzer with driver.
10. Crystal oscillator.
11. IR Sensor.
12. LED indicators.

Software's used:

1. PIC-C compiler for Embedded C programming.
2. PIC kit 2 programmer for dumping code into Micro controller.
3. Express SCH for Circuit design.
4. Proteus for hardware simulation.

Regulated Power Supply:



Block Diagram:

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