"WIRELESS INDUSTRIAL HAZARD DETECTION, CONTROL AND PROTECTION DEVICE USING EMBEDDED SYSTEM"

A KSCST sponsored (Ref No. 34S0915) project work carried out at
S.I.T, Tumkur.

Project report submitted in partial fulfillment of the requirement for the award of

Bachelor of Engineering
in
Instrumentation and Electronics
of
Visvesvaraya Technological University, Belgaum

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(2010 – 2011)

Abstract

The main aim of the project is to develop a device that minimizes the effects of hazards which occur in the process industries. Some of the vital process parameters such as over voltage, under voltage, over load, temperature, water level and fire are monitored by the designed device so as to keep the industrial unit safe.

The device consists of various sensors to check and monitor the process parameters of the industrial unit. To determine the setpoint for safe range of working, the output of these sensors under normal conditions are suitably signal conditioned and are fed to analog input channels of the Analog to digital converter (ADC) which is configured in 8-bit resolution mode. The ADC used in the project is inbuilt within the microcomputing unit. This ADC converts the signal conditioned output from sensors to their corresponding digital equivalent value which is stored in data memory locations of the microcomputing unit. This digitized value is used as set point for the safe working of the industrial unit.

The output from the sensors is continuously checked and compared with pre-defined set point value so as to decide whether the process parameters are in safe range or not. When a catastrophe occurs, these process parameters tend to deviate from their normal working range. In such circumstances the device designed will shut down the industrial unit immediately to control the same from further damage. In the project a Global systems for mobile communication (GSM) module is also used to send a caution message via the short message service (SMS) to the controller in-charge of the master control room, so as to inform and alert him about the events occurred. The GSM platform is a hugely successful wireless technology that has an unprecedented story of global achievement and co-operation compared to other technologies available.

The microcomputing units used in the project are programmed after successful simulation of the software. The firmware used in the project continuously checks and monitors different process parameters of the industrial unit. If any one/more parameters is/are found to deviate from their normal working range, a suitable decision is taken by the microcomputing unit to shut down the industrial unit immediately and to alert the person in-charge of the master control room by sending him a caution SMS.