

Real-time automation design and development of ARM based on the industry by the GSM system

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ABSTRACT:

Automation is a current need for industries. There are a number of techniques to achieve that grow well in factory automation. One of the popular technologies of recent times is to automate the use of sensors and actuators. Here in this development a sheet of ARM7 and the UC / OS-II RTOS on the basis of the communications system in real-time automation industry by responding GSM. The proposed system is a centralized controller, sensors and relays. central unit is the main unit that collects information from the sensors of the plant and give this information to the end user via GSM communication. And the need to control production by automatically switching relays and motors arises. LPC2148 ARM7 is used for monitoring and control unit for various parameters. Some time processes need to be monitored and controlled in real time. To control the process real-time operating system files is deleted in real time UC / OS-II needful that the control arm controller. ARM7 LPC2148 and

programmed using an integral part of the language C. The results obtained by the usefulness and effectiveness of the system appear as planned them.

KEYWORDS: Automation, Sensors, Relays, GSM, RTOS.

INTRODUCTION:

And automate any industry needs to control devices and industrial processes, and reducing the need for human intervention. Technology is growing at a rapid pace, system of automated machine to track the status of automated processes completely is the current need to be used in a variety of ways to track machine information display or situation in real time on mobile devices with wireless technology, such as aberration P / GSM / JP RSS [1] available in the system. is not fully automatic Currently, these should be monitored for the last time. And it is used today, such as SCADA systems for the purpose of automation, but the problem is that these systems can not be

controlled from a remote location. Shop also soil data such as the director of the top, MD authority is not available to people, etc., in the environment, industry and a fully automated process such as Sterlite industry it is to make production fiber optic cables, and once the process starts continuously for several months. In such processes some parameters such as temperature, pressure, gas leaks and production that have been made, and therefore must be controlled in real time from a remote location. There are some qualified people in the industry, but they need to play at all times about the parameters, such as temperature, pressure, gas leaks and production reached etc. Assuming that this automated system developed so that even if the person concerned is not in the field, he said, can become mounted in science, updating and control of the situation of that particular plant with the help of connections GSM sensors . Different data for plant environment. It is given sensor signals to control the ARM to adapt the control signal according to programmed needs and produces control signals for controlling the process. In this system, it is necessary to monitor and control at the same time two or more tasks. In such a system at the University of California / OS-II RTOS is

implemented to manage customized user in an orderly and controlled manner to allow a priority task priority and divert resources

OVERVIEW:

I worked several researchers have been many styles proposal on industrial automation and control using various communication techniques, of which some are still working on better and better. Wehbe C.Gungor et.al proposed [3] that different communication with the backing of two of the main means of communication technology, ie, wired and wireless, and can be used to transfer data between smart meters and power plants. G. M. Rana Sultan Mahmud et.al design and implementation [4] system profitable home security using GSM technology. Theft detection system design, leakage of harmful gases. A. Ajit Kumar suggested et.al perspective on industry test requirements Hbkat- A survey Wireless Sensor, protocols, And challenges, and focus on the use of WSN in the industrial sector Applications [5]. The best industrial and effective Communications are characterized by the fact that Interaction and control must be performed in real time, Requirements difficult time [6]. Looking at the above The work and the need for

industrial applications industries It was developed and oriented automation system Implemented to take care of any "press industry Yesh shree soldier combs. Limited, Aurangabad, "the challenges of the future and And discuss the scope of the future at the end of the document.

SYSTEM IMPLEMETNATION:

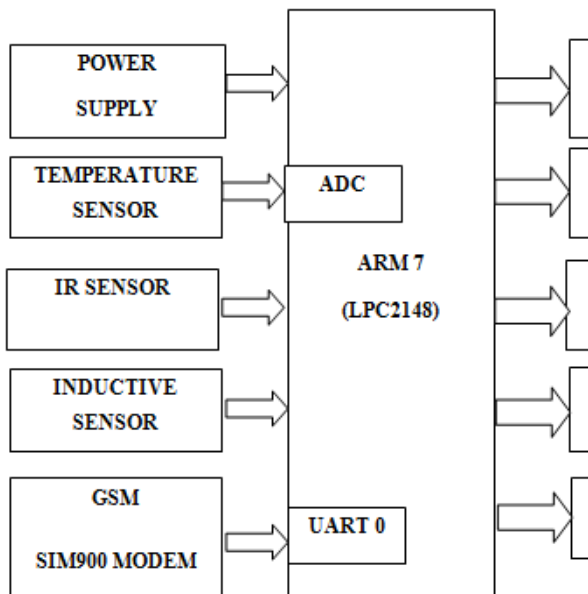


Figure1: Block Diagram of proposed system

The proposed work includes the collection of data from different sensors like temperature sensor, inductive sensor, IR sensor etc are placed in the production working environment. Out of all some sensors gives the analog data and some gives digital pulses, analog signals undergo

signal conditioning to convert it to digital. The controller used is ARM7 LPC2148 which belongs from ARM family. Relays are used for controlling and switching purpose. Controller takes the sensor values and displays it on LCD and as also at the same time send it at remote location to alert user through GSM in the form of SMS .If sensor value exceeds than predefined then user can control the process by passing the commands the through SMS and action can be controlled using relay switching. For execution of operation in Real-Time uC/OS-II RTOS is ported and dumped into LPC2148.

ARM:

The **ARM (Acorn RISC Machine)** architecture is developed at Acorn Computer Limited of Cambridge, England between 1983-1985. ARM Limited founded in 1990. **ARM** became as the **Advanced RISC Machine** is a 32-bit RISC processor architecture that is widely used in embedded designs. **ARM** cores licensed to semiconductor partners who fabricate and sell to their customers. ARM does not fabricate silicon itself

Because of their power saving features, ARM CPUs are dominant in the mobile electronics market, where low

power consumption is a critical design goal. As of 2007, about 98 percent of the more than a billion mobile phones sold each year use at least one ARM CPU.

Today, the ARM family accounts for approximately 75% of all embedded 32-bit RISC CPUs, making it the most widely used 32-bit architecture. ARM CPUs are found in most corners of consumer electronics, from portable devices (PDAs, mobile phones, iPods and other digital media and music players, handheld gaming units, and calculators) to computer peripherals (hard drives, desktop routers).

ARM does not manufacture the CPU itself, but licenses it to other manufacturers to integrate them into their own system

RISC:

RISC, or *Reduced Instruction Set Computer*, is a type of microprocessor architecture that utilizes a small, highly-optimized set of instructions, rather than a more specialized set of instructions often found in other types of architectures.

History:

The first RISC projects came from IBM, Stanford, and UC-Berkeley in the late 70s and early 80s. The IBM 801, Stanford MIPS, and Berkeley RISC 1 and 2 were all

designed with a similar philosophy which has become known as RISC. Certain design features have been characteristic of most RISC processors:

- ***One cycle execution time*** : RISC processors have a CPI (clock per instruction) of one cycle. This is due to the optimization of each instruction on the CPU and a technique called ;
- ***pipelining*** : a technique that allows for simultaneous execution of parts, or stages, of instructions to more efficiently process instructions;
- ***large number of registers*** : the RISC design philosophy generally incorporates a larger number of registers to prevent in large amounts of interactions with memory

LCD (Liquid Cristal Display)

A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. Each pixel consists of a column of liquid crystal molecules suspended between two transparent electrodes, and two polarizing filters, the axes of polarity of which are perpendicular to each other.

Without the liquid crystals between them, light passing through one would be blocked by the other. The liquid crystal twists the polarization of light entering one filter to allow it to pass through the other. A program must interact with the outside world using input and output devices that communicate directly with a human being. One of the most common devices attached to an controller is an LCD display. Some of the most common LCDs connected to the controllers are 16X1, 16x2 and 20x2 displays. This means 16 characters per line by 1 line 16 characters per line by 2 lines and 20 characters per line by 2 lines, respectively.

Inductive sensors

A (inductive) proximity sensor is an electronic Proximity sensor that detects metal objects without Touched. Therefore, it can be particularly useful for Applications where access presents challenges or where Dirt, oil and other water is prevalent. inductive proximity The sensors emit sensor electromagnetic field alternately. When he enters a target metal detection, Hot Tub induced in the target, reducing the signal currents Capacity and lead to a change of state sensors Departure. And the sensor

output as Inductive Pulses requiring no digitalisation.

Infrared sensor

It filter to detect infrared radiation specifically to infrared light. It is not good to detect visible light. To detect infrared Digital is outside - either detects infrared signal and 38kHz low output (0 V) or not detecting high output (5V). When the body is near the sensor, the light LED brake reflecting object and the light sensor. This leads to a significant increase in the intensity, and Considers object detection. When the object is far No sensors reflection of light again, and then Register output.

Conclusion and scope of the future

The system can automate data collection sensor-based smart sensor. It has been designed based on ARM LPC2148 and the University of California / OS-II RTOS and application of wireless communications. It is very suitable in real time the real needs in a data acquisition system in the industrial environment. Different types of sensors can be used, provided they are connected to the system. We can control plant environment via a mobile phone. As the number of tickets limited ARM unit, for the purpose of monitoring the industry can use the control

to high PLC input / output. You can develop an application of automation systems robots with the help of online communication.

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