Abstract : Wireless sensor networks (WSNs) in IoT have become an advanced concept to research in environment of Internet of Things (IoT). The proposal of system is to develop a sensor interface device which is essential for sensor data collection of industrial Wireless Sensor Networks (WSN) in Internet of Things (IoT) environment. A wireless smart sensor platform targeted for instrumentation and predictive maintenance systems is presented. Manual status monitoring and conditional checking of industrial machineries are not possible for machineries used in industries like Power Plants, Steel Plants and other Manufacturing units etc. Hence to measure the status and process parameters like Temperature, Level, Intensity, Gas and Flow etc., present in the industrial environment, there is requirement of intelligent system with wireless networking. Because lot of complication is involved in industrial automation across various sites located far away from each other, especially it is complicated to consolidate status and control each unit by manual operation over wired network. Hence to simplify the operation there is requirement of intelligent system with wireless networking. In this work, to solve these problems, a new method is proposed and designed a reconfigurable smart sensor interface for industrial WSN in IoT environment. It is designed and developed in such a way that a sensor interface device for industrial WSN in IoT atmosphere, in which an Advanced Reduced Instruction Set Machine (ARM) is adopted as the core controller instead of CPLD. Performance of the proposed system is verified and good effects are achieved in practical application of IoT. Thus, it will scan information in parallel and in real time with high speed on multiple completely different device information. Intelligent device interface specification is adopted. IoT is the concept to Operate and check status from anywhere by just using Internet and we can control the parameters by Manually or Automatically by just changing mode. Zigbee is used as Wireless Sensor device at both ends for transferring the data from one to other. By detecting the values from sensors like Temperature, Level, Intensity, Gas and Flow etc., present in the industrial environment. These signals are conditioned and displayed in LCD display. So that critical situation can be avoided and preventive measures are successfully implemented. Wireless sensor network is one of the Pervasive networks. Internet of Things (IoT) has attracted a lot of attention and is expected to bring benefits to numerous application areas including industrial WSN systems, and healthcare systems, environmental monitoring in IoT Environment.

I. INTRODUCTION

A wireless sensor network (WSN) is a distributed autonomous sensor’s to monitor physical and also environmental conditions, such as Temperature, Pressure, Flow, Level, Gas etc. and to cooperatively pass their data through the network to a main location. The more modern networks are bidirectional, also enabling control of sensor activity. The development of wireless sensor networks was motivated by military applications such as battlefield surveillance; today such networks are used in many industrial and consumer applications, such as industrial process monitoring and control, condition monitoring of machines, and so on. Provide a bridge between the real physical and virtual worlds. Allow the ability to observe the previously unobservable at a fine resolution over large spatiotemporal scales. Have a wide range of potential applications to industry, science, transportation, civil infrastructure, and security. The WSN is built of “nodes” – from a few to several hundreds or even thousands, where each node is connected to one (or sometimes several) sensors. Each such sensor network node has typically several parts: a transceiver with an internal antenna or connection to an external antenna, a microcontroller, an electronic circuit for interfacing with the sensors and an energy source, usually a battery or an embedded form of energy harvesting. The topology of the WSNs can vary from a simple star network to an advanced multi-hop wireless mesh network. Reconfigurable smart sensor interface device that integrates data collection data processing, and wired or wireless transmission. The device can be widely used in many application areas of the IOT and WSN to collect various kinds of sensor data in real time. The overall structure of reconfigurable smart sensor interface consists of ARM7 32-bit micro controller. The propagation technique between the hops of the network can be routing or flooding. First of all, microcontroller is used as the core controller to release the restriction on the universal data acquisition interface, and realize truly parallel acquisition of sensor data. It has not only improved the sensor data collection efficiency of industrial WSN, but also extended the application range of the data acquisition. Secondly, a new design method...
is proposed in this paper is that the multi-sensors are controlled using the single system.

II. PROPOSED METHOD

The proposed work includes the collection of data from various sensors like temperature sensor, Level and Flow sensor etc., located in Process and manufacturing industries etc., The signals of the sensors undergo signal conditioning to convert the signals from analog to digital and digital signals are directly connected to controller to control the parameters based on the analog values feedback. Here the Advanced RISC Machine 32-bit microcontroller used instead of CPLD. It processes the data and displays the parameters on the LCD as well as transfer data through the wireless sensor (ZIGBEE) module and here another wireless sensor ZIGBEE is used to at the coordinator node, it receives data from transfer node and the data is grouped together and upload/stored in cloud storage by Machine to Machine network using internet. From the cloud storage the data’s are retrieved using various platforms like mobile, PC etc. The data is received from the server. A wireless smart sensor platform targeted for instrumentation and predictive maintenance systems is presented. The generic smart sensor platform with plug and play capability supports hardware interface, payload and communications needs of multiple inertial and position sensors, and actuators, using a RF link for communications, in a point to point topology. The design also provides means to update operating and monitoring parameters as well as sensor/RF link specific firmware modules, over the air. Sample implementations for industrial applications and system performance are discussed. Zigbee is used at both ends for transferring data from one location to other.

III. ARM MICRO CONTROLLER

A RISC-based computer design approach means ARM processors require significantly fewer transistors than typical processors in average computers. This approach reduces costs, heat and power use. These are desirable traits for light, portable, battery-powered devices—including smartphones, laptops, tablet and notepad computers), and other embedded systems. A simpler design facilitates more efficient multi-core CPUs and higher core counts at lower cost, providing higher processing power and improved energy efficiency for servers and supercomputers. This generation introduced the Thumb 16-bit instruction set providing improved code density compared to previous designs. The most widely used ARM7 designs implement the ARMv4T architecture, but some implement ARMv3 or ARMv5TEJ. All these designs use a Von-Neumann architecture, thus the few versions comprising a cache do not separate data and instruction caches. Some ARM7 cores are obsolete. One historically significant model, the ARM7DI is notable for having introduced JTAG based on-chip debugging the preceding ARM6 cores did not support it. The “D” represented a JTAG TAP for debugging; the “I” denoted an ICE Breaker debug module supporting hardware breakpoints and watch points, and letting the system be stalled for debugging. Subsequent cores included and enhanced this support. It is a versatile processor designed for mobile devices and other low power electronics. This processor architecture is capable of up to 130 MIPS on a typical 0.13 µm process. The ARM7TDMI processor core implements ARM architecture v4T. The processor supports both 32-bit and 16-bit instructions via the ARM and Thumb instruction sets. ARM licenses the processor to various semiconductor companies, which design full chips based on the ARM processor architecture.

HARDWARE IMPLEMENTATION ZIGBEE MODULE

Introduction: ZigBee is the name of a specification for a suite of high level communication protocols using small, low-power digital radios based on the IEEE 802.15.4-2006 standard for wireless personal area networks (WPANs), such as wireless headphones connecting with cell phones via short-range radio. The technology is intended to be simpler and cheaper than other WPANs, such as Bluetooth. ZigBee is targeted at radio-frequency (RF) applications that require a low data rate, long battery life, and secure networking. Incidentally, the term “ZigBee” originates from the silent, but powerful method of communication used by honeybees to report information about food sources. This communication system is known as the “ZigBee Principle”. By flying around in a zig-zag pattern, a bee is able to share critical information, such as the location, distance, and direction of a newly discovered food source to its fellow hive members. The ZigBee Alliance is a group of companies which maintain and publish the Zigbee standard. ZigBee operates in the industrial, scientific and medical (ISM) radio bands; 868 MHz in Europe, 915 MHz in countries such as USA and Australia, and 2.4 GHz in most jurisdictions worldwide. The technology is intended to be simpler and cheaper than other WPANs such as Bluetooth. ZigBee chip vendors typically sell integrated radios and microcontrollers with between 60K and 128K flash memory, such as the Free scale MC13213, the Ember EM250 and the Texas Instruments CC2430. Radios are also available stand-alone to be used with any processor or microcontroller. Generally, the chip vendors also offer the ZigBee software stack, although independent ones are also available.
**Zigbee Features:**
- Point to point, point to multi point, Mesh and peer-to-peer topologies on proprietary stack.
- Direct Sequence Spread Spectrum technology.
- Each direct sequence channel has 64K unique network addresses.
- RF data rate: 250 kbps.
- Acknowledgement mode communication with retries.
- Power saving modes. Source / destination addressing.

**Applications:**
- **Home Entertainment and Control:** Smart lighting, advanced temperature control, safety and security, movies and music
- **Home Awareness:** Water sensors, power sensors, smoke and fire detectors, smart appliances and access sensors
- **Mobile Services:** m-payment, m-monitoring and control, m-security and access control, m-healthcare and tele-assist
- **Industrial Plant:** Process control, asset management, environmental management, energy management.

**LM35 (Temperature sensor)**

The LM35 series are precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature. The LM35 thus has an advantage over linear temperature sensors calibrated in °Kelvin, as the user is not required to subtract a large constant voltage from its output to obtain convenient Centigrade scaling. The LM35 does not require any external calibration or trimming to provide typical accuracies of ±1/4°C at room temperature and ±3/4°C over a full −55 to +150°C temperature range. Low cost is assured by trimming and calibration at the wafer level. The LM35’s low output impedance, linear output, and precise inherent calibration make interfacing to readout or control circuitry especially easy. It can be used with single power supplies, or with plus and minus supplies. As it draws only 60 µA from its supply, it has very low self-heating, less than 0.1°C in still air. The LM35 is rated to operate over a −55° to +150°C temperature range, while the LM35C is rated for a −40° to +110°C range (−10° with improved accuracy). The LM35 series is available pack-aged in hermetic TO-46 transistor packages, while the LM35C, LM35CA, and LM35D are also available in the plastic TO-92 transistor package. The LM35D is also available in an 8-lead surface mount small outline package and a plastic TO-220 package.

**Block Diagram**

![Block Diagram](image)

The LM35 can be applied easily in the same way as other integrated-circuit temperature sensors. It can be glued or cemented to a surface and its temperature will be within about 0.01°C of the surface temperature. This presumes that the ambient air temperature is almost the same as the surface temperature; if the air temperature were much higher or lower than the surface temperature, the actual temperature of the LM35 die would be at an intermediate temperature between the surface temperature and the air temperature. This is especially true for the TO-92 plastic package, where the copper leads are the principal thermal path to carry heat into the device, so its temperature might be closer to the air temperature than to the surface temperature. To
minimize this problem, be sure that the wiring to the LM35, as it leaves the device, is held at the same temperature as the surface of interest. The easiest way to do this is to cover up these wires with a bead of epoxy which will insure that the leads and wires are all at the same temperature as the surface, and that the LM35 die’s temperature will not be affected by the air temperature. The TO-46 metal package can also be soldered to a metal surface or pipe without damage. Of course, in that case the V− terminal of the circuit will be grounded to that metal. Alternatively, the LM35 can be mounted inside a sealed-end metal tube, and can then be dipped into a bath or screwed into a threaded hole in a tank. As with any IC, the LM35 and accompanying wiring and circuits must be kept insulated and dry, to avoid leakage and corrosion. This is especially true if the circuit may operate at cold temperatures where condensation can occur. Printed-circuit coatings and varnishes such as Humiseal and epoxy paints or dips are often used to insure that moisture cannot corrode the LM35 or its connections. These devices are sometimes soldered to a small light-weight heat fin, to decrease the thermal time constant and speed up the response in slowly-moving air. On the other hand, a small thermal mass may be added to the sensor, to give the steadiest reading despite small deviations in the air temperature.

Applications:
Photo resistors come in many different types. Inexpensive cadmium sulfide cells can be found in many consumer items such as camera light meters, clock radios, security alarms, street lights and outdoor clocks. They are also used in some dynamic compressors together with a small incandescent lamp or light emitting diode to control gain reduction. Lead sulfide and indium antimonite LDRs are used for the mid infrared spectral region. Ge: Cu photoconductors are among the best far-infrared detectors available, and are used for infrared astronomy and infrared spectroscopy.

IV. CONCLUSIONS
Now a day applications of Internet are increasing and IoT is the new era of the internet where daily life all things connected to internet and can be monitor & can be operate remotely from anywhere. This paper provides objectives of IoT, most of the application domains where IoT is used and the system architecture of IoT. Literature Survey provides the different IoT based existing system and gives details about the system.

REFERENCES

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