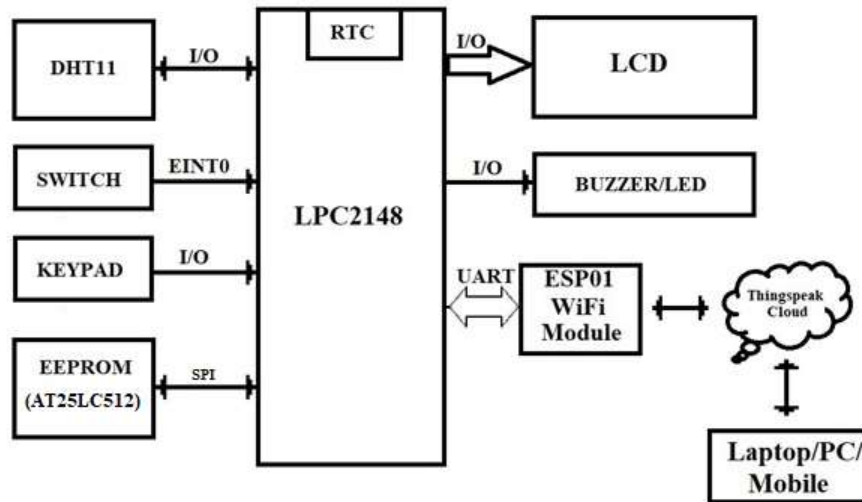# IoT-BASED INDUSTRIAL PROCESS MONITORING SYSTEM USING THINGSPEAK

AIM: The main aim of the project is to develop the industrial process monitoring system using IOT along with some abnormal alerts.

Block diagram:

HARDWRAE REQUIREMENTS:

- ➢ LPC2148
- ➢ DHT11
- ➢ AT25LC512
- ➢ KEYPAD
- ➢ SWITCH
- ➢ LCD
- ➢ WI-FI MODULE (ESP01)
- ➢ DB-9 CABLE/USB-UART CONVERTER

SOFTWARE REQUIREMENTS:

- ➢ KEIL C Compiler
- ➢ PROGRAMMING IN EMBEDDED C
- ➢ Flash Magic

Steps to be followed to complete your project:

➢ Create New Folder in your laptop/PC and save that folder with your project name.

➢ Then copy what you done files - lcd.c, lcd.h, delay,c, delay.h, keypad.c & keypad.h, into project folder.

➢ Individually can check each and every module.

➢ First check lcd to display character constant, string constant and integer constant.

➢ Next check keypad peripheral by displaying key values on LCD.

➢ Next download the UART interrupt code from LMS and check the working of that code on hardware board.

➢ Next connect DHT11 sensor to LPC2148 and develop the driver for DHT11 (reading temperature and humidity from DHT11) and display on LCD. (refer the code given in LMS)

➢ Next check the working condition of ESP01 module with the help of flash magic terminal. (Which commands are required to use for your project refer the screen shots under reference data folder)

➢ Next connect the ESP01 module to LPC2148. (You can refer the data sheet of ESP01 to know which pins are connected to LPC2148 for the proper communication)

➢ Then develop the driver for ESP01 for LPC2148. By using ESP01 driver, send one constant data to thingspeak cloud. (refer the sample code in LMS)

➢ After checking DHT11, ESP01 driver then implement the main logic. Inside main initialize all required peripherals.

➢ Next write n bytes into EEPROM and read that n number of bytes from EEPROM and display on LCD. (refer the sample code in LMS)

Note: Use BYTE WRITE and BYTE READ functions (or) PAGE WRITE and PAGE READ functions

➢ Then check the external interrupt by writing simple code. (refer the sample

code in LMS)

➢ For each physical parameter need to give one set point. If the current physical parameter value is greater than the current value then turns ON the buzzer to alert the near people. Set point value need to save it in the EEPROM so that each time updated set point will come for the comparison. EEPROM is used to get the updated set points information irrespective of the power failure conditions.

➢ In continuous loop, read current temperature value and humidity values from DHT11 and display it on LCD. If the current physical parameter value is greater than the current set point value then turns ON the buzzer to alert the near people. Then send the sensor physical parameters information to thingspeak cloud with respect to some time-interval (use RTC information for time interval monitoring). Timer interval should be 3 or 5 minutes.

➢ If user want to change the set points information, he/she has to generate the interrupt by pressing swich which is connected to interrupt pin. If interrupt is occurred, then stop the current process and display the menu for set point modification. Then based on user requirement, user has to select and change that particular set point and update that latest value into EEPROM.

➢ If you're getting this output then your project is completed.

************************** ALL THE BEST **************************

DIFFERENT IOT APPLICATION PLATFORMS: (FYR)

AWS IoT: Amazon Web Services (AWS) IoT is a cloud-based platform that allows users to connect and manage IoT devices and applications. It provides a wide range of services for data collection, storage, analysis, and visualization.

Microsoft Azure IoT: Microsoft Azure IoT is a comprehensive cloud-based platform that provides tools and services for IoT device management, data analysis, and application development. It supports a wide range of devices and platforms, including Windows and Linux.

Google Cloud IoT: Google Cloud IoT is a cloud-based platform that provides services for IoT device management, data processing, and application development. It supports a wide range of devices and platforms, including Android and iOS.

IBM Watson IoT Platform: IBM Watson IoT Platform is a cloud-based platform that provides services for IoT device management, data analysis, and application development. It supports a wide range of devices and platforms, including Raspberry Pi and Arduino.

ThingSpeak: ThingSpeak is an open-source Internet of Things (IoT) application platform and API (Application Programming Interface) that allows users to collect, analyze and act on data from various sources. It was developed by MathWorks, a leading provider of technical computing software. ThingSpeak provides an easy-to-use interface for users to create and manage IoT devices and applications. It supports a wide range of data sources, including sensors, web services, and social media. The platform also includes features for data visualization, data analysis, and real-time alerts.

Cayenne: Cayenne is a cloud-based IoT platform that provides services for device management, data visualization, and automation. It supports a wide range of devices and platforms, including Arduino and Raspberry Pi.

Kaa IoT Platform: Kaa IoT Platform is an open-source IoT platform that provides tools and services for IoT device management, data processing, and application development. It supports a wide range of devices and platforms, including Android and iOS.

Ubidots: Ubidots is a cloud-based IoT platform that provides services for data collection, visualization, and analysis. It supports a wide range of devices and platforms, including Arduino and Raspberry Pi.

Losant: Losant is a cloud-based IoT platform that provides services for device management, data visualization, and automation. It supports a wide range of devices and platforms, including MQTT and HTTP.

Xively: Xively is a cloud-based IoT platform that provides services for device management, data analytics, and application development. It supports a wide range of devices and platforms, including Arduino and Raspberry Pi.

Blynk: Blynk is a mobile app and cloud-based IoT platform that provides services for device management, data visualization, and control. It supports a wide range of devices and platforms, including Arduino and Raspberry Pi.

Particle: Particle is an IoT platform that provides tools and services for device management, data visualization, and firmware development. It supports a wide range of devices and platforms, including Wi-Fi and cellular.

Thinger.io: Thinger.io is a cloud-based IoT platform that provides services for device management, data collection, and analysis. It supports a wide range of devices and platforms, including ESP8266 and ESP32.

DeviceHive: DeviceHive is an open-source IoT platform that provides services for device management, data analytics, and application development. It supports a wide range of devices and platforms, including Java and .NET.

Mongoose OS: Mongoose OS is an open-source IoT platform that provides services for device management, data analytics, and firmware development. It supports a wide range of devices and platforms, including ESP32 and STM32.

Hologram: Hologram is a cloud-based IoT platform that provides services for device management, data collection, and visualization. It supports a wide range of devices and platforms, including Raspberry Pi and BeagleBone.

ioBroker: ioBroker is an open-source IoT platform that provides services for device management, data visualization, and automation. It supports a wide range of devices and platforms, including Node.js and Docker.

Cayenne: Cayenne is a cloud-based IoT platform that provides services for device management, data visualization, and automation. It supports a wide range of devices and platforms, including Arduino and Raspberry Pi.

Altair SmartWorks: Altair SmartWorks is a cloud-based IoT platform that provides services for device management, data analytics, and application development. It supports a wide range of devices and platforms, including industrial sensors and machines.

Helium: Helium is a decentralized IoT platform that provides services for device management, data collection, and application development. It supports a wide range of devices and platforms, including