BLUETOOTH BASED INDUSTRIAL DATA ACQUISITION SYSTEM

DESCRIPTION:

Bluetooth is a wireless module which transfers data from dongle to blue tooth modem and modem to Bluetooth dongle. This module enables you to transmit & receive wireless data in serial format. It is an advanced technology which can is widely used now-a-days in mobile data sharing and within network communications like modem to printer, etc… allowing transparent two way data communication. In our project we can simply use it for transmitting wireless serial data to establish connection between MCU or embedded project and PC.

In this project we are connecting different sensors to monitor the industrial parameters like level sensor, temperature sensor, (LM35) MQ200 to read the boiler level, boiler temperature, smoke exhaustion……etc., Microcontroller reads data from sensors and sends to Bluetooth modem. Modem sends data to Dongle, Bluetooth modem is connected to microcontroller serially with 9600 baud rate. The range of Bluetooth modem is 10 meters with frequency 2.4 GHz. Blue tooth Transmit power is 4dBm and sensitivity is 84 dBm. Here in our project Bluetooth modem acts as receiver and Bluetooth dongle acts as transmitter which is connected to USB port of the PC. Inside the PC we have an application(c# .net) which takes data from dongle and display on GUI. GUI is a software application which is very useful using which we can easily identify parameters and even we have a provision that the parameters status can be played back in audio format also as announcement from PC Speakers. Our project very near to the real time industry applications.

Here we use an 8051 microcontroller with 5V DC Power supply. Serial (UART) protocol is primary concern here. The heart of this project is Bluetooth modem which works on serial (UART) protocol.

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Microcontroller is interfaced with two digital sensors (Level, Smoke) and one Analog sensor (LM35). All sensors are positive triggered.

TECHNICAL SPECIFICATIONS:

HARDWARE SPECIFICATIONS

- Micro controller : AT89S52
- Crystal : 11.0592 MHz
- LED : 5mm Red LED
- Blue Tooth Modem
- ADC : LM35
- Smoke sensor : MQ200
- Level sensor : Wire leads
- Basic GPIOs
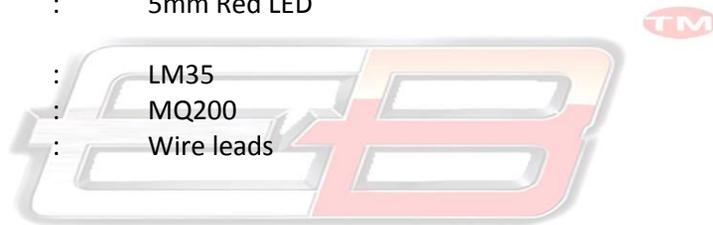
POWER SUPPLY

- Transformer : 12V step down
- Filter : 1000uf/25V
- Voltage Regulator : 7805 / 7812
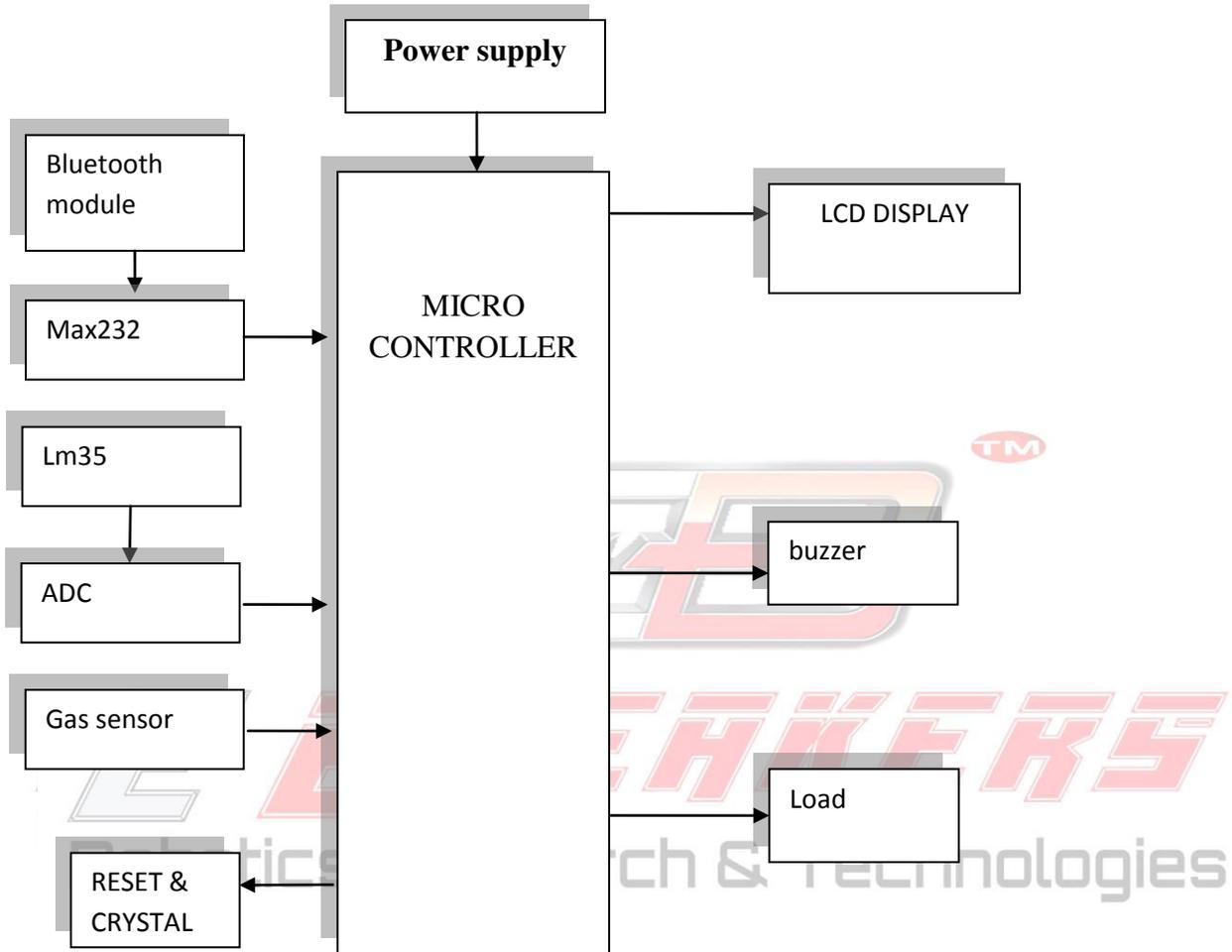
SOFTWARE SPECIFICATIONS

- Keil IDE
- Proteus VSM
- UC flash
- C# .net application

APPLICATIONS
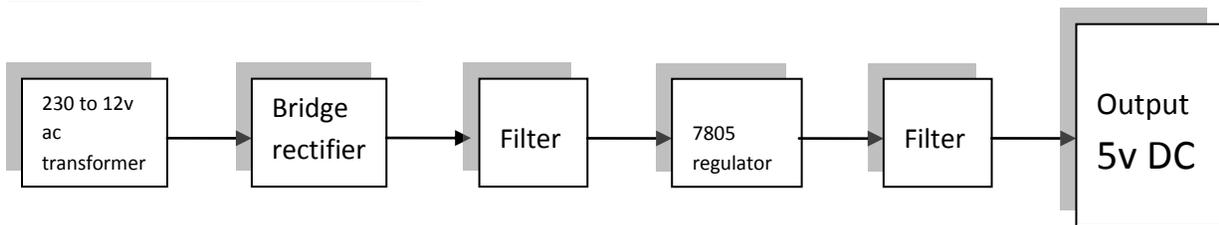
- Industrials
- Sensor Networking

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BLOCKDIAGRAM

```
                        ┌──────────────────┐
                        │   Power supply   │
                        └────────┬─────────┘
                                 │
                                 ▼
┌──────────────┐        ┌──────────────────┐        ┌──────────────────┐
│  Bluetooth   │        │                  │───────▶│   LCD DISPLAY    │
│   module     │        │                  │        └──────────────────┘
└──────┬───────┘        │                  │
       │                │                  │
       ▼                │                  │
┌──────────────┐        │     MICRO        │
│    Max232    │───────▶│  CONTROLLER      │
└──────────────┘        │                  │        ┌──────────────────┐
                        │                  │───────▶│     buzzer       │
┌──────────────┐        │                  │        └──────────────────┘
│    Lm35      │        │                  │
└──────┬───────┘        │                  │
       │                │                  │
       ▼                │                  │        ┌──────────────────┐
┌──────────────┐        │                  │───────▶│      Load        │
│    ADC       │───────▶│                  │        └──────────────────┘
└──────────────┘        │                  │
                        │                  │
┌──────────────┐        │                  │
│  Gas sensor  │───────▶│                  │
└──────────────┘        │                  │
                        │                  │
┌──────────────┐        │                  │
│  RESET &     │◀───────│                  │
│  CRYSTAL     │        └──────────────────┘
└──────────────┘
```

POWER SUPPLY BLOCK DIAGRAM:

```
┌──────────────┐   ┌──────────┐   ┌────────┐   ┌───────────┐   ┌────────┐   ┌──────────┐
│ 230 to 12v   │──▶│  Bridge  │──▶│ Filter │──▶│  7805     │──▶│ Filter │──▶│  Output  │
│ ac           │   │ rectifier│   │        │   │ regulator │   │        │   │  5v DC   │
│ transformer  │   └──────────┘   └────────┘   └───────────┘   └────────┘   └──────────┘
└──────────────┘
```

RECEIVER BLOCK DIAGRAM:

```
┌──────────────┐   ┌──────────────┐   ┌──────────────┐
│   Power      │──▶│  Bluetooth   │──▶│   PC         │
│   supply     │   │   module     │   │   With front │
└──────────────┘   └──────────────┘   └──────────────┘
```