DATA LOGGER USING X- BEE/ZIG-BEE [with front end]

ABSTRACT

The project is aimed to design a data logger system using which the physical parameters such as temperature, humidity, fire and light can be monitored. ZIGBEE technology will be used in this project for wireless communication as it is reliable and can be applicable for long distance communication.

ZIGBEE is a specification for a suite of high level communication protocols using small, low-power digital radios based on the IEEE 802.15.4-2003 standard for Low-Rate Wireless Personal Area Networks (LR-WPANs). ZIGBEE is targeted at radio-frequency (RF) applications that require a low data rate, long battery life, and secure networking. ZIGBEE protocols are intended for use in embedded applications requiring low data rates and low power consumption. ZIGBEEs current focus is to define a general-purpose, inexpensive, self-organizing mesh network that can be used for industrial control, embedded sensing, medical data collection, smoke and intruder warning, building automation, home automation, etc. The resulting network will use very small amounts of power.

The project is designed in such a way that we will interface a temperature, fire, humidity and light sensors to an 8 bit microcontroller 8051, on the transmitter side. And an XBEE transceiver is also interfaced to the controller through a serial line driver IC MAX232, to transmit the status of the sensors. This transmitted data is being received by the other XBEE transceiver on the receiver side and will be fed to the controller. Here a PC is also interfaced to the controller through a line driver IC MAX232, to display the status of the sensors. So we can monitor the status of the sensors through the hyper terminal of PC. So based on the received data, controller will perform the predefined task of sending corresponding data to the PC. We can also design a front end application on PC by using C# .NET, for the good visual effects. The application always interact with the serial port, so there is no need of hyper terminal, we can monitor the status in the application itself.

This project uses regulated 5V, 500mA power supply. 7805 three terminal voltage regulator is used for voltage regulation. Full wave bridge rectifier is used to rectify the ac output of secondary of 230/12V step down transformer.
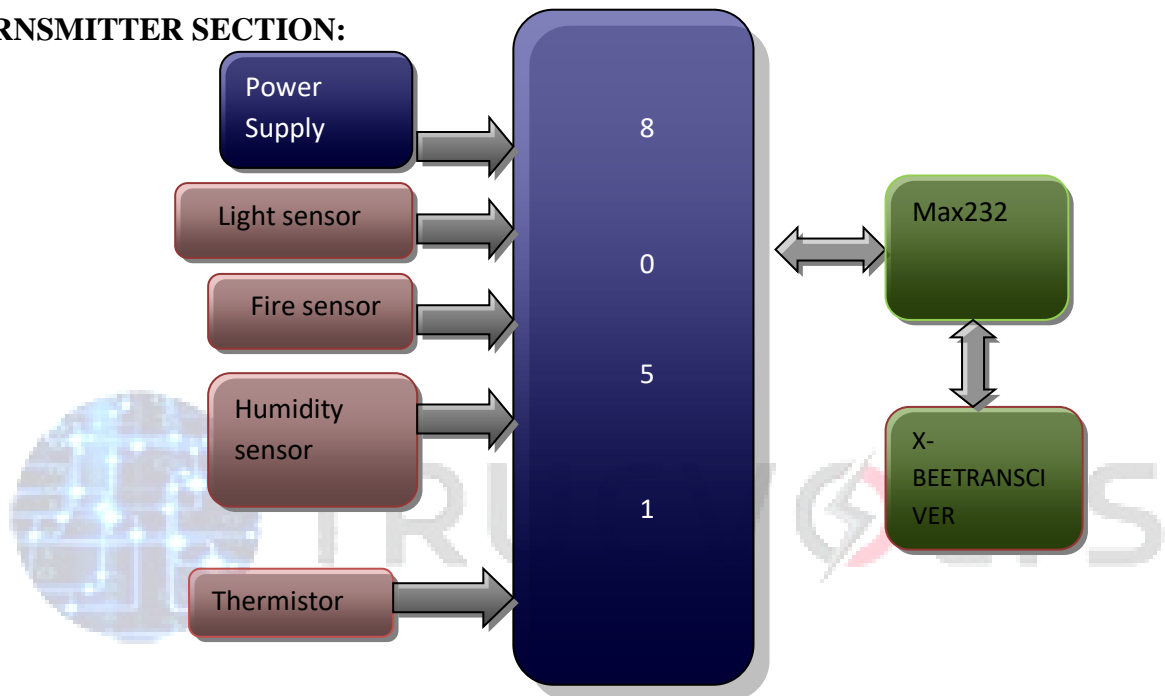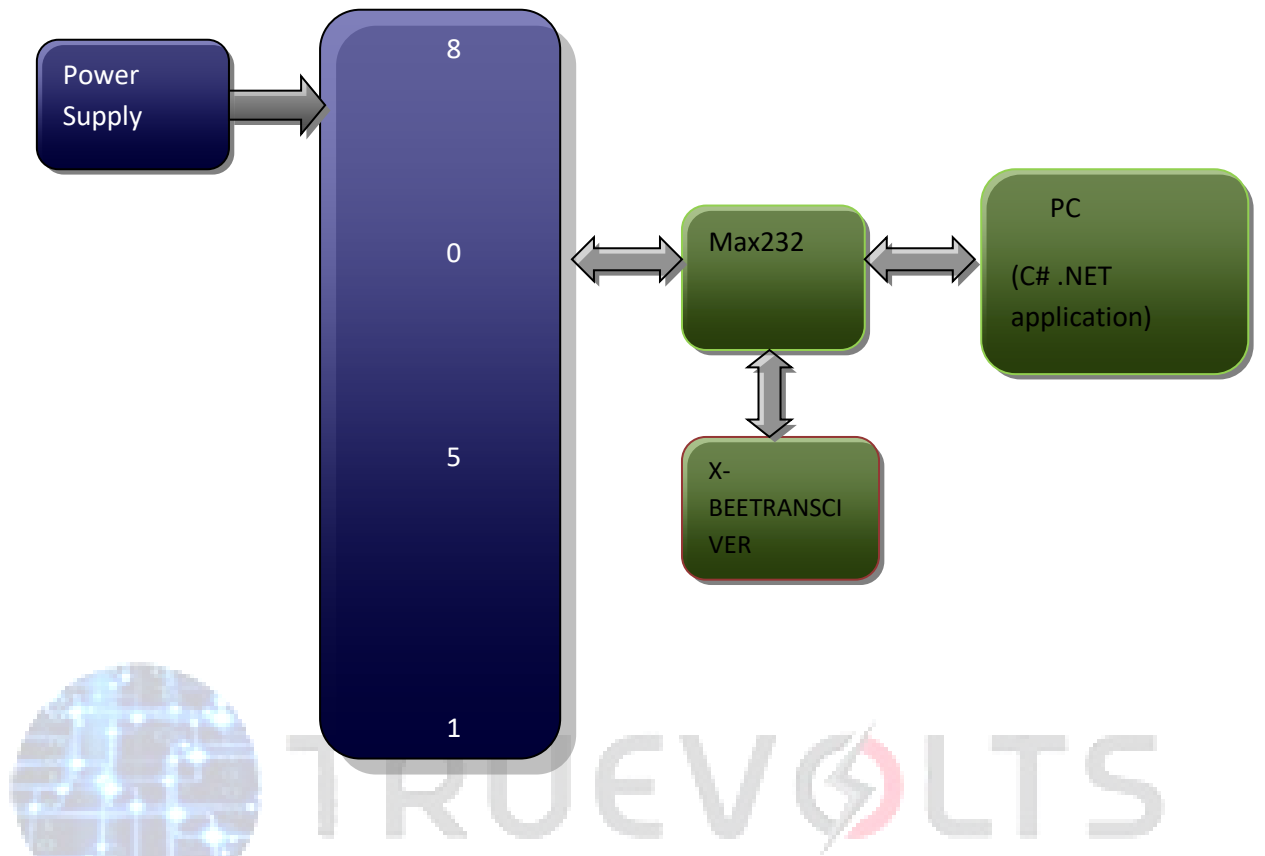
APPLICATIONS:

- Industrial applications
- Household applications

BLOCK DIAGRAM:

TRNSMITTER SECTION:

RECEIVER SECTION:

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Power          ┌──────────────┐                                    ┌──────────────┐
Supply  ──────▶│      8       │                                    │      PC      │
               │              │         ┌─────────┐                │              │
               │      0       │◀───────▶│  Max232 │◀──────────────▶│  (C# .NET    │
               │              │         └─────────┘                │  application)│
               │      5       │              ▲                     └──────────────┘
               │              │              │
               │              │              ▼
               │              │         ┌─────────┐
               │      1       │         │   X-    │
               └──────────────┘         │ BEETRANSCI│
                                        │   VER    │
                                        └─────────┘
```

POWER SUPPLY BLOCK DIAGRAM:

```
┌──────────────┐   ┌──────────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐
│  Step down   │──▶│   Bridge     │──▶│  Filter  │──▶│ Regulator│──▶│  Output  │
│ Transformer  │   │  Rectifier   │   │          │   │          │   │          │
└──────────────┘   └──────────────┘   └──────────┘   └──────────┘   └──────────┘
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