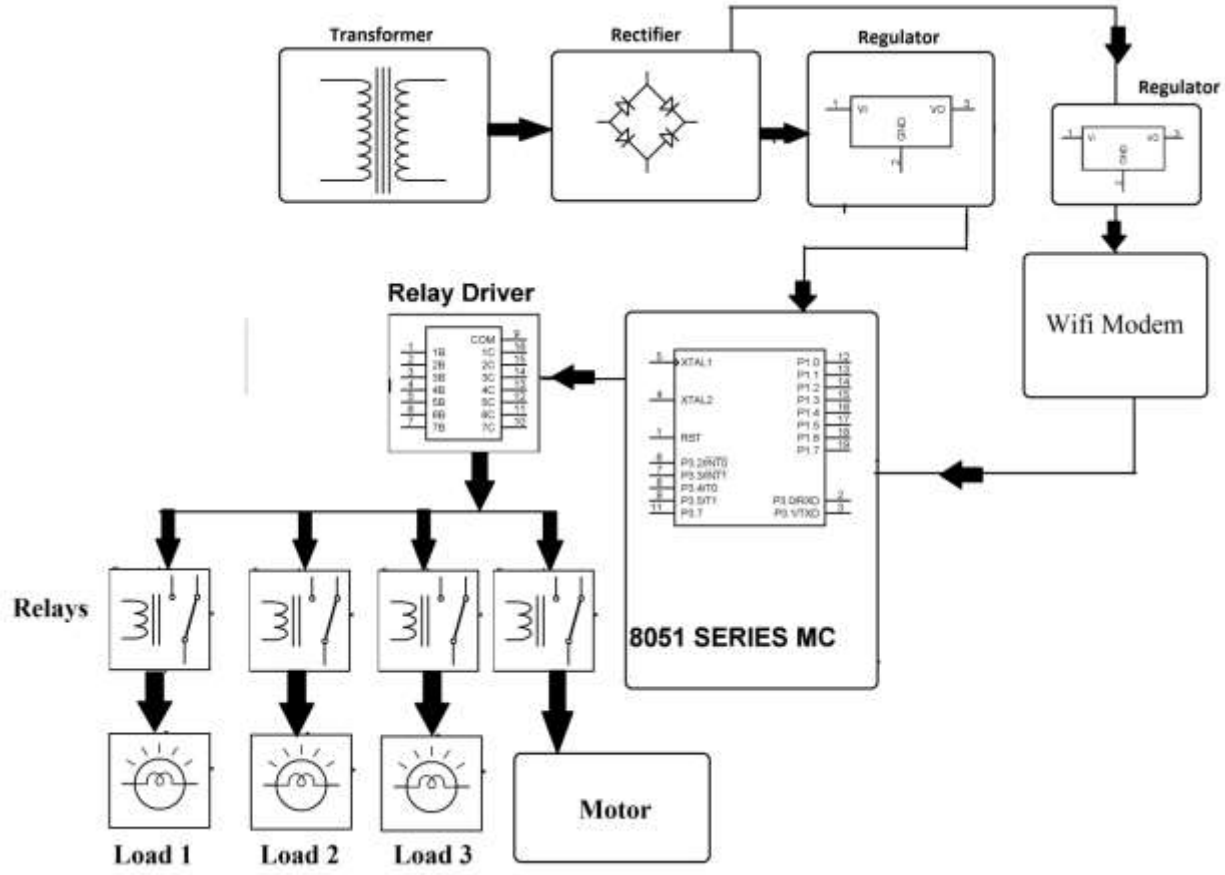
IOT Industry Automation

IOT or internet of things is a technology that deals with bringing control of physical devices over the internet. Here we propose efficient industry automation system that allows user to efficiently control industry appliances/machines over the internet. For demonstration of this system we use 3 loads as industrial appliances or machines and a motor to demonstrate as an industrial motor.

Our system uses an AVR family microcontroller for processing all user commands. A WIFI modem is used to connect to the internet and receive user commands. On sending commands through the internet they are first received by our WIFI modem. The modem decodes information and passes it to the microcontroller for further processing. The microcontroller then switches loads and operates the motors as per Receivers commands. Also it displays the system state on an LCD display. Thus we automate entire industry using online GUI for easy industry automation.

Block Diagram:



Hardware Specifications

- 8051 series Microcontroller
- Wifi Modem
- Diodes
- Transformer
- Relays
- Voltage Regulator
- Crystal
- Loads
- LED
- Relay Driver IC

Software Specifications

- Keil µVision IDE
- MC Programming Language: Embedded C

WIFI Modem:

The ESP8266 WiFi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module comes pre-programmed with an AT command set firmware. The ESP8266 module is an extremely cost effective board with a huge, and ever growing, community.

This module has a powerful enough on-board processing and storage capability that allows it to be integrated with the sensors and other application specific devices through its GPIOs with minimal development up-front and minimal loading during runtime. Its high degree of on-chip integration allows for minimal external circuitry, including the front-end module, is designed to occupy minimal PCB area. The ESP8266 supports APSD for VoIP applications and Bluetooth co-existance interfaces,

it contains a self-calibrated RF allowing it to work under all operating conditions, and requires no external RF parts.

There is an almost limitless fountain of information available for the ESP8266, all of which has been provided by amazing community support. In the Documents section below you will find many resources to aid you in using the ESP8266, even instructions on how to transforming this module into an IoT (Internet of Things) solution!

Note: The ESP8266 Module is not capable of 5-3V logic shifting and will require an external Logic Level Converter. Please do not power it directly from your 5V dev board.

Features:

802.11 b/g/n

Wi-Fi Direct (P2P), soft-AP

Integrated TCP/IP protocol stack

Integrated TR switch, balun, LNA, power amplifier and matching network

Integrated PLLs, regulators, DCXO and power management units

+19.5dBm output power in 802.11b mode

Power down leakage current of <10uA

1MB Flash Memory

Integrated low power 32-bit CPU could be used as application processor

SDIO 1.1 / 2.0, SPI, UART

STBC, 1×1 MIMO, 2×1 MIMO

A-MPDU & A-MSDU aggregation & 0.4ms guard interval

Wake up and transmit packets in < 2ms

Standby power consumption of < 1.0mW (DTIM3)

Reference

- http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=7274681&queryText=iot%20industry&newsearch=true