



Wireless Petroleum Tank and Field Monitoring Using GSM Technology

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ABSTRACT: This project is used to monitor the multiple remote petroleum oilfield banks status by using wireless communication based on embedded technology. In our project designed for to provide the wireless security for remote multiple petroleum banks by using compact embedded security sensors. Here we have to use multiple sensors to monitor the petroleum bank status like wireless oil well shutdown alarm, oil well power failure alarm, oil well running, oil theft and some wireless night patrol point are used to provide the security of this each petroleum bank. This project split into two sections to provide the automation of wireless security system. One is that wireless remote transmitter section and another one is that wireless central monitoring system. This transmitter section was placed on each remote petrol bank and the receiver central unit was placed on central monitoring area. This wireless transmitter section was contain wireless oil well shutdown alarm, oil well power failure alarm, oil well running, and oil theft checking alarm and wireless night patrol point also.

KEYWORDS: Security management system, Wireless communication, Embedded construction

I. INTRODUCTION

Using wireless and embedded technologies, a security managing system is designed, which can be used for both areas of guard against theft and night patrol. This project contain two level scheme, the first level is consist of a some remote controllers, which include wireless oil well shutdown alarm, oil well power failure alarm, oil well running and oil theft alarm and some wireless night patrol point. It can send message by the wireless transmitter. The second level is consisting of a wireless receiver and a wireless alarm controller in the system. The function of a wireless receiver can receive the information of some front-end remote transmitters.

II. AIM OF PRESENT INVESTIGATION

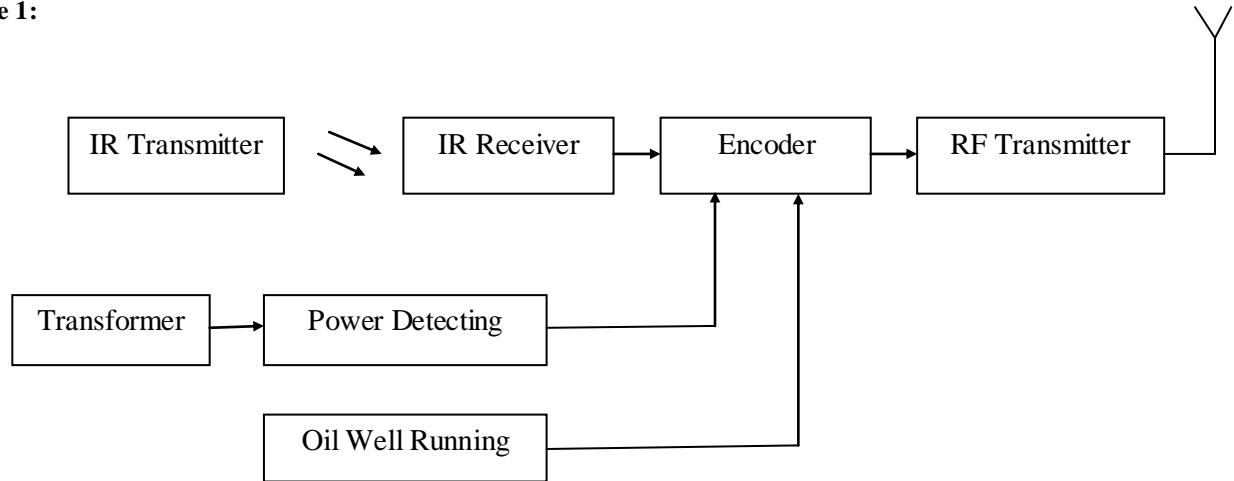
A. Aim of the project

This project is to monitor the oil well shutdown, oil well power failure, oil well good running and oil theft. If any instruction is detected, the message sends to the authority person using GSM technology and finally inform to voice alarm.

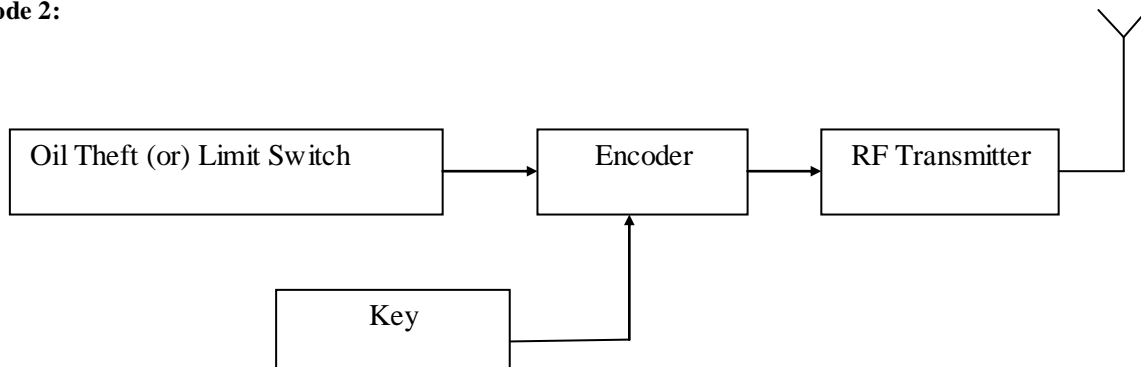
B. BLOCK DIAGRAM

RF Transmitter :

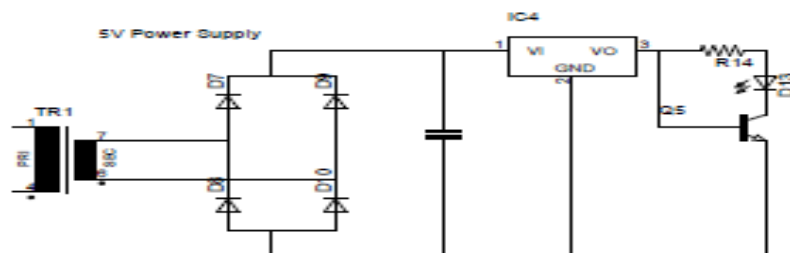
Node 1:



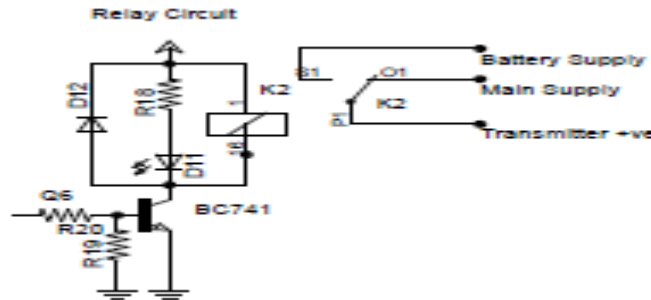
Node 2:



C. POWER DETECTING CIRCUIT



D. RELAY CIRCUIT



A relay is an electrically operated switch. Many relays use an electromagnet to operate a switching mechanism mechanically, but other operating principles are also used. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal.

E. BATTERY

A nine-volt battery, also called a pp3 battery, is shaped as a rounded rectangular prism and has a nominal output of nine volts. Its nominal dimensions are 48 mm × 25 mm × 15 mm. 9v batteries are commonly used in pocket transistor radios, smoke detectors, carbon monoxide alarms, guitar effect units, and radio-controlled vehicle controllers.

II. TRANSMITTING SECTION

A. POWER SUPPLY CIRCUIT

The ac voltage, typically 220v rms, is connected to a transformer, which steps that ac voltage down to the level of the desired dc output. A diode rectifier then provides a full-wave rectified voltage that is initially filtered by a simple capacitor filter to produce a dc voltage. This resulting dc voltage usually has some ripple or ac voltage variation. A regulator circuit removes the ripples and also remains the same dc value even if the input dc voltage varies, or the load connected to the output dc voltage changes. This voltage regulation is usually obtained using one of the popular voltage regulator IC units.

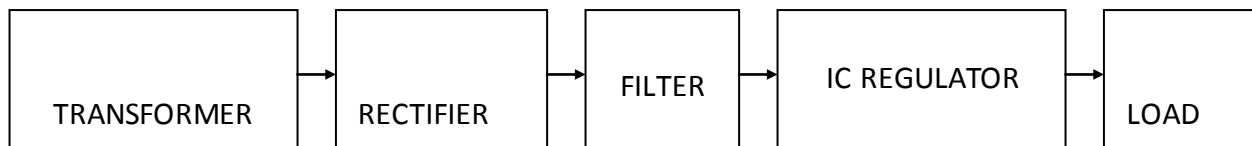
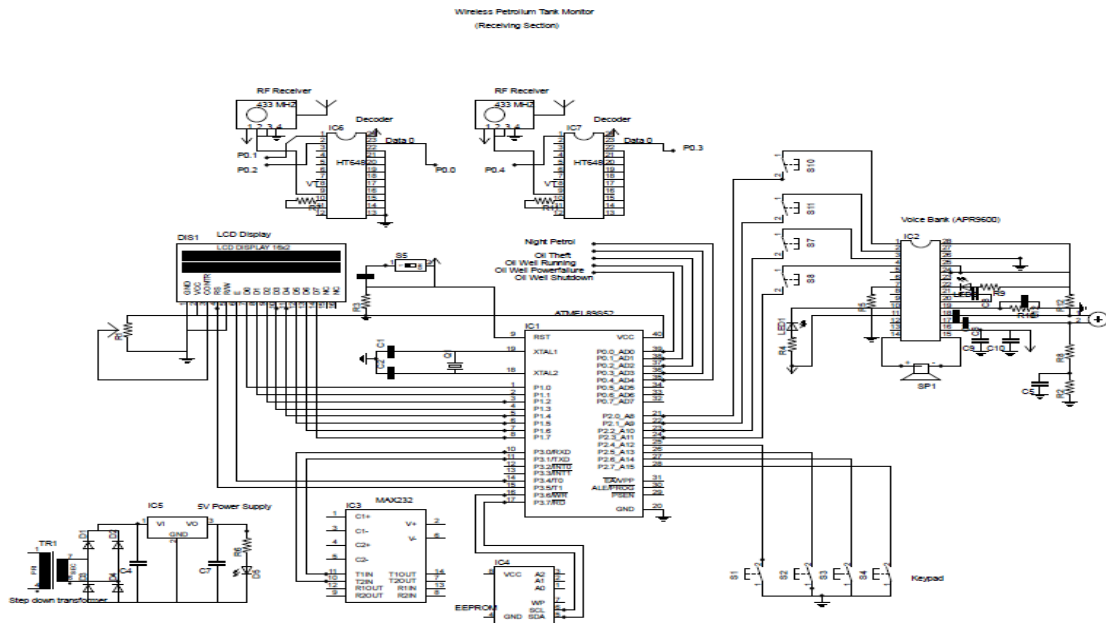
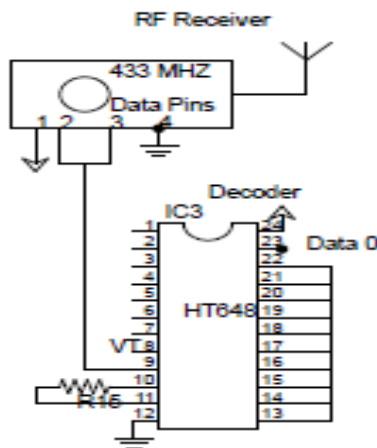


Figure2.5: block diagram (power supply)

V. RECEIVING SECTION



A. RF RECEIVER HT648 RF RECEIVER



B. General description:

The 318 decoders are a series of cmos lsis for remote control system applications. They are paired with the 318 series of encoders. For proper operation a pair of encoder/decoder pair with the same number of address and data format should be selected (refer to the encoder/decoder cross reference tables).



International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 9, September 2014

III. AT89S52 MICROCONTROLLER

A. Description:

The at89s52 is a low-power, high-performance cmos 8-bit microcontroller with 8k bytes of in-system programmable flash memory. The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the Indus-try-standard 80c51 instruction set and pinout.

IV. GSM MODEM

Features of SIM300 Module – Designed for global market, SIM300 is a Tri-band GSM/GPRS engine

- Works on frequencies EGSM 900 MHz, DCS 1800 MHz and PCS 1900 MHz.
- CS-1, CS-2, CS-3 and CS-4. With a tiny configuration of 40mm x 33mm x 2.85mm ,
- SIM300 can fit almost all the space requirements in your applications,
- such as smart phone, PDA phone and other mobile devices

V. RS232 SERIAL COMMUNICATION

A. RS-232 BASICS

RS-232 (recommended standard 232) is a standard for serial binary data signals connecting between a dte (data terminal equipment) and a dce (data circuit-terminating equipment). The rs-232 standard defines the voltage levels that correspond to logical one and logical zero levels. Valid signals are plus or minus 3 to 25 volts. The range near zero volts is not a valid rs-232 level; logic one is defined as a negative voltage, the signal condition is called marking, and has the functional significance of off. Logic zero is positive; the signal condition is spacing, and has the function on. So a logic zero represented as +3v to +25v and logic one represented as -3v to -25

VI. LIQUID CRYSTAL DISPLAY

A liquid crystal display (lcd) is a thin, flat panel used for electronically displaying information such as text, images, and moving pictures. Its uses include monitors for computers, televisions, instrument panels, and other devices ranging from aircraft cockpit displays, to every-day consumer devices such as video players, gaming devices, clocks, watches, calculators, and telephones. Among its major features are its lightweight construction, its portability, and its ability to be produced in much larger screen sizes than are practical for the construction of cathode ray tube (crt) display technology. Its low electrical power consumption enables it to be used in battery-powered electronic equipment

VII. CONCLUSION

The project work has been completed successfully. The project work functions satisfactorily as per the design. The project work was developed after conducting a number of experiments before finalizing the design work, this reduced the bottle necks and we did not face much difficulty in the final integration process. In general the entire development of the project work was educative and we could gain a lot of experience by way of doing the project practically. We could understand the practical constraints of developing such systems about which we have studied by way of lectures in the theory classes. It was satisfying to see so many theoretical aspects work before us in real life practice of which we have heard through lectures and of which we have studied in the books.

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