HOME AUTOMATION SYSTEM USING A/D CONVERTER AND RELAY SWITCH

Home automation or ***domotics*** is building automation for a home, called a **smart home** or **smart house**. A home automation system will control lighting, climate, entertainment systems, and appliances. It may also include home security such as access control and alarm systems. When connected with the Internet, home devices are an important constituent of the Internet of Things.

A home automation system typically connects controlled devices to a central hub or "gateway". The user interface for control of the system uses either wall-mounted terminals, tablet or desktop computers, a mobile phone application, or a Web interface, that may also be accessible off-site through the Internet.

While there are many competing vendors, there are very few worldwide accepted industry standards and the smart home space is heavily fragmented. Manufacturers often prevent independent implementations by withholding documentation and by litigation.

The home automation market was worth US$5.77 billion in 2013, predicted to reach a market value of US$12.81 billion by the year 2020.

Why do we need Analog to Digital converters?

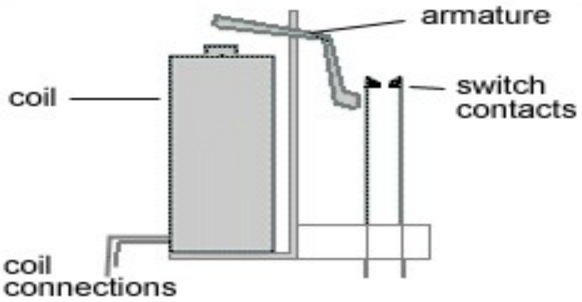
In the real world, most data is characterized by analog signals. In order to manipulate the data using a microprocessor, we need to convert the analog signals to the digital signals, so that the microprocessor will be able to read, understand and manipulate the data.

How does an A/D Converter work?

The main goal of A/D Converter is to digitize the analog signals, which means to record and store the analog signals in NUMBERS. There are two parameters to control in converting the analog signals to the digital signals:

What is a relay and why do we need Relay?

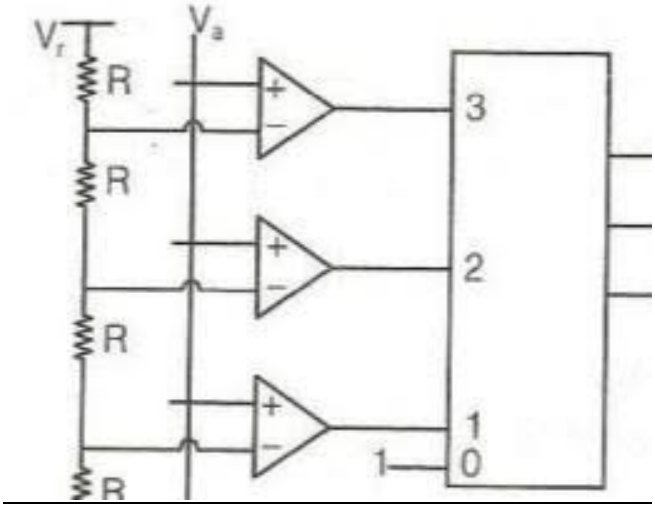
A relay is a special type of switch turned on and off by an electromagnet (see the diagram of a simple relay). When a current flows through the coil an electro-magnetic field is set up. The field attracts an iron armature, whose other end pushes the contacts together, completing the circuit. When the current is switched off, the contacts open again, switching the circuit off.



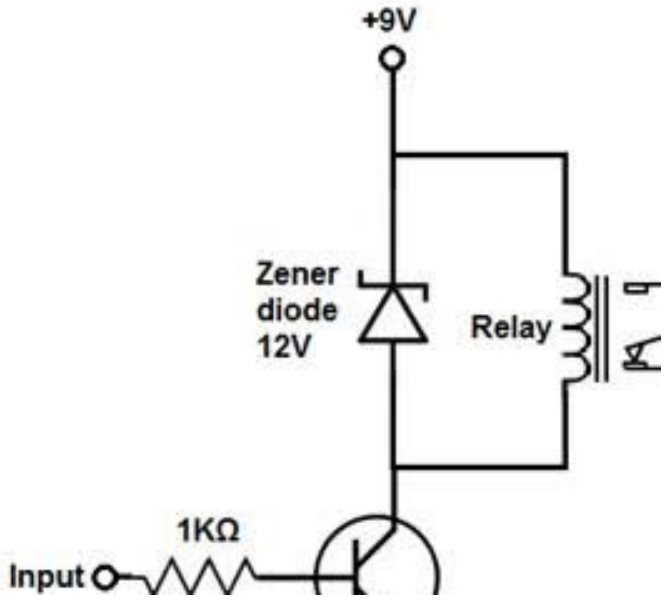
A **useful property of relays** is that the circuit powering the coil is completely separate from the circuit switched on by the relay. For this reason relays are used where a safe low-voltage circuit controls a high-voltage circuit.

CIRCUIT DIAGRAM

- **2-bit Flash ADC**



- **Relay Circuit**



COMPONENTS REQUIRED:

1. **OpAmp UA741**
2. **D Flip Flop(SN74LS74AN)**
3. **AND Gate(74HC08)**
4. **NOT Gate(74LS04)**
5. **OR Gate(74LS32)**
6. **1kΩ Resistor,9.1kΩ Resistor and 5.1kΩ Resistor**
7. **Battery(1.5V and 9V)**
8. **Decoder(**
9. **LED**
10. **Connecting Wires**
11. **Printed Circuit Board**
12. **Relay Board**
13. **Jumper female-female Connector**