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# Abstract :

In this task we are choosing a station, which in our case is the feeding station which feeds the project with parts , then we apply what we learned in the hydraulic and pneumatic systems in order to make this station depend on hydraulic or pneumatic system instead of an electric motor .

We used a pneumatic actuator for the feeding station where it detects the parts using an ir sensor and if the signal was high then the microcontroller sends a signal to the valve in order for the cylinder to push the parts therefore feeding the parts to the project then the actuating cylinder returns to its initial state after 1 second .



*Figure 1 : Project*

# Introduction :

Pneumatics is the science and technology of pressurized air—using piped, compressed air (or a similar gas, such as nitrogen) to transmit force and energy.

So a pneumatic drill (or jackhammer) can blast the pavement apart with a metal chisel pumped up and down by compressed air feeding in from a hose, while a robot paint machine uses compressed air to make an even spray across something like a car body.

As we'll see shortly, pneumatics is similar to hydraulics, where we use water (or another liquid) to transmit force and energy in something like a bulldozer or a crane; both are examples of fluid power, but where hydraulics uses liquid, pneumatics uses gas.

Pneumatic machines need five basic components to make, store, control, move, and use compressed air:

1. A compressor—makes air.
2. A reservoir (or receiver)—stores air.
3. One or more valves—control air.
4. A circuit—moves air between the other components.
5. An actuator or motor—uses air to do something.

# Schematic :

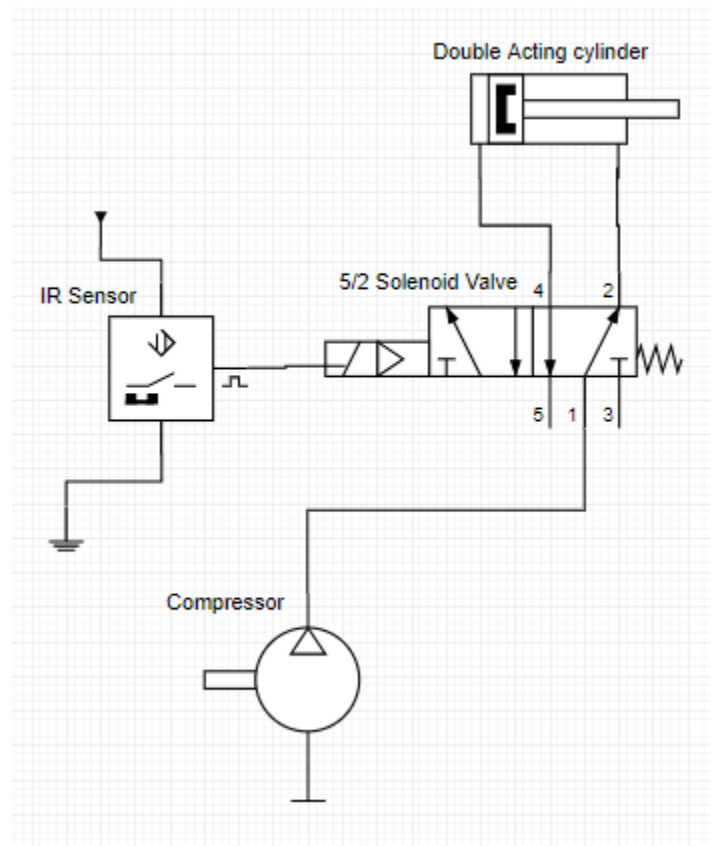


Figure 2 : Schematic

The circuit is simple , When the IR sensor Detect the part, it will send a signal for the valve to open Then the cylinder will actuate forward then after 1 second the Valve will close leading to returning the cylinder to its initial position.

# Components :

## 5/2 Solenoid Valve :

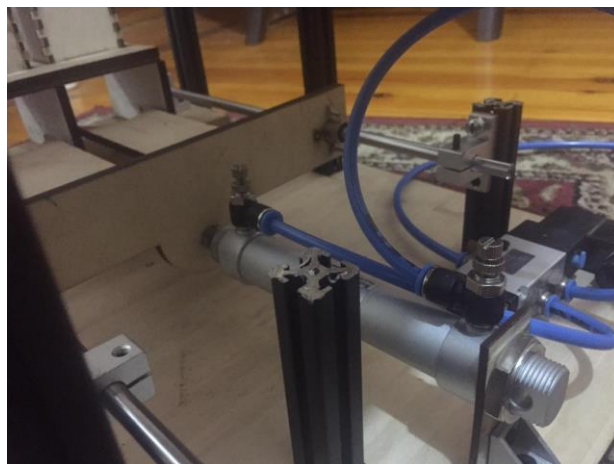
We used a solenoid valve to be able to actuate the cylinder using digital signals ,we chose the 5/2 valve in order to make the cylinder double acting cylinder



*Figure 3 : Valve*

## Pneumatic Cylinder :

We used a double acting cylinder as our actuator with a stroke 75 mm and we made the connections using tubes



*Figure 4 : Pneumatic Cylinder*

# Summary :

Summary of this project is that we used a double acting cylinder to push the parts when they are detected by the IR sensor .

The IR sensor is connected to a controller which transmits the signal to the valve by using a relay .

We used a 5/2 solenoid valve to be able to actuate the cylinder .

The compressor unit is used to provide air to the whole system .