

Experiment 8

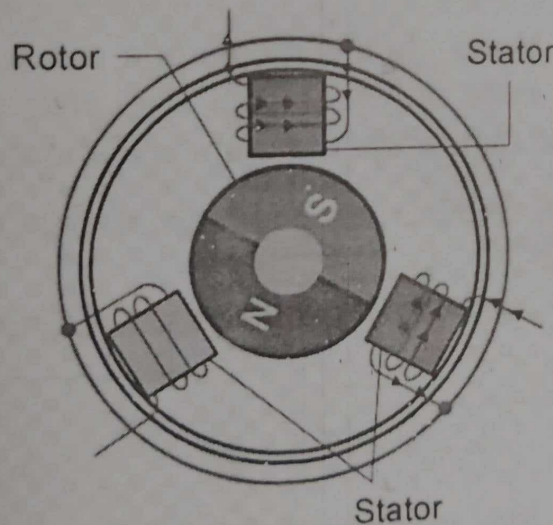
Aim :

Interfacing stepper motor with 8051 microcontroller.

Theory :

1. Stepper Motor :

Stepper motors are used to translate electrical pulses into mechanical movements. In some disk drives, dot matrix printers, and some other different places the stepper motors are used. The main advantage of using the stepper motor is the position control. Stepper motors generally have a permanent magnet shaft (rotor), and it is surrounded by a stator.



Normal motor shafts can move freely but the stepper motor shafts move in fixed repeatable increments.

2. Some parameters of stepper motors :

- **Step Angle** : The step angle is the angle in which the rotor moves when one pulse is applied as an input of the stator. This parameter is used to determine the positioning of a stepper motor.
- **Steps per Revolution** : This is the number of step angles required for a complete revolution. So, the formula is $360^\circ / \text{Step Angle}$.

• Program :

```
#include <reg51.h>
```

```
sbit start = P2^0;
```

```
sbit stop = P2^4;
```

```
sbit m1 = P1^4;
```

```
sbit m2 = P1^5;
```

```
sbit m3 = P1^6;
```

```
sbit m4 = P1^7;
```

```
sbit en1 = P1^0;
```

```
sbit en2 = P1^1;
```

```
unsigned delay (unsigned int t);
```

```
unsigned int run, aa, bb;
```

```
void main ()
```

```
{
```

```
    P1 = 0x00;
```

```
    P2 = 0xFF;
```

```
    en1 = 0;
```

```
    en2 = 0;
```

```
    run = 0;
```

```
    while (1)
```

```
    {
```

```
        aa = start;
```

```
        bb = stop;
```

```
        if (aa == 0 && run == 0)
```

```
        {
```

```
            en1 = 1;
```

```
            en2 = 1;
```

```
            run = 1;
```

```
        }
```