

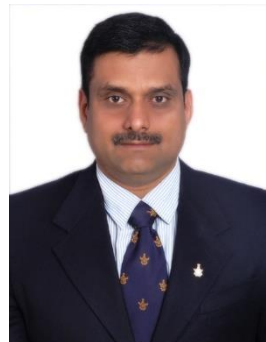


Microprocessors and Interfaces: 2021-22

Lab 9

Program to Control Stepper Motor

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STEPPER MOTOR



8086 EMU STEPPER MOTOR

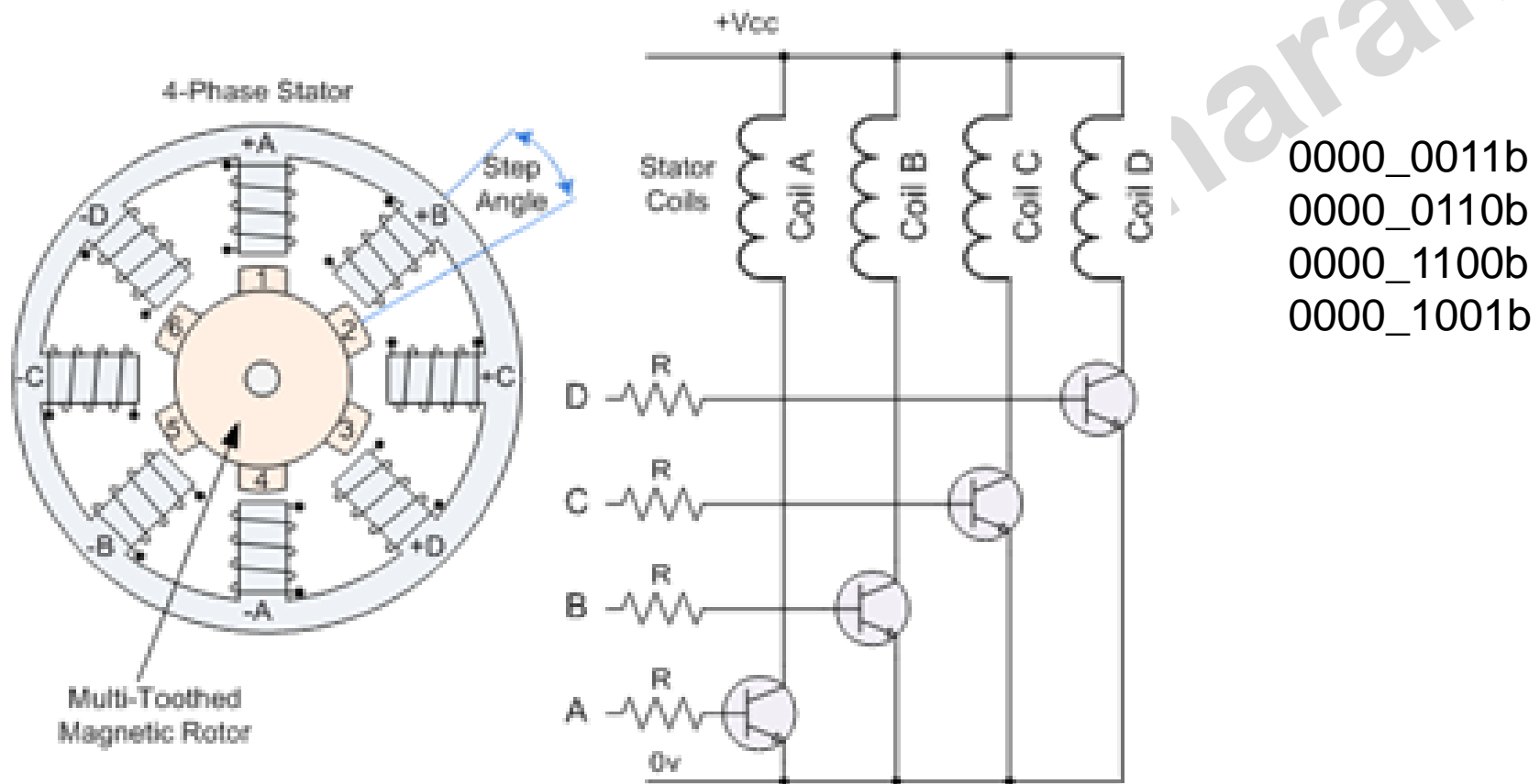


Figure 1: Variable Reluctance

9.1 Stepper Motor Operation : Clockwise rotation

```
#start=stepper_motor.exe#
```

```
jmp start
```

```
datain db 0000_0011b  
        db 0000_0110b  
        db 0000_1100b  
        db 0000_1001b
```

Initializes the virtual stepper motor

Data for clockwise rotation (8-bit format)

```
START:  MOV BX, offset datain
```

```
        MOV SI,0h
```

```
NEXT_STEP:
```

```
WAIT:  IN AL,07H
```

```
        TEST AL,10000000b
```

```
        JZ WAIT
```

```
        MOV AL,[BX][SI]
```

```
        OUT 7,AL
```

```
        INC SI
```

```
        CMP SI,4
```

```
        JC NEXT_STEP
```

```
        MOV SI,0
```

```
        JMP NEXT_STEP
```

Calculates the offset of the initialized data

Loads the default content of stepper motor

Tests if the stepper motor ready or not

Loads the first data in AL

Loads the data into stepper motor

Increase SI for next data

Compare the value of SI with 4 data in 'datain'. If equal load 0 to SI and keep the loop running. If not equal complete the operation for first 4 data.

9.1 Stepper Motor Operation : Clockwise rotation

```
START: MOV BX, offset datain
MOV SI,0h
NEXT_STEP:
WAIT: IN AL,07H
TEST AL,10000000b
JZ WAIT
MOV AL,[BX][SI]
OUT 7,AL
Call Delay
INC SI
CMP SI,4
JC NEXT_STEP
MOV SI,0
JMP NEXT_STEP
ret
```

```
Delay PROC
MOV DX, 0FFh
Loop: DEC DX
NOP                (ADD DX,0h)
JNZ Loop
RET
Delay ENDP
END
```

9.1 Stepper Motor Operation : Clockwise rotation

Rotate left

```
0011_0011  
0110_0110  
1100_1100  
1001-1001  
0011-0011
```

```
org 100h  
#start=stepper_motor.exe#
```

```
START: MOV AL, 00110011b  
AGAIN: OUT 7h, AL  
ROL AL , 01h  
JMP AGAIN  
ret
```

9.2 Stepper Motor Operation : Anti-Clockwise rotation

- (a) With Data Dumping
- (b) Rotate with Delay

Thankyou

Sanjay Vidnyadhharan