



Stepper Motor Driver

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This application may be used as a standalone or as a part of a bigger application. As a standalone application, it may be used to drive the blinds in a window.

APPLICATION OPERATION:

This application describes the way to drive a stepper motor. The stepper motor is characterized with a number of steps per 360 degrees, number of phases (2 or 4), etc. There are different types of stepper motors - 100 steps/rad, 200 steps/rad, etc., but they can be driven by one way. This application drives a 4 phase stepper motor and needs 5 interface connections. One of the connections is the common power lead which is tied to +5V. The other four are the signal connections.

You should note that only one of the A or B connections are driven at a time (fig. 1):

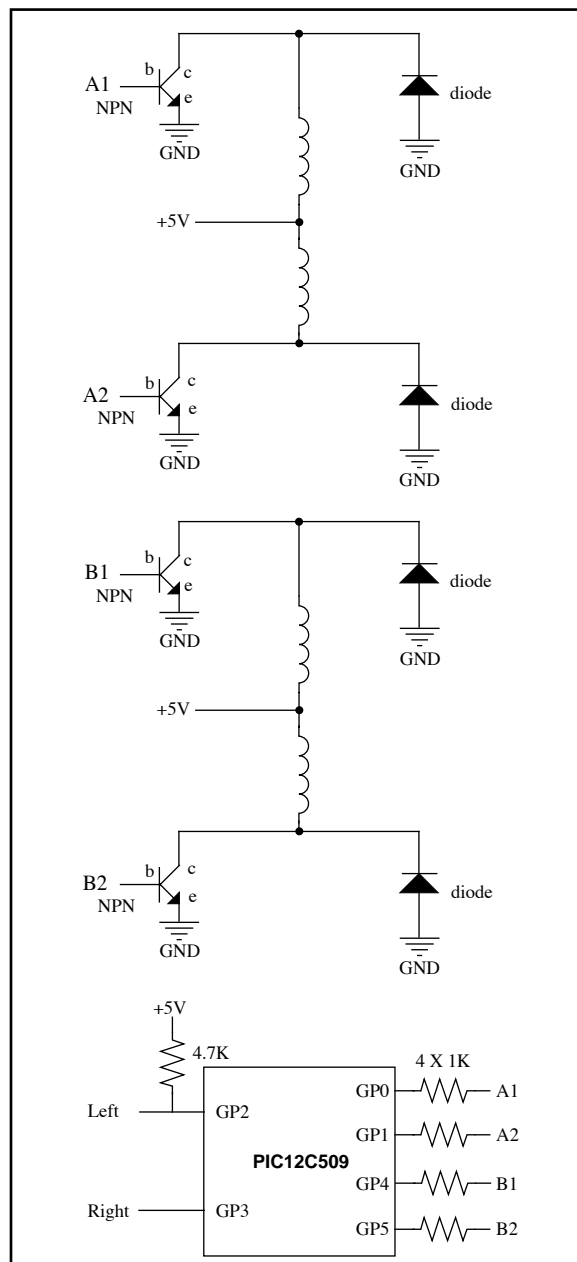
Step	A1	A2	B1	B2
1	0	1	0	1
2	0	1	1	0
3	1	0	1	0
4	1	0	0	1
1	0	1	0	1

To drive the stepper motor in one direction, you should place the above values to the pins of the PIC12C508 in the shown sequence(1,2,3,4,1,...). To drive the stepper motor in the reverse direction, you should place the values in reverse order (4,3,2,1,4, ...).

The program tests every 2 ms if there is a 0 on GP2 or GP3, and if so, a step left or step right is made. The right pin has higher priority than the left pin. This means that if the two pins have value 0, the stepper motor will go right.

The pins right and left can be driven by another logic element or by switches. If they are driven by logics, the pull-up resistor (4.7K) may not be used.

Graphical Hardware Representation:



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APPENDIX A: SOURCE CODE

```
;*****
;
; STEPDRV.ASM
;
;*****
LIST p=12C508

#include "inc\p12c508.inc"

__config _WDT_OFF & _IntRC_OSC & _MCLRE_OFF & _CP_OFF

RAM equ 0x07 ;Begining of RAM

Left equ 2
Right equ 3

cblock RAM
Step
endc

org 0x00

movwf OSCCAL ;calibrating the internal oscillator

clrf GPIO

movlw B'00001100'
TRIS GPIO

movlw B'10010011' ;wake up on pin change disabled
OPTION ;pullups enabled
;tmr0 / 16

clrf Step
clrf TMR0
goto main

;The table gives the values that are required for each step

Table
addwf PCL,f
retlw b'00100001'
retlw b'00100010'
retlw b'00010010'
retlw b'00010001'

main
btfss TMR0,7 ;this gives delay for 2.048 ms
goto $-1

clrf TMR0

RightLabel

btfsc GPIO,Right ;if Right=0 , step right
goto LeftLabel ;else goto LeftLabel
incf Step,f
movlw .4 ;if step is greater than 3 then step=0
subwf Step,w
btfsc STATUS,C
clrf Step
movf Step,W
call Table
```

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```
movwf    GPIO
goto     main

LeftLabel
btfsc   GPIO,Left    ;if Left=0 , step left
goto    main         ;else goto main

decf    Step,f
movlw   .3
btfsc   Step,7       ;if step is less than 0 then step=3;
movwf   Step
movf    Step,W
call    Table
movwf   GPIO
goto    main

end
```

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NOTES: