PICDEM™ Mechatronics Demo Board
Quick Start Guide

The PICDEM Mechatronics Demo Board is programmed at the factory with a demonstration program. The board must be configured as described in this chapter in order to use the demonstration program. Once the board is configured and powered up, the speed of the Brushed DC (BDC) motor on the board may be varied using the potentiometer (POT1). The 8-bit hexadecimal interpretation of the position of POT1 is displayed on the LCD.

Board Setup

Using the provided wire jumpers, screwdriver and shunts (2-pin black hard plastic jumpers), configure the board as shown in the Quick Board Setup Schematic.

1. Attach the leads of the brushed DC motor to Drive 1 and Drive 2 using the screwdriver.
2. Connect POT1 (on J4) to C1- (on J13) using a wire jumper.
3. Connect P1 (on J1) to RD7 (on J10) using a wire jumper.
4. Connect N2 (on J1) to RD2/CCP2 (on J10) using a wire jumper.
5. Connect +5 VDC to the center pin on JP8 using a shunt.

Board Power-Up

Supply power to the board in one of the following ways:

- Connect a 9-12 VDC (0.75 amp minimum) supply using J9 (see note below)
- Connect a 9-12 VDC (0.75 amp minimum) supply to the P21 and P20 screw terminals.
- Connect a 9 VDC battery to the battery connector.
- Connect a 5 VDC (1.2 amp minimum) supply to TP2 and TP3.

Demonstration Program

Press **CLR FAULT** (SW5), which is near the bottom right corner of the board. Turn POT1 clockwise to increase the speed of the motor. Note that the number displayed on the LCD increases as you turn the potentiometer clockwise.

Try experimenting with the other sensors on the board:

- Move the jumper wire on POT1 (J4) to Light (J4). Vary the intensity of light shining on the light sensor located near the top left corner of the board. Notice what happens to the motor.
- Move the same jumper wire to TEMP (J4). Blow on the temperature sensor located on the top left corner of the board. Note what happens to the number displayed on the LCD.
- Move the jumper wire back to POT1. Move the jumper wire from N2 (J1) to D0 (J14). Watch what happens to the intensity of LED D0 as you turn the potentiometer.
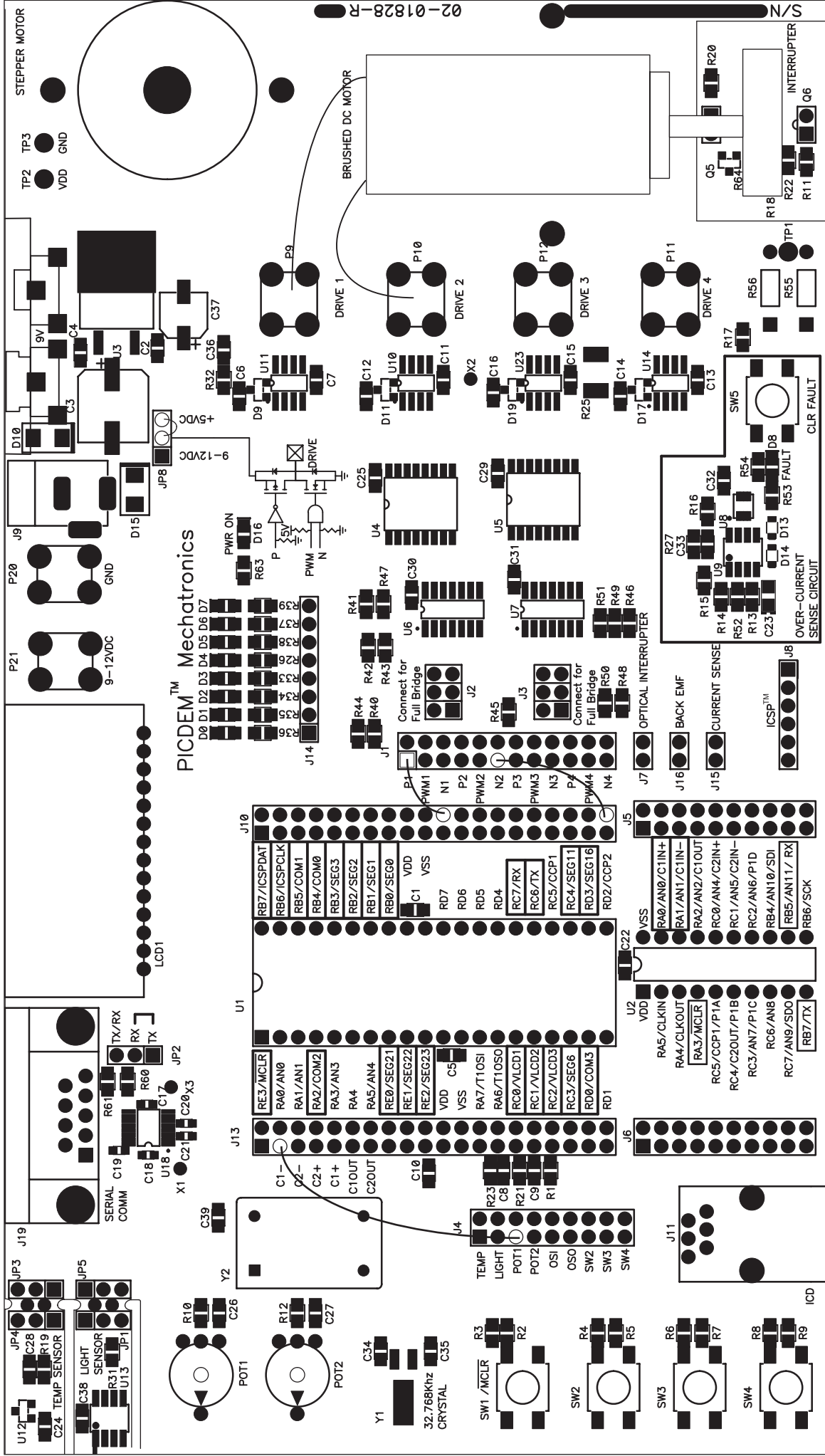

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DS51562B

STEPPER MOTOR

TP3 GND
TP2 VDD

02-01828-R

S/N

BRUSHED DC MOTOR

INTERRUPTER
Q6
R20
Q5
R64
R18 R22 R11

P9 DRIVE 1
P10 DRIVE 2
P12 DRIVE 3
P11 DRIVE 4

TP1
R56 R55
R17

9V
C4 C2 C37
U3
C3
D10
D15

JP8
+5VDC
9-12VDC

C36 C6 U11 C7
R32 D9
C12 U10 C11 X2
D11
C16 U23 C15
D19 R25
C14 U14 C13
D17

SW5
CLR FAULT

D8
R54
R53 FAULT
C32
R16
U8 D13
R27 C33
U9
D14
OVER-CURRENT
SENSE CIRCUIT
R15 R14 R52 R13 C23

PICDEM™ Mechatronics

PWR ON
D16
R63 P
PWM N

C25
U4
C29
U5

C30
R41 R47
C31
U6
U7
R51 R49 R46

Connect for
Full Bridge
J2

R44 R42 R43
R45
J3
Connect for
Full Bridge
R50 R48

OPTICAL INTERRUPTER
BACK EMF
CURRENT SENSE
ICSP™
J8

PWR ON
D0 D1 D2 D3 D4 D5 D6 D7
R39 R37 R38 R26 R34 R35 R36
J14

R44 R40
J1

PWM1 N1
PWM2 N2
PWM3 N3
PWM4 N4
P1 P2 P3 P4

J10

J5

J7 J16 J15

RB7/ICSPDAT
RB6/ICSPCLK
RB5/COM1
RB4/COM0
RB3/SEG3
RB2/SEG2
RB1/SEG1
RB0/SEG0
VDD
VSS
RD7
RD6
RD5
RD4
RC7/RX
RC6/TX
RC5/CCP1
RC4/SEG11
RD3/SEG16
RD2/CCP2

C1

VSS
RA0/AN0/C1IN+
RA1/AN1/C1IN-
RA2/AN2/C1OUT
RC0/AN4/C2IN+
RC1/AN5/C2IN-
RC2/AN6/P1D
RB4/AN10/SDI
RB5/AN11/RX
RB6/SCK

U1

U2
C22
VDD
RA5/CLKIN
RA4/CLKOUT
RA3/MCLR
RC5/CCP1/P1A
RC4/C2OUT/P1B
RC3/AN7/P1C
RC7/AN9/SDO
RB7/TX

RE3/MCLR
RA0/AN0
RA1/AN1
RA2/COM2
RA3/AN3
RA4
RA5/AN4
RE0/SEG21
RE1/SEG22
RE2/SEG23
VDD
VSS
RA7/T1OSI
RA6/T1OSO
RC0/VLCD1
RC1/VLCD2
RC2/VLCD3
RC3/COM3
RD0/COM3
RD1
C5

J13

J6

C10

J4

TEMP
LIGHT
POT1
POT2
OSI
OSO
SW2
SW3
SW4

R23 C8 R21 C9 R1

J11
ICD

LCD1

TX/RX
RX
TX
JP2
R61 R60
C17
C20 X3
C19
C18 U18 C21
X1

SERIAL
COMM
J19

JP3
JP5
JP4 C28 R19
C38 LIGHT SENSOR
R31 JP1
U13
U12
C24 C26
TEMP SENSOR

R10 C26
POT1
R12 C27
POT2

C34
Y1
32.768KHz
CRYSTAL C35

R3 R2
SW1 /MCLR
R4 R5
SW2
R6 R7
SW3
R8 R9
SW4

Y2
C39

P20 GND
P21 9-12VDC
J9

Quick Board Setup Schematic