# ReadMe

1) Install the drivers in the folder "DriverFor ThinkLABS"
   "Setup For HugePine.exe"
   "Hl-340.exe"
   win7 - "PL2303_Prolific_DriverInstaller_v110.exe"
   USBSim9.0 - "Setup.exe"
2) Copy the Provided header[p89v51rx2.h] to "C:\Keil_v5\C51\INC\Philips"
3) Open Keil uVision IDE.
4) Select Project>New uVision Project
5) From the Dropdown menu Select Legacy Device Database
6) Search for P89V51RD2. Select and press OK.
7) Click Yes
8) Right Click 'Target1'. Select Options For Target 'Target1'.
9) GoTo Output Tab. Check 'Create HEX File' tickbox.
10) Expand 'Target1'
11) Right Click 'Source Group 1'.
12) Add New Item to Group 'Source Group 1'.
13) Choose C file. Enter a name click Add.
14) Refer the exemplary code in this folder.
15) Press F7 to build the Code and generate hex file. [Hex File Generated in '/Objects']
16) Connect the USB cable to the PORT.
17) Attach the Power Adapter of the board in the right pin.
18) Press the PowerOn switch on the board.[The Large LED must turn on]
19) Right click on windows button in the bottom left corner.
20) Select Device Manager, Expand 'ports(COM & LPT)', Look at the COM number in the field for device.
21) Launch FlashMagic.
22) Click on Select. Choose 89V51RD2.
23) Choose Appropriate COM Port from step 20.
24) Baud Rate : 9600
    Interface : None(ISP)
    in Firmware section, browse and select your generated HEX file
    in Options make ure only the following are ticked - 'Verify after Programming', 'Prog Clocks Bit'
25) Click on Options>Advanced Options>Harware Config
26) Uncheck use DTR to control RST. Click OK
27) Click on ISP menu
28) Select Read device Signature.
29) When Asked to reset ISP, Press the RESET button on your board. The window will load some value in the fields.
30) Click Close
31) Check "Erase blocks used by Firmware"
32) Click "Start"
33) After the process is finished, Power off the Board using the power button, unplug the USB.
34) Power On the board.

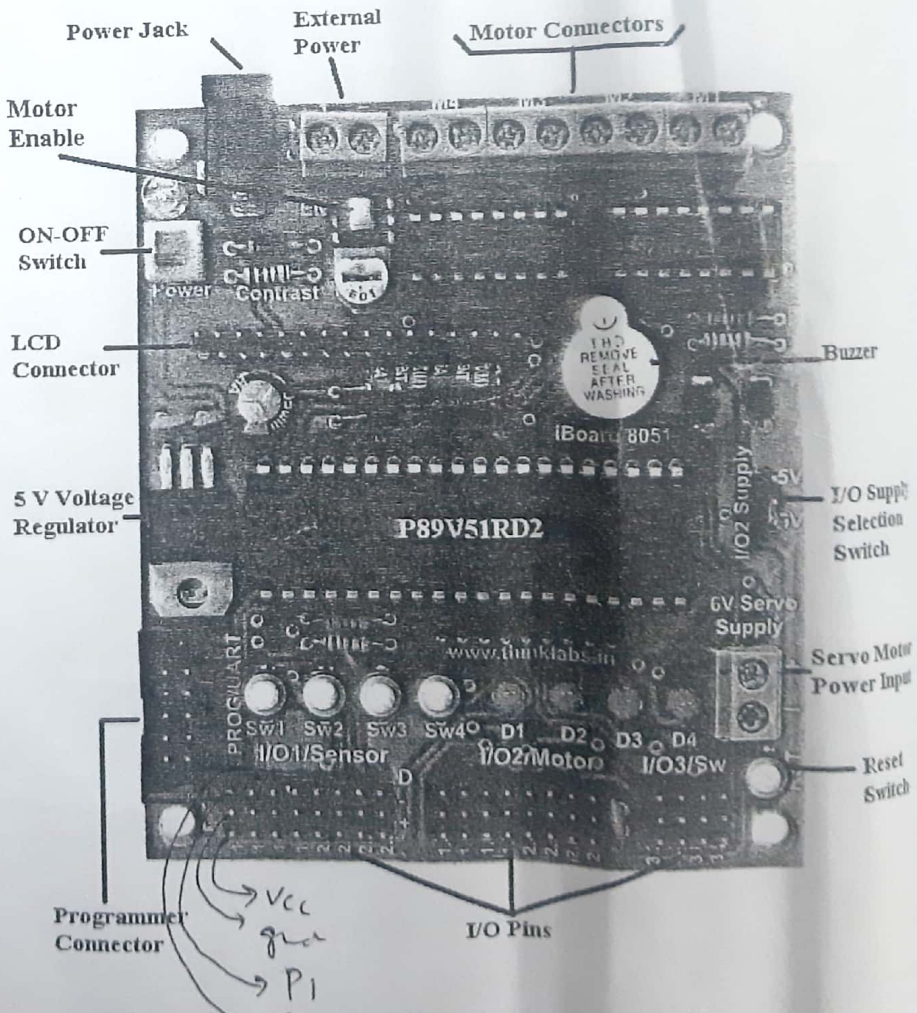
# The iBoard 8051

The iBot 8051 Board is based around the Philips 89V51RD2 microcontroller.

**Features:**

- Built around the popular 89V51RD2 microcontroller with ample of program memory (64Kb)
- 8 channels of motor control, capable of driving 4 dc motors or 2 stepper motors at a time.
- Onboard detachable 16x2 LCD for enhanced interaction.
- 20 digital input channels for sensor interfacing.
- 4 general purpose LEDs and Switches.

**Parts identification:**




Power On Switch: It's a basic push to on - push to off type switch.

IC 7805: It's a three terminal linear 5 volt regulator used to supply the microcontroller and other peripherals.

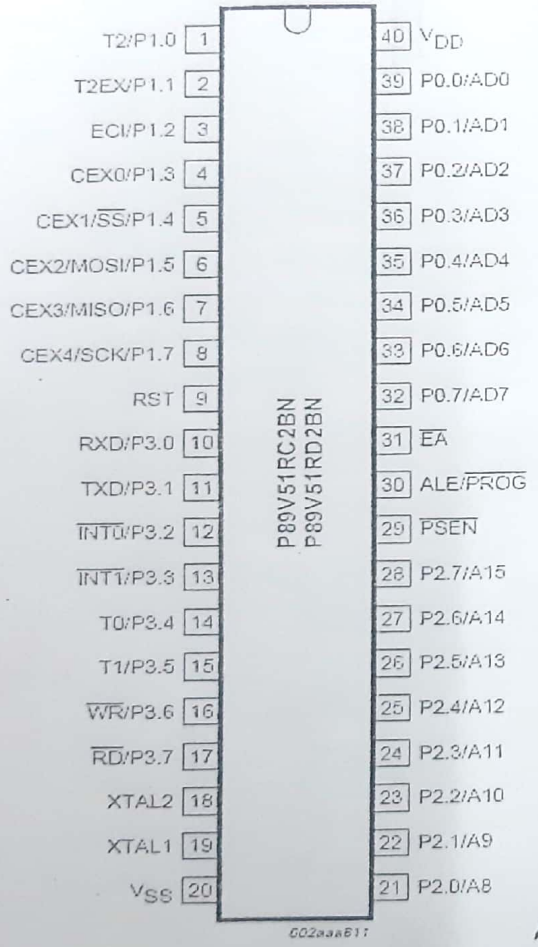
Motor Enable switch: This switch is used to enable/disable the motor driver chips hence in turn enabling/disabling the motors.

Reset Switch: This switch is used to reset the microcontroller.

L293D: It is a 4 channel motor driver with 600mA of current per channel and has inbuilt clamp diodes. The board contains two such chips.

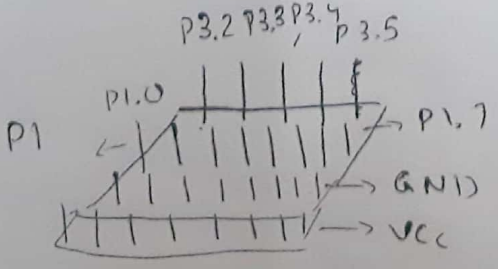
Potentiometer (Pot): The potentiometer is used to vary the contrast of the LCD.

Sensor port: At a time, 20 individual sensor modules can be connected to this port. The port also provides a 5V supply needed drive the sensors.
FRC Connector: This is a 10 pin connector used to connect to the Programmer which connects to the PCs USB port during programming or for general UART communications.
Switch array: Four general purpose switches are connected in the active-low configuration.
Crystal: A crystal sets the microcontroller's clock frequency to 11.0592 MHz.
Beeper: Connected in the active low mode, the beeper can easily be used to get audible feedbacks from the controller.




| Motor Connectors | PORTS |
|---|---|
| M4 | P2.6, P2.7 |
| M3 | P2.4, P2.5 |
| M2 | P1.6, P1.7 |
| M1 | P1.4, P1.5 |
| **Switches** | **(active low)** |
| Sw1 | P3.2 |
| Sw2 | P3.3 |
| Sw3 | P3.4 |
| Sw4 | P3.5 |
| **LEDs** | **(active low)** |
| D1 | P3.0 |
| D2 | P3.1 |
| D3 | P3.6 |
| D4 | P3.7 |
| **LCD** | |
| Data | P0.4 to P0.7 |
| Control pins | P0.0 to P0.2 |
| **ISP** | |
| RXD | P3.0 |
| TXD | P3.1 |
| **Sensor Connectors** | |
| P1.0 to P1.7 | |
| P2.0 to P2.7 | |
| P3.2 to P3.5 | |
| **Misc** | |
| Buzzer | P0.3 |
| Crystal (11.0592Mhz) | Pin 18 and 19 |
| Reset Switch | Pin 9 |

Active low



```
/*Program to blink an LED */

#include<p89v51rd2.h>

 /*we include the necessary header file here which depends on the type of
microcontroller we use. There are separate header files for separate
microcontrollers in SDCC.*/

void delay(unsigned int dela)  /*This a simple delay function using

                                the nested 'for loop'  */

{

      unsigned int i,j;

      for(i=0;i<=1000;i++)

            for(j=0;j<=dela;j++);

}

void main(void)                //main program begins here

{

      while (1)                //since there is no where to return

                               //we put it in an infinite loop

      {

            RXD=0;             //LED 1 is on pin RXD at PORT 3_1, we

                               //turn it ON

            delay (20);        //wait for a short time

            RXD=1;             //turn the LED 1 OFF

            delay(20);         //wait for a short time

       }

}
```