

Driving DC Motor with EAB

Introduction

A 12V DC geared motor can be used for robotics and other related applications. This motor is very easy to use and available in standard size. It comes with nut and threads on shaft and internal threaded shaft for easily connecting it to the chassis's clamp and wheel. The EAB ([Embedded Application Board](#)) can be used to drive such DC Motor with the help of a H-Bridge Circuit.

The H-Bridge Circuit is connected with an external 7V-12V supply. This external power supply is used for powering the DC Motor. The rotation of DC Motor in clockwise or anti-clockwise direction is regulated by EAB through programming. The H-Bridge Circuit powers the DC Motor based on user requirement, which can be done with firmware control.

Components

The Components required for DC Motor Control with [EAB](#)...

- EAB
- DC Motor
- Motor Driver(containing L293D)
- Power Adapter
- Wires and Jumpers



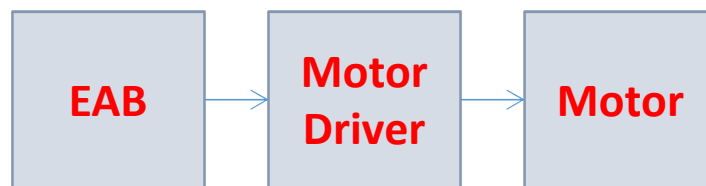
Motor Driver Board

The motor driver board consists of IC L293D. It has 4 inputs and 4 outputs. Since, the current from the EAB is not sufficient enough to drive the motors, so

we have to use this Driver to increase the current by which we can drive the DC Motors.

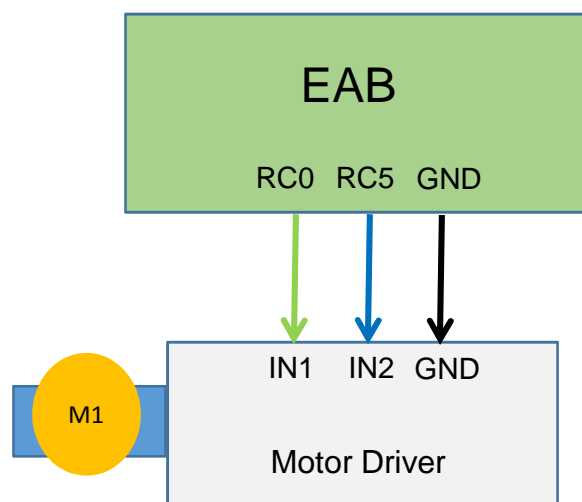
Block Diagram

Block level representation of the different blocks of the DC Motor Control is shown below...



Schematic Diagram

The Schematic diagram illustrates the circuit connections for designing the application.



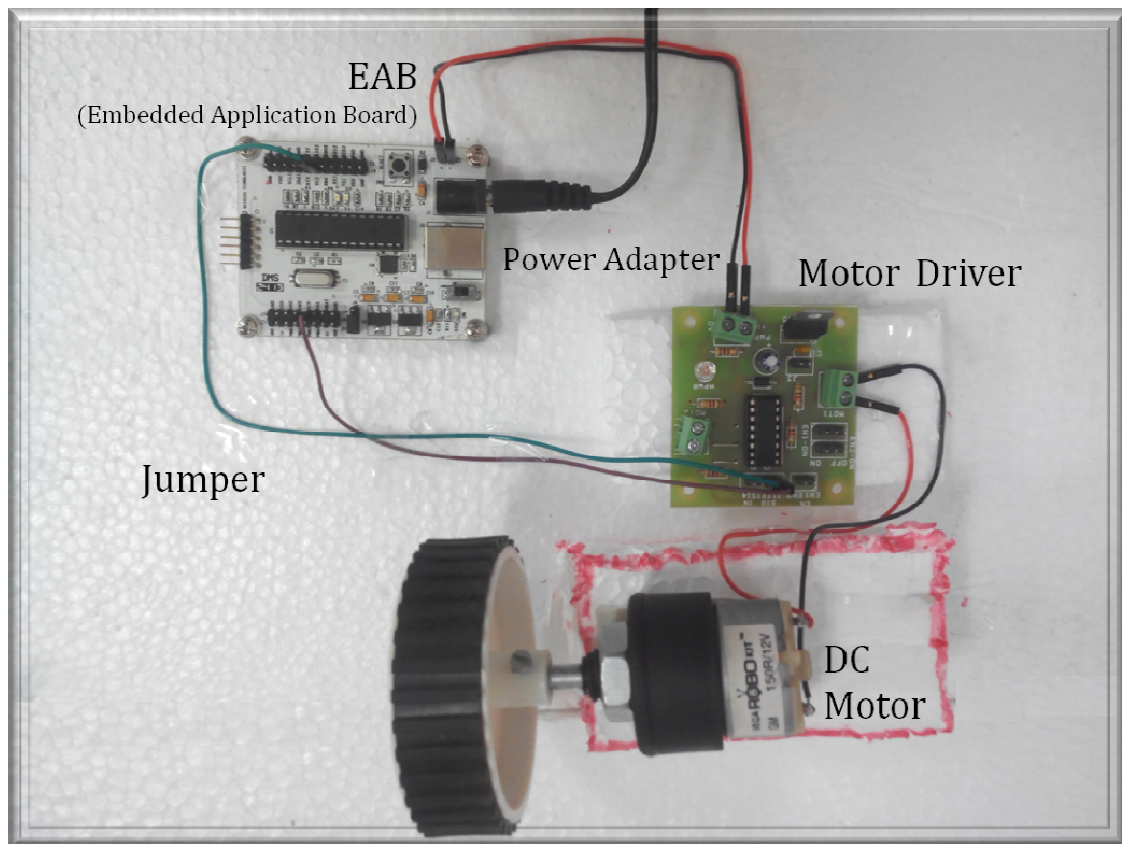
Application Notes

Connection Description

The RC0 and RC5 pin of EAB is connected to the IN1 and IN2 pin of Motor driver circuit i.e. H-Bridge Circuit. Based on RC0 and RC5 pin status, the DC Motor will rotate. The two terminals of the motor are connected to the O/P1 and O/P2 pin of H-Bridge circuit. The

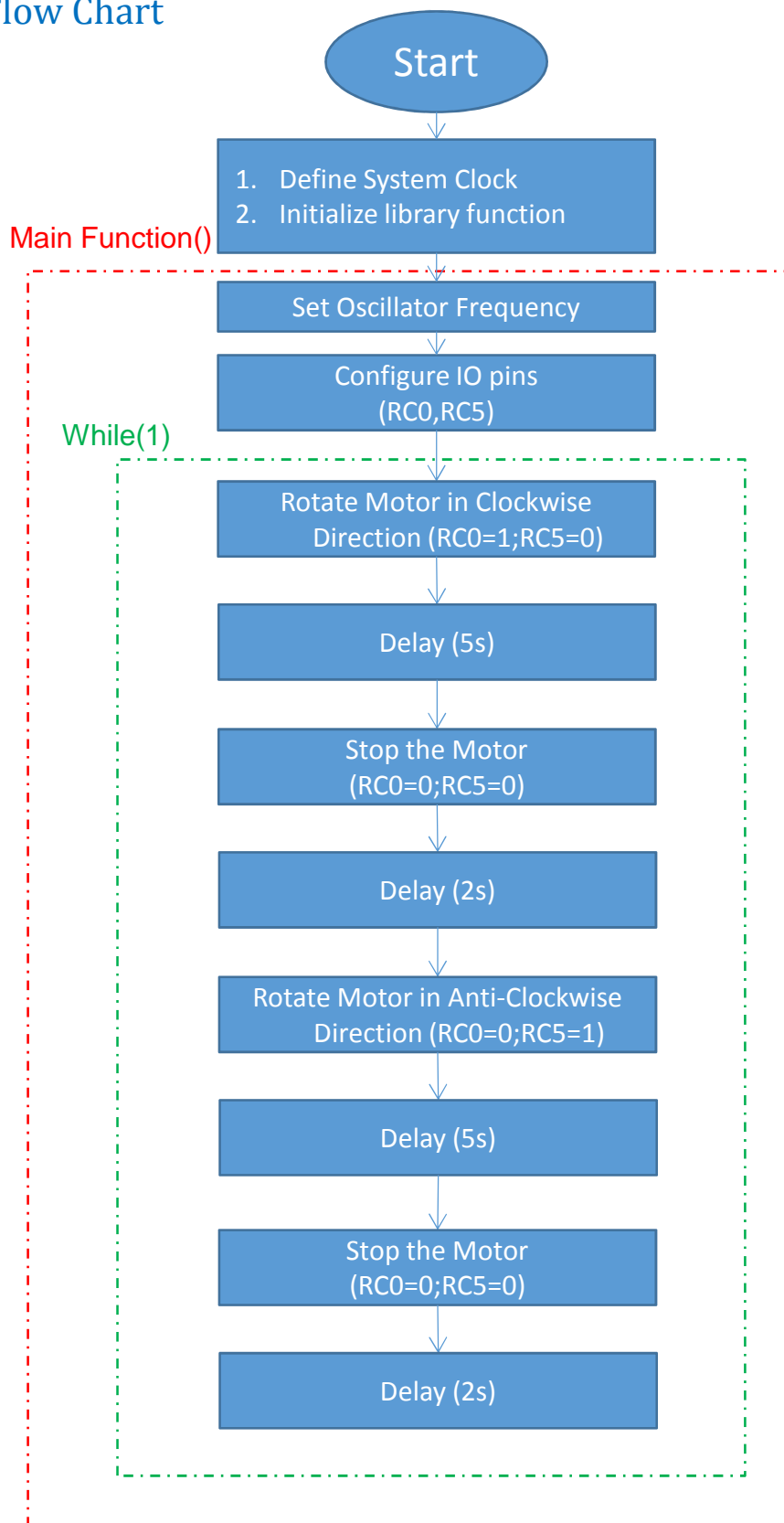
DC Adapter is Connected to the 7-12V power supply. Jumpers wires are used to connect the one end of the Adapter and 12V pin and Ground pin of H-Bridge Circuit. The EAB is also connected with Ground pin for a common ground in the entire circuit connection.

Note: Any GPIO pin can be used for driving a motor. Set the particular GPIO pin to output and provide a high/low signal to the pin.



Application Notes

Code Flow Chart



Application Notes

Source Code

The Source code shown below is the firmware to be flashed in the microcontroller of the Embedded Application Board. The Source code is commented for better understanding of the user.

Refer to the EAB User Guide and the EAB Programming Guide for more details on how to Flash(burn) program(Source Code) in the microcontroller of Embedded Application Board.

```
#define SYS_CLK 8000000                                //Required for delay macro functions
                                                         //Default 1MHZ, else change as per configuration

/** INCLUDE STANDARD HEADERS & LIBRARY **/
#include <stdio.h>
#include <stdlib.h>

#include "EAB_Library.h"

/** GLOBAL VARIABLES ***/

/*-----*/
void main(void)
{
    /** INTITALIZE OSCILLATOR, PERIPHERAL & HARDWARE **/
    Oscillator.SetFreq_8MHZ();                          //Select system clock at 8 MHz

    PinDigitalOut(RC0);                                //RC0 as digital output
    PinDigitalOut(RC5);                                //RC5 as digital output

    /** PLACE THE REPETITIVE TASKS IN THIS LOOP **/
    while(1)
    {
        PinWrite.RC0=HIGH;                              //Set RC0 output High
        PinWrite.RC5=LOW;                                //Set RC5 output Low

        DelayMillisec(5000);                            //wait for 5 sec

        PinWrite.RC0=LOW;                                //Set RC0 output Low
        PinWrite.RC5=LOW;                                //Set RC5 output Low

        DelayMillisec(2000);                            //wait for 2 sec
    }
}
```

Application Notes

```
PinWrite.RC0=LOW;           //Set RC0 output Low
PinWrite.RC5=HIGH;          //Set RC5 output High

DelayMillisec(5000);        //wait for 5 sec

PinWrite.RC0=LOW;           //Set RC0 output Low
PinWrite.RC5=LOW;           //Set RC5 output Low

DelayMillisec(2000);        //wait for 2 sec
}
}
/*-----End Of Code-----*/
```

Output

The Source Code is written to rotate the motor in clockwise and anti-clockwise direction. As soon as you switched ON the system, the motor will start rotating in clockwise direction, for 5sec. Then it will stop for 2sec and start rotating in anti-clockwise direction. Then again stops for 2sec. This process will continue till the system is switched ON.

Applications

The controlled rotation of DC Motor has various applications. This controlled rotation can be used to:

- ✓ Control Robotic Motion
- ✓ Security Gate Systems
- ✓ Industrial Applications