L293d motor driver manual

From Wiki SunFounder, L293D is a monolithic integrated, high-voltage, high-current, 4-channel driver. Basically this means that with this chip you can use the engines and power sources up to 16 volts, these are some pretty large engines and the chip can deliver a maximum current of 600mA to the channel, the L293D chip is also what is known as the type of H-Bridge. The H-Bridge is usually an electrical circuit that allows voltage to be applied through the load in any direction to the exit, such as the engine. The schematic chart looks like this: the L293D L293D is a four-seater high current semi-H driver. It is designed to provide bidirectional current drive up to 600 mA at a voltage of 4.5 B to 36 B. Both devices are designed to drive inductive loads such as relays, solenoids, DC and bipolar jet engines, as well as other high-voltage/high voltage loads in positive-offer applications. All inputs are compatible with TTL. Each outlet is a full totem-pole drive chain, with a Darlington transistor sink and a pseudo-Darlington source. Drivers are included in the pairs, with drivers 1 and 2 included 1.2EN and drivers 3 and 4 included 3.4EN. At high entry, the associated drivers are turned on, and their exits are active and are in the input phase. When inputs are low, these drivers are disconnected and their exits are turned off and are at high speed. With proper data input, each pair of drivers forms a full-H (or bridge) reverse drive suitable for selenoid or motor applications. Pin Function Pin Title Feature 1 Enable1.2 Turn on the pin to control the 1.2 Driver 2 Entry 1A Entry to control 1Y 3 Exit 1Y Exit, Engine Connection 4 GND Land and Heat Sink 5 GND Land and Heat Sink 6 Exit 2Y Exit, Engine Connection 7 Entry 2A Entry to Control 2Y 8 Vcc2 Power Exit Voltage 9 Enable3.4 Turn on the pin to control 3.4 drivers 10 Entry 3A Entry to control 3Y 11 Exit 3Y Exit 3Y Exit, Engine connection 12 GND Land and heat sink 13 GND Land and heat sink 14 Exit 4Y Exit, connection to motor 15 Entry 4A Entrance to control 4Y 16 Vcc1 Voltage Supply (7 max) Features Wide voltage range: 4.5 V to 36 v Separate Entry-Logic Supplies Internal ESD Heat Shutdown High Noise-Immunity Entry Current 600 mA to Channel Peak Exit Current 1.2 A On Channel 74HC595 74HC595 consists of 8-bit register change and register storage with three states of parallel exits. It converts serial input into a parallel outlet, so you can save MCU IO ports. The 74HC595 is widely used to refer to multipathic LEDs and drive multi-layered segment displays. The three states refers to the fact that you can set weekend pins as low or high impedance. If you're fixing the data, the instant output won't be affected during the switch; With the release of the data, you can cascade 74HC595s easier. Pin Without Name Function 1 x 0 - 7 8-bit parallel parallel Weekend pins capable of controlling 8 LEDs or 8 pins of a 7-segment display directly. 2 q7' Series output pin, connected to the DS another 74HC595 to connect several 74HC595s in the series 3 MR Reset pin, active at a low level; here it is directly related to 5V. 4 SHcp Time sequence of register change input. At the upward edge, data in the shift register is consistently moved by one bit, i.e. the data in the first quarter go to the second quarter and so on. While on the falling edge, the data in the shift register remain the same. 5 STcp Storage Register Time. At the upward edge, the data in the shift register is transferred to the memory register. 6 OE Exit include contact, active low level 7 DS Serial Log Data Contact 8 VCC Positive Power Voltage 9 GND Ground Features 8-Bit Serial-In, Parallel-Out Shift Wide range of operating voltage from 2 V to 6 v High-Current 3-state outputs can result in 15 LSTTL loads of low energy consumption, 80-A Max ICC Typical tpd No. 13 ns Low Input 1 Shift Register has a direct clear resource L293D_datasheet 74HC595 sheet of data L293D_Module_test_code 8 October 2017 - 0 Comments Motor Driver IC L293D Pinout Click on the image to zoom it Pin Number Pin Name Description 1 Turn 1.2 This pin allows entry contact entry 1 (2) and Entrance 2 (7) 2 Entrance 1 Directly controls the output of 1 pin. Controlled by digital circuits 3 Output 1, connected to one end of the Pins Motor 1 4 Ground Ground, connected to the ground circuit (0V) 5 terrestrial pins connected to the ground chain (0V) 6 Exit 2 Connected to the other end Of Motor 1 7 Input 2 Directly manages the Output 2 pin. Controlled by digital circuits 8 Vcc2 (Vs) Connected to the Voltage contact for running engines (4.5V to 36V) 9 Turn 3.4 This pin allows entry pin Entry 3 (10) and Entrance 4 (15) 10 Entrance 3 Directly controls the output of 3 pins. The 11 Output 3 digital circuits, connected to one end of the Motor 2 12 Ground Ground, are connected to ground pins (0V) 14 Output 4 connected to the other end of Motor 2 15 Input 4 Directly controls the Output 4 pin. The 16 Vcc2 (Vss) digitally controlled circuit, connected to 5V to enable IC functions, can be used to run two DC engines with the same IC. Speed and direction of control possible motor voltage Vcc2 (Vs): 4.5V to 36V Maximum engine peak: 1.2A Maximum continuous motor current: 600mA Vcc1 voltage (against): 4.5V to 7V Transition time: 300ns (at 5Vand 24V) Automatic thermal shutdown in available 16-pin DIP, DIP TSSOP, SOIC Packages Note: Full technical information can be found on the L293D data sheet given at the end of this page. L293D Double Equivalent IC LB1909MC, SN754410, ULN2003 Where to use L293D IC L293D is a popular 16-Pin Motor Driver IC. As the name implies, it is mainly used to drive engines. One L293D IC is capable of operating with two DC engines on the At the same time; also the direction of these two engines can be controlled independently. So if you have engines that have an operating voltage of less than 36V and running a current of less than 600mA that must be controlled by digital circuits like Op-Amp, 555 timers, digital gates or even Micron commercials like Arduino, PIC, ARM etc this IC will be the right choice for you. How to use the L293D Motor Driver IC Using this L293D driver ic is very simple. IC works on the principle of Half H-Bridge, let's not delve into what H-Bridge means, but now just know that the H bridge is created, which is used to run engines both clockwise and counterclockwise. As previously said this IC is capable of running two engines in any direction at the same time, the scheme to achieve the same is shown below. All ground pins must be grounded. There are two power pins for this IC, one Vss (Vcc1), which provides voltage for IC to work, It should be connected to 5V. Another Vs (Vcc2) that provides voltage for the engines to run, based on the specification of your engine you can connect this pin anywhere between 4.5V to 36V, here I'm hooked up to 12V. Since in most cases we will use both engines, both pins are high by default, connecting to the delivery of 5V. Input 1.2 input pins are used to control engine 1 and input pins 3.4 are used to control Motor 2. The input pins are connected to any digital circuit or microcontroller to control the speed and direction of the engine. You can switch input pins based on the next table to control the engine. Entrance 1 - HIGH (5v) Exit 1 - HIGH Motor 1 rotates in Hours wise Destination Entry 2 - LOW (0v) Exit 2 - LOW Input 3 - HIGH (5v) Exit 1 - HIGH Motor 2 rotates in Hours of Wise Direction Entry 4 - LOW (0v) Exit 2 1 2 - Low Input 1 - LOW (0v) Exit 1 - LOW Motor 1 Spins in Anti-Clock Wise Destination Entry 2 - HIGH (5v) Exit 2 - HIGH Input 3 - LOW (0v) Exit 1 - LOW Motor 2 rotates in Anti-Watch Wise Direction Entry 4 HIGH (5v) Exit 2 - HIGH Input 1 - HIGH (5v) Exit 1 - HIGH Motor 1 Remains Still Entry 2 - HIGH (5v) Exit 2 (5v) Exit 2 - HIGH App, Used to drive high current motors using digital circuits can be used to drive Stepper engines High current LED can be controlled by relay Driver module (Latching Relay possible) 2D Model L293D (PDIP) Engine driver IC L293D Datasheet You can read this and other amazing tutorials on the official electroPeakOverview websiteIn this tutorial You will learn how to drive DC, stepper and servo using the Arduino L293D driver's shield What do you learnGeneral information about DC MotorsIntroduction to the L293D L293D engine DC, Servo and Stepper MotorsMotors - DriversMotors are an integral part of many robotics and electronics projects and have different types that can be used depending on their application. Here is some information about different types of engines: DC Motors: DC engine is the most common type of engine that can be used for many applications. We can see this in remote control cars, robots, etc. It will start rolling, applying the proper voltage to its ends and change its direction by switching the polarity of the voltage. The speed of the dc engines is directly controlled by the applied voltage. When the voltage level is less than the maximum voltage allowed, the speed will decrease. Stepper Motors: In some projects, such as 3D printers, scanners and CNC machines, we need to know exactly the steps of the engine rotation. In these cases, we use Stepper engines. Stepper Motor is an electric motor that divides full rotation into several equal steps. The amount of rotation per step is determined by the engine structure. These engines have very high accuracy. Servo Motors: Servo engine is a simple DC engine with state control service. With the help of the servo, you will be able to control the amount of shaft rotation and move it to a certain position. They usually have a small dimension and are the best choice for robotic weapons. But we can't connect these engines to microcontrollers or controllers like Arduino directly in order to control them, as they may need more toy than a microcontroller can control, so we need drivers. The driver is an interface scheme between the engine and the control unit to facilitate driving. Discs come in different types. In this instruction you will learn how to work on the L293D motor shield. The L293D Shield is a driver board based on the L293 IC, which can control 4 DC engines and 2 stepper or Servo engines at the same time. Each channel of this module has a maximum current of 1.2A and does not work if the voltage is greater than 25v or less than 4.5v. So be careful with choosing the right engine according to its nominal voltage and tone. For more information on the features of this shield, let's mention compatibility with Arduini UNO and MEGA, electromagnetic and thermal protection of the engine and circuit disconnection in case of an unconventional voltage increase. How to use arduino L293D motorcycle shield driver? When using this shield 6 analog pins (which can be used as digital contacts too), Contact 2 and Contact 13 arduino are free. In the case of the Servo engine, pins 9, 10, 2 are used. If you use the engine Current, pin11 for #1, pin3 for #2, pin5 for #3, pin6 for #4 and pins 4, 7, 8 and 12 for all of them in use. In the case of a Stepper engine, pins 11 and 3 for #1, pins 5 and 6 for #2 and pins 4, 7, 8 and 12 for all of them are in use. You can use free contacts by wired connections. If you apply a separate power supply in Arduino and shield, do make you turned off the jumper on the shield. Driving DC Motor includes in the library you need to control the engine: AF_DCMotor engine (1, MOTOR12_64KHZ) Definition of the dc engine you use. The first argument means the number of engines in the shield, and the second - the frequency of engine speed control. The second argument may be MOTOR12_2KHZ, MOTOR12_8KHZ, MOTOR12_8KHZ and MOTOR12_8KHZ for engines 1 and 2, as well as MOTOR12_8KHZ, MOTOR12_8KHZ and MOTOR12_8KHZ engines Nos. 3 and 4. And if it doesn't stop, it will be 1KH by default. Determining engine speed. It can be installed from 0 to 255.void loops () - motor.run (FORWARD); Delay (1000); motor.run (BACKWARD); Delay (1000); motor.run (RELEASE); Delay (1000); Motor.run () determines the state of engine movement. Status can be FORWARD, BACKWARD and RELEASE. RELEASE is the same as the brake, but it may take some time until the engine stops completely. Recommended solder 100nF capacitor for each engine pin to reduce noise. Driving Servo MotorArduino IDE Library and examples are suitable for driving Servo motor.#include Library of the zlt.h'gt; you need to drive Servo MotorServo myservo; Definition of a Servo motor object. void installation () - myservo.attach (9); Identify the pin that connects to Servo. (pin 9 for #1 and pin 10 for servo #2) void loop - myservo.write (val); Delay (15); Determine the amount of engine rotation. 0 to 360 or 0 to 180 depending on engine type. Stepper Motor Driving includes the identification of the library needed AF_Stepper (48, 2); Identify stepper motor object. The first argument is the resolution of the engine step. (For example, if your engine has an accuracy of 7.5 deg/step, it means that the engine step resolution. shield.void () - motor.setSpeed (10); motor.onestep (FORWARD, SINGLE); motor.release (); delay (1000); - void loop () - motor.step (100, FORWARD, SINGLE); motor.step (100, BACKWARD, SINGLE); motor.step (100, FORWARD, DOUBLE); BACKWARD, DOUBLE); motor.step (100, FORWARD, INTERLEAVE); motor.step (100, BACKWARD, INTERLEAVE); motor.step (100, FORWARD, MICROSTEP); motor.step.step (100, MICROSTEP); Determine engine speed at rpm The first argument is the number of steps needed to move, the second is to determine the direction (FORWARD or BACKWARD), and the third argument determines the type of steps: SINGLE (Activate coils), DOUBLE (Activate two coils for greater torque), INTERLEAVED (Continuous change in the number of coils from one to two and vice versa to double the accuracy of accuracy However, in this case, the speed is twice) In this case, the torque below). By default, when the engine stops moving, it retains its status. You should use the function of the AFMotor.h.'s release the engine. If you find this tutorial useful and interesting, please like us on Facebook. Facebook.