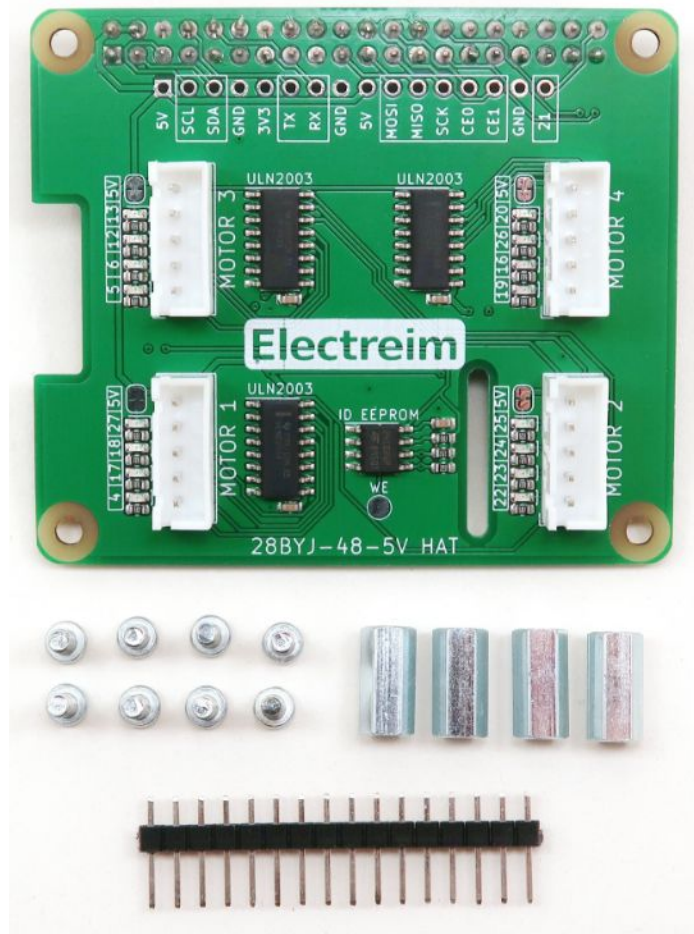


28BYJ-48-5V Raspberry Pi Stepper Motor HAT Datasheet



Author: Ethan Opheim

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Electreim Electronics LLC

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General Description

The Raspberry Pi stepper HAT uses three ULN2003A driver ICs to power 5V 28BYJ-48 stepper motors directly from the Raspberry Pi GPIO pins. The 28BYJ-48 5V stepper motors get directly plugged into the white JST connectors on the stepper HAT. The HAT also has a 16 pin header the can be used to easily solder a standard pin header or directly solder wires to external hardware. The 16 pin header easily marks the pins for I2C, UART, and SPI. There is also an EEPROM chip that is used by the Raspberry Pi to get the HAT board info directly from the stepper HAT.

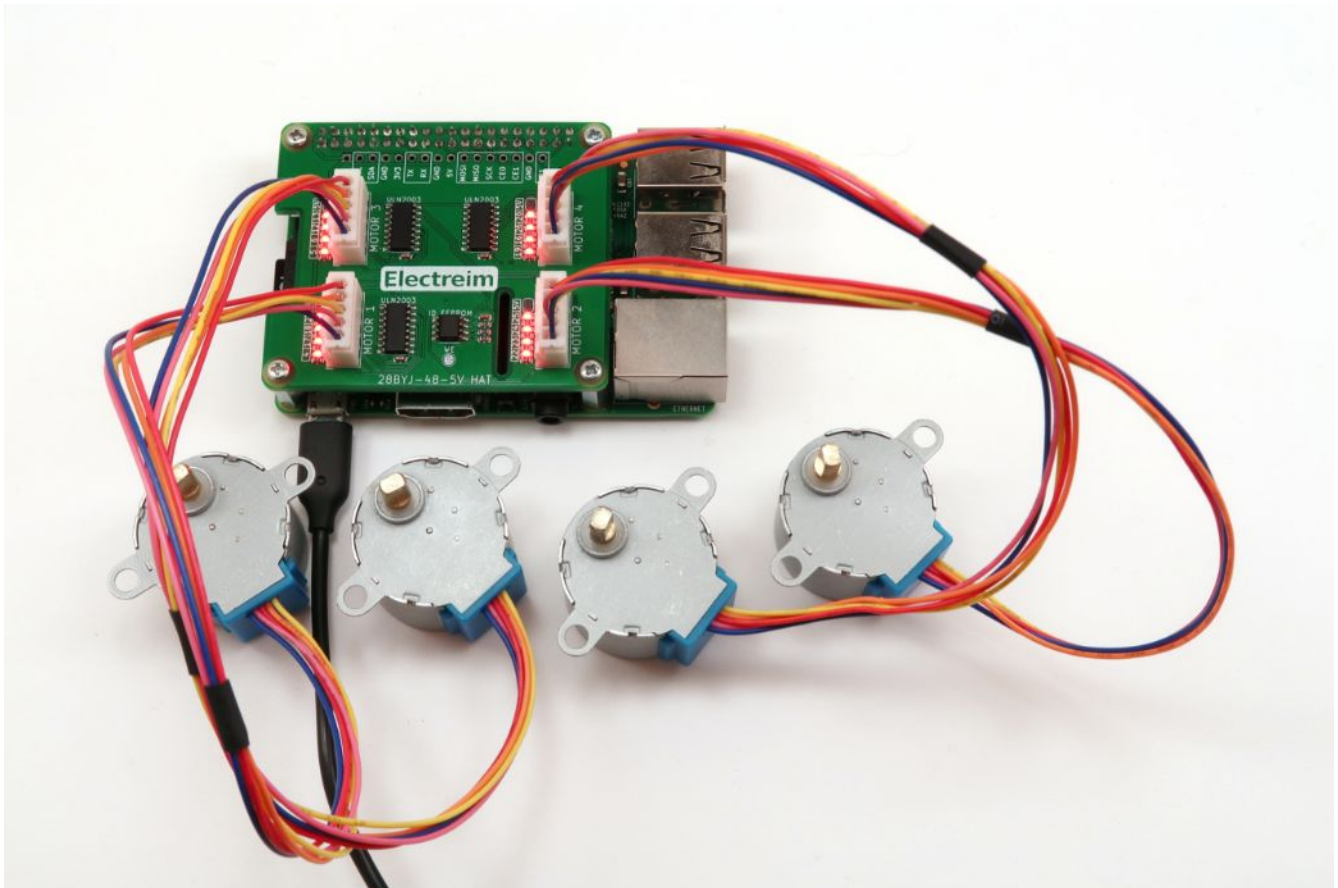


Figure 1: Stepper HAT driving four 28BYJ-48-5V stepper motors.

Pinout

Motor 4	
28BYJ-48 Motor Coil	GPIO
1	19
2	16
3	26
4	20
5V	5V

Motor 3	
28BYJ-48 Motor Coil	GPIO
1	5
2	6
3	12
4	13
5V	5V

Motor 1	
28BYJ-48 Motor Coil	GPIO
1	4
2	17
3	18
4	27
5V	5V

Motor 2	
28BYJ-48 Motor Coil	GPIO
1	22
2	23
3	24
4	25
5V	5V

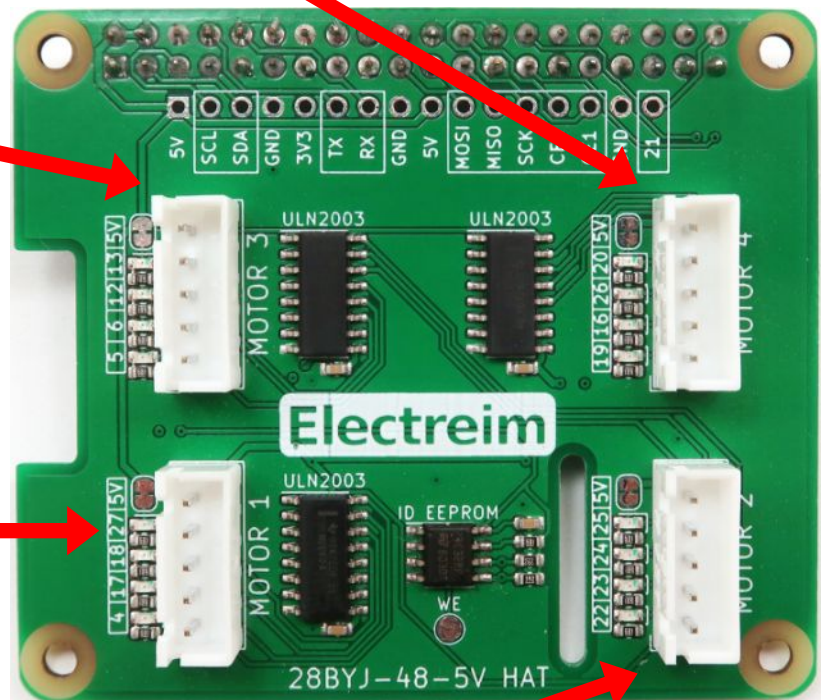


Figure 2: JST stepper connectors.

Pin Header

+5V	5V	POWER
GPIO3	SCL	I2C
GPIO2	SDA	
GND	GND	POWER
+3.3V	3V3	
GPIO14	TX	SERIAL
GPIO15	RX	
GND	GND	POWER
+5V	5V	
GPIO10	MOSI	SPI
GPIO9	MISO	
GPIO11	SCK	
GPIO8	CE0	
GPIO7	CE1	
GND	GND	POWER
GPIO21	21	GPIO



Disable LED

There are four red LEDs in front of each motor connector which indicate the current coil of the motor being powered. The LEDs are enabled by default on every stepper HAT. The LEDs can be easily disabled for each motor connector by carefully cutting the connector between the jumper pads. To enable the LEDs, solder a small bridge on the jumper pads to connect them together.

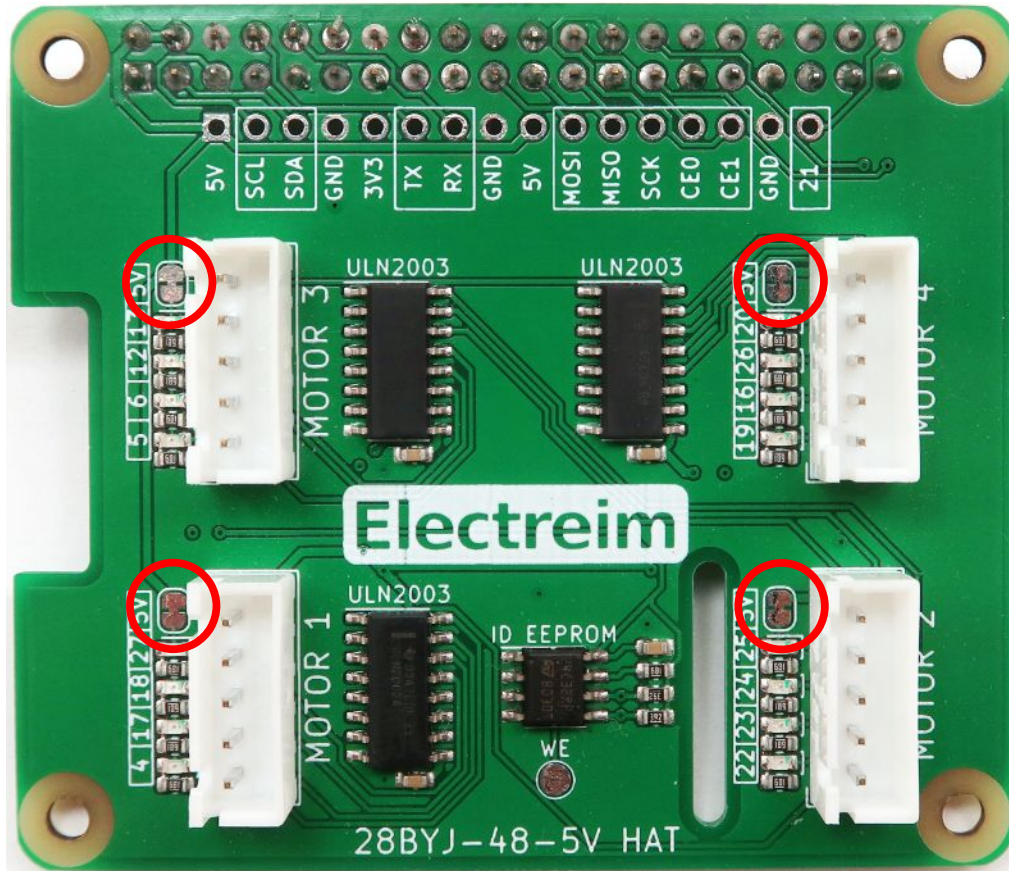


Figure 3: LED enable jumper pads.

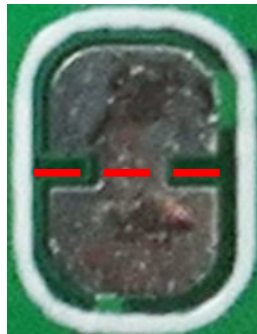


Figure 4: Cut trace to disable LEDs.

ID EEPROM

The stepper HAT comes with an EEPROM chip that is used by the Raspberry Pi to get device information from the stepper HAT. The stepper HAT does not require any firmware or drivers to work as the HAT is directly controlled through the GPIO. The EEPROM only contains information about the board such as the name, company, and version. If the EEPROM needs to be written to, write access can be enabled by connecting the EEPROM test pad (WE) on the front of the HAT to ground before and during a write cycle. Updating the EEPROM is not necessary unless the data gets corrupted or there is a firmware update.



Figure 5: EEPROM WE pad.

Schematic

